Monetarism: A Retrospective

Thomas Mayer & Patrick Minford

Monetarism: A Rejoinder

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Introduction

Since monetarism developed as a challenge to the then dominant Keynesian theory (at one time also called the 'Neoclassical synthesis') we discuss it primarily by contrasting it with that theory, but we also take up some subsequent developments, such as the conflict between monetarism and New Classical theory. Mainstream economics has moved considerably beyond the stark confrontation of Keynesianism and monetarism, towards a position that embodies important elements of both. This gives our discussion a historical flavor. It also means that monetarism is hard to define, because it is not the doctrine of a school that is sharply differentiated from the rival Keynesian and New Classical schools. While some economists are clearly monetarists, others take intermediate positions that make it more or less arbitrary whether to call them monetarists. The basic theoretical proposition of monetarism—that changes in the quantity of money (defined as currency plus at least checkable deposits) play the central role in the determination of nominal income—differs only in degree from the view held in recent years (but not in say, 1955) by most Keynesians, that changes in the quantity of money are a major (and in the long run the dominant) determinant of changes in nominal income. There is little disagreement between modern Keynesians, monetarists and New Classical economists about long-run equilibrium. However, while New Classical economists think that this equilibrium is reached rapidly and Keynesians think it is reached slowly, monetarists take an intermediate position. That is an important difference, because many policy questions relate to an intermediate period.

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To be sure, much of the monetarist research strategy focuses on changes in the supply of and demand for money, while the Keynesian strategy is to look also at the propensity to consume, the marginal efficiency of investment, government expenditures and net exports. But this difference relates only to the way of proceeding with research, and not directly to how the economy functions.

There is greater disagreement on policy. Some monetarists agree with Keynesians that—in principle—fiscal policy can have a significant effect on nominal income, but deny that it has a large effect in practice; others deny that even in principle fiscal policy has a significant effect on income. While hard-core monetarists believe that the money supply should grow at a fixed rate, others merely want the growth rate of money to be stable, a position not so different from that of some Keynesians who oppose 'fine-tuning'.

There are several major sources of monetarism. One is the work of Milton Friedman (see Friedman 1956, 1969), a leader of the Chicago School; the other is the work of Karl Brunner and Allan Meltzer (see Brunner and Meltzer 1989, 1993). Brunner and Meltzer's work tends to focus somewhat more than Friedman's on theoretical issues. For a time, work done at the Federal Reserve Bank of St Louis, showing the dominance of monetary policy over fiscal policy, also did much to buttress the monetarist case. Other important monetarists are: in the USA, Phillip Cagan, Robert Hetzel, William Poole, Robert Rasche, Anna Schwartz and the late Clark Warburton (who had anticipated much of Friedman's work); in Canada, David Laidler; in Germany, Manfred Neumann; and in Israel, Alex Cukierman. In the United Kingdom, Alan Walters is probably the best known.

Basic ideas and history

The term 'monetarism' was coined in 1968 by Karl Brunner, but the core idea of monetarism—the quantity theory of money—is much older. This theory, which asserts that changes in the supply of money are the dominant determinant of changes in nominal income or prices, can be found as far back as antiquity. David Hume presented a remarkably sophisticated version of this theory and also upheld many other monetarist views.

Early in the twentieth century, Irving Fisher's *The Purchasing Power of Money* (1911) was a landmark in the development of the quantity theory and in its empirical testing. Fisher used what is called the transactions version of the *equation of exchange*, $MV = PT$, where M is the money supply, V its velocity, i.e. the number of times the average unit of money is spent per period (say a year), T is the total volume of transactions undertaken with money, and P is the average price of the items exchanged in the transactions. These transactions encompass not only final output, i.e. real GDP, but also transactions in intermediate goods (such as the iron ore that is used to make steel), factor payments and purchases of financial assets. An alternative, more popular, version, called the income version, defines V as the number of time a unit of money becomes income during the period, T as real GDP, and P as the average price of items included in GDP.

The equation of exchange should not be confused with the quantity theory. It does not tell us whether most of the change in P is due to changes in M or V or to changes in T, or whether causation runs from money to prices, prices to money or velocity to prices; etc. To establish the quantity theory two empirical suppositions are required, which Fisher tested at length. One is that, since the velocity of money depends on customs and slow-changing institutions, it is stable after adjusting for a secular trend; in particular, over the relevant period changes in the quantity of money do not produce largely offsetting changes in velocity. The other supposition is that changes in the money supply are the cause, and changes in prices the effect—for example that new gold discoveries raise the money supply, which then raises real income and prices. On the other hand, suppose that prices rise because of greater union pressures for wage increases, and that the central bank responds to the resulting rise in the demand for nominal money by increasing the money supply. The observed correlation between prices and the money supply would then not be evidence supporting the quantity theory, because causation is running in the wrong direction.

While Fisher developed his version of the quantity theory, Arthur C. Pigou at Cambridge University developed further Alfred Marshall's 'Cambridge' version (Pigou 1917). This states the equation as $M = KPT$, where M, P and T have the same meanings as before, and K (the reciprocal of V in the income version of Fisher's equation) is the proportion of their incomes that people keep as cash balances. This version has the

advantage of relating people's behavior, with respect to money holdings, explicitly to their decisions, and hence to the optimizing behavior, that forms the basis of economic theory.

Modern quantity theorists therefore use the Cambridge formulation rather than Fisher's formulation. They use the income version in part because they are more concerned with the behavior of GDP, and with the prices of those goods that are included in GDP, than with the volume of total transactions and their prices. Moreover, while GDP data are readily available, data on total transactions are not.

In continental Europe the quantity theory was discussed by Albert Aftalion, Maffeo Pantaleoni, Leon Walras and Knut Wicksell. In the early part of the twentieth century many economists in Britain and the United States were quantity theorists. That changed drastically in the 1930s. During the Great Depression, velocity in the United States and in Britain fell sharply, a development that at the time appeared to invalidate the quantity theory with its assumption of a stable velocity. And the fact that apparently low interest rates failed to stimulate the economy then seemed to suggest that monetary factors were not an important determinant of income. What was perhaps even more important was the publication in 1936 of *The General Theory of Employment, Interest and Money,* in which John Maynard Keynes brilliantly presented an alternative approach to income determination based on an analysis of the incentives to spend on consumption and investment. It soon swept the field, and, at least in the United States and Britain, the quantity theory came to be considered an exploded fallacy. The *General Theory*, along with the depression, also initiated a shift in economist's attention from long-run trends to short-run developments, and from changes in prices to changes in output and unemployment. Moreover, with expenditures now seen as governed primarily by income rather than by money holdings, monetary policy was considered weak, and fiscal policy, which directly changes income, was considered strong.

That situation changed in the 1950s, for several reasons. First, quite unexpectedly, it was inflation, and not massive unemployment, that proved to be the major postwar economic problem. This is a problem in which the quantity theory has a *comparative* advantage. Second, it was intuitively appealing to relate the ongoing inflations to the expansionary monetary policies being followed, thus supporting the quantity theory.

Third, Milton Friedman reformulated the quantity theory in a way that appealed to modern economists, shifting the focus of attention away from the long run, where it had been in Fisher's work—Fisher did not apply the quantity theory to the short run—to encompass the short run as well. This was important, because concern about business cycles and unemployment had shifted economists' attention to the short run. In that connection, Friedman also shifted the emphasis from explaining the price level (a variable that is more responsive in the long run) to explaining nominal income. This meant that the quantity theory could now explain changes in output as well as in prices, and could no longer be dismissed as arbitrarily assuming full employment. Moreover, instead of treating velocity as more or less exogenously given, Friedman explained it along the lines of standard portfolio theory, making it a function of income (or wealth) and the interest rate. In this he followed Keynes, though he rejected Keynes's idea that the demand for money, and hence velocity, is highly interest elastic and unstable.

Indeed, Don Patinkin has strongly argued that Friedman's quantity theory is a further development of Keynesian theory, and not of the traditional quantity theory. Friedman strongly disagrees. A reasonable resolution of this dispute is to say that Friedman uses some of Keynes's theoretical tools to reach traditional quantity theory results. Whether one calls it a Keynesian theory or a quantity theory, therefore, depends in part on whether one classifies theories by their tools or by their conclusions. But even in the former case, Friedman differs from Keynes in an important way: unlike Keynes, he determines aggregate expenditures indirectly, by looking at what is *not* spent, that is at money holdings.

Friedman's success in restoring the quantity theory to a position where, though it was not accepted by the majority of economists, it was at least a serious competitor, was aided by several factors in addition to Friedman's brilliance, both as an economist and as an expositor. One was that the then prevailing version of Keynesian theory had gone much too far in de-emphasizing the role of changes in the quantity of money, which made it an easy target for monetarist criticism. Second, in part under the influence of other writings of Friedman, a methodological shift had occurred in economics. There was now less emphasis on apparently plausible reasoning and more on empirical evidence. Keynesian theory had benefited from the previous emphasis on common-sense plausibility because it seemed much

more plausible that our expenditures are determined by our incomes than that they are determined by the amount of money we happen to hold. So, when Friedman and his students, as well as other monetarists, pointed to empirical evidence showing a close correlation between money and nominal income, that is to a stable Cambridge *K*, economists took notice. Thus, someone reading Friedman's theoretical essay on the quantity theory might be skeptical about what the theory could accomplish; but that skepticism would be reduced by reading the essays by Friedman's students, which successfully applied the theory to specific cases, such as hyperinflation, and velocity in the United States.

At the same time, Don Patinkin reformulated the traditional quantity theory in a much more abstract way providing greater elegance and rigor, and thus brought the quantity theory into line with contemporaneous advances in economic theory. And in the 1970s Brunner and Meltzer developed a monetarist model of income determination that challenged Keynesian theory in fundamental ways, though it never attained the prominence of either Friedman's or Patinkin's version of the quantity theory.

As a result, during the 1960s and 1970s a substantial part of the work in monetary theory dealt with the quantity theory. Much of it consisted of trying to explain the determinants of the demand for money, but there were also extensive debates about the stability of velocity, and the interest elasticity of the demand for money. Indeed, Friedman had labeled the quantity theory a theory of the demand for money, because, once one has pinned down the demand for money, and knows the (exogenously given) supply of money, one can determine the levels of nominal income and interest rates needed to equilibrate the supply and demand for money.

In the 1980s the monetarist theory of income determination lost much support. One reason was that the demand for money and velocity had become much less stable, so that the quantity theory no longer provided a useful tool for predicting nominal income. Another reason is that starting in the late 1970s economists became interested in a rival theory, the New Classical theory. The technical challenge of employing the complex models of New Classical theory, combined with a renewed emphasis on formal theory, attracted many younger economists, who otherwise might have become monetarists.

The other main doctrine of monetarism—that central banks should let the money supply grow at a stable rate—has much less of a history. Under the gold standard central banks were not supposed to control the money supply for domestic objectives. Hence the question of whether it is better to let money grow at a stable rate than to undertake countercyclical policies did not become salient until the 1930s, when the gold standard collapsed. At that point most economists probably believed that central banks should focus on countercyclical policies. But in 1936 Henry Simons challenged this view and advocated stable money growth, a position that Friedman then developed much further and buttressed by empirical evidence of wrong-headed central bank policies.

The monetarist theory of nominal income determination

Everyone agrees that, since nominal income is equal to aggregate expenditures, to know nominal income one must know nominal expenditures. But monetarists, unlike Keynesians, explain aggregate expenditures indirectly. Suppose that everyone spends their entire receipts. In each period aggregate expenditures would then be equal to the receipts—and hence the expenditures and income—of the previous period. But if people try to add to their money holdings or to reduce them, or if additional money is injected into the economy or withdrawn from it, then expenditures will change. Hence one can explain changes in nominal income by looking at changes in the supply of money and in the demand for money. This is the research strategy of the quantity theory.

This research strategy differs from the Keynesian strategy in several ways. First it focuses on equilibrium in a single market, the market for money. It can do so, since any receipts that are not added to money holdings are spent on goods and securities, so that the market for goods and securities is in equilibrium if, and only if, the market for money is in equilibrium. Such an indirect approach to determining aggregate expenditures has the advantage in that analyzing the market for money is easier than analyzing the markets for the various types of expenditure and their interactions. Hence, while Keynesians often use large econometric models to trace the effects of changes in the quantity of money on income, monetarists usually avoid such elaborate treatment of the transmission process from money to income, and simply say that if the supply of money rises the public will spend more. They do this, in part, because they believe

that capital markets are fluid, so that if, say, firms decide to invest less, the funds not used for business investment will readily find their way to other spenders, such as households that want to purchase houses.

Moreover, because they do not estimate GDP by adding demands in various sectors, monetarists make a sharp distinction between macroeconomic and microeconomic phenomena. Assume, for example, that investment opportunities in the trucking industry increase, so that trucking firms invest more. Keynesians recognize that one should not simply add this additional investment to the previous estimate of investment because, by raising interest rates, it will reduce other investment. But they treat this as an indirect effect, and are tempted to treat such indirect effects as secondary. Monetarists, on the other hand, argue that, except insofar as the demand for more trucks, by raising interest rates, lowers the Cambridge k or induces the central bank to increase supply of money, it will not change GDP.

This difference between giving a certain effect a direct or an indirect role may seem subtle, and one that should play no role in a comprehensive analysis that takes indirect effects, as well as direct effects, into account. However, much economic analysis is not comprehensive. Suppose, for example, that a Keynesian economist and a monetarist economist were asked to estimate the effect on the general price level of a 10% rise in steel prices. The Keynesian would be tempted to argue as follows: since steel accounts for x% of the value of total output, as a first approximation the price level will rise by $0.1x$%. By contrast, the monetarist would be tempted to say that, since the money supply is constant, as a first approximation only the relative price of steel will rise, while the price level will remain constant. Both would have to concede that their analyses are not complete, but incomplete analysis does, of necessity, infuse much of our thinking and forms the background that often shapes our more elaborate analyses.

