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PLAYING WITH MONETARY FIRE

By Professor Tim Congdon CBE

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About the author

Professor Tim Congdon is one of Britain's leading economic commentators and the founder of Lombard Street Research. Between 1992 and 1997 he was a member of the Treasury Panel of Independent Forecasters (the so-called "wise men") which advised the Chancellor of the Exchequer on economic policy. In 1997 he was awarded the CBE for services to economic debate. Tim is currently a member of the Shadow Monetary Policy Committee. His opinion and comments are frequently reported in the media and he is the author of a number of books - the latest being *Keynes, the Keynesians and Monetarism*.

Preface

The three years from mid-2004 saw a clear upturn in the rate of money supply growth in the UK and indeed in many other countries. They were also marked in the UK by buoyancy in asset prices, above-trend growth in demand and a rise in inflation. For the first time since the current regime of inflation targets was introduced, the increase in the consumer price index in the year to March 2007 exceeded the official 2 per cent target by more than 1 per cent.

The association between money growth and inflation in the current cycle recalls similar patterns in previous cycles, notably those in the early 1970s ('the Heath/Barber boom') and late 1980s ('the Lawson boom'). Fortunately, the rises in money growth and inflation were much more subdued in the latest cycle than in the earlier episodes. But much commentary insists that there is no relationship between money and inflation, and even that the rate of money growth has no wider message for the economy and is not worth tracking at all. The purpose of the two essays in this booklet is to show that money and inflation are related, and that the rate of money growth is of fundamental macroeconomic significance.

The first essay is published here for the first time. (A somewhat different version appeared in the Special Papers series from the Financial Markets Group at the London School of Economics.) It sets out both a summary of the theory on money and inflation, and a review of the facts of the relationships in the UK between the growth rates of money on the hand, and the rates of increase in national expenditure and the price level on the other since 1963. (The 1963 starting point reflects the inception of detailed monetary data, the compilation of which had been recommended in the 1959 report from the Radcliffe Committee.) The second essay was given, in a slightly different form, as part of my evidence to the House of Lords' Economic Affairs Committee in late 2006. It describes how a change in the quantity of money affects the equilibrium level of both asset prices and national income. It also discusses a number of misunderstandings which I come across repeatedly in debates on these matters. (The second essay appeared in *Report with Evidence* of the House of Lords' Select Committee on Economic Affairs, 18th December 2006, HL Paper 14. Incidentally, my evidence correctly warned – several months ahead of the event – of the high risk of above-target inflation and the implied need for higher interest rates.)

In the two essays the quantity of money is understood to consist of notes and bank deposits (including so-called 'time deposits'), and to be dominated nowadays by bank deposits. By implication, the relationships between money and inflation are in fact between bank deposits and inflation. In modern circumstances the statement 'the price level will increase if the growth rate of money is significantly above the trend growth rate of output' should be read as 'the price level will increase if the growth rate of bank deposits is significantly above the trend growth rate of output'. In my experience the focus on bank deposits surprises many people, particularly if they have not read widely in the subject. Nevertheless, it is a central outcome of a large body of traditional monetary theory developed by such names as Irving Fisher, John Maynard Keynes, Dennis Robertson, Milton Friedman and Harry Johnson. (In both the essays I set out an argument which justifies the particular attention I pay to an all-inclusive or 'broadly-defined' measure of money; in the second essay I also spend time attacking the doctrine – now widely adopted even in academic circles – that 'credit' is by itself the key variable in monetary analysis.)

The growth rate of bank deposits and, hence, the wider behaviour of the banking system have a pivotal role in macroeconomic fluctuations. The macroeconomic potency of events in the banking system has received further confirmation in recent months. Many observers have suggested that the recent banking crisis, which may have destroyed the specialist mortgage bank, Northern Rock, will lead to slower economic growth in 2008. If Northern Rock had indeed been unable to repay its depositors in full, the blow to financial confidence and consumer sentiment would undoubtedly have been severe.

The Northern Rock affair will have a major impact on 2008's macroeconomic numbers. A plunge in new mortgage credit and a sharp slowdown in money growth do seem likely. If so, the relevance of the banking system's behaviour to the economy will arise mostly because of the sort of effects analysed in these two essays, in both of which it is taken for granted that banks can honour their obligation to repay deposits at par. The shock to the economy would be far more drastic if a bank – or a group of banks with similar business patterns – were unable to meet this obligation. (It is sometimes said that the last serious UK banking run occurred in 1878, with the failure of a bank in Glasgow, but note that UK retail depositors – yes, UK retail depositors – did lose substantial amounts when the Bank of Credit and Commerce International failed in the 1990s. Nothing can be taken for granted in this subject.)

The Northern Rock crisis blew up very suddenly. It may now seem rather hypothetical to ask, 'what will happen to inflation in 2008, 2009 and 2010 if double-digit money growth persists?'. But the exercise is interesting even if it has been overtaken by the autumn 2007 banking crisis. In the two years to the first

quarter of 2007 the growth rate of the quantity of money was more than 6 per cent (i.e., 600 basis points) above the growth rate of nominal GDP. A probability analysis in the first essay shows that – on the basis of past experience – the likelihood of the ‘velocity of circulation’ falling by more than 6 per cent in two consecutive years is only about one in six. Further, the probability of the velocity of circulation falling by more than 6 per cent in three consecutive years is little better than one in ten, in four consecutive years about one in twelve and in five consecutive years one in 16. In other words, if the annual rate of money growth were to remain at about 12 per cent in 2008 and 2009, there is very high probability that the increase in nominal GDP would exceed 6 per cent. As the trend rate of output growth cannot be much above 2 ½ per cent, consumer inflation more than 1 per cent above the 2 per cent target would be almost inevitable.

In practice the banking crisis will lead to a sharp dip in money growth, at current interest rates. A halving of the amount of new bank lending between 2007 and 2008 looks plausible, as banks try to rebuild their liquidity (i.e., their balances at the Bank of England) and to improve their solvency (i.e., the ratio of capital to assets). The annual growth rate of the UK’s bank deposit total (i.e., M4, more or less) could fall to 5 per cent next year. (In terms of numbers, new bank lending by banks and building societies in the year to September 2007 came in total to over £240 billion, with rather less than half – about £110b. – being mortgages. In 2008 new bank lending is unlikely to exceed £150 billion and mortgages could well be under £80 billion. Some of the decline will be due to banks’ selling their mortgage books to non-banks, such as insurance companies.)

Ironically, the crisis will therefore help to achieve the slowdown in monetary growth that was an important item on the Bank of England’s agenda in early 2007. The Bank of England and the government were lucky that the upward blip on money growth since 2004 did not lead to an even more pronounced acceleration in inflation. But they were playing with fire.

Two points are clear from the events of autumn 2007 and the larger pattern of the current business cycle. First, the banks’ profitability and liquidity positions affect the growth rate of their balance sheets and deposit liabilities. Secondly, the growth rate of bank deposits is a basic determinant of macroeconomic outcomes. As both essays here remark, two of the most well-regarded and influential schools of modern macroeconomic thought, New Classical Economics and New Keynesianism, assert that money in the form of bank deposits and the banking system are virtually irrelevant to aggregate demand and the price level. This view is surely wrong. The two essays here are an appeal to members of the New Classical and New Keynesian schools, as well as to anyone involved in British economic policy-making, to check the facts and to reorganize their theories in the light of those facts.

Finally, on a more personal note, I would like to express my gratitude to Dan Lewis for his outstanding work in preparing this document and the Economic Research Council for their support in publishing it.

Tim Congdon CBE

Chapter 1: How does money growth affect inflation?

Introduction: high money growth since early 2005

Rapid expansion of money, on the broadly-defined M3 and M4 measures, preceded sharp rises in inflation in the mid-1970s and the late 1980s. The latest surge of money growth in the UK – with the M4 money measure showing an annual growth rate of over 10 per cent since early 2005 – has some resemblances to these earlier episodes and has stirred up old debates. As Martin Wolf remarked in his column in the *Financial Times* on 15th June 2007, 'Interpreting changes in the growth of the stock of broad money is difficult and, in the UK, extremely controversial'. Indeed, he felt that many economists 'suffered from a visceral unwillingness to accept that the broad money stock has any significance for inflation'.

Sceptics about the role of money in the inflationary process sometimes claim that the ratio of expenditure to money (also known as 'the velocity of circulation') can vary enormously. A celebrated statement on the subject was made in the Report of Lord Radcliffe's Committee on The Working of the Monetary System, which was agreed unanimously in 1959. The Committee's view was that 'we cannot find any reason for supposing, or any experience in monetary history indicating, that there is any limit to the velocity of circulation'.¹ The Radcliffe Report's hostility to a monetary account of inflation was countered by one of the earliest pamphlets from the Institute of Economic Affairs, *Not Unanimous*, edited by Arthur Seldon.² More recently a view not unlike Radcliffe's has been expressed by Patrick Minford. In his words, 'Velocity growth is all over the place'.³ Minford's apparent repudiation of a link between money and inflation is made the more noteworthy by the contrast with his position at the start of the Thatcher government, when he advocated monetary control to defeat inflation.⁴

So two questions need to be answered, 'are there general reasons why high money growth leads to rapid inflation?' and 'what in particular are the risks to future inflation implied by continued double-digit UK money growth?' The message of the analysis here will be that the desired ratio of money to income (i.e., the inverse of velocity) is a variable amenable to economic analysis, in just the same way as the desired ratio of any good or service to income. Its movements are therefore not arbitrary and erratic, and changes in velocity are not 'all over the place'. Finally, an examination of changes in the ratio of the UK's money to its nominal GDP in the 1971 – 2004 period will lead to a quantification of the risks of above-target inflation latent in continued high money growth.

The desired ratio of money to income: some theory

Central to economic analysis are the notions of supply and demand, and their representation in supply and demand 'curves' or 'schedules'. Quantity and price are determined in an individual market (partial equilibrium) by the intersection of supply and demand schedules for the product traded in that market; quantities and prices for the economy as a whole (general equilibrium) are determined when the supply and demand schedules for all products intersect. This is not the place for a disquisition on the role of equilibrium in economics, but – if the usefulness of supply-and-demand analysis is accepted – a few observations immediately become pertinent. First, monetary economics has appropriated the equilibrium idea by saying that national income is 'determined' (i.e., reached its equilibrium level) when the demand to hold money balances is equal to the supply of such balances. If the quantity of money is not equal to the demand to hold money, agents take steps (by altering their spending on goods and services, or rearranging their portfolios) to bring them into equality. They keep on doing this – with the resulting impacts on aggregate expenditure and the value of assets – until the quantity of money is equal to the demand to hold it.⁵

The characterisation of economy-wide monetary equilibrium as the successful coupling of money supply and demand ought to be no more controversial than any other kind of supply-and-demand analysis. Further, every demand schedule has two main terms, income and price. If economists agree that the demand for foreign holidays, socks or potatoes is a function of income and price, they should have no 'visceral unwillingness' to accept the proposition that the demand to hold money balances is also a

function of income and price. Once 'income' is an argument in an aggregate money demand function, it must be the case that the equilibrium level of national income changes with the quantity of money. The steps in the argument have the force of logical propositions. Admittedly, there is a little awkwardness in the notion of 'price' in the money demand function, but its replacement by some such phrase as 'expected rate of return relative to a competing assets' or 'the opportunity cost of holding money' ought to be adequate and unremarkable.

Why, then, are so many economists (and indeed non-economists) seemingly allergic to the theory that the quantity of money is basic to the determination of national income? In this essay three possible sources of Wolf's '*visceral unwillingness*' are identified. The first is a suspicion of any mono-causal account of national income determination. Should so much attention be paid to only one macroeconomic variable? Critics of monetary analysis might say that the economy consists of thousands of goods and services, and that an economist might just as well talk about the equilibrium condition in the market for holidays, socks or potatoes as vital to the determination of national income.⁶ Why is there all this fuss about money?

The answer here begins by highlighting one of money's distinctive features, its fixed nominal value. A note issued by the central bank is worth its stated value by law; a deposit in a bank is worth its nominal value because it is convertible at par into central bank notes. The nominal value of a note and the nominal value of money circulating inside the banking system do not change in the course of transactions. If the quantity of socks is doubled by an Act of God, and the number of feet is given, the nominal price of socks falls. If fewer package holidays are arranged because the *deus ex machina* of an airline pilots' strike, and the number of days in July and August is fixed, the nominal price of package holidays rises. But, if the quantity of money is halved or doubled by an Act of God (or indeed by the Prime Minister in cahoots with the Chancellor and the Governor of the Bank of England), and the quantity of goods is given, the nominal price of money does not rise or fall. It does not change, because – by its very definition – it cannot change.

