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Central Bank Policy: Some First Principles
by Allan H. Meltzer*

The acceptance by central banks in many countries of the importance
of controlling inflation and the failure of previous central bank practices
in several countries to reduce inflation had renewed interest by central
banks in the technical aspects of monetary policy. The most recent expres-
sion is the statement by the Chancellor of the Exchequer in March 1980. ¹
Like earlier statements issued by central banks and governments in Europe
and North America, the Chancellor's statement is not entirely clear about
the principles of monetary control, so it is useful to restate some of the
main principles.

The failures of monetary policy in recent years occur at three levels.
There is, or has been, a lack of clarity about both goals and strategies --
what monetary policy should do and what monetary policy can do. Further,
there is misunderstanding of the tactical issues -- the techniques used to
implement a strategy of monetary control and to achieve the goals set for
monetary policy. Now that the failures of the past have been acknowledged,
explicitly in some countries, and new procedures have been, or are about to
be adopted, the chances for success can be increased by a more careful
consideration of principles than appears to have been the case. The cost
of repeating principles that are well-known, but neglected, seems smaller
than the cost of their continued neglect. Some of what I have to say about

* I am indebted to Karl Brunner and Alex Cukierman for many helpful discussions
of the issues and the analysis of permanent and transitory changes.

¹ Monetary Control, Cmnd.7858 London, Her Majesty's Stationery Office,
March 1980.
goals, strategies and tactics will be familiar but, I believe, most of the monetary problems of the past two decades are the result of failure or unwillingness to go from first principles to practice, and it is this failure that has produced the lack of clarity about goals, strategies and tactics of central bank policy.

Goals or Objectives

A first principle of monetary theory is that the predictable or reliable lasting effect of monetary policy is on the price level and not on real interest rates, real exchange rates, real income or other real variables. Monetary policy can stabilize market interest rates or exchange rates only if the government or central bank is prepared to accept the price level and the companion rate of inflation (or deflation) required to maintain the chosen interest rate or exchange rate. To put the point in another, more useful, way the monetary authority can choose the price level or rate of inflation to which the economy adjusts or can permit the rest of the world to choose the price level or rate of inflation. Choice of the price level as a goal implies that inflation will average around zero. The choice of a real variable or relative price means that the authorities and the country accept whatever price level and rate of inflation the world dictates.

The principal monetary problems of the twentieth century were exacerbated, some would say caused, by decisions to choose fixity of exchange rates as the goal of monetary policy. The deflation of the 1930's and the inflation of the 1960's became severe worldwide, rather than primarily localized, problems because central banks and governments kept exchange rates fixed as deflation or inflation spread from the United States to the rest of the world.
A price level target would have reduced the severity of the depression locally, as it did for example, in Sweden, or globally, if countries had abandoned fixed exchange rates in 1930 or in 1931 when Britain left the gold standard. Few would now argue that the abandonment of fixed exchange rates in the seventies has not had lasting benefits for those countries that chose to reduce inflation. These experiences speak to the benefit of avoiding fixed exchange rates as the objective of monetary policy.

Some people across the channel, particularly in France, speak or write as if the reconstruction of the gold standard would restore price and exchange rate stability. This can be accomplished only if three conditions are met: changes in the price of gold relative to goods must bring forward or restrain the production of gold with sufficient speed and reliability to adjust individual countries price levels in a manner consistent with the maintenance of existing exchange parties; there must be no permanent change in the relative price of gold such as would occur with changes in the distribution of world population and wealth and exhaustion of discoverable gold mines; and countries must be willing to abandon, or severely restrict, reliance on fiscal policy as a means of affecting the timing of domestic spending and employment decisions.

Issues about the gold standard may seem far removed from current concern, but they are not. The gold standard is, or was, a workable system for maintaining fixed exchange rates. Participating countries gave primacy to exchange rates -- and therefore reduced uncertainty -- about the goal of

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monetary policy. Prices, employment, interest rates and all real variables were permitted to fluctuate as required by fixed exchange rates.

Many of the countries in the E.E.C. have joined the European Monetary System, EMS. The EMS does not force countries to announce their choices between price stability and exchange rate stability. Some may see this as an advantage, but it is, I believe, a defect. No one can be certain about which goal will be chosen or the extent to which either price stability or exchange rate stability will be achieved. Confident predictions have been made on all sides of these issues, but no one knows. Uncertainty about the future is increased.