Another difference in research strategy is that, while Keynesians formulate their analysis in terms of changes in the interest rate, monetarists do so in terms of changes in the supply of or demand for money. To a considerable extent, that is just a matter of wording. Given the demand curve for money, i.e. the quantity of money demanded at each interest rate, one can express any point on the curve equally well by reference to either the y-axis (the interest rate) or the x-axis (the money supply.) Monetarists

argue that it is better to think in terms of the money supply, because the most relevant measure of the interest rate—the expected real rate of interest—is hard to estimate. This is so because price expectations cannot be measured accurately, and also because it is difficult to combine the numerous interest rates that exist (some of which are not even recorded by our data) into a single measure. Monetarists therefore focus on the money supply instead of the interest rate, not because they somehow think that money can affect income in some mysterious way independently of what is happening to the yields on various assets, but because of practical problems of measurement. Keynesians respond that, for reasons discussed below, it is even more difficult to measure the quantity of money. Moreover, the interest rate provides more information about what will happen to income than does the quantity of money, because it combines the effect of changes in both the supply of money and the demand for money.

Measuring the money supply

Monetarists are right when they say that, since the price level is the exchange rate between money and goods, an increase in the money supply, *ceteris paribus*, raises prices. But to go from this insight to a theory that can be used for (and tested by) predictions requires that money be defined in a way that can be measured with sufficient accuracy. This has proved a major problem for monetarism. There are three main alternative definitions of money. Narrow money, M_1, consists of currency and checkable deposits. A broader definition, M_2, adds certain other highly liquid assets to M_1, while M_3 adds still more liquid assets. The exact definitions of M_2 and M_3 vary among countries. In the United States, for example, M_2 includes time deposits of $100,000 or less, overnight repurchase agreements and shares in certain mutual money market funds and overnight Eurodollar holdings, while M_3 adds those time deposits, repurchase agreements and Eurodollar holdings and mutual money market shares that are excluded from M_2. In the United Kingdom a related concept, known as M_4, adds to £M_3 building society deposits. (£M_3 consists of all bank deposits denominated in sterling and held by UK residents.) Even broader definitions of money than M_4 have been proposed. Another, but much narrower, concept that is used, though it is not strictly speaking 'money', is M_0, called base money, which consists of currency and bank reserves.

Suppose that M_0 is falling at a 1% rate, M_1 and M_2 are rising at rates of 1% and 3%, respectively, while M_3 is constant. Does the quantity theory predict that nominal income will rise, fall or remain constant? A standard way of dealing with this problem is to use the measure of money that has the best correlation with income. But this procedure has several weaknesses. First, the answer may vary from time to time, and may change in unexpected ways. For example, in the United States M_1 had at least as good a correlation with income as M_2 did until the 1980s, but a much worse correlation afterwards. Second, a high correlation between a particular measure of money and income may result not from money causing income, but from income causing money (the problem of 'reverse causation' discussed below), or from a third variable affecting both money and income. Third, if the quantity theory is to be used as a guide to monetary policy, it should employ a measure of money that the central bank can control with sufficient accuracy. If quantity theorists demonstrate that a certain broad measure of money has a close relation to income, this is of only limited use to a central bank that can exercise reliable control over only a narrow measure.

A basic problem is that the market drives returns on financial assets, including deposits to a rate that yields the same expected utility. This proposition is not so important in a world of bank and intermediary regulation, in which legal ceilings limit deposit-rate competition and other regulations limit the type of deposit and security that can be provided. Such conditions have been typical for many periods of history, including especially the postwar period. But by now deregulation has spread to finance, and the demand for monetary instruments has adjusted to changes in deposit rates. There is now intense competition and substitution between 'wide' money and other assets.

An additional problem is that residents of one country can hold some of their money balances in another country's currency. Suppose that the sterling holdings of British residents are constant, but that they now hold more euros or dollars. Their ability to purchase British goods has gone up just about as much as if they had held these deposits in dollars. But their euros and dollar holdings do not show up as a change in the British money supply. It is not just large corporations that hold foreign monies: households do it too, by holding currency notes. Since currency notes held outside a country have no effect on its income, they should be excluded from the

country's money supply. But the necessary data are not available. Such foreign currency holdings are not trivial. Perhaps three-quarters of US currency (and hence almost a quarter of M_1) is held abroad. There are also foreign holdings of other currencies.

Moreover, at least in the United States, the initially available money supply data that are used to make policy are subject to substantial subsequent revision. All in all, the difficulty of empirically defining and measuring money is one of the greatest weaknesses of monetarism.

The demand for money and the effect of changes in the money supply

Although in their other work leading quantity theorists have made substantial contributions to explaining what determines the supply of money, for the quantity theory itself they take the money supply as exogenously determined. Hence, it is the determinants of the demand for money that quantity theorists have to investigate. Like other economists, they assume that the demand for money in real terms, like the demand for any other durable good, depends primarily on its cost (which in the case of money is the interest forgone), on nominal income or wealth, and on 'tastes', a variable including the prevailing payments technology (e.g. the use of GIRO accounts) and the public's preferences. Assuming that these tastes are stable, there is a stable function relating the demand for money to interest rates and nominal income.

Suppose, for example, that the supply of money increases by 10%. Equilibrium in the market for money then requires that the demand for money also rise by 10%. This, in turn, requires a particular combination of a decline in interest rates and a rise in nominal income. Suppose for the moment that interest rates are constant. If so, nominal income will have to rise by enough to make the public demand 10% more nominal money. Suppose, further, that real income and real wealth are constant, so that only prices rise. With real income and interest rates constant, rational behavior, *ceteris paribus*, implies that the *real* quantity of money that the public wants to hold is constant. And to keep the real quantity of money constant, prices have to rise in proportion to the increase in the money supply, i.e. by 10% in this example. Only then will the money supply be equal to the amount of money that the public wants to hold. One can therefore say that: (a) the government and the banking system determine

the quantity of nominal money in existence; (b) the public determines the real quantity of money it wants to hold; and (c) the price level adjusts to make the nominal quantity of money supplied correspond to the real quantity that the public wants to hold.

But how can quantity theorists assume that the interest rate is constant? Surely, an increase in the quantity of money lowers interest rates as holders of the additional money offer it on the loan market. There are two possible answers. An old-fashioned one is to assume that the demand for money responds very little, if at all, to changes in interest rates, so that even when interest rates change substantially the demand for money is scarcely affected, and it is therefore mainly changes in nominal income that are responsible for equilibrating the demand and supply of money. This explanation has not survived empirical tests. A much better explanation is to look beyond the first-round effect of an increase in the money supply. Assume, just for ease of exposition, that prices and real income are stable before the money supply increases. At first the interest rate declines, so that expenditures, real income and prices all rise. As a result, the demand for money increases, and this drives up the interest rate again. And it has to continue to rise until it is back at its previous level. Since we started out from an equilibrium level of the interest rate at which prices and real income were stable, as long as the interest rate is below that level, expenditures are higher than before. That continues to drive up the real income and prices, and hence the interest rate. If one assumes that the economy was operating at full employment at the time the money supply increased, then all of the rise in nominal income that occurred must represent a rise in the price level. Since, with interest rates back at their previous level, the public wants to hold the same quantity of *real* money as before, to equate the supply and demand for money, the price level must then have risen in proportion to the increase in the nominal money supply.

What is critical here is how long it takes the interest rate to return to its previous level. Most economists would agree that the quantity theory is correct in the sense that an increase in the quantity of money will *eventually* lead to a proportional rise in prices. Keynes did not deny that. What is subject to dispute is how long it takes for this to occur. If it takes, say, twenty years, then it is not a very interesting proposition, since policymakers and others who want to forecast economic conditions usually have

a much shorter horizon, often less than five years. Hence, to a considerable extent one can treat the dispute between quantity theorists and Keynesians as a dispute about how long it takes for prices to adjust fully to changes in the money supply. That is an empirical issue.

Other aspects of the quantity theory

Keynesians explain changes in nominal income not only by changes in the money supply, which change interest rates, but also by changes in the propensity to consume, the incentives to invest, government expenditures and net exports. In the quantity theory these four variables also affect nominal income, but they do so indirectly. If households want to consume more, or firms want to invest more, or if the government borrows to increase its expenditures, then the interest rate rises. As the opportunity cost of holding money has thereby increased, the public has an incentive to hold less money per dollar of income, so that that the Cambridge k falls and hence nominal income rises.

This does not mean, however, that the quantity theory and the Keynesian theory are the same, only that we can state the propositions of one theory in the language of the other. The two theories differ not in rejecting each other's logical chains, but on the empirical suppositions that determine what conclusions the logical chains generate. Suppose for example that the interest elasticity of the demand for money is low, while the interest elasticity of investment is high. Then, if the incentives to invest increase, the demand for funds to invest drives up the interest rate substantially, since it takes a big rise in interest rates to induce the public to hold significantly less money relative to its income. This rise in interest rates then limits substantially the rise in investment, and hence income does not increase much. Similarly, under these conditions, if the government deficit increases, nominal income is little changed. The quantity theory's prediction that if the money supply is constant nominal income does not change much is then valid. By contrast, if the interest elasticity of demand for money is high and the interest elasticity of investment is low, then a rise in government expenditures financed by borrowing is not offset by much of a decline in investment.

As discussed below, the quantity theory and Keynesian theory also differ in their interpretation of history. In Keynesian thinking, the incentive

to invest (Keynes's 'marginal productivity of capital') is unstable and is a major factor driving fluctuations in income. In quantity theory thinking, the marginal productivity of capital and other expenditure incentives are fairly stable (or else changes in them are mutually offsetting), so that most of the fluctuations in income that have occurred are due to changes in the money supply. Moreover, in Keynesian thinking, when an increase in the money supply does occur, for some time a substantial part of its effect is on interest rates rather than on expenditures and income; in quantity theory thinking such an increase affects prices almost immediately. It might seem that these are empirical issues that are easy to resolve—one could, for example, compare past changes in the money supply with past changes in the incentives to invest. But the incentives to invest are hard to measure.

Quantity theorists are frequently criticized for not having a genuine theory, and for relying on the mere correlation of changes in money and income, and thus committing the fallacy of *post hoc ergo propter hoc.* However, they can respond that they are relying on standard economic theory, which tells us that if the supply of an item increases its relative price falls, so that an increase in the supply of money lowers the price of money in terms of goods; that is, it raises prices. While it would certainly be useful to have the steps leading from money to income spelled out in detail, rather than left vague and general, quantity theorists believe that that this is not a necessary requirement for a coherent theory. In part, the dispute about whether monetarists really have a theory is methodological and relates to the criteria for a good theory. A scientific theory should connect a wide set of empirical observations to theories we already hold, and should allow us to predict other observations. Monetarists focus on prediction and on a theory's ability to encompass a wide variety of observations. Some anti-monetarists focus on the rigor and detail with which the observations are linked to standard microeconomic theory. For example, a leading anti-monetarist, Frank Hahn (1971), charged that Friedman does not have a theory of money, because he does not explain why people hold money. But from Friedman's point of view what matters is not some deep explanation of *why* money is held, but an explanation of *how much* money the public wants to hold, so that one can predict changes in nominal income from changes in the money supply, and from changes in factors such as income that determine how much money people want to hold.

If the quantity theory explains the price level in a particular country, it should also be able to explain the world price level. Indeed, under firmly fixed exchange rates, the quantity theory should be used to explain only the world price level, since for any single country the money supply is endogenous. Suppose, for example, that income, and hence interest rates, rise in country A. This induces an inflow of capital. To prevent the exchange rate from appreciating, A's central bank then has to buy the resulting excess supply of foreign exchange; that is, it has to increase its own money supply. Causation now runs from a rise in income to a rise in the money supply.

Monetarist models have been developed which assume that the 'law of one price' equalizes prices in all countries—an assumption that is much stronger than appears at first glance. They show that in the long run exchange rate policy is useless in changing a country's 'competitiveness': depreciation results in a higher price level, but not in a higher level of exports and employment.

International monetarism interprets movements of the exchange rate as indications of an excess supply of or demand for money in a country. If the residents of a country want to hold more money, they import it by increasing their net sales of goods and securities to foreigners. Under fixed exchange rates, this results in the central bank increasing the money supply as it buys up the resulting increase in the supply of foreign currency. Under flexible rates the currency appreciates, which, by reducing import prices and hence the price level, increases the real stock of domestic money.

The Brunner–Meltzer model

The quantity theory standing alone is not the only theoretical framework used by monetarists. Brunner and Meltzer have provided a more elaborate framework, which investigates the transmission process from money to income and prices in much detail. They reject Keynesian theory mainly because (a) it uses an underdeveloped model of the market for assets that does not distinguish between the markets for capital and bonds and the markets for money and credit; (b) it arbitrarily assumes that money and bonds are substitutes; and (c) it makes insufficient allowance for the effect of changes in expenditure on the stock of wealth and in the relative yields of assets. For example, in their formal analysis Brunner and Meltzer treat

a government deficit as having a potentially important longer-run effect on aggregate expenditures, because it raises the stock of government securities that the public holds, and hence its wealth. As the increased security holdings raise the public's consumption, as well as its investment in firms, expenditures and thus income rise, which then raises tax revenues. Equilibrium is reached when tax revenues have risen enough, and certain government expenditures, such as unemployment compensation payments, have fallen enough, to eliminate the deficit. Until income has risen sufficiently to balance the budget, the economy is not in equilibrium because the public's stock of government debt is increasing.

Some economists have argued that this Brunner–Meltzer model is essentially a modified Keynesian model. Brunner and Meltzer, however, cited their above mentioned criticisms of Keynesian models as indication of a substantial difference. In addition, they regarded investment incentives and the economy as a whole, in the absence of government intervention, as being more stable than Keynesians believe. Moreover, to Brunner and Meltzer the empirical evidence on the critical parameters shows coefficient values that imply that the observed changes in income are largely due to changes in the money supply.

The Brunner–Meltzer model can be cited in reply to the frequent Keynesian charge that monetarists lack a genuine theory and rely on the mere correlation of changes in money and income. This does not mean, of course, that Brunner and Meltzer were able to establish the superiority of the monetarist explanation of economic events over the Keynesian explanation on theoretical grounds alone. Depending upon the values of certain parameters, their model can yield Keynesian as well as monetarist results. Brunner and Meltzer therefore devoted much effort to empirical work. Thus, they have contributed notably to the estimation of demand functions for money.

Fiscal policy

The disagreement about the effect of fiscal policy—a central issue in the monetarist debate—illustrates the monetarists' position. Monetarists, both those who use the quantity theory and those who use the Brunner–Meltzer model, agree with Keynesians that, in principle, a rise in the deficit raises nominal income. According to the quantity theory, it raises interest rates, and hence lowers the Cambridge k. In the

Brunner–Meltzer model it raises aggregate demand and hence income directly in the short run, as the government spends more or cuts taxes, and indirectly in the longer run, by raising wealth. But what matters is what the empirical evidence shows—which, claim many monetarists, is that deficits have little effect on income.