The fixity of the price of money in nominal terms is essential in understanding why changes in the quantity of money cause changes in the price of non-money goods and services. A doubling of the quantity of money creates an 'excess supply of money' and violates equilibrium. Because equilibrium cannot be restored through a change in the nominal value of money, a rise in the prices of goods and services is necessary instead. A focus on money in discussions of economy-wide equilibrium is therefore justified by its distinctiveness as the system's numeraire.

But that is just the start. Not only is money special in having a fixed nominal value, it also in modern circumstances has the property that its quantity can be heavily influenced by 'the monetary authorities' (i.e., the central bank and the government). It is – to some degree – 'a policy variable'. Huge debates have arisen about whether bank deposits are under the direct control of the monetary authorities and whether the central bank should manage the quantity of its own liabilities (notes, the monetary base) or a rate of interest.⁷ There is no room here to pursue these debates, but the susceptibility of money to the influence of actions by the monetary authorities is not really in doubt. In short, money shares with non-money goods and services the characteristic that the quantity demanded (i.e., the quantity that agents wish to hold) is a function of income and price, but differs from them in that its nominal value is given and its quantity is subject to influence by policy-making bodies.

The widespread aversion to the mention of money may have a second source in the apparent ambiguity of the concept. According to a long-standing textbook convention, two groups of assets are amalgamated inside the single category of 'money'. These are, first, money issued by the central bank and held outside the banking system (i.e., notes and coin in circulation with the public), and, secondly, the deposit liabilities of the commercial banks. But notes and deposits are not the same thing. The value of notes is fixed by the legal tender laws. In principle, deposits are convertible into notes at par, but – if banks go bust – full redemption may not be possible. Some economists have emphasized the distinction between the two forms of money and suggested that they be given different names, with notes being called 'outside money' and deposits 'inside money'.⁸ Other have gone further and argued that macroeconomic analysis can be restricted to outside money.⁹ Eugene Fama at the University of Chicago has urged the conclusion 'that a competitive banking sector is largely a passive participant in the determination of a general equilibrium, with no special control over prices or real activity'.¹⁰ In other words, analysts do not need to bother themselves with banks and broad money when they make macroeconomic prognoses.

Practicing central bankers are suspicious of Fama's argument, since bank failures and declines in broad money have been conspicuous in periods of deflationary macroeconomic trauma (such as the Great Depression in the USA).¹¹ Nevertheless, Fama's position has had great influence in monetary

economics. When Minford asserted (as he did at a meeting of the Shadow Monetary Policy Committee in August 2007) that 'the various money supply definitions form part of an industrial equilibrium in the intermediary sector' and so need not figure in an assessment of the economic outlook, he is taking his cue from Fama.¹² In an earlier statement Minford was even more forthright, with the claim that 'though many deposits continue to be used in transactions through clearing systems, they cease to be money with a determinate demand, and become savings vehicles [like unit trust units] with an indeterminate demand'.¹³ Statements such as these provide background to the assertion that the ratio of broad money to income is 'all over the place'.

But Fama and Minford are wrong. Bank deposits and unit trust units are different assets with distinct characteristics, and banks are not at all like fund management groups. As a matter of routine unit trust units change in nominal value, whereas the nominal value of bank deposits does not. (The significance of this contrast should be evident from the earlier discussion.) Also basic is that bank deposits can be used to make transactions and are a medium of exchange, whereas unit trust units cannot generally be so used and are not a medium of exchange.¹⁴ The ability to give payment instructions against bank deposits enables their holders to reduce transactions costs. On the other hand, the expected rate of return on deposits is lower than that on unit trusts.

If bank deposits and unit trusts units were the only two financial assets, the equilibrium condition between them could be easily specified. It would be that money in the form of bank deposits is held in preference to unit trust units until the marginal expected reduction in transactions costs is equal to the marginal expected loss of return. Of course banks compete in order to provide the lowest bank charges and attract the most business. A key feature of the banks' own equilibrium condition is that the expected marginal cost of providing transactions services to depositors (i.e., investing in clearing infrastructure, employing staff to operate it and so on) be equal to the expected marginal revenue from the balance-sheet expansion due to deposit-taking (i.e., the excess of the interest received on assets over that paid on deposits).¹⁵ These are valid equilibrium conditions, in just the same way as those that specify the equivalence of the marginal utility of foreign holidays, socks and potatoes to their market price or the equivalence of the marginal cost of sock and potato production to their suppliers' marginal revenue. The demand function to describe the holding of bank deposits is just as 'determinate' as the demand function for holidays, socks and so on.

The third source of irritation with money may be the variety of functions that it serves and the resulting difficulties of analysis. Money is used in the flow of transactions in goods and services that constitute national expenditure in the current period, and forms part of the stock of assets that survives from period to period. The holding of money can therefore be rationalised in alternative ways, either as a 'transactions demand' or as an aspect of portfolio choice. Money held in portfolios is said to be for 'savings', in the sense that it contributes to the accumulation of financial assets. Asset accumulation and selection are often regarded as being at some distance from the determination of expenditure and income. So a common procedure is to include only notes and coin in circulation and sight deposits in 'money', because they are immediately available for transactions, and to exclude time deposits. By extension, 'transactions money' (or 'narrow money', which usually comes to much the same thing) is said to matter to the determination of aggregate demand, whereas 'savings money' (or 'broad money') does not.¹⁶ The effect is again to diminish the significance of commercial banks in macroeconomic discussion, particularly in those economies (such as the USA today) where time deposits have become several times larger than sight deposits. Some economists even make statements about the relationship between narrow money on the one hand, and both national income and asset prices on the other. Implicitly, they see sight deposits as playing a major role in portfolio decisions, and time deposits as an unwelcome and irrelevant guest in the proceedings.

The mistake here is to talk about the economy as if in terms of a general equilibrium, with the intention that every relevant category (money, goods, assets) is embraced, and yet to eliminate one major type of asset (i.e., time deposits). In truth the monetary assets in an economy consist of notes and coin, sight deposits and time deposits, and there are equilibrium relationships between all of these and goods and assets. The nearest alternative to a sight deposit is plainly a time deposit, not a good or an asset. To eliminate such deposits by assumption is to omit a relevant and potentially very important variable.¹⁷ Indeed, since nowadays time deposits are considerably larger than sight deposits in many nations, remarks on the relationship between 'money', in the sense of narrow money alone, and asset prices are likely to be misleading.

A further argument against the restriction of money to notes, coin and sight deposits is more complex, but perhaps more fundamental. Its punch line is that the standard account of the monetary determination of national income works properly only with an all-inclusive measure of money. As is familiar, the standard account posits a stable desired ratio of money to income and an initial position of

equilibrium. The equilibrium is then disturbed by a sudden increase in the quantity of money. Agents respond by a sequence of rounds of spending in which the excess supply of money is associated with excess demand for goods and causes a rise in prices until the original ratio of money to income is restored. The analysis turns on the premise that individual agents cannot change the aggregate quantity of money when they buy and sell goods and services. In Friedman's words, in the hypothetical situation under discussion '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'.¹⁸

But here is the rub. The premise of the invariance of aggregate money to individuals' transactions does not hold for a less-than-fully-inclusive money aggregate. The explanation is simple, that when agents switch sums between the different forms of money (for example, from a sight deposit to a time deposit) – when in other words they conduct money-into-money transactions – they change both the size of their own narrow money holdings and the aggregate quantity of narrow money. By contrast, the invariance premise does hold for an all-inclusive measure of money, because by definition money-into-money transactions are impossible for such a measure.¹⁹

In short, a large body of theory argues that the desired ratio of money to income is likely to be stable. The ratio may change over the long run, because of developments in technology, tastes and institutions. But at any one time – with technology, tastes and institutions given – a clear implication of the stability of the desired ratio of money to income is that large increases or decreases in the quantity of money alter the equilibrium level of national income. The stability of the desired money/income ratio should apply for any measure of money (i.e., of cash, narrow money and broad money). Nevertheless, an all-inclusive measure of money was the traditional focus of economists' analytical attention.²⁰ A strong argument can be made less-than-all-inclusive money measures are unconvincing if put to work in the standard account of the monetary determination of national income. The shift in American monetary economics towards regarding the monetary base as the only valid and interesting measure of 'money', and the related belittling of the macroeconomic significance of the banking system, are dangerous intellectual trends and need to be resisted.²¹

The desired ratio of money to income: some facts

So theory argues that money's velocity ought not to move 'all over the place'. What about the facts? Detailed UK monetary statistics were first prepared officially in 1963, following a recommendation in the Radcliffe Report. What do they say about the ratio of money to income?

The key numbers are easily summarised. In the 43 years from the second quarter of 1963 to Q2 2006 the M4 measure of money rose by 98.5 times at a compound annual rate of 11.3 per cent, while national output (more precisely, 'gross value added at basic prices, in current price terms') climbed by 40.6 times at a compound annual rate of 9.0 per cent. Critics of the monetary approach might use these numbers to question claims of a stable money/income ratio. It cannot be gainsaid that the ratio of money to national output rose substantially, by almost 2 ½ times, in the 43 years. But the four decades in question saw immense institutional upheaval in the banking system, because of computerisation, internationalisation, the removal of restrictions on bank lending, the intensification of competition and other developments. Given the scale of these technological and regulatory changes in the background, an increase of only just above 2 per cent a year in the ratio of money to national output is modest. More pointedly, the changes in both money and national output are an order of magnitude larger (almost 100 times and 40 times) than the change in the ratio of money to output.

Another way of looking at the facts is to divide the 43-year period into sub-periods (of three decades and one sub-period of 13 years) and to see whether high growth rates of money and national output are associated. The exercise is carried out in Table 1.1. While the increase in money is not identical to that in nominal GDP in any decade and while indeed the difference between the growth rates of money and nominal GDP varies significantly over time, the link between trends in money and nominal GDP is clear.

The decade to Q2 1983 saw the highest growth rates of money and nominal GDP, whereas the 13 years to Q2 2006 had the lowest growth rates of money and nominal GDP. Much more rigorous econometric tests have been conducted on many occasions and mostly confirm, if with a variety of technical qualifications, the validity of the relationship between money on the one hand and national income or output on the other.²²

Table 1.1 Growth of money and national output, 1963 - 2006 divided (roughly) by decade

Compound % annual growth rate in periods, according to Office for National Statistics website as at 1st August 2007.

		M4	GVA (i.e., national output)
Ten years to	Q2 1973	11.4	9.1
	Q2 1983	14.1	14.9
	Q2 1993	12.1	7.8
Thirteen years to	Q2 2006	8.4	5.9

Further insight is obtained by analysing the types of agent that were holding money over the 43-year period. Data are available in the UK, for all the 43 years at quarterly intervals, for the money holdings of

- 'the household sector' (predominantly individuals as such),
- non-financial corporations, and
- financial corporations other than banks

Their respective money holdings at the start and end of the period are given in Table 1.2. A number of comments arise.

First, the household sector was the largest holder of money at both the start and the end of the period. The critics might emphasize that households' money increased almost 90 times in the period under consideration, whereas national output was up just over 40 times. But the nature of people's money holdings changed dramatically in the four decades from the early 1960s. Because credit cards had not been introduced, note holdings – which of course paid no interest – were much larger relative to deposits than nowadays. (In April 1963 the estimated circulation of currency with the public was £2,201m, while the deposit liabilities of the UK banking sector were under £11,000m. Many of these deposits were in company hands.) Further, non-interest-bearing current accounts at the English clearing banks (£4,339m. at 17th April 1963) were larger than interest-bearing deposit accounts (£2,725m. at the same date).²³ By contrast, at the start of the 21st century individuals' holdings of deposits are many times larger than their holdings of notes, while the majority of deposit holdings are interest-bearing. (At Q2 2006 households' currency holdings were £35.4b., compared with sterling bank deposits of £616.2b. At the end of June 2006 the M4 money measure included £689.3b. of interest-bearing retail deposits, but only £53.5b. of non-interest-bearing bank deposits).²⁴ In short, whereas in the early 1960s non-interest-bearing money represented over two-thirds of all household money, nowadays such money is little more than 10 per cent of the household total. Because money has become a more attractive asset, it is – in equilibrium – larger relative to incomes and output than it was over 40 years ago. In fact, econometric analyses of the UK household sector's demand for money have routinely found it to be stable in recent decades.²⁵ Since individuals have been the most important single type of money holder since the early 1960s (and no doubt for much longer), this finding goes far to refute claims about the instability of money demand and the alleged unreliability of the relationship between money and income.