It is a first principle of economics that welfare is increased if governments, including their central banks, act in ways that reduce uncertainty to the minimum level inherent in nature and in trading practices. The uncertainty engendered by the EMS is undoubtedly larger than the minimum that can be reached because, as just mentioned, no one knows whether the result of EMS will be stabilization of country rates of inflation around the EEC average or a series of exchange rate adjustments.

Publication of Monetary Control suggests that the U.K. does not intend to join the EMS. There is no mention of EMS or of exchange rates. The stated goal of monetary policy is to reduce the rate of inflation for the next several years. This is a useful statement of objectives. A better statement would have made a commitment to domestic price stability, by which I mean, an average rate of inflation of zero.
Thornton's *Paper Credit* combines details about the monetary practices of his day with clear statements of principle. The book is an example of the highest standard of economic analysis applied to practical problems, which is to say that it contributes to a level of understanding of the principles and the practices that had not been reached before. I will go further by offering my opinion that Thornton's understanding of the workings of the monetary system and the principles of money surpassed that of most writers during the next one hundred fifty years. It is striking, therefore, that Thornton does not provide a clear statement of his reason for choosing monetary control over the alternatives that have appealed to central bankers -- interest rates or exchange rates.

A contemporary central banker, conversant with economic theory, might state the question this way. Why does it matter whether the central bank fixes the quantity, in this case money, and allows its price to change, or fixes the price and allows the quantity of money to change? If the choices are consistent, the outcome will be the same. No important strategic issue can be involved; the issue is tactical, not strategic. The choice of money instead of interest rates or exchange rates as the focus of monetary policy should be based on convenience or custom and should not be made a matter of principle.

I neither accept this argument, nor regard it as correct. I repeat it, not to make a parody of the argument but to propose an answer. I believe that the argument I have attributed to the central bank is not very different from the argument often made by central bankers. 

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4 See Chap. 4 and Appendix B of *Monetary Control*, op.cit., for examples.
there is very little difference between intervention in the foreign exchange market that is supposed to affect exchange rates -- so called managed floating -- and intervention in the bond or bill market that is supposed to affect interest rates.

A purchase of domestic securities by the central bank increases the domestic source of the monetary base and lowers interest rates on domestic securities. The public holds fewer domestic securities and, because domestic interest rates are reduced relative to covered foreign interest rates, the public sells domestic currency, purchases foreign exchange and foreign securities. The sale of domestic currency to purchase foreign currency raises the spot exchange rate defined as the number of units of domestic currency that exchange for a unit of foreign currency. Home currency depreciates.

Suppose the central bank had increased the base by purchasing foreign exchange. Instead of holding more domestic securities, the central bank holds more foreign exchange. The purchase raises the spot rate, depreciating the currency, and increases the stock of domestic money. The public purchases domestic securities, lowering the rate of interest on home securities until interest parity is restored at lower interest rates and a higher spot rate.

The critical assumption in this analysis is that the forward exchange rate is not affected differently by the two operations. Whatever people believe in one case, they believe in the other. For example, if the market perceives the increase in the base as larger than anticipated, the forward exchange rate rises and the domestic rate of interest rises. The two changes reflect a common cause -- the increase in anticipated inflation -- that induces
holders of domestic securities to sell their securities, purchase foreign securities and sell domestic currency on the forward market.

When exchange rates are not fixed, the two operations differ in one important respect. Exchange rate intervention changes the mix of assets in the central banks' portfolio. This alters the distribution of exchange rate risk between the central bank and the public. In all other respects -- the level of the monetary base, the levels of market interest rates and exchange rates -- the two operations have similar effects.

Comparison of the two central bank operations brings out some applicable principles of monetary economics. The effects of central bank policy on interest rates and exchange rates, with floating rates, do not depend on the way in which intervention occurs. The effect depends, at the first stage, on two related changes brought about by the policy; the change in the monetary base relative to the anticipated change in the monetary base and the change in the anticipated monetary base relative to the anticipated change in nominal income. If the increase in the base is seen as part of the policy to achieve a rate of change of money that is consistent with the expected growth of nominal income, the central bank's operation has little effect on the economy. Observed growth of the base at a rate that is faster, or slower, than anticipated leads to revisions of anticipations that alter spot and forward exchange rates and interest rates. The adjustment of spot exchange rates and interest rates is large, if the change in anticipations is large, and is small if the change in anticipations is small.