This ineffectiveness of fiscal policy does not need to be left as an unexplained and puzzling observation. In the first place, if the interest elasticity of the demand for money is low relative to the interest elasticity of expenditures, a rise in the interest rate induced by a deficit does not lower the Cambridge k much and mainly crowds out other expenditures. Second, any decline in the Cambridge k that does result from lower interest rates could be offset by the public wanting to hold more money as the deficit increases its holdings of government securities. Third, there is the Ricardian equivalence theorem, which (independently of monetarism) claims that the public responds to an increase in the deficit by saving more in the expectation that sooner or later taxes will have to be raised to pay the interest on the larger debt, or to repay some the debt. (Friedman, but not Brunner and Meltzer, gives some credence to this theory.) Hence, while the monetarist position that fiscal policy is ineffective is rooted in empirical findings, it is not necessarily inconsistent with economic theory.

The statistical evidence

A major part of the empirical evidence cited by monetarists is the high correlation between the nominal money supply and nominal income that has been amply documented for various countries, in particular the United States (Friedman and Schwartz 1963, 1982) and the United Kingdom (Friedman and Schwartz 1982; Walters 1970). This correlation exists not only for secular movements, but also for cyclical ones. Hence, monetarists argue that business cycles, or at least major business cycles, are the result of an unstable growth rate of money. Comparison of the growth rates of money and inflation rates across countries also support the quantity theory.

Keynesians have no trouble with the long-run correlation; such a finding is consistent with Keynesian theory, though Keynesians would stress the importance of not ignoring the short run. The correlation between cyclical movements in money growth and income is another matter. Keynesians do not deny that some business cycles have a monetary origin,

but they treat a decline in the growth rate of money as just one of several factors that can account for business cycles.

They have therefore challenged the monetarist interpretation of the short-run correlations, arguing that there is often 'reverse causation', that is, causation running from changes in income to changes in the money supply. Such reverse causation could result from the behavior of the money multiplier, i.e. the relation between changes in the monetary base and the money supply. The money multiplier depends on the public's preference for currency relative to bank deposits, and on the ratio of reserves that banks hold against their deposits. Suppose that a sharp drop in profitability causes many firms to fail and raises fears that some banks will be dragged down. The public then withdraws deposits from banks. To prevent their reserve ratios from falling, banks respond to this decline in their reserves by reducing their loans and security holdings, so that their deposits and hence the money supply fall. In addition, banks may try to protect themselves by holding a higher reserve ratio, which further reduces deposits and the money supply. Such behavior has played a role in some business cycles, but is unlikely to account for much of the observed correlation of money and income. Much more importantly, reverse correlation can also result from the behavior of the central bank. Central banks often want to prevent large swings in interest rates. They therefore provide banks with more reserves when income, and hence the demand for loans and money, increase, and with fewer reserves when income, and with it the demand for loans and money, decrease. In principle, the observed correlation between the growth rates of money and income could therefore be due to income causing money, not money causing income. Whether that is the correct explanation of the observed correlation is an empirical issue.

Friedman and Schwartz have dealt with the reverse causation problem in several ways. First, they tried to show that for all the major, i.e. severe, US cycles causation could not have run primarily from income to money, because in each case the change in the money supply was due to some exogenous factor, such as a greater gold supply induced by an innovation in gold refining, or a change in central bank policy. However, they admit that they can demonstrate this only for the major cycles, and not for the much more numerous smaller cycles. Here they rely on the argument that if something can be shown to hold for major cycles it is also likely to hold for minor cycles, whose smaller amplitude makes it harder to observe what

is going on. Second, if causation runs from income to money, one would expect the characteristics of the relation of money to income to depend on the particular transmission mechanism, and hence on the type of monetary system. But the relation between money and income has not changed much, despite substantial changes in the monetary system, such as the abandonment of the gold standard. Third, cyclical turning points in money preceded business cycle turning points. All the same, Friedman and Schwartz do not claim that causation runs entirely from money to income, but only that the money–income chain is more important than the income–money chain.

This claim has not gone unchallenged. The argument that one can generalize from the observation that money is causal in major cycles to state that money is also causal in minor cycles has not convinced everyone. Perhaps most recessions result from Keynesian factors, such as a decline in the profitability of investment, and then perhaps in some cycles a negative shock to the money supply turns what would otherwise have been a normal recession into a major recession. If so, one can hardly argue that, because a monetary shock is a dominating factor in major recessions it must also be one in minor recessions. Moreover, while there have been major changes in the monetary system, they need not necessarily have led to noticeable changes in the way in which income affects money. In addition, as James Tobin (1970) and Tobin and Brainard (1963) have shown, one can construct models in which income causes money and yet the turning points of money precedes the turning points of income.

Some economists have explored the causality issue econometrically. Essentially, they first regress income in one period on income in previous periods, and on money in the current and previous periods. Then they reverse the procedure and regress money in the current period on money in previous periods, and on income in the current and previous periods. If in the first regression money contributes little to explaining income, while in the second regression income contributes much to explaining money, they take this as evidence that income 'causes' money. But the concept of causality used in these tests is controversial, and, what is worse, the results obtained are sensitive to the specific technique used, such as the particular set of additional variables that are included in the regressions.

All in all, the causality issue has proved extremely troublesome. It has sometimes led to a confusion between what *did* happen and what *can*

happen. Monetarists are right in claiming that if the central bank is determined enough it can control the money supply. But for interpreting the observed correlation of money and income, what is relevant is what the central bank actually did, not what it has the power to do.

Monetarists have also tried to show that there is a stable demand function for money. Suppose the money demand function is $M^D = a + bY + ci$, where M^d is the demand for money, Y is nominal income, i is the interest rate and a, b, c are stable coefficients. Since the money market brings the supply and demand for money into equality, one can replace M^d by M^s and then solve for Y. If one takes the interest rate as constant or otherwise known (or else assumes that the coefficient c is small enough for the term ci to be ignored), then, if one knows the change in the money supply, one can predict the change in nominal income. This formulation avoids the causality issue because it makes no claim about why income changed. All that it claims is that, *if* the money supply changes, then income will change correspondingly.

Many economists have fitted variants of such money demand functions, often containing additional variables, hoping to find one in which the coefficients are stable. Such a function would allow monetarists to predict income. But it would not, on its own, validate the quantity theory, because this theory also requires either that the interest rate is stable, or that its coefficient (the interest elasticity in a logarithmic version of the above equation) is low. Otherwise, what could be changing income might be a change not in the money supply but in, say, fiscal policy, operating through a change in the interest rate, and hence a change in the demand for money. This is the causality issue again.

During the 1960s and early 1970s money demand functions, some of them for long spans of yearly data and some for short spans of quarterly data, gave good fits for many countries, though often not as good for other countries as for the United States. In particular, Friedman and Schwartz (1982) argued that the demand for money had been remarkably stable in the United Kingdom and the United States for over a hundred years.

But starting in the mid-1970s, the fit of money demand functions in the United States and some other countries seriously deteriorated as financial innovations, induced by high interest rates and facilitated by the computer revolution, allowed the public to economize on its money holdings. Subsequently, institutional changes that permitted the payment of

interest on some types of checkable deposits and eliminated interest rate ceilings on other deposits led to substantial additional instability in the demand for money.

At first this did not create a serious problem for monetarists in the United States, because, though the demand function for money no longer gave a good fit, velocity was growing at a stable 3% rate, so that one could still predict income accurately from a knowledge of the money supply. But in 1982 the velocity of the narrow money supply (currency plus checkable deposits) became highly unstable. This was probably due mainly to changes in institutions, such as the payment of interest on checkable deposits, so that the public now holds as M_1 money that it does not intend to spend soon. M_2 continued to have a stable velocity for some time, but in the early 1990s its velocity too became unstable. At least in the United States, the velocity of base money has remained more stable; but with so much of it being currency, there is the problem of reverse causation.

Another line of empirical research was initiated in 1963 by Milton Friedman and David Meiselman when they claimed that a regression of consumption on the money supply yields a much better fit than a regression of consumption on more distinctively Keynesian variables. A debate ensued that focused on technical issues, such as the appropriate time period to be considered, and the problem of reverse causation. A subsequent variant of the Friedman–Meiselman procedure by two economists at the St Louis Federal Reserve Bank, Leonall Andersen and Jerry Jordan (1968), addressed the narrower question of whether fiscal policy or monetary policy had a stronger, more predictable and faster effect on income. It found that monetary policy did, with the effects of fiscal policy quickly disappearing. Though Andersen and Jordan avoided some of the problems that plagued the Friedman–Meiselman study, their work led to a long debate, much of it again dealing with reverse causation. When, in the early 1980s, the velocity of narrow money became unstable, the Andersen–Jordan equation was no longer able to predict income, and this debate died down.

Economic history

Monetarists do not share the Keynesian belief that in the absence of stabilization policy a capitalist economy is highly unstable. This does not mean that they attribute all fluctuations to bad monetary policy, but only

that they think that if the growth rate of money were kept stable GDP would fluctuate less than it does now. In particular, Brunner and Meltzer, in their more recent thinking, allowed for the possibility that fluctuations in the profitability of investment account for a significant proportion of GDP fluctuations. All the same, monetarists consider the private sector more stable than Keynesians do. Unfortunately, it has proved extremely difficult to bring empirical evidence to bear on this issue.

Monetarists have devoted considerable effort to explaining various inflations as resulting from an excessive growth rate of the money supply, and not from cost–push factors, such as union militancy and supply shocks. They stress that a supply shock, such as the quadrupling of oil prices by OPEC, can lead only to a temporary blip in the price level, and not to an ongoing higher rate of inflation—as long as the central bank does not accommodate the increased demand for money resulting from the rise in prices. And if it does accommodate it, then the inflation should be blamed on the central bank.

It is not surprising that the most dramatic instance of instability, the Great Depression of the 1930s, has drawn much attention. At the time, this depression was treated as demonstrating the instability of the capitalist system, and also as showing the unimportance of monetary policy. But in 1963 Friedman and Schwartz published a monetary history of the United States from 1867 to 1960 that explained the behavior of income and prices by changes in the quantity of money, and offered a radical re-interpretation of the Great Depression. They argued that its severity and length resulted from the great decline of the quantity of money that occurred (nominal M_1 fell by about one quarter), owing to the failure of many banks, the public's withdrawal of currency from banks, and the desire of banks for a higher reserve ratio. They blamed the Federal Reserve ('Fed') for not increasing bank reserves sufficiently to maintain the money supply. Not only monetarists, but also many other economists, have found this re-interpretation wholly or partly persuasive, though it has also drawn criticism. Thus Peter Temin (1976) argued that the decline in the money supply resulted not from a downward shift of the supply curve of money, but from a downward shift of the demand curve for money as income fell, thus raising the familiar issue of reverse causation. Friedman and Schwartz have also been criticized for de-emphasizing the influence of international factors on the American economy, and for ignoring the

effect of bank failures on the availability of credit to firms that depended on bank credit. Critics have also argued that the Fed should not be blamed for allowing massive bank failures, because many banks were so weakened by the fall in agricultural prices and by bad banking practices that even a highly expansionary Fed policy would not have saved them. The debate is still ongoing, but it seems likely that eventually the Friedman–Schwartz explanation will be seen as a major part of, but not the entire explanation of, this episode.

From nominal income to prices and real income

Macroeconomics has to explain more than just nominal income—a sustained 5% rise in nominal income denotes a good performance if all of it represents a rise in real income, but not if it represents an 8% rise in prices and a 3% decline in real income. In other words, one needs to understand the supply side as well as the demand side of the macroeconomy. This has proved difficult. There is little disagreement about the underlying idea that the aggregate supply curve slopes upwards, but the nature and slope of this curve has proved controversial. A curve called the Phillips curve, after A.W. Phillips, relates changes in wages or prices to the level of unemployment. (Alternative versions linking the *level* of wages and prices to unemployment are not as widely used.) Ideally, the change in wages would be linked to changes in both the supply of and demand for labor, but, since the demand for labor is hard to measure, unemployment is used as a proxy for the balance of supply and demand in the labor market.

In the 1960s many Keynesians argued that the Phillips curve provides the government with a menu of policy choices, allowing it to select its preferred combination of unemployment and inflation rates. This optimistic view was soon discredited, with serious damage to the Keynesian cause (see Leeson 2000). It was discredited by the facts when in the 1970s both unemployment and inflation rose in the United States. More fundamentally, in the late 1960s Edward Phelps and Friedman challenged the belief that there is a stable and hence usable trade-off between inflation and unemployment. They pointed out that economic theory tells us that the supply of labor depends on real, not nominal, wages. While this basic insight cannot be denied, it has been used in different ways by various schools.

The standard response was to relate the change in wages (and hence implicitly also the change in prices) not just to the unemployment rate, but also to the expected inflation rate. Suppose that when the public expects zero inflation it takes a 5% unemployment rate to keep wage increases equal to the 2% rate at which productivity is growing. But if the public expects, say, 6% inflation, then nominal wages will rise by 8% whenever the unemployment rate is 5%. This 8% rise in nominal wages will then raise the inflation rate, which in turn will raise the rate of wage increases, so that inflation will be continually accelerating. There is a certain unemployment rate, called the 'natural rate' by Friedman and the 'non-accelerating inflation rate of unemployment' (NAIRU) by Modigliani, that keeps the inflation rate constant. Since this unemployment rate is likely to vary over time, it has proved hard to estimate. But there is widespread, though not unanimous, agreement among Keynesians and traditional monetarists that, while the short-run Phillips curve is not vertical, so that a short-run inflation–unemployment trade-off exists, the long-run curve is vertical.

Various schools of economics have responded differently to these findings. Post-Keynesians adhere to a low unemployment goal and advocate incomes policy to control inflation. Most mainstream Keynesians nowadays accept that in the long run one cannot maintain an unemployment rate below the NAIRU, but they sometimes argue that the long run is a very long way off, and at one time they seemed to argue that inflation expectations would never catch up, so that the Phillips curve would never become vertical. The latter is no longer a widely maintained position. But since, as discussed below, Keynesians are generally not as opposed to inflation as monetarists are, they have shown a greater willingness to experiment with running the economy at low rates of unemployment.