Table 1.2 Money holdings by type of agent, 1963 - 2006

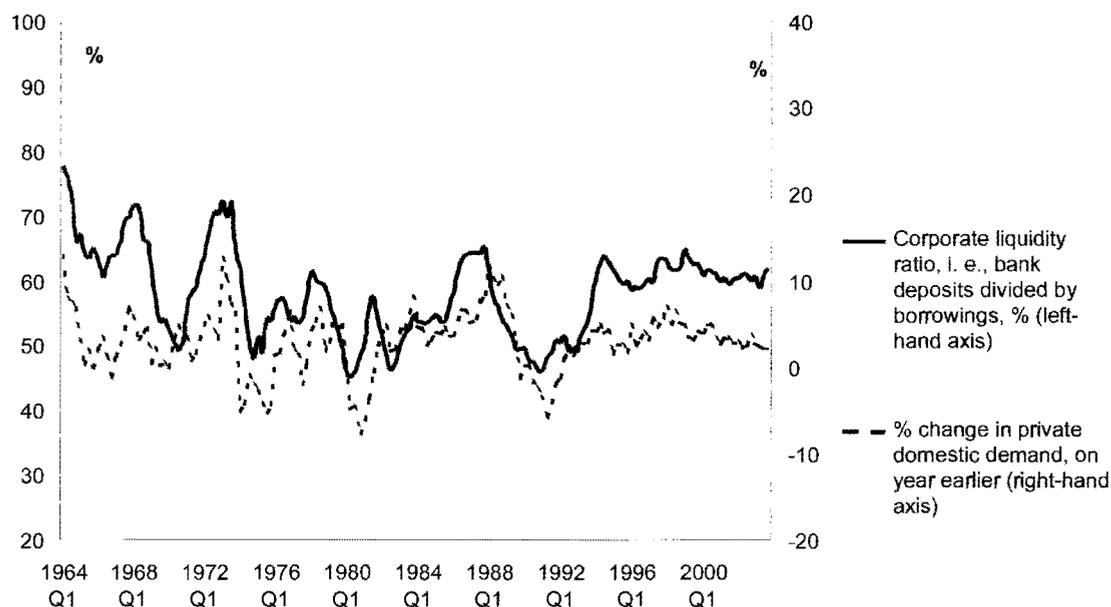
Figures are of M4 holdings at end of quarter, in £m., seasonally adjusted, according to Office for National Statistics website at 1st August 2007.

	1963 Q2	2006 Q2	2006 as multiple of 1963
Household sector	9,583	832,257	86.8
Non-financial corporations	4,324	209,723	48.5
Other financial institutions*	258	362,069	1403.4
National output			40.6

Secondly, non-financial corporations' money has grown over the 43-year period at virtually the same rate as national output. (The compound annual growth rate of their M4 balances was 9.4 per cent, while that of national output was 9.0 per cent.) The similarity of the growth rates is striking, particularly as the non-financial corporate sector – then deemed a high-priority part of the economy by officialdom because of its role in producing and exporting – was the least subject to credit restrictions in the 1960s. It has therefore gained least from subsequent financial liberalisation and its money holdings have not grown much faster than output. In a separate statistical exercise the author has shown that the ratio of non-

financial companies' bank borrowings to their deposits (or 'the corporate liquidity ratio') has changed remarkably little in the last four decades, while the corporate liquidity ratio has been correlated with the buoyancy of domestic demand.²⁶ (The relationship is depicted below in Chart 1.1.) This correlation may be interpreted as due to companies' actions in response to fluctuations in the adequacy of their money balances relative to a desired or 'equilibrium' level. As far as the UK corporate sector is concerned, the notion that money demand and velocity go 'all over the place' is untenable.

Chart 1.1 Corporate liquidity and domestic demand, 1964 – 2003



Thirdly, the suggestion might be made that the financial sector holds money to help in the timing of asset purchases and its activities have no direct bearing on national expenditure. (This is a mischievous suggestion, but let it stand for the moment.) If the financial sector is then excluded from the discussion, the result is to bring the growth rates of money and national output over the 43-year period much closer together. In mid-1963 and mid-2006 the combined money holdings of the household and non-financial corporate sectors were £13,907m. and £1,041,980m. respectively. The compound annual growth rate implied by these numbers is 10.6 per cent, compared with 11.3 per cent for total M4 and 9.0 per cent for national output. A gap between money and income growth remains, but it is not particularly large. Moreover, it can plausibly be attributed to the stimulus to the banks from liberalisation and intensifying competition. The banks reduced their margins and introduced more interest-bearing accounts, and as a result the equilibrium ratio of deposits to income increased substantially. Roughly speaking, for households and non-financial companies, the equilibrium ratio of money to income doubled in the 43 years from mid-1963 to mid-2006. A doubling was a big change, but – surely – it was overshadowed by the very much larger increases in money and income. Whereas 'velocity' in this sense altered by a factor of about two, money in the hands of households and companies soared by a factor of 75 and national output by a factor of over 40. An emphasis on the instability of velocity seems misplaced, to say the least. If the annual growth rate of money had been significantly lower, by say 5 per cent, a fair conjecture is that the inflation rate would have been reduced by a similar figure.

Finally, quite unlike households and companies, the financial sector appears to be seriously misbehaved. Over the 43-year period under review financial institutions' money holdings exploded by more than 1,400 times. The compound annual growth rate of almost 20 per cent was markedly higher than that of national output, while the variation in the growth rate from year to year was much higher than for households and companies. The claim that velocity can change 'without limit' appears to have worthwhile supporting evidence in this part of the economy.

The analysis of financial institutions' demand to hold money is indeed difficult, but it would be wrong to say that their monetary behaviour is a pure will o' the wisp. As already noted, the financial sector's task is to manage assets rather than to oversee the production of goods and services. An essential point to reiterate is that the last four decades have seen major moves towards the liberalisation of financial markets and a narrowing of banks' loan margins. Organisations which simultaneously borrow from

banks and hold money balances (and which are therefore particularly concerned that loan margins be as low as possible) have gained disproportionately from these developments. Typically these organisations, which include investment banks (labelled 'securities dealers' in the official data) and 'private banks' (i.e., companies that manage all the assets, and not just the bank deposits, of wealthy individuals and families), are in the financial sector. As such organisations have grown at a higher rate than national output, and as the UK has captured a significant share of rapidly-growing international financial services business in the last 40 years, the money balances of financial institutions have increased much faster than national output. This development has been understandable and is readily interpreted in economic terms. To some extent the impact of the boom in international financial services on UK money demand could be compared to shift in 'technology' or 'taste', which – as the earlier discussion recognised – could change the equilibrium ratio of money to income without affecting the validity of the underlying theory. If attention is focussed on institutions that have been active in the UK and relatively stable in structure over the whole of the last four decades, it turns out that money-holding behaviour is quite stable. For example, life insurance companies and pension funds have kept the ratio of their liquid assets (dominated by bank deposits) to their total assets consistently close to 4 per cent since the mid-1970s, even though their assets have climbed by more than 50 times since then.²⁷

While the analytical difficulties created by money held in the financial sector must be recognised, it is important to maintain a sense of perspective. The evidence seems to be that households, and to a lesser extent, non-financial companies keep their money holdings at all times fairly close to the 'equilibrium' levels suggested by the best-fitting money demand functions. As a result, when aggregate money growth fluctuates, the fluctuations in the money growth rates of the financial sector are amplified. When the annual growth rate of M4 as a whole rises from, say, 8 per cent to 12 per cent, the annual growth rate of financial sector increases from, say, 10 or 11 per cent to over 20 per cent. Conversely, when the annual growth rate of M4 falls from 8 per cent to 4 per cent, the annual growth rate of financial sector money falls from 10 or 11 per cent to virtually nil. Some financial institutions – of whom life insurance companies and pension funds are good examples – try to keep their money holdings quite stable relative to their total assets. It is therefore not surprising that fluctuations in M4 growth, and the associated swings in financial sector money holdings, are accompanied by marked oscillations in asset prices (i.e., share prices, house prices and the values of commercial property).²⁸ These oscillations are undoubtedly relevant to the behaviour of demand, output and employment, and – at a further remove – to movements in the price level and the inflation rate.

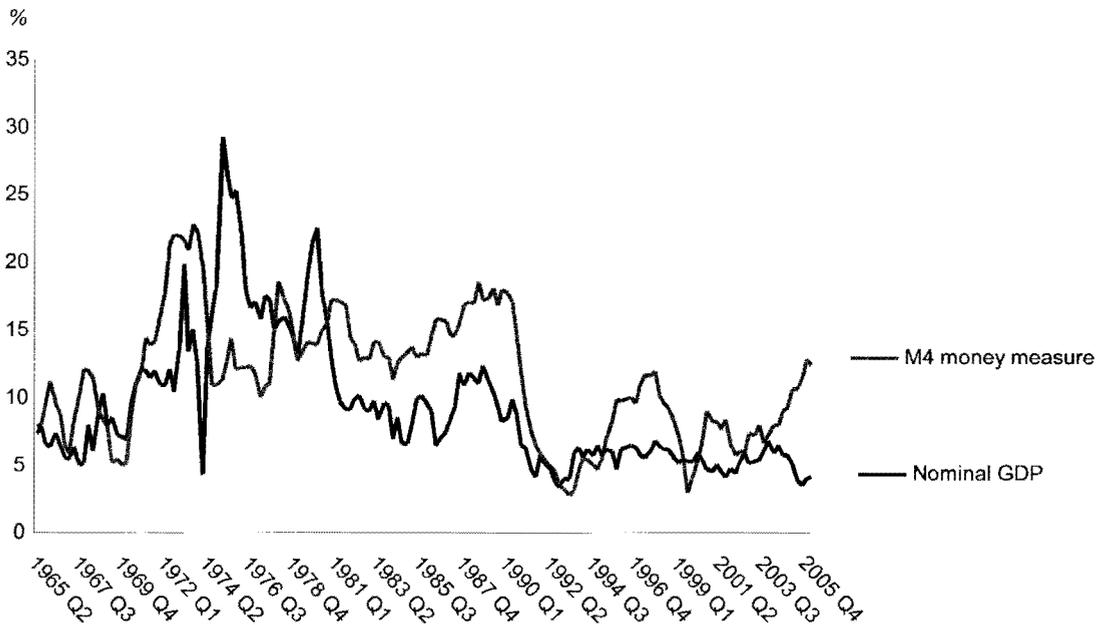
In summary, a sector-based analysis of money-holding behaviour yields valuable insights on top of those generated by the aggregate data. If particular sectors can be shown to have stable money-holding behaviour, that adds credibility to the claim that the combination of all the sectors – or, in other words, the private sector as a whole – should also have stable money-holding behaviour. A warning nevertheless needs to be inserted here about the notion of a money balance 'belonging' to a particular sector. While this notion is inescapable for analytical purposes and valid at any particular moment, it is invalid over the medium and long runs. Monetary data are a sequence of snapshots, but in the real world money balances are like the actors in a film and are constantly on the move. A particular 'sum of money' may be held by a financial institution on 1st January 2004, but by an industrial company on 23rd February 2005 (after the company has issued some shares and sold them to the financial institution) and a household on 18th October 2006 (after the company has paid some wages). People and companies are always seeking the right balance – the equilibrium value – of the money they hold relative to both their assets and their expenditure. Money therefore passes ceaselessly from agent to agent, and from sector to sector. Of course, this is one reason why the exclusion of financial sector money from the analysis is dangerous. A balance that was held by a life insurance company or a private equity fund at one date (when it is allegedly irrelevant to 'spending in the shops') may have circulated, after two or three rounds of transactions, to a balance in the hands of a household at another date (when the more stable money demand functions of the household sector argue that it is very relevant to expenditure).²⁹

Assessing the inflation risks

Claims that velocity moves 'all over the place' and that it is not subject to any upper limit have a definite statistical implication. This is that – if a series of values of the change in velocity is compiled – it will not conform to any known statistical distribution and will therefore resist a probability analysis. But, because of the availability of data in the UK since 1963, it is an easy matter to prepare such a series and to check whether it resembles one of the familiar statistical distributions.