There is no way for the central bank or anyone else to be certain about which actions will be regarded as consistent with prevailing anticipations and
which actions will lead to revisions of anticipations. Markets receive information frequently. Some changes are regarded as transitory; others are believed to be permanent. A change in the growth rate of base money that is believed to be transitory has very little effect on prices or output; the effects are absorbed by transitory changes in interest rates and exchange rates. Let the change in the growth of money be perceived as permanent and the structure of interest rates, forward rates, output and prices start to adjust.

Again, it is the growth of the base, relative to anticipations, that determines the market adjustment. The decision by the central bank to remove or provide base money by purchasing foreign exchange instead of purchasing domestic securities is a distinctly secondary issue. To avoid misunderstanding, let me emphasize that I do not mean that the difference is worked out in long-term adjustment; I mean that any discernible difference in the position of the economy or the markets from day to day, arising from the way in which changes in the monetary base are brought about, is limited to the effect on exchange risk and is, therefore, likely to be small and is best neglected. For this reason, I will, hereafter, discuss monetary policy operations as if the operations are entirely in domestic securities.

Base Money and Interest Rates

The choice between interest rates and base money as the variable used to implement strategy is as important for the conduct of central bank policy as the choice between interest rates and exchange rates is unimportant in a world of floating rates. To bring out the reason, I want to distinguish more fully between permanent or persistent changes and temporary or transitory changes. I will argue that the distinction between permanent and transitory
changes, when joined to the distinction between real and nominal changes, leads to a conclusion about the proper strategy for central bankers who intend to reduce inflation.

Monetary theory has insisted on the distinction between anticipated and unanticipated changes for a very long time. Only unanticipated monetary changes affect real variables. Among the unanticipated changes however, we must distinguish those which are perceived to be transitory -- not expected to persist -- and those which are permanent and are expected to persist.

The distinction between transitory and permanent changes must be made for real as for nominal changes. The discovery of North Sea oil is a permanent real change; changes in technology, changes in the expected growth of government following Mrs. Thatcher's election victory, and changes in the perceived power of the OPEC cartel are examples of other permanent, or at least persistent, real changes. Announcements about the current short-fall in Soviet wheat production or the temporary disappearance of anchovies from the coast of Peru in 1974 are examples of transitory real changes that alter relative prices, interest rates and exchange rates but have trivial long-term effects on income, wealth, the rate of inflation, and the exchange rate.

At the time changes occur, people are frequently unable to discern what is permanent and what is transitory. Many knowledgeable people believed that the OPEC cartel would not permanently raise the relative price of oil. The discovery of North Sea oil did not immediately bring forth estimates of the size of the change in real income or reliable estimates of the life of the wells or their capacity. The outbreak of a war gives rise to sudden changes in market prices, but the ultimate effects are difficult to discern until knowledge about extent, duration and severity gradually become clearer.
Let time pass, and some of the uncertainty is removed. Better estimates of the effect of the past on the future become available. The permanent effects are more clearly discerned.

The same principle applies to money. People do not know what the growth rate of money will be. Often the central bank does not know. By observing the past, and making judgements about the future, people make estimates of the anticipated growth rate. A sudden spurt in money growth will often be dismissed as transitory. Let the growth rate persist for a few weeks or months and observers start to revise anticipations about future inflation, interest rates and exchange rates.

Monetary policy is made under conditions of uncertainty about permanent and transitory, real and nominal changes. Recognition of uncertainty is essential to the proper choice of a strategy for implementing policy.

Consider two alternatives. In the first, the central bank sets a market rate of interest and only varies the interest rate when there are perceived deviations of the growth rate of money from the announced growth path. In the second, the central bank sets a target rate of money growth and allows the interest rate to adjust as frequently and as much as required to keep the growth rate of money as close to the target as possible.