By contrast, monetarists believe that expectations adjust soon enough to limit the applicability of the short-run Phillips curve to a time span that is too brief to be relevant for policy. Thus, Friedman has suggested that at a time of low inflation there is a two-year lag between changes in the growth rate of money and the resulting change in the inflation rate, and that this lag shrinks as the public becomes more aware of inflation. Moreover, some monetarists have argued that the short-run Phillips curve is highly unstable, which provides another reason for not basing policy on it.

New Classical economists offer a radically different interpretation of the Phillips curve. They argue that, since expectations are formed rationally, the adoption of an inflationary policy will immediately raise expectations of future inflation, and hence the rate of wage increases, so that even the short-run Phillips curve will be vertical when the government adopts a visibly expansionary policy. They therefore interpret the observed positive relation between inflation and output (which implies a negative relation between inflation and unemployment) very differently. Instead of an equilibrium in which extra output is voluntarily supplied in response to inflationary shocks, causation runs from unexpected inflation to output. The supply response occurs because suppliers mistake the rise in absolute prices that they observe for their products for a relative price improvement in their product. But that occurs only if the inflation is unexpected, and is therefore less likely in countries in which most of the observed changes in prices are due to a rise in the price level rather than to a rise in relative prices.

Keynesians and monetarists respond that, even though the public may on average correctly predict a change in the inflation rate, institutional rigidities such as long-run wage contracts prevent the immediate adaptation of money wages, so that in the short run the Phillips curve is not completely inelastic. Terminating an inflation may therefore result in a substantial rise in unemployment which may last a considerable time.

Monetary policy

Monetarism is as well known for its strong policy implications as for its ideas about the economy's behavior. It is no doubt for this reason that it arouses such strong passions, not merely among economists, but in some countries also in the wider political arena. Four issues need to be discussed: the general outlook of monetarists, their focus on controlling inflation, their views on the targets and instruments that the central bank should use, and their advocacy of stable monetary growth.

General outlook

Monetarists generally favor free market policies. Thus, in the United Kingdom monetarism was the doctrine of the Conservative Party under Margaret Thatcher in the early 1980s, while in the United States the lead-

ing monetarist, Milton Friedman, is also a leading opponent of government intervention. Monetarists have been among the strongest critics of various financial regulations, such as deposit rate ceilings.

There are several links between the monetarist theory of income determination and monetarists' preference for market processes. One is that in this theory fluctuations in nominal income are due largely to fluctuations in the money supply generated by monetary policy, and not to an inherent instability of the private sector that the government needs to offset. Moreover, if the price level is determined by the quantity of money rather than by wage pressures and market power, then another reason for certain government interventions, such as price controls, disappears.

All the same, the connection between monetarist theory and free market economics is not tight, and a socialist could readily accept the quantity theory. Germany, which has followed a much more monetarist policy than the United States, has a stronger social safety net than the latter. Monetary policy was more monetarist in Austria (via a tight exchange rate link to the DM) than in Britain, despite Austria's having a much larger public sector and a corporatist policy. Moreover, one can be a strong supporter of free markets while rejecting monetarism.

Importance of controlling inflation

Monetarists are more concerned about inflation than are Keynesians. In part, this is due to their focusing more on the long run. It is also due to their belief that it takes less time than Keynesians think before we reach the long run with its vertical Phillips curve; they are less influenced than many Keynesians by a model in which prices are slow to adjust. So they are reluctant to tolerate inflation to gain a temporary decline in unemployment. Moreover, since monetarists believe that, given monetary stability, the market system can be trusted to deliver with reasonable rapidity its normal equilibrium of relative prices and real quantities, monetary conditions should be set primarily with the aim of price stability. In addition, while many Keynesians view the economy as operating much of the time at an unemployment rate that is greater than that needed to prevent accelerating inflation, monetarists do not share this view. Hence they are less willing to accept expansionary policies whenever unemployment rises. Some Keynesians have accused monetarists of giving preference to price stability because they have greater social sympathy with the well-to-do,

who lose more from inflation, than with the less well-off, who lose more from unemployment. But the previously cited reasons suffice to explain why monetarists tend to be more concerned about inflation.

The New Classical view is more equivocal. Since the economy adapts efficiently and rapidly to any predictable monetary policy, predictable inflation does little damage, except to induce people to hold too little currency. But since it does not do any good, it is better to have stable prices.

Targets and instruments

The central bank controls *directly* bank reserves, short-term interest rates and the exchange rate, but not GDP or the price level. The latter variables are far removed from its tools, and it needs a way of translating its desired GDP level into specific operating instructions for its tools. Brunner and Meltzer found in 1964 that the Federal Reserve had only vague and often misleading ideas about how its open market operations affected GDP, so that it frequently mistook even the direction of its effects (see Brunner and Meltzer 1989). They therefore developed an analytic framework of targets and instruments allowing a central bank to see the relation between its actions and their effects. This requires the central bank to select a target variable, such as the money supply or the long-term interest rate, that bears a predictable relation to its goal for GDP or for the inflation rate. The bank then tries to attain the appropriate level of this target variable by manipulating the instrumental variables that it controls directly, such as short-term interest rates and bank reserves. This schematization of monetary policy strategy was a major contribution of monetarism, although it has since lost out to a strategy of using not just a single target variable, but many different target variables that are related to GDP or to the inflation rate.

In the 1960s and 1970s there was an extensive debate about what target the central bank should use. Monetarists advocated the money supply, while many Keynesians advocated long-term interest rates, though in principle a money supply target is also consistent with Keynesian theory. The main issues in this debate were the relatedness of the target variable to GDP, its measurability, and the extent to which the central bank could control it. If the central bank cannot measure how far away it is from its target, or lacks the tools to attain it with sufficient accuracy, then such a target is useless.

The problems of measuring money and interest rates have already been discussed. The control problem arises because in the short run the relation between bank reserves or short-term interest rates and the money supply is loose, as is the relation between short-term and long-term interest rates. The relatedness issue is more complex. Suppose that, at a time when GDP is at the appropriate level, the demand for money increases. Unless the central bank increases the money supply correspondingly, interest rates rise and expenditures fall, so that GDP declines. Hence, if the demand for money changes, the central bank should follow a policy of stabilizing interest rates by adjusting the money supply accordingly. But now consider the case in which expenditure incentives, say the profitability of investment, rise and the increased expenditures raise interest rates. In this case, to keep income constant the central bank should let interest rates rise, and should not increase the money supply. If it does increase the money supply, this will have a destabilizing effect, because it will prevent the natural increase in interest rates that would act as an automatic stabilizer. The trouble is that the central bank usually does not know which of these two cases are confronting it. All it can observe is that interest rates are rising, and it has to decide whether or not to hold them down by increasing the money supply. If it has an interest rate target, it will automatically increase the money supply to keep the interest rate at its target level. If it has a money supply target, it will keep the money supply constant and let the interest rate rise.

Since the central bank's tools of open market operations and discount rate changes do not directly set the money supply or the long-term interest rate, it needs some instruments that are closer to its tools. One such instrument is the short-term interest rate. This affects the long-term rate through the term structure relationship, and it affects the growth rate of money by influencing the quantity of money that the public wants to hold. Another tool, preferred by monetarists, is the volume of bank reserves. However, in the United States using reserves as an instrument is no longer feasible, because the reserve ratio has been cut to a point where for many banks the reserve requirement is no longer binding.

Stable growth rate of money

Monetarists advocate not just a money supply target, but one that mandates a stable growth rate (which might be zero) for money. In the

hard-core version of monetarism, the central bank should refrain from all activist stabilization policy and keep the money supply or the base growing each month at a fixed rate. Monetarists offer two main reasons for this. First, they claim that the central bank cannot predict GDP, or the effects of its actions on GDP, sufficiently well to be stabilizing. As Friedman (1953) has shown, a countercyclical policy that is right half the time is actually destabilizing. And the forecasting accuracy required to guarantee a significant stabilizing effect is substantial. For example, to reduce the standard deviation of income by one third, the correlation between the initial fluctuation in income and the change in income induced by countercyclical policy must exceed 0.7, and the policy must be of optimal size. If it is too strong it will destabilize income. Given the long and probably variable lag between changes in monetary policy and the resulting change in GDP, countercyclical policy may easily do more harm than good.

In addition, New Classical theory supports the traditional monetarist position by emphasizing the possibility of shifting behavioral responses to activist policies. This *Lucas critique* arises from the optimizing nature of behavior, which will adjust to new constraints set by policy-makers. By showing that the effects of activist policy will be uncertain, this argument reinforces the standard monetarist arguments about the central bank's ignorance.

The second reason monetarists give for opposing countercyclical policy is that the central bank lacks the incentive to pursue an effective stabilization policy. They believe that, like other government agencies, it often acts not to maximize the public's welfare, but to maximize the welfare of its political masters, or its own welfare. It may, for example, ease policy excessively before an election, or adopt inflationary policies because they raise government revenues. A central bank also acts to maximize its own autonomy, power and prestige. Thus, it may stabilize the short-term interest rate instead of GDP because the public sees it more directly at fault if the interest rates it controls fluctuate than if GDP, which is influenced by many other factors as well, does so. Moreover, since central banks lack sufficient accountability, they are under insufficient pressure to abandon outworn views. This dispute between monetarists and Keynesians deals with topics on which economic theory and econometric testing provide only limited help, and the case that monetarists have made is more suggestive than conclusive (see Mayer 1998).

In the 1980s another argument became prominent. This is that the central bank has an incentive to fool people into overestimating the real wage. If people believe that the real wage is higher they will work harder, and thus generate more tax revenue, and unemployment will fall. The central bank therefore has an incentive to claim that it will follow a low-inflation policy, so that the nominal wage that employers offer looks like a high real wage. Once people have accepted employment on the basis of their belief in a low inflation rate, the central bank raises the inflation rate. What makes this problem worse is that people may expect the central bank to do this, so that, to protect their real wage, they demand a higher nominal wage. To prevent this from generating unemployment, the central bank then has to validate the higher wage demands by inflationary policies. The result is a higher inflation rate and no increased work or reduction in unemployment. However, since this is a sub-optimal outcome, the public may expect that the central bank will not play this game, which then gives the central bank an incentive to do so after all. Game-theoretic analysis has shown that various solutions are possible. A rule requiring the central bank to pursue a fixed monetary growth rate or an announced inflation rate target offers one solution to this problem.

On the other side, Keynesians have largely ignored the monetarist arguments, and have proceeded as though it were all but self-evident that central banks act almost entirely in the public interest. Nor have Keynesians provided compelling evidence that central banks can predict sufficiently well for countercyclical policy to be effective. To some extent the debate turns on the credibility of large econometric models.

The strongest Keynesian argument against a constant monetary growth rate rule was that velocity may become unstable. And when in the 1980s M_1 velocity, and in the 1990s M_2 velocity in the United States, did become unstable (as also happened in the United Kingdom with respect to M_3 and M_4 in the 1980s, and to a more modest extent with respect to M_0 from the late 1980s), belief in a fixed monetary growth rate rule in its simple form lost much of its appeal. However, its basic idea has survived in the form of feedback rules. These are rules that specify not a fixed growth rate for money, but a fixed response of the monetary growth rate to economic developments. Such a rule (advocated by Meltzer) might specify that the monetary base grow at a rate equal to a 12-quarter moving average of real GDP minus a 12-quarter moving average of the velocity of the base.

Another type of rule, the Taylor Rule, has the monetary growth rate vary in fixed proportion to the difference between (a) the actual unemployment rate and the natural rate and (b) the difference between the actual and the desired inflation rates.

Such rules (which some observers believe that some central banks have actually followed in recent years) meet the monetarists' concern that central banks cannot forecast well enough and that they cannot be trusted, while at the same time meeting the Keynesian concern that the growth rates of velocity or of potential GDP may vary. Other developments that partly meet the monetarists' concern about the motivation of central banks are the widespread move to grant central banks independence from their governments, and a stipulation requiring them to be more transparent.

Monetarism in practice

Monetarism has influenced monetary policy in many countries. Perhaps under its influence, along with the lessons of experience, all G-7 countries have brought their inflation rates down to low levels; indeed, Japan is—and Germany may soon be—suffering deflation. In an effort to achieve this reduction, many countries adopted publicly announced monetary targets in the late 1960s and 1970s. But most of them abandoned monetary targeting again in the 1980s, when financial innovations, largely connected with computer technology and deregulation, caused velocity to become unstable.

Yet it can be said that most central banks in industrialized countries are monetarist converts, in the sense that they regard monetary conditions as the crucial determinant of nominal demand, which needs to be controlled—if only the money supply could be properly measured. The problem has been to devise reliable measures in a deregulated, global world with rapid technological change.

Indeed, this conversion of central banks is intimately connected with the resurgence of free market ideas, which, along with some other reforms, have helped to create this new financial world. Before monetarism came back into favor it was fashionable for policy-makers—not just in the Anglo-Saxon world of the 1960s, but also in the social democratic countries of continental Europe—to regard wage and price controls as viable instruments for controlling inflation. Monetarism, with its faith in the operations

of free markets, then replaced such controls, ridding the marketplace of their distortions of relative prices and their generally debilitating effects on market forces. Thus, monetarism can be seen as an important ally of free market forces generally.

The experience of three countries—Germany, the United Kingdom and the United States—deserves particular attention.

German monetarism

Germany is the most monetarist among the large industrialized countries. One characteristic of monetarism, great concern about inflation, has a natural appeal in Germany because of its history of hyperinflation. Accordingly, the Bundesbank was legally required to give priority to maintaining the value of the currency, and generally aimed at an inflation rate of about 2%.

German policy was also monetarist in its continued reliance on money supply targeting. The specific measure it used as a target from 1975 through 1987 was essentially similar to the monetary base, and after that it used M_3. In 15 of the 20 years, 1975–94, the Bundesbank succeeded in keeping the actual growth of its targeted monetary aggregate essentially within its target range. All the same, the Bundesbank had to 'interpret' the actual growth rate of M_3 because since 1990 it has both undershot and overshot its targets significantly.

It seems plausible to conclude that during this period monetarism was successful in Germany. Its inflation rate was remarkably low, while its unemployment rate was fairly stable around a rising trend (owing to a rising natural rate), which implies that its inflation-oriented policy has not been costly. It is therefore not surprising that the German experience influenced plans for the European Central Bank (ECB); and indeed, the ECB, with its emphasis not merely on the target of price stability but also on the growth rate of the money supply, shows that influence clearly. Opponents of monetarism can, of course, argue that the Bundesbank's success has been due to factors other than its monetarist policies, such as the German aversion to inflation, and its system of labor relations.