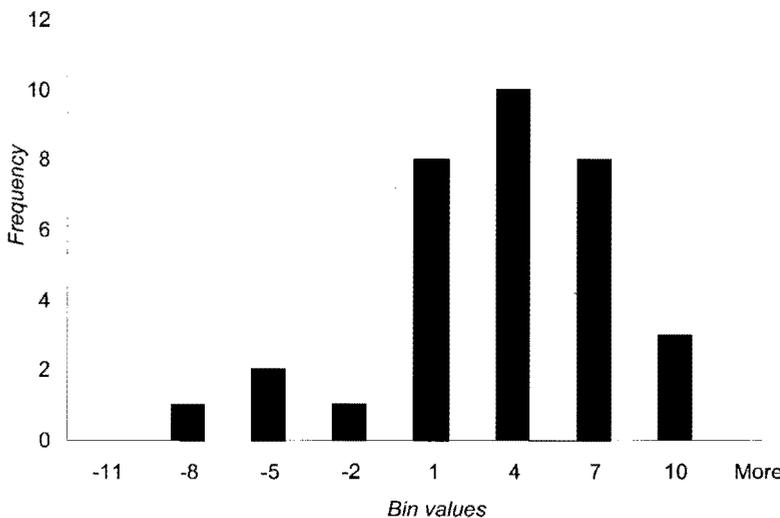
Chart 1.2: Money and nominal GDP, 1965 - 2001

Chart shows annual rates of changes in nominal GDP and M4 money, 1965 Q2 to 2006 Q1, quarterly data



The chart above gives the annual rates of increase in money and nominal GDP between 1965 and 2006, and a series for changes in velocity can be derived from the data underlying it. Visual inspection shows that the differences between the growth rates of money and nominal GDP were more pronounced after the early 1970s than before. As it happens, September 1971 saw a radical change in banking regulation, known as 'Competition and Credit Control', which liberalised bank credit and disturbed earlier relationships between money and macroeconomic data. The following analysis therefore relates to the period after the CCC reforms, as this is the period when some economists emphasized the 'breakdown' in demand-for-money functions and the supposed instability of velocity.³⁰ The period covered is in fact from the end of 1971 to the end of 2004, which contains 32 values for the change in velocity in the year to the fourth quarter (beginning with the annual change to Q4 1972). The histogram of these 32 values is shown below. The cut-off point of end-2004 has been chosen because it is the last full year before the current phase of double-digit annual rates of M4 growth.

Histogram 1: Histogram shows number of times the change in velocity fell within certain bins (value 1 to 4, 4 to 7, etc.) in the 1971 - 2004 period – Histogram relates to annual data



Whether the 32 values for the change in velocity constitute a recognised statistical distribution can be determined by a variety of tests, some of considerable complexity.³¹ However, in order to take the discussion forward, it is assumed that the 32 values conform to a normal distribution. (Again, visual inspection is sufficient to suggest that the assumption is not silly.) It is then a mechanical matter to estimate the probability that – in any one year – the change in velocity will fall between certain values. The mean value of the increase in the ratio of money to nominal GDP (i.e., the inverse of velocity) in the 32 years was almost exactly 2.0 per cent, with a standard deviation of 4.39. The probability that the increase in the ratio of money to GDP will lie between nil and 3.99 per cent (i.e., with values of the change in velocity that are 2 per cent either side of the mean) can then be calculated as over a third (34.8 per cent); the probability that the increase in the ratio of money to GDP will lie between 4.0 per cent and 5.99 per cent is 14.5 per cent; and the probability that the increase in the ratio of money to GDP will be more than 4 per cent above the 2.0 per cent mean (i.e., that it will be 6 per cent or more) is 18.1 per cent – or less than one in five. (The line showing probabilities of 6-per-cent-or-more increases in the ratio of money to GDP is highlighted in bold in the accompanying matrix.)

But the analysis can be taken further. Most economists who believe in the macroeconomic significance of money accept that the relationship between money and nominal GDP is rather imprecise in the short term and improves in the medium term. The greater reliability of the medium-term relationship can be assessed by taking two-year, three-year and so on moving averages of the change in velocity, and then conducting probability analyses with the resulting series of moving average values.³²

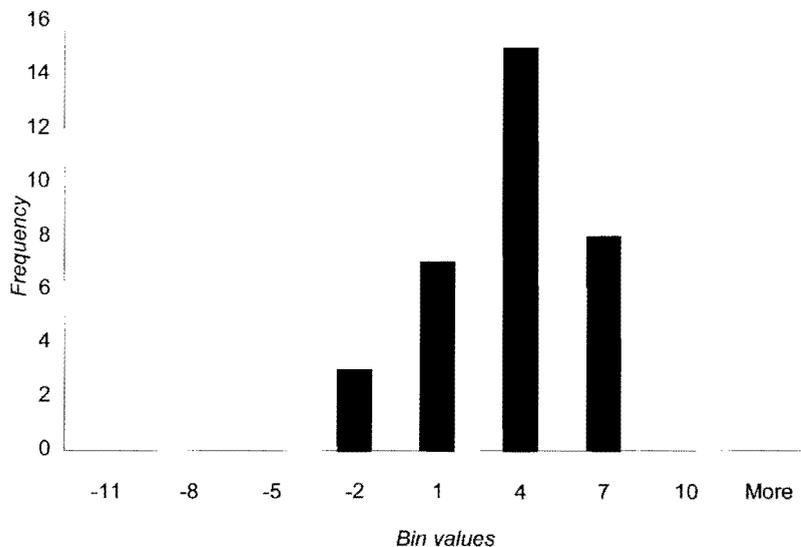
Table 1.3 Assessing probabilities of changes in the ratio of money to GDP

Ratio increases by % per annum:	Length of time under consideration				
	In any	In periods of successive years:			
	One year	Two years	Three years	Four years	Five years
Between 2.0% and 3.99%	17.4	21	22.9	25.8	26.9
Between 4.0% and 5.99%	14.5	14.5	15.8	15.8	15.3
Over 6.0%	18.1	14.5	11.3	8.4	6.2
Memorandum items:					
Mean value	2.01	2.01	1.99	1.95	1.9
Standard deviation	4.39	3.78	3.3	2.93	2.66

As would be expected, the standard deviation of the five-year moving average of the annual change in the ratio of money to GDP is appreciably lower than the standard deviation of the annual change itself. As a result, the probability of extreme outcomes is reduced. The likelihood that the ratio of money to GDP can rise by much more than 2 per cent a year (i.e., its average rate of rise over the period) within a particular period declines the longer the period under consideration. In fact, the probability that the ratio of money to GDP will rise by 6.0 per cent or more in five successive years is only 6.2 per cent, little better than 1-in-20. (See Histogram 2. As would be expected, this second histogram has fewer extreme values.)

In the two years to Q1 2007 the velocity of circulation of M4 fell by just over 6.4 per cent a year. The above analysis shows that this outcome is improbable. Assuming that the underlying relationships between money and income in the UK are much the same now as over the last three decades, the likelihood of two successive years in which the ratio of money to GDP rises by more than 6 per cent is only 14.5 per cent. To say that an outcome has a probability of less than one in six is not to preclude it. (Of course it has just happened!) The trouble is that the odds against sustained large falls in velocity become increasingly stretched the longer that rapid money growth persists. To repeat, the probability that the ratio of money to GDP will rise by 6 per cent or more in five successive years is little better than 1-in-20. In fact, the probability that the ratio of money to GDP will rise continuously by under 4 per cent a year over a five-year period (i.e., by under 22 per cent in the full five-year period) is roughly 72 per cent. Since the ratio of money to GDP has already increased by about 13 per cent since early 2005, it is very likely that the ratio of money to GDP will rise more slowly (perhaps by only 1 or 2 per cent a year) over the next three years. If M4 growth were 12 per cent in, say, the year from mid-2008, a 3 per cent rise in the ratio of money to GDP would be consistent with a 9 per cent increase in nominal GDP. Since the trend annual growth rate of real output is not much more than 2 ½ per cent, that would imply an inflation rate of over 5 per cent. The official inflation target would be in ruins.

Histogram 2: Histogram follows same format as Histogram 1, but relates to periods of five consecutive years



Conclusion: velocity is not 'all over the place'

The UK evidence assembled in this paper argues strongly that – over the medium and long runs – changes in the ratio of money to income and expenditure (i.e., the inverse of velocity) have not been 'all over the place'. Minford's claim is contradicted by the facts. Since the UK's money demand function is known to be badly behaved compared with other countries and therefore to be something of a 'black sheep' in international comparisons (perhaps because of the scale of its financial sector), the wider invalidity of the Minford claim is evident.³³

When an allowance is made for a variety of influences which may alter the equilibrium ratio of money to income, a change in the rate of broad money growth is accompanied by a very similar change in the equilibrium rate of increase in nominal GDP. It is true that several quarters of disequilibrium may elapse before the rate of increase in nominal GDP responds fully to the new higher or lower rate of increase of broad money. One purpose of the probability analysis carried out here has been to quantify the differences in the closeness of the relationship between changes in money and nominal GDP growth rates for different periods of different length. To repeat a key conclusion, the UK data from 1971 to 2004 suggest that the likelihood of two consecutive years in which the ratio of money to GDP rises by more than 6 per cent is less than one-in-six, but that the likelihood of sustained large changes in the ratio of money to GDP declines the longer the period under consideration. Over five years the probability of consecutive annual rises in the money-to-GDP ratio of more than 6 per cent falls to little better than 1-in-20. Given the risks, policy-makers would be foolish to ignore the message of the monetary data.

There is a puzzle about the reception of monetary economics in UK policy-making (and indeed political) circles. The vital propositions are little more than amplifications of supply-and-demand analysis, and are clearly grounded in a large body of theory and evidence. Yet they remain controversial and continue to be resisted. Part of the trouble may be the widely-attested association between an interest in monetary economics and support for the free market, which upsets the high proportion of British economists with left-of-centre political tendencies.³⁴ Other possible explanations are a misguided over-commitment to the Keynesian income-expenditure model of national income determination (which in the naïve versions has no room for money) and an exaggeration of the problems of fitting money into general equilibrium models.³⁵ Fama's exclusion of the banking system (and so bank deposits and broad money) from an active role in the determination of national income illustrates how economists may slide from the identification of a curiosity in general equilibrium theory to the propagation of wholly mistaken views about how the real economy works. As Keynes once remarked, there is a danger in economics that – once a remorseless logician has started with an error – he or she may end up in bedlam.³⁶

This paper has relied on the traditional understanding of the relationship between money on the one hand and expenditure and inflation on the other, in which 'money' includes bank deposits. It has also been highly empirical. Attention has been paid to the facts about money, expenditure and velocity in the

period, now somewhat longer than four decades, in which modern monetary and banking statistics have been compiled in the UK. Today's economists should be grateful to the Radcliffe Committee for recommending almost 50 years ago that better data be collected. Ironically, that data now demonstrates the invalidity of one of the committee's most widely-cited conclusions.

Notes

1. *Committee on the Working of the Monetary System Report* (London: HMSO, 1959), p. 133.
2. Arthur Seldon (ed.) *Not Unanimous* (London: Institute of Economic Affairs, 1960).
3. Patrick Minford 'Should central banks target anything other than inflation (such as money supply)?', contribution to EMU Monitor in the www.eurointelligence.com website, 15th January 2007.
4. The first Liverpool Occasional Paper on 'Monetarism, inflation and economic policy' by Minford was published in early 1980 and based on his inaugural lecture, given at Liverpool University on 28th November 1979. The opening paragraphs referred to charts on inflation, budget deficits as a percentage of national income and the rate of growth of the money supply. According to Minford at that time, 'the strong associations between these three magnitudes is [sic] not coincidental' as 'there is a powerful body of economic theory predicting them'.
5. Numerous accounts of the processes at work are available in the literature, with one of the earliest and clearest statements being by Irving Fisher in his 1912 *Elementary Principles of Economics*. (William J. Barber [ed.] *The Works of Irving Fisher*, vol. 5, *Elementary Principles of Economics* [London: Pickering & Chatto, 1997, originally published by Macmillan, New York, 1912].)
6. A common trick in the critique of general equilibrium results is to insist the equilibrium requirement for a trivial commodity (peanuts, potatoes) is as much a necessary condition of full equilibrium as the equivalence of the demand for and supply of money, bonds or whatever. The monetary equilibrium condition is then derided as of no particular significance. (Lerner used peanuts in a discussion of Hicks' Value and Capital. See Mervyn K. Lewis and Paul D. Mizen *Monetary Economics* [Oxford: Oxford University Press, 2000], p. 113. Patinkin mocked Friedman's observation about inflation being a 'monetary phenomenon' with the observation that 'by the same token one can say that the price of potatoes is a potato phenomenon'. See Don Patinkin 'Some observations on the inflationary process', in M. Flanders and A. Razin [eds.] *Developments in an Inflationary World* [New York: Academic Press, 1981].)
7. This is of course a reference to the famous debate about monetary base control, which harked back to the 19th century debate between the Banking and Currency Schools. According to Charles Goodhart, writing in 1995, 'the debate over monetary base control appears largely historical'. (Goodhart *The Central Bank and the Financial System* [London: Macmillan, 1995], p. 261.)
8. The distinction is usually attributed to John Gurley and Edward Shaw who made it in their book on *Money in a Theory of Finance* (Washington, D.C.: Brookings Institution, 1960). The 'which money?' debate goes back at least 150 years before Gurley and Shaw.
9. For a recent example of a paper in this tradition, see Ed Nelson 'Direct effects of base money on aggregate demand: some theory and evidence' *Journal of Monetary Economics*, vol. 49, 2002, pp. 687 – 708. The author of the current paper has strongly criticised the notion that base money (i.e., notes) can have any strong bearing on demand nowadays, with two facts being obtrusive. These are, first, that the value of transactions in notes are less than 1 per cent of the value of transactions passing through cheque and other bank clearing systems in the USA and the UK (and no doubt other industrial countries) and, secondly, a very high proportion of the note issue is held in the black, unrecorded economy, often outside the country of issue. See Tim Congdon 'Broad money vs. narrow money', no. 166 in the Special Paper series published by the *London School of Economics' Financial Markets Group* (London: 2006). The suggestion that notes form a meaningful element in wealth portfolios is also preposterous, partly because of their quantitative insignificance and partly because the very high costs of counting, bundling and transporting notes makes them impracticable in major legal capital transactions across the industrial world.
10. Eugene Fama 'Banking in the theory of finance' *Journal of Monetary Economics*, vol. 6, 1980, pp. 39 – 57. The quotation is from p. 47.
11. Ben Bernanke, the current chairman of the USA's Federal Reserve, explicitly rejected Fama's ideas in a 2005 interview. In his words, one lesson of the Great Depression was

- that 'the financial industry is a special industry in terms of its role in macroeconomic stability'. (Randall E. Parker *The Economics of the Great Depression* [Cheltenham, UK, and Northampton, USA: Edward Elgar Publishing, 2007], p. 66.
12. Minford 'Comment', p. 6, in *The Shadow Monetary Policy Committee: Quarterly Meeting and E-Mail Poll* (London: Lombard Street Research for the Institute of Economic Affairs), August 2007 issue.
 13. Minford *The Supply Side Revolution in Britain* (Aldershot, UK, and Brookfield, USA: Edward Elgar Publishing, 1991), p. 71.
 14. In a tradition initiated by Gurley and Shaw's *Money in a Theory of Finance* and a 1963 article by Tobin, no sharp operational distinction holds between banks and deposit-taking non-bank intermediaries, because deposit-taking non-bank intermediaries can – like banks – make payments on depositors' behalf. (John G. Gurley and Edward S. Shaw *Money in a Theory of Finance* [Washington, D.C.: Brookings Institution, 1960]), and James Tobin 'Commercial banks as creators of money', pp. 408 – 19, in Deane Carson [ed.] *Banking and Monetary Studies* [Homewood, Illinois, USA: Richard D. Irwin, 1963].) The claim has even been extended to certain types of investment organization, including 'non-bank mutual investment funds' (i.e., the US equivalent of unit trust groups), which have been said to provide 'transactions services'. (See 'Why do banks need a central bank?', pp. 3 – 18, in Charles Goodhart *The Central Bank and the Financial System* [Basingstoke and London: Macmillan, 1995]. The quotation is from p. 4.) Gurley and Shaw, and subsequently Tobin and Fama, went on to propose that the distinction between banks and other financial institutions was regulatory, that banks were subject to cash reserve requirements whereas non-bank financial institutions were not. The mistake is to overlook that there are two types of specialist in clearing. A bank (or, at any rate, 'a clearing bank') holds deposits in cash (i.e., legal-tender base money, mostly notes nowadays) from non-banks. Its specific expertise enables it to repay deposits in notes and to make payments for depositors where settlement is also in cash (i.e., in an account at the central bank). A variety of other clearing specialists (securities exchanges, commodities exchanges) do not take deposits in legal-tender base money. Instead they include in their assets an account with a clearing bank, which is matched on the other side of the balance sheet with deposit liabilities to other agents who can be labelled for simplicity as 'savers'. It is evident that the savers can make a multiplicity of payments to each other across this account, with each saver settling the difference between debits and credits by a change in his or her net claim on the clearing specialist. But the clearing specialist is not a bank and the savers do not expect it to repay their deposit with notes. Why – it might be asked – are savers prepared to have any claim on a clearing specialist of this sort, since they cannot immediately 'get their money back'? The answer is that the clearing specialist can repay a saver's deposit by transferring a sum in its balance with a bank (i.e., a clearing bank) to a bank balance held by a saver. The saver can then exchange the deposit for notes. Empirical substantiation of the distinction between banks as such and non-banks is easy. In a non-regulated environment genuine banks (i.e., to repeat, organizations involved in settlement in legal-tender base money) include among their assets both vault cash and a claim on the central bank. Other organizations do not hold significant amounts of vault cash or need to have an account with the central bank. (If they do have such an account, it is not to facilitate clearing business.) Pace Gurley, Shaw, Tobin, Fama and many others, genuine banks would hold vault cash and have a central bank account if there were no reserve requirements or 'legal restrictions' on their business whatsoever. Banks are operationally distinct from non-banks; they are not different purely because of regulation. The point – which is of fundamental importance in monetary economics – has been noticed before, but is widely misunderstood. (Jack M. Guttentag and Robert Lindsay 'The uniqueness of commercial banks' *Journal of Political Economy*, vol. 76, 1968, pp. 991 – 1014.) None of the four economists mostly responsible for the mistake discussed here – Gurley, Shaw, Tobin and Fama – notice the distinction between clearing in cash and clearing across a bank account.
 15. Both a clearing bank and a non-clearing 'bank' (such as an investment bank or a specialist housing finance institution) can lend money. But their supply functions are quite different. The non-clearing bank can expand its balance sheet only by borrowing, where 'borrowing' is the transfer of sums from other agents' bank accounts to its bank account. An individual clearing bank could expand in this way, just like a non-clearing bank, if it held an account with another clearing bank. But in practice – for competitive reasons – clearing banks are averse to holding significant claims on each other. The individual clearing bank expands in two different ways. First, it can incur liabilities by attracting cash across the counter or (usually on a temporary basis) by borrowing cash from other clearing banks. Secondly, it can simultaneously add to assets (by extending a loan) and create deposit liabilities against itself 'by a stroke of the pen'. The clearing banks' ability to create money, apparently 'out of thin air', is limited by the adequacy of both its cash and its capital. But –

- since the system as a whole can borrow cash from the central bank – the ultimate constraint on money growth is imposed by banks' capital. Further, the clearing banks could not create money unless they were involved in taking cash deposits. (In terms of the literature, only clearing banks possess 'the widow's cruse'. For a classic discussion, see the second chapter of John Maynard Keynes' *Treatise on Money* on 'Bank money'. [Donald Moggridge and Elizabeth Johnson (eds.) *The Collected Writings of John Maynard Keynes* (London and Basingstoke: Macmillan, 1971), vol. V, *A Treatise on Money: I The Pure Theory of Money*, pp. 20 – 29. *A Treatise on Money* was first published by Macmillan in 1930.] In Keynes' words, 'There can be no doubt that, in the most convenient use of language, all deposits are "created" by the bank' on whose balance sheet they appear'.) The remarks in this footnote are of considerable importance in understanding the contrasting fortunes of former building societies (Northern Rock, Alliance & Leicester, Bradford & Bingley) and the clearing banks in the liquidity crisis of September 2007.
16. For an example of an emphasis on the transactions role of money and a related view that only narrow money matters to macroeconomic outcomes, see Alan Walters *Britain's Economic Renaissance* (New York and Oxford: Oxford University Press, 1986), p. 117 and p. 121.
 17. In the first volume of his *A History of the Federal Reserve* (Chicago and London: University of Chicago Press, 2003), Allan Meltzer has an extended discussion (pp. 54 – 62) on the debates about defining money in the 19th and early 20th centuries, criticising the Banking School for its interest in credit and emphasis on the private sector's ability to create money substitutes. But he fails to spell out why he limits money to cash and 'checking deposits' or 'demand deposits', i.e., M1. (On p. 271 the stock of money is explicitly 'currency and demand deposits', although on p. 39 it is said that time deposits may sometimes be admitted.) It is easy to show that in the USA between 1920 and 1935 an index of the prices of common stock was correlated with time deposits, but not with the monetary base or M1. (See Tim Congdon *Money and Asset Prices in Boom and Bust* [London: Institute of Economic Affairs, 2005], pp. 89 – 95.) Meltzer's position in the 'which money?' debate is different from Friedman's. In his last published paper Friedman adopted M2, which includes time deposits, in a discussion of three large stock market cycles, and their macroeconomic sequels, in the 20th century. In his words, 'I have found M2 to be have a more reliable relation to other economic magnitudes than the other monetary aggregates.' (The quotation is from p. 146 of Milton Friedman 'A natural experiment in monetary policy covering three episodes of growth and decline in the economy and the stock market' *Journal of Economic Perspectives*, vol. 19, no. 4, 2005, pp. 145 – 50.) Edward Nelson discusses Friedman's changing allegiances on the money aggregates in Nelson 'Milton Friedman and US monetary history 1961 – 2006' *Federal Reserve Bank of St. Louis Review*, vol. 89, no. 3, 2007, pp. 153 – 82. For most of his career Friedman followed M2, but in 1982 he switched to M1. This led to a serious forecasting error and he reverted to M2 from 1986. Unfortunately, Friedman was sometimes less than accurate in remembering his own earlier positions on the subject. (See p. 164 of the Nelson article.)
 18. See Milton Friedman 'Statement on monetary theory and policy', given in Congressional hearings in 1959, reprinted on pp. 136 – 45 of R. James Ball and Peter Boyle (eds.) *Inflation* (Harmondsworth: Penguin, 1959). The quotations are from p. 141.
 19. The author first made this analytical point, which is basic to the emphasis on a broadly-defined, all-inclusive measure of money throughout his work, in stockbroker research papers in the late 1970s. He has made the argument that money-into-money transactions can nullify the causal role of a less-than-all-inclusive money aggregate on many occasions. For a relatively formal statement, see Tim Congdon 'Broad money vs. narrow money' *The Review of Policy Issues* (Sheffield: Sheffield Hallam University), vol. 1, no. 5, 1995, pp. 13 – 27. However, the point was clearly anticipated by Irving Fisher in 1912. If cheque payments are ignored, 'we may classify exchanges into three groups: the exchange of goods against goods, or barter; the exchange of money against money, or "changing" money; and the exchange of money against goods, or purchase and sale. Only the last-named species of exchange involves what we call the circulation of money.' (William J. Barber [ed.], *The Works of Irving Fisher*, vol. 5, *The Elementary Principles of Economics* [London: Pickering & Chatto, 1997, originally published in 1912], p. 151. Italics are in the original.) See also p. 178 of *Elementary Principles* on the same theme. The point is repeated on p. 34 of Fisher's 1914 *Why is the Dollar Shrinking?* (New York: Macmillan, 1914). The argument was also developed in John P. Judd and Bharat Trehan 'Velocity in the 1980s: an analysis of interactions between monetary components', no. 87 – 05, July 1987, in the Federal Reserve Bank of San Francisco's working paper series, accompanied by an expression of support for broadly-defined money in macroeconomic analysis.
 20. Wicksell did not endorse a definition of money including all bank deposits, but his discussion of 'the cumulative process' in *Lectures on Political Economy* would be incomprehensible if it were not implicitly assumed throughout that the banking system's

behaviour could affect the price level, and he explicitly rejected a quantity-theory approach in which money consisted only of metallic money (p. 154 and pp. 190 – 208 of vol. II, *Money*, of Knut Wicksell Lecture on Political Economy [London: George Routledge and Sons, 1935]); Fisher explicitly included bank deposits in his 'equation of exchange' and noted the effect of 'deposit money' on the price level (p. 179 and pp. 186 – 7 of Fisher *Elementary Principles of Economics*); Keynes' approval for broad money measures in a footnote on p. 267 of *The General Theory* was forthright ('As a rule, I shall, as in my *Treatise on Money*, assume that money is co-extensive with deposits.');

Robertson was relatively pragmatic, but clearly leaned towards an all-inclusive measure in the *Lectures on Economic Principles* published towards the end of his life ('I am in favour of casting [the net of definition] fairly widely...[F]or the kind of community in which we are most interested, we must include deposits with a bank drawable on by cheque...; and I doubt whether it is convenient to try...to draw line at "current accounts" (UK) or "demand deposits" (USA).')