American monetarism

On October 5, 1979, in response to high and rising inflation that threatened both domestic and foreign confidence in the dollar, the Fed made a

dramatic move towards monetarism. It placed much greater emphasis on lowering inflation, and also gave much greater weight to achieving its targets for the growth rate of money. This policy is therefore often called the 'monetarist experiment'. Not surprisingly, interest rates and interest rate volatility rose sharply. But very surprisingly, the volatility of the monetary growth rate also rose. In the autumn of 1982 this policy was abandoned, and monetary policy was eased. It had succeeded in greatly lowering the inflation rate, though at the cost of very high unemployment. But on the tactical level of controlling the money supply, it had been a total failure. Keynesians point to this 'experiment' as demonstrating the infeasibility of controlling the money supply and the unrealism of the whole monetarist program. Monetarists respond by denying that the policy was monetarist, because the Fed had not changed its operating procedures in the ways they had recommended.

The monetary growth rate now plays only a very limited role in Fed policy-making. In addition, the Fed again uses short-term interest rates as its instrument. But it has by no means returned entirely to its previous policy. It now gives substantially greater weight to controlling inflation, and has announced the essentially monetarist goal of keeping inflation at a low enough rate for it to be no longer a significant consideration in the public's planning. It also recognized that, given the lag in the effect of monetary policy, it should tighten its control as soon as aggregate demand threatens to become excessive, even if the inflation rate has not yet risen. Moreover, it now realizes the dangers of stabilizing the nominal interest rate in the face of changing conditions.

Monetarism in the United Kingdom

Monetarism in Britain differs from that in Germany and in the United States not only by the conditions that brought it forth, but also because it formed the central part of the program of a political party at a crucial time. In Germany the policies of the Bundesbank were not a major political issue, and in the United States monetarism was just one of several strands of the Reagan program, and never received much publicity. But in Britain it was the centerpiece of the Mrs Thatcher's program. The key reason for this was that monetarism was seen as an effective free market tool for controlling inflation, whereas previously UK incomes policy was both interventionist and ineffective.

In 1979 Mrs Thatcher inherited a monetary mess. Inflation was rising rapidly from an initial rate of 10%. The policy of wage controls that had been used to hold it down in 1978 had crumbled in the 'Winter of Discontent' of that year, when graves went undug and rubbish piled up in the streets. Additional public sector pay increases were promised by a commission that the previous government had set up. The Budget was in crisis; already the deficit was up to 5% of GDP, and it would clearly rise sharply with these pay awards on top of the usual spending pressures. The deficit was seen to be important in conditioning financial confidence, and until spending was reduced the Conservatives could not satisfy their wish to cut taxes.

This was the background to the policies pursued. Little importance was attached to the operating methods used by the central bank, whether monetary base control or interest rate setting in pursuit of monetary targets. So, what with this and the emphasis on fiscal policy support, the debate on monetary policy in Britain took a very different form from that in the United States, though it had perhaps a rather European character.

For monetary policy, the key problem was seen to be the lack of long-term credibility of the counter-inflation policy. The previous government had instituted monetary targets in 1976 in conjunction with IMF support for sterling. It had also managed a substantial reduction in the budget deficit: the public sector borrowing requirement (PSBR) fell from 10% of GDP in 1975 to below 4% in 1977. Nevertheless, the policies lacked long-term durability. Incomes policy, which had been emphasized as the key bulwark against inflation, crumbled, as was widely predicted it must in a free economy. The money supply target for £M_3 was eventually 'achieved', but only by imposing a tax on deposits that are not included in £M_3; while other measures of money, such as M_0, rose excessively. And budgetary discipline was based on cuts without any long-term strategy for reducing the size of the public sector, so that they were seen as a temporary pain to be reversed once the pressure from the IMF was off.

Thus, the problem of a credibly durable monetary restraint on prices was one of fundamental political economy, and not merely a technical matter of the central bank setting appropriate targets (see Minford 1995). To achieve durability and, it was hoped, to convince people rapidly of that durability, policy was cast in the form of a Medium Term Financial Strategy (MTFS). This consisted of several strands. First, there was a

commitment to a five-year rolling target for gradually decelerating £ M_{3+}. Second, controls were removed, including incomes policy, exchange controls and the special reserve requirement on excessive growth in interest-yielding deposits. Third, the monetary commitment was backed up by parallel reductions in the PSBR/GDP ratio. The MTFS carried the full authority of the Prime Minister and notionally of the Cabinet, so that future deviations should be seen as a seriously embarrassing breach of promise to the electorate. On the optimistic view that it should be regarded as totally credible, market expectations of both short and long-term inflation should drop, interest rates should fall rapidly and any recession should be short-lived, possibly non-existent, as the falling monetary growth was offset by a falling inflation rate, thereby maintaining real money balances and consumer purchasing power.

In spite of apparently impeccable logic, the MTFS not only failed to command credibility to any significant extent, but also failed to be carried out on its own literal terms. Yet policy turned out to be more fiercely contractionary than the gradualism intended: it was closer to shock tactics than gradualism—a paradoxical outcome. The trouble came from two directions: technical design and politics. Technically, the choice of £M_3 was an error, because after deregulation of the banks (including offshore ones with no exchange controls) high-interest rate deposits became the major weapon in the banks' battle for market share; as the banks' fortunes ebbed and flowed, so did £M_3. In 1980–81 £M_3 overshot its target massively. Yet M_0 was unaffected by deregulation and revealed a quite different story of sharply tightening monetary conditions. Its growth rate halved in the 12 months to mid-1980 and halved again in the next 12. It is obvious from the behavior of the economy which was the better guide. The sharp recession in 1980–81, the rapid fall in inflation and the strong exchange rate all confirm M_0 as the accurate indicator; M_4, a broader aggregate than £M_3 (roughly equivalent to the US M_3), also supports M_0 for this period when the main intermediary competition was between the banks and the building societies (equivalent to US savings and loans), whose deposits are included in M_4. Naturally, with hindsight, enthusiasts for broad money redefined it in terms of M_4, but too late. (And who could tell when the next twist of intermediary competition would destabilize M_4 in turn?)

Politically, the pain of recession, especially in the manufacturing sector, undermined the already insecure position of the monetarists in the

Conservative party, and Mrs Thatcher faced substantial internal opposition. The days of the MTFS, and perhaps even of Mrs Thatcher herself, seemed numbered.

So the MTFS was widely written off as a failure at this time because its targets had not been achieved, and it came to be seen as a temporary interlude before traditional politics returned.

In early 1981 the technical problems concerning M_3 began to be appreciated, largely as a result of the arrival in Britain and Downing Street of Sir Alan Walters. The decision was taken to loosen monetary policy in order to weaken the exchange rate, to stabilize M_0 at a growth rate around 5%, and to permit output to recover. To enhance credibility, the Budget of 1981 increased taxes by 2% of GDP to cut the PSBR, even though the recession still had not ended. This cut was crucial in finally creating market confidence in the policies' durability. Long-term interest rates, which had fluctuated around 14% for two years, began to fall at last. Output also started to recover. The policy emphasis thus switched towards fiscal and away from monetary tightness. But overall policy remained extremely tight throughout.

Policies close to shock tactics were implemented by these means, perhaps mainly by accident, but to some degree surely by intuitive survival instinct; that is, given that the recession was connected in popular debate with monetarist policies, it was vital to get results on inflation in short order as a justification for these policies. In the end, the rapid fall in inflation—down to 5% by end-1982—restored the fortunes of Mrs Thatcher and her supporters.

Evaluation

As the century drew to a close, a critic of monetarism might have said that it was in a crisis. Given the disappearance of a stable demand function for money and stable velocity, monetarism was providing no reliable way of predicting GDP. And this is serious for a theory that puts its emphasis on practicality rather than elegance. But this problem should not be exaggerated. The quantity theory can still predict fairly accurately by how much an increase in the money supply will raise income. Moreover, it is possible that velocity will again become predictable, either because of institutional changes or because of more sophisticated econometric techniques. For the

time being, however, there is no monetary aggregate target that central banks can use to control nominal GDP. Instead, in Keynesian fashion, they have to select an interest rate that they hope corresponds to their GDP target and, in sharp contrast to the monetarist prescription, supply all the money the public wants to hold at that interest rate.

A second problem is that, while monetarists have raised cogent questions about the ability and good intentions of central banks, they have not really established that countercyclical monetary policy cannot succeed. But what they have done is to raise a question that is difficult for their opponents to answer: what evidence is there that stabilization policy actually stabilizes rather destabilizes the economy?

The third problem for monetarists is internal to the economics profession. The simple, empirically oriented theory that monetarism represents has lost popularity as the economics profession has been caught up in the intellectual excitement of New Classical theory. Perhaps this is one of the reasons why relatively few young economists are monetarists, and why economists are now much less occupied than previously with debating monetarism.

But that is much too gloomy a picture. To a considerable extent, monetarism is the victim of its own success; some of its basic ideas have become so widely accepted that they are now no longer labeled monetarist. Keynesians have moved substantially in the monetarist direction. They now consider the money supply and monetary policy much more important than they did in the 1950s. Many, probably most, Keynesians accept that the Phillips curve is vertical in the long run, and have ceased to treat the long run as a never-never land. A major growth point of Keynesian theory, New Keynesian theory, which defends the price stickiness proposition of both Keynesians and monetarists, might just as well be called New Monetarist as New Keynesian. New Classical theory is essentially monetarist theory minus the proposition of price stickiness.

There is also much support for making price stability the central goal of monetary policy, though this is due in part to the development of time-inconsistency theory, which is more closely associated with the work of New Classical than with monetarist economists. But that is essentially an accident of history: substantively, time-inconsistency theory fits in as well with monetarism as with New Classical theory. Moreover, while the instability of velocity has greatly reduced support for a fixed monetary growth rate, its basic idea lives on in proposals for feedback rules.

To be sure, one might argue that the changed way in which economists think about monetary policy is due more to the pressure of brute facts than to the teachings of monetarists; but if this is the case, then monetarists should be credited with having seen important truths ahead of others. Monetarism as a distinct school is in decline, but monetarist ideas are flourishing and form a major part of the modern synthesis.

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Monetarism: A Rejoinder

Tim Congdon

Introduction: understating the achievement

Seen from a British standpoint, Mayer and Minford's 'Monetarism: A retrospective'[1] (MM) seriously understates the achievement of monetarism. They are of course correct to describe it as a set of theoretical ideas revived by (mostly) American economists in the 1950s and 1960s, and translated into policy across the industrial world to combat the high inflation of the 1970s; they are also right to recognise the strong influence that monetarism had on UK policy-making in the early years of the Thatcher Government from 1979. But they mislead in two respects. They underestimate the success of the monetarist challenge to the Keynesian and corporatist styles of policy-making which prevailed (especially in the UK) before the 1970s; and they are far too polite to the conventional wisdom in their remarks on the empirical validity of key monetarist ideas in the closing three decades of the twentieth century. The following discussion will concentrate on the UK, although the remarks will have wider relevance.

The challenge to Keynesianism and corporatism

In their opening remarks and in a section on 'Basic ideas and history' MM compare monetarism with other schools of macroeconomic thought, particularly Keynesianism. In their view the differences are hardly fundamental. Whereas the monetarists believe in the importance of money to national income determination in the short and long runs, the Keynesians accept the role of money of national income determination in the long run, but question it in the short and medium terms; monetarists such as Milton Friedman regard the proposition that money and national income have similar rates of changes as a reasonable working hypothesis (but acknowledge that the theory of money is an aspect of the theory of portfolio selection), while Keynesians emphasize that desired money holdings may change relative to other types of wealth and income, put questions of

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[1] Thomas Mayer and Patrick Minford, 'Monetarism: A retrospective', *World Economics*, Vol. 5, No. 2 (April–June), 2004, pp. 147–185.

portfolio selection first and repudiate a mechanical one-to-one relationship between money and national income; and so on. In this ball of economic theory the dancers change their partners from time to time, but they all know the sequence of steps in the Cambridge cash balances equation, the routines of the IS–LM model, and other familiar tunes and rhythms. Everyone enjoys everyone else's company, and the gap between monetarism and other schools of thought arises from differences of nuance and emphasis. There is no clash of worldview and ideology, and no need for polemics.

But that was not how matters stood in Britain in the mid–1970s or for many years afterwards. The study of monetary economics in British universities had declined in the 1950s and 1960s, and most university teachers rejected both a monetary theory of inflation and a role for money in the determination of national income.[1] Inflation was widely attributed to trade union greed or 'pushfulness', with one commentator remarking that "pulp forests have been consumed" in discussing the role of the trade unions in the inflationary process.[2] The standard view about the national income was that both output and income were equal to expenditure, and that expenditure was determined by past income plus or minus demand withdrawals by the state (i.e., by the use of fiscal policy) or from overseas (as the world economy waxed and waned, or because the exchange rate changed).[3] As a consequence of these beliefs, mainstream professional opinion favoured two policy approaches. First, incomes policy (or 'wages and prices policy') should be used to control inflation, with high-level bargaining between the government, the trade unions and industry on dividend freezes, pay norms and such like. Secondly, fiscal policy should be used to manage demand, with the annual 'Budget judgement' (i.e., the net injection or withdrawal of demand by the state, approximated by the cyclically-adjusted change in the budget deficit) being critical. The purpose of demand management was to achieve full employment, in line with an agenda widely attributed to the 1944 White Paper on *Employment Policy*.

Monetary policy—often defined only in terms of interest rates (i.e., the price of money) rather than in terms of the quantity of money—was widely considered to be peripheral to the economy, even though interest rates were thought to affect the exchange rate. According to Goodhart,

> Throughout most of the 1960s...interest rates varied mainly in response to external conditions, being raised whenever there was a need to support the fixed exchange rate, which was often under pressure, and lowered—in a spirit of general benevolence towards investment—as each balance-of-payments crisis temporarily receded. With interest rate policy mainly determined by external considerations, the money supply was allowed to vary passively.[4]

Support for incomes policy and active fiscal management, and disdain for monetary policy, had huge political significance. They did not reflect merely technical differences of opin-

ion about the effectiveness of the various economic instruments, but were instead motivated by deeper ideological commitments in British society. The high-level bargaining associated with incomes policy gave the trade unions considerable political power. Comparisons were made between the style of British economic government in the two decades from 1960, as politicians sought economy-wide deals with senior figures in the trade unions and large companies, and the state capitalism or 'corporatism' of several European nations earlier in the twentieth century.[5] Clearly, the greater the reliance on incomes policy to curb inflation, the stronger was the position of the trade unions in key policy debates.