Dennis H. Robertson *Lectures on Economic Principles, vol. III, Money* [London: Staples Press, 1959, p. 13.);

Hawtrey's early work was written before concepts of 'money' had stabilised, but he proposed a concept of 'the unspent margin' which 'could be arrived at by adding up the liabilities of all the banks, or by adding up all the credits held by all their customers, whether depositors or note-holders', and observed that it was the banks' 'action, not the [central bank] note issue, which directly affects the value of the monetary unit' (p. 34 and p. 50 Ralph Hawtrey *Currency and Credit* [London: Longmans, 1923]);

Friedman and Schwartz said in their *Monetary History* that 'currency held by the public and sight and time deposits...in commercial banks' (author's italics) is 'our concept of money' (p. 630 of *A Monetary History of the United States, 1867 – 1960* (Princeton, New Jersey: Princeton University Press, 1963);

and Johnson remarked that 'in a modern economy' money is 'created by the banking system' (p. 121 of Harry Johnson *Money, Trade and Economic Growth* [London: Allen & Unwin, 1962]). Numerous other references could be given for all these authors.

21. As already mentioned, Fama has been a seminal influence on the tendency to downplay – or even to dismiss – broad money and the banking system. But he is far from being the only prominent economist responsible for this intellectual development. Also important, for example, have been Patinkin and Lucas (and indeed the entire New Classical School in association with Lucas). In his 1961 article in the *American Economic Review* reviewing Gurley and Shaw's *Money in a Theory of Finance*, Patinkin adopted their distinction between outside and inside money, and began his practice of claiming that increases in inside money did not entail an increase in society's net wealth and therefore that the real balance effect related only to outside money. (Don Patinkin 'Financial intermediaries and monetary theory' *American Economic Review*, vol. LI, no. 1, 1961, pp. 95 – 116.) In Lucas's theoretical papers money is issued by a consolidated state sector (i.e., by the government and central bank combined) and not by commercial banks. Bank deposits are therefore banished by assumption. (See, for example, Robert E. Lucas 'Expectations and the neutrality of money' *Journal of Economic Theory*, vol. 4, 1972, pp. 103 – 24, and particularly p. 229, with the statement that – apart from output and labour – his model contains only one more good, 'fiat money issued by the government which has no other function'.) Typically in Lucas's papers monetary equilibrium holds at all times. By implication, developments in money aggregates in the recent past have no message for future macroeconomic outcomes, because equality between the supply of and demand for money has already been attained. Events in the labour and goods markets instead become the causes of the business cycle. To the extent that money can matter, its influence arises because of the interplay between agents' expectations and the monetary authorities' attempts to influence those expectations. The expected growth rate of money is therefore more important than the growth rate of money recorded in the last few months and quarters. Because of the way Lucas's models are set up, with only fiat money in existence and no banking system, it is only the expected growth of the base (i.e., M0 in UK parlance) that can be intended. Minford has clearly been influenced by Lucas' work, just as he has been by Fama's. In his paper on 'Optimal monetary policy with endogenous contracts' in Kent Matthews and Philip Booth (eds.) *Issues in Monetary Policy* (Chichester: John Wiley & Sons, 2006) he states in the first footnote 'by money supply I mean here M0, the monetary base' (p. 63) and his conclusion is that the money supply, in the sense of M0, 'may well be the best operating instrument' for monetary policy (p. 75). In this sort of world – which undoubtedly originates from New Classical Economics – agents' expectations about the future behaviour of M0 are pivotal to macroeconomic outcomes. Is the world assumed in the theorising of Fama, Lucas, Minford and many others in the New Classical tradition realistic? In the author's view it is not.
22. Luca Benati 'UK monetary regimes and macroeconomic stylised facts', *Bank of England Working Papers*, no. 290, 2006.

23. *Financial Statistics* (London: HMSO for the Central Statistical Office), December 1965 issue, p. 33 and p. 34, and *Financial Statistics*, December 1965 issue, p. 44.
24. *Financial Statistics* (London: Palgrave Macmillan for the Office of National Statistics), June 2007 issue, p. 224 and p. 59.
25. Ryland Thomas 'The demand for M4: a sectoral analysis, Part I – The personal sector' (London: Bank of England, Working Paper Series no. 61, 1997) and K. Alec Chrystal and L. Drake 'Personal sector money demand in the UK' *Oxford Economic Papers* (Oxford: Clarendon Press, 1997). A paper on the subject – Tim Congdon and Simon Ward 'The personal sector's demand for M4 balances', Lombard Street Research Econometric Research Note, May 1993 – was discussed at a meeting of the UK's Money Study Group in 1993.
26. Tim Congdon 'The role of money in the British business cycle' *The Business Economist*, vol. 35, no. 3, 2004. A slightly amended and updated version of this paper appears as essay 15 on 'Some aspects of the transmission mechanism', pp. 316 – 29, in Tim Congdon *Keynes, the Keynesians and Monetarism* (Cheltenham: Edward Elgar Publishing, 2007).
27. The behaviour of life offices' and pensions funds' cash ratio is discussed in the paper mentioned in footnote (26) above. It is also covered in pp. 32 – 40 of Tim Congdon *Money and Asset Prices in Boom and Bust* (London: Institute of Economic Affairs, 2005).
28. This point is the central theme of Tim Congdon *Money and Asset Prices in Boom and Bust* (London: Institute of Economic Affairs, 2005). Numerous other papers with a similar argument have appeared. See, for example, Ramon Adalid and Carsten Detken 'Liquidity shocks and asset price boom/bust cycles', *ECB Working Paper Series*, no., 732, February 2007, and Annick Bruggeman 'Can excess liquidity signal an asset price boom?', *National Bank of Belgium Working Paper Research*, no. 117, August 2007.
29. The August 2007 issue of the Bank of England's Inflation Report surveys the behaviour of the money holdings of different sectors on p. 14. It notes that much of the recent 'pickup in broad money growth reflects increased holdings by non-bank financial corporations'. It proceeds to remark, 'This sector is made up of a diverse range of businesses, which are likely to use their money holdings in different ways.' This may seem innocuous, but the writer may suffer from the misunderstanding that – when an agent 'uses' a money balance to purchase, say, an asset – the money disappears from the economy. Of course that is not so. The money reappears in the balance of the agent that sold the asset and it subsequently circulates an indefinitely large number of times. (As Wicksell, Fisher, Friedman and many others have explained over the decades, one individual's purchases of goods and assets may reduce his or her money balance, but they do not change aggregate money.) The mistake – which is very common – might be called 'the individual experiment illusion'. Bank of England publications also repeatedly make statement on the lines 'household money goes into consumption' and 'financial sector money is used to buy assets'. The statements again reflect a misunderstanding, this time about the permanence of a money balance's possession by a particular type of agent. Money is never 'used' or 'goes into' an economic end in a final sense. It instead circulates forever, passing between very different types of agent, some of them households, some of them companies and so on. Equilibrium – which has both stock and flow dimensions – is between the amount of money held and variables (income, assets, payments technology and so on) which similarly can be expected to survive for numerous periods to come.
30. The 'breakdown' of the money demand function was pointed out by Michael Artis and Mervyn Lewis in a 1974 paper in *The Banker* and a 1976 paper in *The Manchester School*. See Artis and Lewis *Monetary Control in the United Kingdom* (Deddington: Philip Allan, 1981), *passim*, for further discussion. Numerous papers on similar lines followed those by Artis and Lewis.
31. Two examples are the Kolmogorov-Smirnov and Shapiro-Wilk tests. The author – using a facility available on the Internet – carried out the KS test for the five-year moving average series of the change in the velocity of circulation. The verdict was that the test was 'not particularly happy' to call the distribution normal. (The results for the higher-frequency series would be worse.) Should that put one off? The author has no doubt that – with suitable massaging (increasing the number of observations, taking out the financial sector or whatever) – he could obtain a distribution which satisfied the KS and Shapiro-Wilk tests. Whether the economic interpretation would be enhanced is doubtful, although the matter is – of course – open to debate. Statisticians may notice that, in order to calculate a five-year moving average ending in Q4 1972 values are needed for the change in velocity in the years to Q4 1968, Q4 1969, Q4 1970 and Q4 1971. This feature – as well as the introduction of CCC – helps to justify the truncation of the period of analysis.
32. As noted by Luca Benati in a recent Bank of England working paper, 'the high correlation between inflation and the rates of growth of both broad and narrow monetary aggregates

at the very low frequencies' is 'a stylised fact' in the UK. (The phrase 'very low frequencies' refers to the calculation of rolling multi-year averages for the various series.) Benati's paper shows that the money/inflation relationship is 'remarkably invariant' to changes in policy regime (for example, from fixed to floating exchange rates). (See p. 32 of '*UK monetary regimes and macroeconomic stylised facts*', *Bank of England Working Papers*, no. 290, 2006.)

33. The tendency for UK money/inflation relationships to be rather poor compared with money/inflation relationships in other countries is something of a puzzle and is long-standing. See the footnote on p. 514 of Peter Jonson '*Money, prices and output: an integrative essay*', *Kredit und Kapital*, vol. 4, 1976, pp. 499 – 518. Statistical work by international organizations has generally found the UK's money demand functions to be less well-behaved than those of other countries.
34. The left-of-centre political orientation of most university economists has been established by a number of surveys. In the 1987 general election – when the Conservative Party had many more votes than Labour – only 17 per cent of academics supported the Conservatives. (David Willets *Modern Conservatism* [Harmondsworth: Penguin, 1992], p. 21, citing a MORI survey in *The Times Higher Education Supplement* of 5th June 1987.)
35. On the difficulties of accommodating money and assets in the Keynesian income-expenditure model, see Tim Congdon '*Why the 1981 Budget mattered: the end of naïve Keynesianism*', pp. 19 – 53, in Philip Booth (ed.) *Were 364 Economists All Wrong?* (Institute of Economic Affairs: London, 2006). Frank Hahn has written several papers in which his identification of lacuna in theoretical monetary economics is extended to a wholesale critique of so-called 'monetarism'. See Hahn *Equilibrium and Macroeconomics* (Oxford: Basil Blackwell, 1984).
36. One purpose of this paper has been to show how Minford's approach to macroeconomic analysis and prognostication – in which the expected behaviour of M0 is of great importance – originates in papers by, among others, Patinkin, Fama and Lucas. These papers are very widely cited (as they have been here) and are generally regarded as classic contributions to the subject. It is very important to understand that these papers deny the relevance of events in the banking system to macroeconomic outcomes. Many people involved in business, investment and real-world policy-making – including the author – find this denial difficult to accept.

Chapter 2: Why and how does the level and growth rate of bank deposits affect asset prices, demand and inflation?

Introduction: equilibrium and disequilibrium

In the long run inflation is caused by the quantity of money rising significantly faster than the quantity of goods and services. The centrality of money in the inflationary process is implicit in an equation which has appeared in hundreds of macroeconomics textbooks and, given its universality, ought to be uncontroversial.¹ The meaning of the equation can be expressed in words as follows,

‘national income and asset prices are in equilibrium only when the demand to hold money balances is equal to the quantity of such balances actually in existence’.

The equation is what economists call ‘an equilibrium condition’. In economics ‘equilibrium’ means a state of affairs which, once established, will persist unless disturbed by an outside influence of some kind. In the real world the monetary equilibrium condition may not hold at all times. Consider someone who has just won the National Lottery. He or she plainly has more money than was formerly the case (in ‘equilibrium’), and it will take at least a few months – perhaps even a few years – before most of the money has left his or her bank deposit, and been reflected in new higher equilibrium levels of expenditure, housing wealth, unit trusts, jewellery and so on. In that period the equilibrium monetary condition does not hold for this particular individual.

Indeed, the equilibrium condition may be violated for all individuals and companies in the UK because of sudden changes in the quantity of money. In that case two statements can be made,

‘because the demand to hold money is not equal to the quantity of such balances in existence, national income and asset prices are not in equilibrium’, and

‘strong forces will exist in the economy to change the values of asset prices, expenditure and national income so that the demand to hold money is again equal to the actual quantity of money’.²

This may sound rather theoretical, but it can readily be brought back to today’s realities. The UK’s GDP is almost £1.4 trillion (i.e., £1,400b.) and the value of its national wealth is about £7.0 trillion. The value of the broadly-defined M4 measure of money – which includes virtually all bank and building society deposits, and is dominated by them – may for simplicity also be taken at £1.4 trillion. (Actually, the value M4 is somewhat higher, but the numbers will do for illustration.) The £7 trillion of wealth includes a huge diversity of assets, but – again for simplicity – we may think of it as divided between £3.5 trillion of houses and £3.5 trillion of “equities” (i.e., claims on productive capital, in all its forms). Again, for ease of exposition, we may assume that equilibrium prevails with these values of national income and expenditure, national wealth and the quantity of money.

The adjustment of expenditure and asset prices to money

A windfall which doubles the quantity of money

Now suppose that all the individuals and companies receive a windfall. The precise nature of this windfall may have some relevance to the processes by which national income and wealth subsequently adjust to their extra money balances, but our interest is in the adjustment processes, not in the windfall.³ For the sake of argument, we may imagine that foreign investors – for whatever reason – regard selected UK houses and equities, amounting to a sixth of the existing stock, as under-valued also by a

sixth (i.e., they are prepared to pay 20 per cent more than the current price). They seek and obtain £1.4 trillion of sterling loans from British banks, and purchase £1.4 trillion of UK houses and equities. £1.4 trillion is credited to the bank accounts of UK agents.

Plainly the quantity of money has doubled. All UK agents are to a limited degree in the same position as someone who has won the National Lottery. Whereas before UK agents had the 'right' amount of money (£1.4 trillion) in their bank accounts for the £1.4 trillion of national income and the £7.0 trillion of assets, they now have £2.8 trillion of money and this is 'too much'. The monetary equilibrium condition has been broken. In jargon, the UK's individuals and companies have 'excess money balances'. What now happens to restore the equilibrium condition? To illustrate the processes at work, we start by distinguishing **between two** elements in the adjustment process. The excess money balances have effects, first, on expenditure on goods and services (or 'current expenditure'), and, secondly, on asset values.

The adjustment of spending on goods and services to excess money

The adjustment of current expenditure to excess money has been described many times in the literature. In our example equilibrium is established when the national income and expenditure are equal to the amount of money, but – after the windfall – agents' money holdings are twice their income. Suppose that a particular individual A has excess money, and that he or she tries to get rid of it by spending above income for a period, perhaps by buying goods from individual B. That gets rid of A's excess money, but it does not remove the excess money from the economy. Individual B now has the money originally held by A, and – if B tries to get rid of it by spending above income on goods from individual C – then individual C also has excess money. As Friedman explained in Congressional hearings almost 50 years ago, 'if individuals as a whole were to try to reduce the number of [monetary units] they held, they could not all do so, they would simply be playing musical chairs'.

However, **with everyone** trying to spend above income in round after round of expenditure, the eventual result is that the values of national income and expenditure increase, probably in association with a big rise in the price level. To quote Friedman again, while individuals may be 'frustrated in their attempt to reduce the number of [monetary units] they hold, they succeed in achieving an equivalent change in their position, for the rise in money incomes and prices reduces the ratio of [money] balances to their income and also the real value of these balances'. In the example under consideration here, the original equilibrium one-to-one equivalence between money and income has been restored when national expenditure and income have reached £2.8 trillion.

The adjustment of asset prices to excess money

What about asset prices? Much the same sort of story can be told about their adjustment to excess money by assuming that a particular proportion of money balances is held for portfolio reasons and that there is an equilibrium ratio between such balances and the total value of assets. In the UK life insurance companies and pension funds have for many decades been the principal institutional holders of equities, and they have tended in the long run to keep their money balances at between 3 per cent and 4 per cent of total assets. Suppose that – because of the doubling of the aggregate quantity of money – these institutions' money holdings are at between 6 per cent and 8 per cent of total assets.

In the first round of transactions after the windfall life company A tries to get rid of its excess money by buying equities from pension fund A. But pension fund A now has the money originally held by life company A, and – if pension fund A tries to get rid of it by purchasing equities from life company B – then life company B has excess money (i.e., a money-to-assets ratio of well over the equilibrium 3 per cent to 4 per cent). In successive rounds of transactions the excess supply of money causes buyers to be keener than sellers, pushing up the prices of equities. In due course the value of equities (and, realistically, a variety of other assets) has climbed by enough to re-establish the equilibrium money-to-assets ratio. In the aggregate equilibrium requires – in our example – that the value of the stock of equities roughly doubles to £7 trillion after the quantity of money has risen to £2.8 trillion.⁴

In his *Treatise on Money* Keynes called the transactions that represent expenditure on goods and services 'the industrial circulation' and those that represent purchases and sales of assets 'the financial circulation'. It may be heuristically convenient to think of them as separate and distinct, but in the real world they are interrelated. True enough, transactions carried out by financial institutions are predominantly in assets, while those of less well-off people are almost entirely in goods and services.

(The bottom half of the population have almost no assets, apart from housing and pensions, both of which are illiquid.) But all wealth is held only for the purpose of eventual consumption. People and companies are constantly comparing the prices of one type of asset with another type of asset, and considering whether they should sell assets in order to buy a consumption item or to postpone the purchase of a consumption item in order to acquire an asset. As a result, a doubling of the price of equities (in our example) is unlikely to leave the price of houses unaffected. Some wealthy individuals will sell equities and use the proceeds to buy London houses. The former owners of London houses will buy less expensive houses in the South East and use the equity thus freed up to buy financial assets and/or to finance consumption. Although the homes bought by the former London owners may have lower unit prices than London houses, they may have to pay more for their new homes in the South East than earlier applied, enabling the vendors (the former South East owners) to release equity when they in turn move to the South West, and the former South East owners are again able to buy financial assets and/or to finance consumption. And so on. These types of arbitrage – arising from comparisons between the prices of securities and house prices, and between house prices in different localities – are a matter of everyday observation.

In the example under consideration here, with money doubled from £1.4 trillion to £2.8 trillion, equilibrium is restored by a doubling of national expenditure, also to £2.8 trillion, and an approximate doubling of the values of both equities and houses to a combined total of about £14 trillion. But the argument is general. Assets are being bought and sold endlessly, while people and companies are forever taking decisions in the light of the value of items in their overall wealth totals and balance sheets. In the long run the prices of assets increase at a similar rate to the increase in national income, and the driving force behind the increases in the nominal values of both assets and expenditure is the quantity of money. (The real value increases because of better technology, improvements in quality and so on.)

It is very important to recognise that – in the example under discussion here – bank lending to the UK private sector has not changed. The key relationships are between bank deposits on the one hand and income and wealth on the other. They hold whether bank lending to the private sector is expanding, static or contracting. It is true that – in practice – the growth rates of bank credit and bank deposits are nowadays highly correlated, but that does not alter the strategic position of bank deposits in the analysis. If deposits had risen by £1.4 trillion because banks had purchased existing securities from UK residents (i.e., there had been no new credit to either UK residents or foreigners), the same set of processes would have been triggered to restore the equilibrium levels of income and asset prices.

(I have found widespread confusion on this point. Some of the trouble arises because of the misapprehension that the phrase ‘the demand for money’ means ‘the demand for bank credit’. Standard usage in economics is that ‘the demand for money’ connotes ‘the demand to hold money balances’, which nowadays comes to virtually the same thing as ‘the demand to hold bank deposits’. The dominant processes in the determination of asset prices and national income are those which arise from agents’ attempts to equilibrate the demand to hold bank deposits with the quantity of deposits created by the banks. This remark – which in my experience puzzles many British economists – reiterates what Keynes described as ‘the fundamental proposition of monetary theory’ on p. 85 of his *General Theory*.)

Some misunderstandings

Many economists say that they agree with the argument presented so far, but in discussion then cite evidence which shows that they have not understood it (or at any rate – in my opinion – not understood it fully). I want to highlight three common views which I regard as misunderstandings.

The significance of narrow money aggregates

The argument about the adjustment of income and asset prices to money applies only to an all-inclusive measure of money, that is, a measure which embraces all assets of a given nominal value which can be used to make payments, even if after a notice period. In the UK it can be equated – without too much loss of precision – with all bank and building society deposits, and referred to (for brevity) as ‘bank deposits’. (‘Deposit accounts’, ‘time deposits’ and ‘wholesale deposits’ are certainly money, and cannot be excluded from the story.)⁵ However, some economists prefer to focus on a subset of monetary assets, either the note issue alone (in the UK formerly ‘M0’) or a measure consisting of the note issue and only sight deposits (M1, although UK data have not been published for many years). They occasionally draw conclusions about current expenditure or even asset prices from data on M0 and M1 (so-called ‘narrow money’).

The main analytical difficulty here is that the nearest alternative to narrow money is a money balance not included in the narrow money definition. The nearest alternative to a note holding (i.e., M0) is not a product in the shops or an asset like a life insurance policy, but a bank deposit. If I have an excessively large note holding, I can get rid of the excess notes by placing them on deposit with a bank, with no effect on current expenditure or asset prices. Similarly, if I have an excessive amount in my current account, I can get rid of it by transferring the excess sum in a deposit account, again with no effect on my current expenditure or asset prices. Because of the obvious scope for money-into-money transactions, narrow money measures do not work in the adjustment process described above. But an all-inclusive measure undoubtedly does. If all my money holdings are excessive relative to expenditure and wealth, I cannot get rid of the excess money by switching into another money balance because – by definition – no such balance exists. When the quantity of money doubled in our example from £1.4 trillion to £2.8 trillion, it was current expenditure and asset values that had to adjust, not the balance between different types of money balance within a wider money aggregate.

Other points are relevant here, although they are contingent on structural characteristics of modern economies. For example, a very high proportion of M0 in the UK is held inside the black economy. The quantity of notes may be relevant to the expenditure decisions of deviant or even criminal agents, but these are only a tiny fraction of the legitimate economy. Meanwhile the note holdings of companies and financial institutions are trivial, and cannot have any bearing on these organizations' behaviour. But there is no question that companies' investment expenditure and financial institutions' portfolio decisions have major impacts on macroeconomic outcomes.

Nowadays the note issue matters hardly at all to anything large and volatile in a modern economy. The key proposition in monetary economics is the following,

'national income and asset prices are in equilibrium only when the demand to hold bank deposits is equal to the quantity of such deposits actually in existence'.

This emphasis on deposits puts the banking system at the heart of macroeconomic analysis.

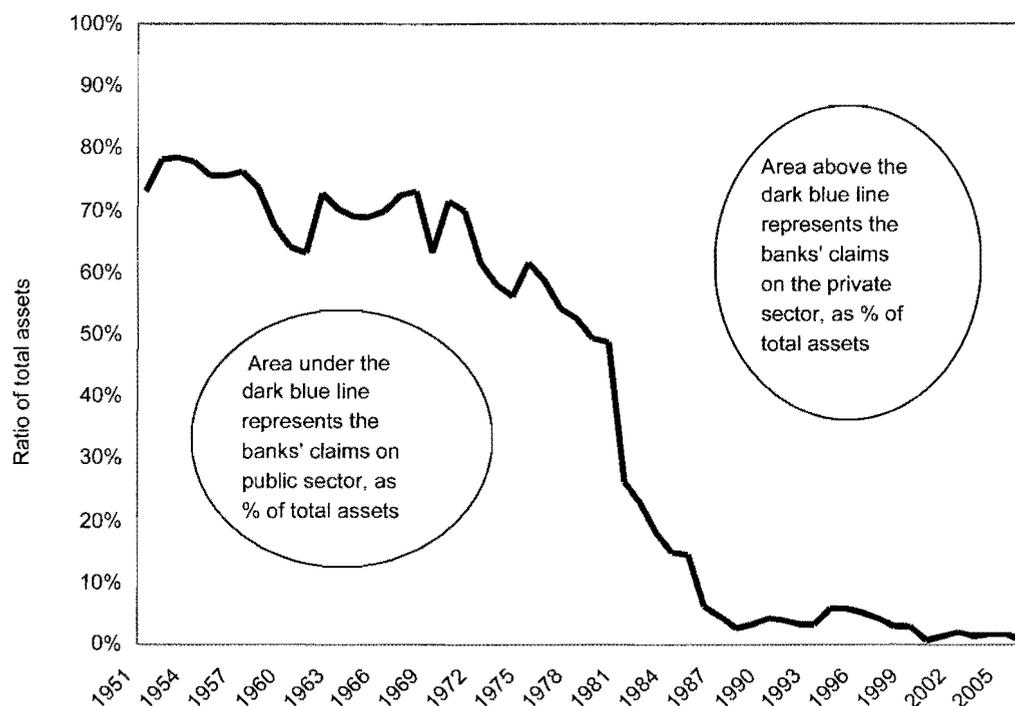
The significance of the banking system's assets

The banking system must lie at the heart of macroeconomic analysis, but it is important to understand which aspects of banks' behaviour matter and why they matter. Banks' assets necessarily equal banks' liabilities and these liabilities are dominated by the deposits which are so fundamental in the determination of macroeconomic outcomes. It follows that monetary economists need to make judgements about how quickly banks' assets are likely to grow (because that will affect the growth of deposits). Further, insofar as the types of asset acquired are relevant to the process of money creation, monetary economists may want to take an interest in them.

But it is important to understand the limitations of the exercise. In the immediate post-war years the UK banking system's assets were preponderantly (to the extent of over 80 per cent in the late 1940s) claims on the British government. By contrast, nowadays its assets are – almost exclusively – claims on the UK private sector and the overseas sector. Claims on the British government are a mere 1 per cent of total assets. (See Chart 2.1) However, these radical changes in banks' asset composition have had no effect on the equilibrium relationships between money on the one hand, and national income and asset prices on the other. In the late 1940s – as today – a depositor is concerned that the money in his or her bank account should be worth its nominal value and readily convertible into cash. The depositor is not directly interested in the banks' asset holdings. (My guess is that most people would not know whether UK banks' loans to the private sector are larger or smaller than their holdings of government securities, but the ratio between these two types of asset holdings has changed drastically in the last 60 years.)