The pre-eminence of fiscal policy also had implications for the UK's social and political structure. In his *General Theory*, published in 1936, Keynes had said that fiscal policy would work best in a nation with "a somewhat comprehensive socialisation of investment". He thereby established a persuasive argument for a mixed economy with an extensive state-owned sector. To quote Keynes' words, "The central controls necessary to ensure full employment will, of course, involve a large extension of the traditional functions of government."[6] In short, both corporatism and Keynesianism accorded with the interventionist bias of most British writers and thinkers, including most British economists, in the early post-war decades.[7]

A fair comment is that by the early 1970s the macroeconomic thinking of many British economists, and the often rather pugilistic espousal of such thinking as 'Keynesianism', had become idiosyncratic by international standards.[8] Nevertheless, a blend of Keynesian and corporatist doctrines conditioned economic policy-making. Taken to extremes, it prescribed a policy mix in which incomes policy set a politically determined and administratively enforced limit on inflation, and fiscal expansionism—justified by rhetoric about full employment—drove output to its employment-maximising level. A policy mix of this kind was indeed favoured by the National Institute of Economic and Social Research in the 1960s and 1970s, but could not be freely pursued in the 1960s because a fixed exchange rate constrained UK policy-making.[9] After the breakdown of the Bretton Woods fixed-exchange-rate system in 1971, the British government was able for the first time in the post-war period to combine incomes policy with aggressive fiscal reflation. The external barrier to high money supply growth was removed, while the increased budget deficit was financed to a large extent from the banking system. In the two years to the end of 1973 the sterling M3 money supply measure—which consisted mostly of sterling bank deposits—increased by over 25% a year. A wild boom in 1972 and 1973 was followed by rising inflation in 1974 and a peak inflation rate (as measured by the annual change in the retail price index) of 26.9% in August 1975.[10] Well-respected commentators warned of the possible collapse of British democracy.[11]

Monetarism in the UK developed partly under the influence of academic ideas from the USA (such as the quantity theory of money associated with Milton Friedman and the Chicago school), but mostly it was a response to the economic and political crisis of the mid–1970s. Its central tenet was that inflation is a monetary phenomenon, in the sense that inflation is caused by the quantity of money rising too rapidly relative to the quantity of goods and services. To monetarist participants in the British public debates at that time the facts supporting this proposition were compelling. But Friedman's thinking supplemented the education by events in one very important way. In his presidential address to the American Economic Association in 1967 he had argued that there is no long-run trade-off between unemployment and inflation, and that the pursuit of 'full employment' (meaning a low level of unemployment with an excess demand for labour) would be accompanied not by a stable high rate of inflation, but by ever-accelerating inflation. As economists examined the data, evidence for this 'accelerationist hypothesis' could be found in the UK and many other countries.

Three vital implications followed. The first was that income policy was an ineffective answer to inflation and should be dropped; the second was that fiscal policy should be subordinated to monetary control; and the third was that policy-making should not try to achieve full employment, but should instead be focussed on the reduction of inflation (and eventual price stability) by lowering the rate of money supply growth. Heavy emphasis must be placed on one point. While the agenda could be presented as largely technical, its wider social and political consequences were drastic. Keynesianism and corporatism were ideas that fitted the post-war so-called 'Butskellite' consensus, with a large public sector, extensive state ownership of the nation's capital assets, and close relations (or, at any rate, attempted close relations) between the trade unions and the government.[12] Even into the 1960s many leading figures in British public life saw the mixed economy as a half-way house between the *laissez-faire* capitalism of the nineteenth century and a communist end-state that was certain to arrive at some future date.[13] Despite bitter controversy the first post-war generation of Labour politicians kept Clause Four (in favour of government ownership of all the means of production) in their party's constitution.

Monetarism represented not just an alternative to Keynesianism and corporatism in technical macroeconomics, but was also an expression of an utterly different worldview. Without incomes policy, Cabinet ministers did not need to negotiate with the trade union movement; without an activist fiscal policy, the Keynesian case for a large state sector collapsed; without a full employment commitment, the government could concentrate on the provision of a sound currency to promote the efficiency of a market economy. Monetarism welcomed the liberation of market forces to collect the nation's savings, and their management by

private sector companies and institutions ('the City', in the UK context) according to profitability. By rejecting the traditional arguments for the state ownership of the so-called 'commanding heights of the economy' (steel mills, nuclear reactors, state-subsidized aluminium smelters and such like), it laid the intellectual foundations for the privatisations of the 1980s. Hundreds of thousands of British people—in the trade unions, in the media, in the universities, and indeed in positions of trust and responsibility as civil servants in government departments—had believed from the 1930s onwards that the inevitable long-run drift in UK policy-making was towards increased state ownership, more planning and intervention, and ever-growing public sector supply of services. It came as a shock to such people to find that in the mid- and late 1970s there were advocates of a diametrically opposite point of view. This clash of worldviews—about which Mayer and Minford say almost nothing—must be mentioned if monetarism is to be understood in a British setting.[14]

The implementation of monetarism

In May 1979 the intellectual jolt to Britain's left-leaning chattering classes became a real-world political trauma. The Conservative Party led by Mrs Margaret (later Lady) Thatcher was elected with a comfortable majority in the House of Commons. It quickly set about implementing an agenda quite different from its Labour predecessor's. Within a few weeks prices and incomes policies, and the accompanying institutional machinery, were scrapped. In October exchange controls —which had been in force for 40 years—were also abolished. The task of inflation control was to fall exclusively on monetary policy. Thatcher and her ministers were prepared to test the theory that inflation has only monetary causes, and pledged themselves not to commit a U-turn ("the lady's not for turning") and restore incomes policy. In the March 1980 Budget, Sir Geoffrey (later Lord) Howe announced a medium-term financial strategy, with year-by-year targets for reductions in the rate of money supply growth and in the ratio of the budget deficit (as measured by the 'public sector borrowing requirement') to gross domestic product.

Unhappily, the attempt to curb money supply growth involved very high interest rates and led to a deep recession in 1980 and early 1981. The severity of the recession undermined tax revenues and increased social security costs, endangering the MTFS target for a lower PSBR/GDP ratio in 1981/82 than in 1980/81. In the 1981 Budget, Howe raised taxes sharply in order to keep the budgetary position under control. This was a direct challenge to Keynesianism, as the cyclically-adjusted budget deficit was being cut despite high unemployment and weak demand. The budget deficit was not being varied contra-cyclically (as the textbooks recommended), but in order to facilitate a reduction in money supply growth over the medium term. 364 economists—undoubtedly representative of main-

stream academic opinion in the UK—wrote a letter to *The Times* in protest. It was categorical in its repudiation of "monetarist policies", and warned that "present policies will deepen the depression, erode the industrial base of our economy, and threaten its social and political stability". The 364 threw down the gauntlet and invited the monetarists (who were far fewer in numbers) to a duel of ideas.

Implicitly, the duel was to be decided by the future passage of events. This is not the place to provide a narrative account, even in a potted version, of the main policy decisions and outcomes of the following 20 years. However, in any meaningful assessment of monetarism the main features of policy-making after the 1981 letter to *The Times* must be discussed. Mayer and Minford fail to provide such a discussion. Instead their pages on 'Monetarism in the United Kingdom' contain an outline of events between the mid–1970s and 1982, implying that—although monetary policy was rather disorganized—"shock tactics" did get inflation down and eventually "restored the fortunes of Mrs Thatcher and her supporters". Almost nothing is said about events after 1982, as if the second Thatcher election victory marked the end of 'the monetarist experiment'. In their final sentence MM say that monetarism "as a distinct school is in decline", but "monetarist ideas are flourishing and form a major part of the modern synthesis". The next few paragraphs will argue that, at the level of real-world policy-making, this conclusion is almost wholly wrong. Far from slipping into decline, monetarism demolished Keynesianism and corporatism.

What has happened in the three crucial areas of incomes policy, fiscal policy and the conduct of monetary policy? Incomes policy may be taken first. If monetarism had really fallen into "decline", a fair expectation might be that British economists would again be lauding the virtues of incomes policy as a way of curbing inflation. But that is not so. In sharp contrast to 'the pulp forests' consumed in comment about and advocacy of incomes policy in the 1960s and 1970s, it is difficult to think of a single recent book on the topic. Academic articles and historical monographs may still be written about Jack Jones, Vic Feather, the Counter-Inflation Programme and that sort of thing, but incomes policy is no longer a live and relevant option for policy-makers. Trade union membership has fallen heavily, while newspapers no longer feel obliged to report the proceedings of the Trades Union Congress as if the 'union barons' were a major power in the land. In this respect the contrast between Britain today and Britain in the early 1970s could hardly be more total. For all practical purposes incomes policy is dead.

Income policy did not become a permanent fixture in standard macroeconomics texts and has been easy to forget. Fiscal policy is another matter entirely. Its validity as a stabilisation tool has been asserted in most textbooks since 1945, and its supposed effectiveness in this role is still widely seen as the explanation for the increased stability of the American and

British economies compared with the 1930s. But in fact the textbooks have lost touch with reality. The announcement of the MTFS in 1980 marked the beginning of a period of over two decades in which fiscal policy decisions would be set within a medium-term framework, with one key objective being to ensure that the ratio of debt to GDP was kept under control. MM give the impression that a veil was drawn over the MTFS by embarrassed policy-makers in the early 1980s. In their words, "the MTFS was widely written off as a failure at this time...and it came to be seen as a temporary interlude before traditional politics resumed".[15] On the contrary, a version of the MTFS was retained in all the Budgets until 1997. Although its contents evolved over the years and the monetary element was downplayed, the MTFS continued to set the context for fiscal policy decisions throughout the long period of Conservative rule. It undoubtedly had a major effect on public finance outcomes. For example, the UK and Norway were the only members of the Organization of Economic Cooperation and Development to have a lower ratio of public debt to GDP in 1997 than in 1980, while the British banking system—whose assets had been dominated by claims on the public sector in the 1950s—held virtually no public sector debt at the start of the twenty-first century.

There may still be a debate about the wisdom of orienting fiscal policy on medium-term debt sustainability rather than short-run demand management. But, if there is such a debate in the UK, it is a very quiet one. When a Labour government replaced the Conservatives in 1997, the MTFS was dropped, but Mr Gordon Brown did not revert to old-style Keynesianism. Instead a commitment to medium-term fiscal stability was a hallmark of Mr Brown's supposedly new policy regime. He announced a 'golden rule' (in which current expenditure was to be covered by taxation) and a 'sustainable investment rule' (which set a limit on the ratio of public debt to GDP). Both these rules had nothing whatever to do with the type of fiscal demand management recommended by British Keynesians in the 1950s and 1960s, and could more plausibly be interpreted as a modern refurbishment of Gladstonian principles of public finance.[16] Again, for all practical purposes Keynesianism—in the sense of short-run changes in the fiscal position to manage demand—is defunct in the UK.

Finally, as far as the conduct of monetary policy is concerned, many years have now passed since it was directed to the maximisation of employment. The first half of the Thatcher premiership showed that monetary policy could be used to reduce inflation, without relying on the crutch of incomes policy. (The second half—which saw a marked acceleration in money supply growth in the unfortunate 'Lawson boom' and a subsequent rise in inflation—also demonstrated the validity of the monetary theory of inflation, and is discussed below.) In the 1990s decision-making on interest rates was transferred from politicians to monetary specialists in two steps,

first the publication of the minutes of the monthly meetings between the Chancellor of the Exchequer and the Governor of the Bank of England from early 1993, and secondly the granting of operational independence to the Bank of England in 1997. This transfer of power was possible only because informed opinion was quite different from what it had been in the 1960s. The UK's sorry experience of boom and bust had persuaded almost everyone who mattered in policy formation (politicians in all three main parties, their advisers, leading civil servants, the most influential newspaper commentators) of the validity of Friedman's 1967 proposition that no long-run trade-off exists between inflation and unemployment. The phrase 'full employment' had lost its totemic status in public debate.

It was therefore sensible for the setting of interest rates to be taken out of the political domain and given to technicians. Paradoxically, the decade from 1994 saw almost uninterrupted increases in employment and falls in unemployment, so that the UK now has high labour force participation and low unemployment by European standards. These gains can be interpreted as partly due to policy and, in particular, to supply-side reforms to improve labour market flexibility, which date back to the early 1980s. But no-one in officialdom had planned them in the sense of having a quantified target for either employment or unemployment, and no-one in the Treasury or the Bank of England would have dreamt at any stage in the 1990s of adjusting interest rates to raise or lower employment. Indeed, the decade from 1992 was characterised by extraordinary macroeconomic stability compared with any previous decade in the post-war period, including the years from 1948 to the early 1970s, the heyday of the supposed 'Keynesian revolution'. A case can be made that the vital theoretical basis for this policy achievement was a generalisation of Friedman's ideas on the link between changes in inflation and departures from the so-called 'natural rate of unemployment'.[17] If so, it is monetarism—and certainly not corporatism or Keynesianism—that deserves the accolades for Britain's much improved macroeconomic performance. To say that monetarism is 'in decline' is a travesty. It may be in decline in the sense that the number of references to it in newspapers and parliamentary debates has fallen heavily, but the lack of attention is due to the general acceptance of its core recommendations on the structure of policy-making.[18] On a wider canvas, the Labour Party has dropped Clause Four from its constitution and its leaders embrace the market economy, although with reservations.

The 'which money?' debate

MM have therefore not given enough weight to the role of monetarism in causing a comprehensive change in the structure of UK policy-making in the final 25 years of the twentieth century and they have not recognised the improvement in outcomes which followed these changes. As their comments on two more technical issues—the relative significance of dif-

ferent money supply measures and the stability of the demand for money—are in line with the conventional wisdom, they may seem more difficult to criticise. This is not so. Both MM and the conventional wisdom are wrong.