This is not to deny that – if banks' solvency is undermined by bad lending decisions – depositors may become anxious about the value of their money balances. However, the analysis does refute a common but fallacious view held by misguided policy-makers over the decades. This is that – as long as the banks are acquiring solid, high-quality assets which support 'genuinely productive' activities (i.e., 'real bills') – monetary policy is being responsibly conducted. This 'real bills doctrine', which was first enunciated in the Napoleonic Wars, has been widely blamed for the blunders in American monetary policy during the Great Depression. It neglects entirely the need for the quantity of money to grow at a similar rate to that of real output if price stability (and wider macroeconomic stability) is to be preserved.

Chart 2.1: The changing composition of the UK banking system's assets



The significance of the banks' credit extension: bank credit by itself is unimportant

So the character of the stock of banks' assets is of little macroeconomic importance. It does not matter to the equilibrium relationships between money, national income and asset prices whether banks' assets consist of government securities, loans to the domestic private sector or loans overseas, as long as banks have enough cash to repay deposits and enough capital to buffer themselves against losses. But can the same be said about the character of the flow of banks' asset acquisitions and the implied rate of growth of total assets? Should monetary economists worry about new bank credit?

One line of thought seems to present itself here. If an individual has no assets and no spare money balances, he or she can spend above income by borrowing from a bank. This seems to imply an addition to demand. Surely it follows that – if a large number of individuals decide to borrow at the same time – there will be a significant boost to demand. Further, two general principles are implied, that

- high levels of new bank borrowing are likely to be associated with buoyant demand growth, and
- the availability of bank credit is a fundamental measure of the stance of monetary policy.

If these principles were correct, monetary economists ought always to pay considerable attention to the type of assets that banks are acquiring and the rate of growth of their lending. Indeed, a huge number of statements appear in newspaper articles, academic papers and elsewhere which make sense only if the two principles are correct.

However, both principles are wrong. One mistake is conceptual. It is to assume that – when an individual borrows from a bank to finance the purchase of a good or service that has recently been or is about to be produced – the result is an addition to the demand for such currently produced goods. This is simply not so. When an individual borrows from a bank, he or she can certainly spend above income in a certain period. But there must be another individual that receives payment from the borrower and deposits the money in his or her bank account. Such depositing of money implies that – for this individual – expenditure is beneath income in that same period. No clear demand effect arises from new bank credit, even when such credit is specifically to finance currently produced goods.

The other objection is empirical. The overwhelming majority of bank loans are to finance the acquisition of existing assets. Residential mortgages constitute about half of the UK banking system's sterling loan portfolios and are the largest single type of loan asset. It is a matter of common observation – which is incidentally confirmed by detailed official statistics – that most mortgages finance the purchase of a house that has already been built. Only a small proportion is for newly-built houses. Similarly, most loans to companies are to support shifts in asset structure of some kind, and bank lending to companies is correlated with levels of merger and acquisition activity.

But – when a bank makes a loan to finance the acquisition of an existing asset – there is no first-round impact on demand whatever. It needs to be remembered that demand is the sum of consumption and investment, where investment represents the acquisition of newly-created capital assets, i.e., extra capital goods that form part of the current period's output and require resources of labour, capital and so on to be produced. Since most bank loans help in the acquisition of existing assets and not of newly-created assets, they have no direct relevance to the buoyancy of demand.

No relationship between banks' credit extension by itself and aggregate demand is implied by recognised economic theory. The availability of bank credit is therefore not a measure of monetary policy. Nevertheless, the future growth of bank credit is a valuable part of monetary analysis, as will now be explained.

The significance of banks' credit extension: new bank credit is important if and when it creates new bank deposits

The remarks in the last section may seem dismissive about bank lending. However, a vital qualification has to be made. Most new bank loans create new bank deposits. Apparently by magic, banks manufacture new money when they extend loans to non-bank agents. (When a bank makes a new loan, it adds identical amounts to both sides of its balance sheet. This requires nothing more than 'a stroke of the pen'. But it is not magic. The bank must have enough capital to meet the risk that the loan will go bad and enough cash to anticipate the possibility that the borrower will use the loan proceeds to make payments to the customers of other banks.⁶)

Because new bank credit generally create new bank deposits, and because national income and asset prices are in equilibrium only when the demand to hold bank deposits is equal to the actual quantity of bank deposits, the prospective rate of growth of bank lending is of critical importance in the assessment of the monetary situation. This observation has particular relevance in the UK nowadays, when holdings of government securities are only a tiny fraction of banks' assets.

The argument can be taken further. So far the discussion has proceeded without a single mention of the Bank of England's repo rate. (This repo rate is in practice very close to the clearing banks' base rate.) But – by describing the wider context within which monetary variables affect macroeconomic variables – the significance of this rate may be easier to understand. If the level of the Bank of England's repo rate influences the rate of growth of bank lending, the likely similarity of the growth rates of bank lending and bank deposits implies that the repo rate is an extremely powerful instrument of monetary policy. Experience in the last 30 years has in fact dispelled the orthodoxy among British economists in the immediate post-war decades, that the variation of interest rates was an inefficient way of influencing demand and should play second fiddle to fiscal policy. Today the conventional wisdom is that the UK economy is highly sensitive to the Bank of England's interest rate decisions.

Conclusion: how UK expenditure and asset prices adjust to money

The argument of these pages has been that the behaviour of a broadly-defined measure of money – which in practice boils down to the behaviour of bank deposits – is fundamental to the determination of national income and asset prices in the UK, as in other economies. To make this statement is not to claim that the annual rate of increase in money will be identical at all times to the annual rate of increase in nominal GDP. However, it does imply that a large change in the rate of monetary growth – such as that seen in the UK in the last two-and-a-half years – has an important bearing on future macroeconomic outcomes. More specifically, past experience suggests that the Bank of England will have difficulty keeping inflation on target over the medium term unless the rate of monetary growth slows sharply in the next few quarters. It does not seem likely, although it is not certain, that the liquidity

crisis of autumn 2007 will lead to a marked reduction in the rate of money supply growth without further action by the Bank of England.

I will conclude by offering a few generalisations about how asset prices and income adjust to situations of monetary disequilibrium (of 'excess money balances' or indeed deficient money balances, if agents have too little money relative to the equation set out in the first footnote). These generalisations reflect my analysis of UK money supply data in a 30-year career as a monetary analyst in the City of London and have been made possible by the availability of sector-based money data since the early 1960s. They are a central theme of my 2005 monograph on *Money and Asset Prices in Boom and Bust*, but I have written a great deal of other material in this area.⁷ (Analyses of the sector-based UK money data was a key specialisation of the company - Lombard Street Research – which I used to manage.)

- Generalisation 1. Fluctuations in asset prices are invariably larger than fluctuations in the price level of goods and services in the course of any particular business cycle,
- Generalisation 2. Nevertheless, in the long run (i.e., in the course of several business cycles) the rates of increase in asset prices and nominal GDP are similar,
- Generalisation 3. An implication of the first two generalisations is that the fluctuations in asset prices play an important role in motivating the changes in expenditure growth which are a feature of the business cycle,
- Generalisation 4. Fluctuations in the growth rate of money held by financial institutions (and to a lesser extent money held by industrial and commercial companies) are much higher than fluctuations in the growth rate of money held by the personal sector, and
- Generalisation 5. It is difficult not to believe that generalisations 1 and 4 are related. In other words, financial institutions and companies play a far more important direct role in the determination of asset prices (except house prices) than the personal sector, and the volatility of non-personal money holdings is associated with the volatility of asset prices.

The message of these generalisations can be expressed more pithily. Monetary disequilibrium – which sets up the forces responsible for the adjustment of national income and asset prices to money – is particularly characteristic of the financial and company sectors. Economists at the Treasury and the Bank of England have routinely over the last 30 years dismissed the large swings in financial and corporate money holdings as of little relevance to macroeconomic outcomes, with (in my opinion) catastrophic results in the boom-bust cycles of the 1970s and 1980s. It will be interesting to see if the coming slowdown in money growth is accompanied, yet again, by a more marked deceleration (or even a contraction) in financial and corporate money, with the usual wider macroeconomic ramifications.

Notes

1. The equation is usually written $M_s = M_d(Y, r, x)$, where M_s denotes the money supply, M_d the demand for money, Y national income, r the rate of interest (in the sense of 'the return on the nearest alternative asset to money') and x a ragbag of variables which affect the attractiveness of holding money relative to not holding it. Strictly, the only non-money asset in this equation is 'the nearest alternative to money', usually to be taken as a bond of some description. The formulation originates, particularly, in Keynes' *The General Theory of Employment, Interest and Money*. However, it has been argued – notably by Leijonhufvud in his 1968 study *On Keynesian Economics and the Economics of Keynes* (New York and London: Oxford University Press, 1968) – that Keynes intended money to be viewed in portfolios containing many assets.
2. The first statement is implied by the equation which has appeared in hundreds of textbooks and so – one presumes – it cannot be controversial. However, the second statement is undoubtedly controversial. I believe that these forces – which are described technically in economics as 'real balance effects' – are of immense significance to macroeconomic outcomes. However, many other economists deny not just their importance, but even their existence. For example, real balance effects play virtually no role in the determination of national income in the standard income-expenditure models used by the large forecasting groups (i.e., the National Institute, the London Business School and indeed the Bank of England). Indeed, the current fashion in theorising about macroeconomic policy is to exclude money by assumptions. This is true, for example, of the three-equation New Keynesian model which is sometimes said to be the workhouse of analysis and forecasting in central banks. (See, for example, the paper by Philip Arestis and Malcolm Sawyer in P. Arestis et al [eds.] *The New Monetary Policy* [Cheltenham, UK, and Northampton, USA: Edward Elgar, 2005, particularly pp. 7 – 8.]

3. Professor Friedman invited mockery when he once called up a 'helicopter' to explain sudden changes in the quantity of money. But the processes by which the economy adjusts to the quantity of money are – in general – far more important and powerful than the processes by which money enters the economy. In the example under consideration here, the foreign purchase of UK assets may have an initial effect on their market prices. If the prices of all houses and equities owned in the UK move in line with the prices of houses and equities bought by foreigners, the first effect is to raise the value of all houses and equities to £8.4 trillion, of which £7 trillion (or 5/6 of all assets) is held by UK agents and £1.4 trillion (1/6) by the foreign investors. The initial purchases do affect asset prices, but this effect is swamped by the eventual doubling of all UK asset prices and national income because of the doubling of the quantity of money. Consider an alternative case, with non-bank financing of the foreign asset purchases. If the foreigners borrowed from UK non-banks in order to finance their acquisitions (by, for example, issuing £1.4 trillion of bonds or equities, with all the issues purchased by transfers from UK non-banks' sterling deposits), the quantity of money held by UK agents would drop to zero immediately after taking up the bond and equity issues, but would then return to £1.4 trillion after they had sold a sixth of the nation's assets to the foreign investors. The quantity of money would be unchanged, and the equilibrium values of national income and asset prices would also be little affected. The preparedness of foreigners to pay 20 per cent more for a proportion of the national wealth might affect valuations a little, but probably by less than 20 per cent. The very different macroeconomic consequences of alternative ways of financing asset acquisition comes as a surprise to many people, but there is no doubt that our account corresponds to 'what happens in the real world'. As amplified at greater length in the first essay in this publication, the long-run relationships between the levels of bank deposits, income and expenditure, and asset prices are inescapable. Economists who believe that 'credit' is the key variable might note that – in both the case in which the foreigners' asset purchases are financed by bank loans and that in which they are financed by bond or equity issues – the foreigners rely on 'credit'. (Bond and equity issues are certainly new credit, on any sensible definition of the term.) But bank finance doubles equilibrium asset prices, whereas securities issuance leaves them unchanged.
4. There is the complication of the assets held by foreigners. It does not affect the essence of the analysis.
5. See footnotes (19) and (20) to the first essay for more on the doctrinal background to the 'which money?' debate.
6. See footnote (15) to the first essay for a longer discussion on the importance of banks keeping enough cash (and liquid assets quickly, cheaply and predictably convertible into cash) among their assets.
7. Tim Congdon *Money and Asset Prices in Boom and Bust* (London: Institute of Economic Affairs, 2005). See also essays 14 and 15 in Tim Congdon *Keynes, the Keynesians and Monetarism* (Cheltenham, UK, and Northampton, USA: Edward Elgar, 2007).