The debate about the merits of different money aggregates—the so-called 'which money?' debate—can be tackled first.[19] Introducing "the research strategy of the quantity theory", they note that when agents try to run down their money balances, they can spend above income. To quote, "if people try to add to their money balances or to reduce them, or if additional money is injected into the economy or withdrawn from it, then expenditure will change. Hence one can explain changes in nominal income by looking at changes in the supply of money and in the demand for money" (p. 153). As a description of the research strategy of quantity theorists, this is somewhat truncated, but it does at least highlight that decisions about the size of money holdings are taken in the context of expenditure on goods and services.

This emphasis has a vital implication, although MM seem not to have noticed it. If agents are deciding on the size of their money holdings in the context of expenditure on goods and services, it must be an all-inclusive measure of money that is relevant. The difficulty with focussing on a narrow money measure (such as M1, including sight deposits) or the monetary base (M0 in the UK, including the note issue) is that agents have to make decisions on the relative size of their holdings of different types of money. If a person has too large sight deposits, he or she can transfer the excess into a time deposit *without any effect on expenditure on goods or services*; if a person has too large a holding of notes, the excess can be transferred to a bank deposit, *again without any effect on expenditure.* Within a given all-inclusive quantity of money, these 'money transfers' alter the relative size of *both* the particular types of money held by individual agents (i.e., the relative size of the note issue, sight deposits and time deposits held by agent A, agent B, and so on) *and* the aggregate quantity of the narrow money measures (i.e., the relative size of aggregate M0, aggregate M1 and other less-than-all-inclusive money aggregates held by every agent in the economy). But—since any individual money transfers plainly do not affect expenditure on goods and services—the resulting changes to the aggregate narrow money measures also do not affect expenditure on goods and services.

To the extent that imbalances between the demand for and supply of narrow money measures are eliminated by money transfers, these measures are of no relevance in causing expenditure on goods and services or portfolio adjustments. Given the efficiency of modern banking arrangements, switches between different types of money balance have become extremely easy to make. It follows that in an important sense all narrow money measures are 'endogenous'.[20] The position is quite different with an all-inclusive money aggregate (i.e., a broad money measure which includes all bank deposits). If agents have

excessive or deficient broad money, the attempt to restore equilibrium involves changes in expenditure on goods and services and/or asset dispositions. Meaningful and interesting macroeconomic analysis can then begin. (This is not to deny that M0 and other narrow money measures have some use as an 'indicator' of current spending, but they are not forward-looking.)

MM conclude their section on 'Measuring the money supply' by saying, "All in all, the difficulty of empirically defining and measuring money is one of the greatest weaknesses of monetarism" (p. 157). It must be conceded to them that this is a fair comment on the debate over the last 30 years. Much of the trouble has stemmed from the profusion of demand-for-money estimates made possible by modern computers and the tendency to take high statistical 'fits' as the alpha and omega of monetary understanding. This tendency is potentially very dangerous. As MM wisely observe, "a high correlation between a particular measure of money and income may result not from money causing income but from income causing money...or from a third variable affecting both money and income" (p. 156). Demand-for-money estimation has had a recurrent finding, in virtually all countries and over all time periods. This is that the statistical fits are better for narrow money measures than for broad money measures. However, this finding does *not* mean that narrow money does all the hard work in causing asset prices and national income. Instead it reflects the ease and low cost of transferring funds between different types of money in a modern economy. Ironically, as we shall see later, it may be instability in money-holding behaviour, particularly in the holding of the bank deposits that make up most of broad money, which is most interesting in macroeconomic analysis.

The uncertainties about the role of different money aggregates have a major bearing on the debate about the stability of the demand for money which arose from attempts to implement the monetarist agenda. According to MM, echoing many other authors, the demand for money became unstable in the 1980s and this instability broke any predictable relationship with national income. After referring to the 'good fits' achieved by long-run demand-for-money studies in the 1960s and 1970s, they say, "starting in the mid-1970s, the fit of money demand functions in the United States and some other countries deteriorated as financial innovations, induced by high interest rates and facilitated by the computer revolution, allowed the public to economize on its money holdings. Subsequently, institutional changes...led to substantial additional instability in the demand for money" (p. 167). Later they note the difficulties in the UK context more specifically. The velocity of the M3 and M4 broad money measures is said to have become unstable in the 1980s (p. 176) and enthusiasts for the M3 broad money measure are alleged to have "redefined it in terms of M4, but too late" (p. 181). MM's final evaluation is that, "Given the disappearance of a

stable demand function for money and a stable velocity, monetarism was providing no reliable way of predicting GDP" (p. 182).

MM and the conventional wisdom have to meet four lines of criticism. The first is a simple matter of logic, even semantics, but is nevertheless fundamental. The strength or weakness of the statistical confidence with which a relationship is held must *not* be confused with the existence or non-existence of a relationship. Suppose that a simple two-variable relationship (for example, one with the change in national income as the dependent variable and the change in a money aggregate as the independent variable) estimated in the 1980s had a lower correlation coefficient than in the 1960s and 1970s, and that the regression coefficient did badly on the usual significance tests ("it was not significant at the 5% level"). Analysts may therefore have less confidence in their central view (i.e., the expected mean value) about the value of the rate of nominal GDP growth implied by a particular rate of money growth. They may say that 10% money growth is most likely to be accompanied by 8% growth of nominal GDP, but they cannot be more than 50% certain that in any particular year the outcome will lie between 5% and 11%. By contrast, in the 1960s and 1970s they might have been 80% certain it would lie between these two values.

Yet—even with a key idea under such heavy statistical attack—monetary analysts would be able to make two statements without embarrassment. These are, first, that it is extremely unlikely "in the 1980s" that a 1% increase in the rate of money supply growth will be accompanied by a decline in the rate of growth of nominal GDP and, secondly, that the % change in the expected mean annual increase in nominal GDP associated with a % change in the annual increase in the money supply is positive (and may even be close to one). Then policy-makers would still be foolish to ignore the quantity of money. The second statement has the same message as the data in the 1960s and 1970s, that the higher the rate of money growth, the higher is the expected mean value of the rate of nominal GDP growth. It follows that the supposed instability of money demand in the 1980s did not excuse policy-makers from the need to keep money supply growth under control. (The same point is valid today and is always valid. In a speech at Loughborough University on 22nd October 1986—given when the annual rate of money supply growth had accelerated into the teens—the Governor of the Bank of England, Mr Robin Leigh-Pemberton [later Lord Kingsdown], said that it was "fair to ask whether a broad money target continues to serve a useful purpose" and perhaps "we would do better to dispense with monetary targetry altogether". One is reminded of Mr Polly, in the H. G. Wells novel, who thought that he could not go bankrupt if he dispensed with an accountant.)

Secondly, MM have been careless and inconsistent in their use of words. As MM note, because of the centrality of the equivalence of the demand for and supply of money in their theory of

national income determination, "it is the determinants of the demand for money that quantity theorists have to investigate" (p. 157). In these remarks they acknowledge that the demand for money is a function of its opportunity cost (i.e., the difference between the rate of return on money and the nearest alternative asset), financial technology and 'taste' as well as income. In other words, agents' desired ratio of money to income, and hence the equilibrium 'velocity of money', may change over time. Further, changes in the values of the arguments in the money demand function may cause the rates of growth of money and income to diverge, perhaps substantially, without invalidating the core monetarist claim that inflation is a monetary phenomenon.

But later they forget these subtleties. In their discussion of the early 1980s they take the relative stability of narrow money (on the M0 measure) to nominal GDP in the UK as validating its accuracy as an indicator and reject broad money on the grounds that it rose sharply relative to nominal GDP. They should recall their own statements on p. 157. A change in the ratio of broad money to GDP—indeed, a continuing change in the ratio of broad money to GDP over many years—does not mean that the demand-for-money function has become unstable. Real interest rates rose abruptly in 1979 (with Minimum Lending Rate at 17% in October of that year, compared with 5% two years earlier), while competition between banks caused them to offer interest on a wider range of accounts, including current accounts for large customers. The result was a change in the trend in the velocity of broad money. Whereas in the 25 years to 1977 the ratio of broad money to GDP declined, thereafter it was on a rising trend.

Careful research is needed to check whether the change in the velocity trend (which, incidentally, is misrepresented by the phrase "instability in velocity") was due to instability in the money demand function itself or to changes in the value of the arguments in the function. Given the difficulties, the bracketing of "a stable demand function for money" with "a stable velocity" on p. 182 is mischievous. Confidence in MM's analysis might be increased if they had given any footnote justifications for their statements about the "instability" of money demand, and the "disappearance" of stable money demand and velocity, but they have given none. They have relied on flat assertion, perhaps taking it for granted that they are in line with the prevailing orthodoxy and do not have to trouble with journal references. As we shall see, this is unsatisfactory.

Thirdly, what then was really happening to money and the UK economy in the early 1980s and later? Can the necessary "careful research" overturn MM's conclusions and the conventional wisdom? Without doubt the events of the early 1980s unsettled monetarist economists and required them to rethink their approach. Given the sharpness of the break in the velocity of broad money, one response was to ask whether certain types of agent were particularly affected by the

financial innovations of the period and to see if the demand-for-money functions of these agents had different characteristics from those of other sectors. The research agenda had to be expanded. The estimation of aggregate demand-for-money functions to assess their stability over time needed to be supplemented by the estimation of demand-for-money functions for particular sectors to check their stability relative to each other.

A significant body of work on sectoral demand-for-money functions in the UK has now appeared, made possible by the availability of data from 1963 until the present.[21] While the research is far from complete, some reasonably firm conclusions have emerged. Both in 1963 and today the personal (or household) sector is the largest single holder of money balances, where money balances are taken to include bank and building society deposits. Several papers have been published on the UK personal sector's money demand function, typically estimated over periods of two or three decades. Two points are clear. First, when sensibly specified, demand-for-money functions for the personal sector consistently meet the required levels of significance in statistical tests. Secondly, the financial deregulation of the early 1980s did not disturb this stability. More technically, the residuals estimated in the best-fitting equation are not markedly different in the early 1980s from the residuals in other years. It follows that—as far as the largest type of money holder in the UK is concerned—the undoubted change in the trend of money/income ratio from the late 1970s was *not* due to instability in the money demand function. This result is illustrated in the accompanying charts—see Figures 1 and 2—which show the residuals in a personal sector money demand function estimated at Lombard Street Research.[22]

The two other sectors of the economy tracked in UK monetary data are companies (also known as 'industrial and commercial companies' and, more recently, as 'private non-financial corporations') and financial institutions ('other financial institutions'). Here the money demand estimates have been much less convincing. Money demand analysis for companies has produced statistically interesting results,[23] but there is no doubt that companies have seen much greater monetary instability than the personal sector. The financial sector turns out to be the black sheep of the analysis. Conventional money demand analysis simply fails in the UK financial sector in the 40 years from 2003.[24] In short, the instability in UK money demand in recent decades has been concentrated in the company and financial sectors.

MM and other economists might say that the evidence on instability in these parts of the economy validates their contention that money ceased to give reliable signals. But there is a quite different view. The relationship between broad money and the economy may have become unstable in the 1980s, but it remained true that the levels of asset prices and national income would be out of equilibrium as long as the demand to hold broad

THE STABILITY OF THE HOUSEHOLD MONEY DEMAND FUNCTION OVER 40 YEARS

Figure 1: The UK household sector's actual and "desired" money holdings, 1964–2003

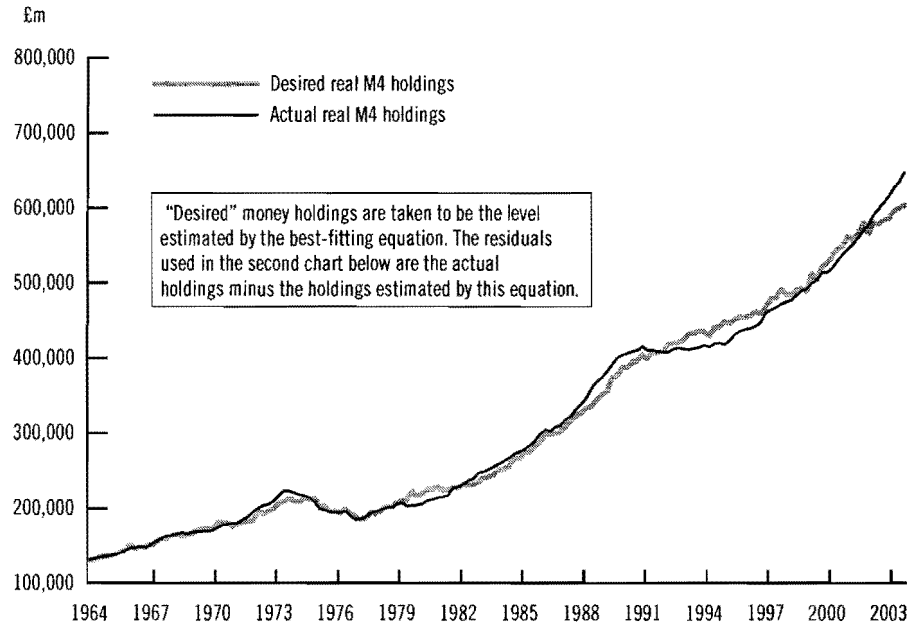
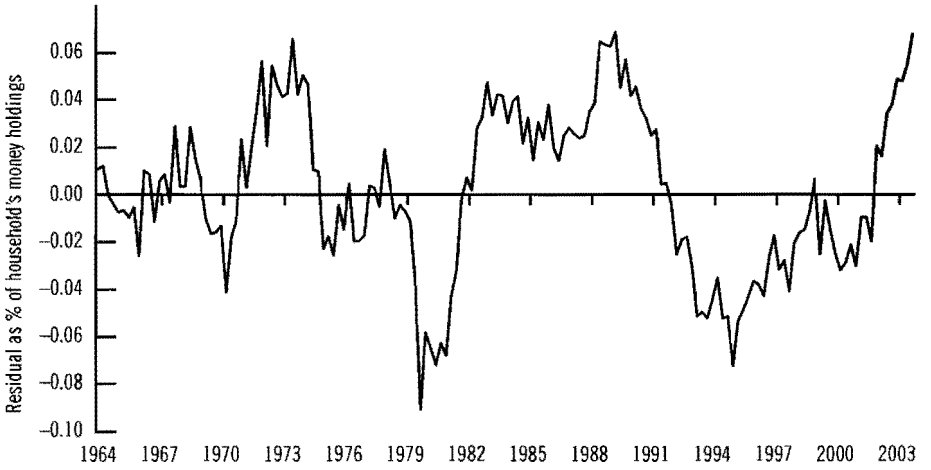


Figure 2: The behaviour of the residuals to households' demand-for-money function, 1964–2003



money were different from the broadly-defined quantity of money. Consequently, fluctuations in broad money growth might have had drastic effects on the portfolio and spending decisions of certain agents, and these effects, perhaps evidenced in violent asset price swings, might have been the dominant causal influence in the changes in domestic demand. The contrasting stability of personal and non-personal money demand hints at a way of interpreting the situation. It suggests that—precisely because of the instability of money demand—very detailed work is needed in the company and financial sectors to understand their behaviour. Research of this kind identifies a clear link between, for example, the money holdings of the large UK financial institutions—the life offices and pension funds—and the value of their total assets. An obvious and unsurprising message is that the sharp fluctuations in the growth of financial institutions' money had a powerful influence on the asset price volatility which was such a notorious feature of the boom–bust cycles of the 1970s and 1980s. Whatever the difficulties of aggregate money demand estimation, finance directors and senior investment executives had to pay attention to their bank statements.

With the differences in sectoral money-holding behaviour understood, a fourth line of criticism of MM's conclusions becomes particularly compelling. So many brickbats were thrown at monetarism in the early Thatcher years that broad money targets were suspended in October 1985 and abandoned completely less than a year later. A marked upturn in the growth of broad money followed, while the growth of M0—which was still targeted—remained modest. (See Table 1.)[25] If MM, the 364 and the conventional wisdom had been right, nothing of any great significance was implied by the pronounced acceleration in the growth rate of bank deposits in 1986 and 1987. Indeed, if some MM statements are taken literally, the upturn in broad money growth had no predictable message for the economy. What happened in fact to demand, output and inflation?

Table 1: Growth rate of UK money supply aggregates
% growth rates in years to Q2

	M0	M3	M4
1983	5.9	11.5	13.7
1984	5.4	7.9	12.5
1985	5.4	11.4	12.8
1986	3.0	18.7	15.7
1987	4.6	19.3	13.9
1988	6.4	20.3	16.8
1989	5.7	21.9	18.3
1990	7.4	n/a	17.2
1991	1.5	n/a	7.9

Source: *Financial Statistics*
Note: M0 consists of notes and coin in circulation (including banks' vault cash) and bankers' operational deposits at the Bank of England. M3 consisted of notes and coin in circulation with the public and sterling bank deposits held by UK residents. M4 consists of all the components of M3 plus building society deposits, again in sterling held by UK residents. The publication of the M3 series ceased in mid-1989, on the grounds that the conversion of Abbey National from a building society to a bank had led (and future such conversions would lead) to a purely statistical change in the M3 growth rate and would render the series difficult to interpret. See 'Statistical consequences of the conversion of the Abbey National Building Society to a public limited company', pp. 352–3, August 1989 issue of *Bank of England Quarterly Bulletin*.

The answer is straightforward. Because of the sudden increase in

money growth, agents had an excess supply of money in 1986 and 1987. People tried to eliminate their excess money balances by purchases of houses and financial products (life insurance companies, unit trusts and so on), and the excess supply of money was most marked in the company and financial sectors. The excess supply of money in company balance sheets was accompanied by a boom in mergers and acquisitions, while the excess supply of money in the financial sector led to excess demand for assets (i.e., equities, commercial property) and surges in asset prices. UK share prices roughly doubled in the two years to September 1987, while house prices climbed at over 20% a year. In 1988 the increase in UK private sector domestic demand was the highest in the post-war period. Severe over-heating resulted in a widening payments deficit and rising inflation in 1988, and policy-makers more than doubled interest rates between the spring of 1988 and the autumn of 1989 to compensate for earlier mistakes. In 1990 the annual rate of inflation reached double digits, while money supply growth collapsed. The squeeze on real money balances intensified the downturn. Recovery was delayed until 1993.

The episode (the so-called 'Lawson boom' and the sequel of recession from 1990 to 1993)—strikingly similar to the earlier mismanagement that had made monetarism so relevant in the mid-1970s—demonstrated once again the persuasiveness of a monetary approach to cyclical analysis. In this analysis it was the behaviour of an all-inclusive, broadly-defined money supply measure that mattered, and it was in the unstable parts of the economy, particularly in the financial sector, that imbalances between money demand and supply most clearly caused agents to alter their behaviour. If MM's assessment of monetarism in the UK were to be authoritative, they would have to discuss the Lawson boom and at least acknowledge in a footnote that some analysts used monetary trends to make quite accurate forecasts of the economy. But they completely ignore the Lawson boom, and the relative success of monetarist and non-monetarist economists in forecasting it.[26]

Evaluating the evaluation

MM are not unsympathetic to monetarism, but they make far too many concessions to monetarism's opponents and the conventional wisdom. It cannot be emphasized too strongly that in the late 1970s monetarists were heavily out-numbered in the academic debate and that in the 1980s the monetarist agenda of the Thatcher Government was implemented in defiance of beliefs held by the great majority of British economists. These economists have every reason to find excuses, even more than 20 years later, for their misjudgements. The 364 have been quite wrong in their jeremiads about the UK's 'industrial base', and its 'social and political stability'. There should be no surprise that a conventional wisdom has emerged which is carping and mean towards monetarism, and fails to recognise its contribution to the improvement in the British economy's performance.

Further, the technical element in the conventional wisdom (with its aspersions on the instability of velocity, the unreliability of forecasts, and so on) is largely wrong and needs a critical re-appraisal. MM ought to have been more enthusiastic about monetarism and given its opponents a much rougher ride.

Notes

1. Martin Ricketts and Edward Shoesmith, *British Economic Opinion: a survey of a thousand economists*, London: Institute of Economic Affairs, 1990. A large majority of survey respondents disagreed that the central bank should follow a money supply rule, but agreed—if with reservations—to a wages policy as a means of controlling inflation. See pp. 74–78.

2. The reference to 'pulp forests' was made by Samuel Brittan. (See p. 173 of his paper, 'Inflation and democracy', on pp. 161–85 of Fred Hirsch and John H. Goldthorpe, eds., *The Political Economy of Inflation*, London: Martin Robertson, 1978.) Literally thousands of papers were written in the 1960s and 1970s about the influence of trade union bargaining on inflation. See, for example, J. Johnston and M. Timbrell, 'Empirical tests of a bargaining theory of wage rate determination', pp. 79–108, in David Laidler and D. Purdy, eds., *Inflation in Labour Markets*, Manchester: Manchester University Press, 1974.

3. An example of strong emphasis on the income–expenditure model of national income determination is provided by the opening pages of Christopher Dow's *Major Recessions: Britain and the World, 1920–1995*, Oxford: Oxford University Press, 2000.

4. Charles E. E. Goodhart, *Money, Information and Uncertainty*, 1st edition, London: Macmillan, 1975, p. 242.

5. The word 'corporatism' was used, for example, by Mr Peter Jay in his Wincott Lecture on 'A general hypothesis of employment, inflation and politics', reproduced on pp. 33–55 of Peter Jay, *The Crisis for Western Political Economy*, London: Andre Deutsch, 1984. See p. 47.

6. John Maynard Keynes, *The General Theory of Employment, Interest and Money*, London: Macmillan & Co., 1964 (paperback reprint of 1936 edition), p. 379.

7. The phrase 'interventionist bias' may seem a little shrill, but opinion surveys of British university economists confirm that the great majority have been and remain supporters of planning and intervention with the price mechanism. See Ricketts and Shoesmith, *British Economic Opinion* and Wilfred Beckerman, ed., *The Labour Government's Economic Record: 1964–70*, London: Duckworth, 1972, both *passim*. There can also be little doubt about the bias of elite opinion in the immediate aftermath of the Second World War. According to George Orwell, writing in 1945, "Among the intelligentsia, it hardly needs saying that the dominant form of nationalism is Communism...A Communist, for my purposes here, is one who looks upon the U.S.S.R. as his Fatherland and feels it his duty to justify Russian policy and advance Russian interests at all costs. Obviously, such people abound in England today, and their direct and indirect influence is very great." Sonia Orwell and Ian Angus, eds., *The Collected Essays, Journalism and Letters of George Orwell*, Vol. III, Harmondsworth: Penguin Books in association with Secker & Warburg, 1971 (paperback reprint of 1968 hardback original), p. 414.

8. James Tobin, *Policies for Prosperity*, Brighton: Wheatsheaf Books, 1987, pp. 265–66.

9. R. J. Ball and T. Burns, 'The inflationary mechanism in the UK economy', *American Economic Review*, Vol. 66, September 1976.

10. In its *Quarterly Review* of May 1973 the National Institute opined—in the middle of the biggest boom in the post-war period—that "there is no reason why the present boom should either bust or have to be busted".

11. The alarm was expressed in the weekly columns of Peter Jay in *The Times*, Samuel Brittan in *The Financial Times* and other commentators. On 29 April 1975 the *Wall Street Journal* carried a leading article entitled 'Goodbye, Great Britain'.

12. 'Butskellite' is a corruption of the names of Reginald Butler, Conservative Chancellor of the Exchequer from 1951 to 1955, and Hugh Gaitskell, leader of the Labour Party in the 1950s.

13. The first edition of Karl Popper's polemical *The Poverty of Historicism* (London: Routledge & Kegan Paul), written "in memory of the countless men and women of all creeds or nations or races who fell victims to the fascist and communist belief in Inexorable Laws of Historical Destiny", was published in 1957 and went through five reprints in the 1960s.

14. Noel Annan, *Our Age: Portrait of a Generation*, London: Weidenfeld and Nicholson, 1990, *passim* but especially Chapter 26 'Our vision of life rejected'; and Bryan Magee, *Confessions of a Philosopher*, London: Weidenfeld & Nicholson, 1997, pp. 413–15.

15. MM, p. 182. Incidentally, MM's statement on p. 181 that the ending of incomes policy and exchange controls, and associated measures of financial deregulation, was part of the MTFS is wrong. They occurred in 1979, ahead of the announcement of the MTFS in the 1980 Budget. For the antecedents to the MTFS, see Gordon Pepper and Michael Oliver, *Monetarism under Thatcher: Lessons for the Future*, Cheltenham, UK, and Northampton, USA: Edward Elgar, 2001, especially pp. 8–20.

16. A large part of the rationale for the references to 'prudence' in Mr Gordon Brown's speeches and to the more extended treatment in the 1998 Treasury paper on *Stability and Investment for the Long Term* is to be sought in ideas of inter-generational equity developed in the last 20 years by the American economist, Laurence Kotlikoff, and others. These ideas have nothing whatever to do with Keynes or Keynesianism.

17. Tim Congdon, 'The UK's Achievement of Economic Stability: how and why did it happen?', *World Economics*, Vol. 3, No. 4 (October–December), 2002, pp. 25–41.

18. MM do say that "some of its [monetarism's] basic ideas have become so widely accepted that they are no longer monetarist" (p. 183).

19. The autumn 1995 issue of *The Review of Policy Issues* (Sheffield: Sheffield Hallam University) is devoted to this subject.

20. For many years the Bank of England questioned the significance of M0 for monetary policy, on the grounds that the note issue was 'demand-determined'. "Cash is supplied on demand by the Bank of England to the banks and, similarly, by the banks to the general public." (Paul Temperton, *A Guide to UK Monetary Policy*, Basingstoke and London: Macmillan, 1986, p. 73.)

21. Much of this work has been done at the Bank of England, notably by Alec Chrystal, Paul Mizen and Ryland Thomas. It should be made clear that the interpretation placed on the sectoral demand-for-money studies in this paper may not be shared by Chrystal, Mizen or Thomas. Note that the stability of the personal sector's demand for money was recognised by the author in the 1980s, and frequently mentioned in his own research for the stockbrokers, L. Messel & Co., and the investment bank, Shearson Lehman (now 'Lehman Brothers').

22. For details of the equation, please contact the author at tim.congdon@lombardstreetresearch.com. For the key papers on the personal sector's money demand function, see L. Drake and K. A. Chrystal, 'Personal sector money demand in the UK', pp. 188–206, *Oxford Economic Papers*, Oxford: Clarendon Press, Vol. 49 (2), April 1977; and R. S. J. Thomas, 'The demand for M4: a sectoral analysis. Part I—The personal sector', *Bank of England Working Paper*, London: Bank of England, 1997, paper no. 61. 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 Money Study Group in 1993. The equation now used to estimate personal sector money in Lombard Street Research's forecasts is only slightly changed from that given in the 1993 paper.

23. L. Drake and K. A. Chrystal, 'Company sector money demand: new evidence on the existence of a stable long-run relationship for the UK', pp. 479–94, *Journal of Money, Credit and Banking*, Vol. 26 (3), August 1994.

24. R. S. J. Thomas, 'The demand for M4: a sectoral analysis. Part 2—The company sector', *Bank of England Working Paper*, London: Bank of England, 1997, paper no. 62.

25. MM are wrong to say that "enthusiasts for broad money redefined it in terms of M4". The decision to end publication of the M3 series was taken within the Bank of England in the summer of 1989, for reasons explained in the note to Table 1. Enthusiasts for broad money outside the official machine had no say in the matter. In practice, the ending of the M3 series had little effect on the analysis of different sectors' monetary behaviour and so on the attempt to relate broad money to agent's spending and portfolio decisions. The major M4 component not in M3 was building society deposits, but these were held almost exclusively by the personal sector. A stable personal sector money demand function could be estimated, whether its money holdings consisted of bank deposits alone, or of bank and building society deposits. Table 1 shows a marked and apparently puzzling divergence between the increases in the growth rates of M3 and M4 between the mid– and late 1980s. The M3 growth rate jumped by 6%–7% a year and the M4 growth rate by only 3%–4% a year. The bulk of the explanation was that, because of a regulatory change, the building societies held less of their liquidity in the form of gilt-edged securities and more in the form of bank deposits. These deposits were effectively 'inter-bank deposits', without much significance for non-bank behaviour. They were netted out in M4, but not in M3. Analysts at the time were fully aware of this detail and allowed for it in their interpretation of events. (See Tim Congdon, *Reflections on Monetarism*, Aldershot: Edward Elgar Publishing, 1992, p. 163.)

26. See chapters six to nine, pp. 50–154, of Gordon Pepper, *Inside Thatcher's Monetarist Revolution*, Basingstoke and London: Macmillan, 1998, for a comparison of monetarist and non-monetarist forecasts.