If all shocks are transitory, the difference between the two control strategies is slight. The former produces less variability in interest rates and greater variability of money growth; the latter produces less variability of money growth and greater variability of market interest rates from day to day. Greater variability of interest rates or of money growth imposes different costs and provides different tasks for markets. The principal problem of central bank strategy –- providing the growth rate of
permanent or transitory, is matched by an increase or decrease in the money stock. The increase in money prevents any real effect of changes in the demand for money on prices and output.

A policy of controlling interest rates requires the central bank to increase the stock of money when there are changes in aggregate real demand. If the real changes are permanent, the central bank reinforces the effect of the change on prices and output by increasing money when aggregate demand increases and reducing money when aggregate demand falls. Monetary policy is pro-cyclical.

Suppose that the real growth of the public sector increases. The increase in the growth of real expenditure raises interest rates. Central bank policy prevents or delays the increases in interest rates by increasing the stock of base money and its rate of change. The higher growth of the monetary base finances the growth of public spending. As long as the public and the central bank believe that the changes in government spending and money are temporary, they do not adjust anticipations of inflation fully. The increase in money growth reinforces the effects of increased government spending on output. The central bank policy of maintaining interest rates in the presence of a real increase in the growth of aggregate demand heightens the real boom in the economy and the subsequent inflation.

Neither the central bank, nor anyone else, knows how much to raise interest rates to slow inflation. If the central bank raises the market rate too little, money growth remains inflationary. If the central bank increases interest rates too much, the anticipated rate of inflation is revised downwards. A sudden reduction in the anticipated rate of inflation reduces the growth of real expenditure and often brings on a recession.
There is no way for the central bank to know precisely where to set the interest rate. To find the interest rate that slows the growth of base money, the central bank must have information about anticipations, about the relative size of real and nominal shocks and about the way in which beliefs about the permanent effects of policies adjust to changes in interest rates and other variables.

By setting the interest rate, the central bank permits permanent changes in the growth of real expenditure to change the growth of money. The central bank does not change interest rates quickly enough to prevent persistent changes in the rate of growth of money and the rate of inflation. If the change in real expenditure is a change in level, there is a bulge in the money stock, rather than a permanent change in the growth of money. People cannot quickly separate changes in the rate of growth from changes in the nominal stock, so they underestimate or overestimate the rate of inflation. Central bank policy increases uncertainty about future prices and rates of price change.

Principles Guiding the Choice of Strategy

Let me summarize by stating the consequences of alternative strategies. (1) If unanticipated changes in the growth rate of the demand for money are the principal cause of fluctuations in the economy, the central bank damps fluctuations in economic activity by controlling interest rates. Changes in the demand for money call forth changes in the money stock that dampen changes in real rates of interest. (2) If the dominant causes of fluctuations are changes in the growth of spending, controlling the growth of money prevents changes in the rate of inflation. Controlling money maintains inflation
at an average rate and reduces the severity of recessions by preventing reductions in money growth. (3) If there are permanent changes in the growth of productivity of financial or non-financial firms, the central bank cannot maintain zero (or constant) average inflation by setting the rate of monetary growth permanently. To keep prices stable, on average, the rate of monetary growth must adjust periodically to reflect changes in productivity and changes in intermediation. If the central bank is slow to respond to permanent changes in productivity growth, permanent changes in productivity growth either cause changes in the rate of inflation or must be offset by changes in the maintained rate of money growth. The historical record makes it hard to sustain a belief that the dominant cause of persistent inflation in the United States, the United Kingdom or much of Western Europe has been the result of permanent changes in the growth of productivity.

A policy of controlling the growth of money does not permit the central bank to offset the effect of transitory real shocks to aggregate demand or to productivity. Consequently, prices will vary around the maintained rate of inflation, and output will vary. Recessions and expansions induced by changes in productivity will not be avoided. What will be avoided is the pro-cyclical effect of changes in money introduced by the central bank to offset the effect of changes in real demand and supply -- real shocks. No one will mistake one-time or temporary changes in money for persistent changes in the rate of money growth, however, so the strategy of controlling money reduces uncertainty about the future price level and the maintained rate of inflation.

It is an indictment of past policies, and current strategies that rely on control of interest rates, that neither the central bank, nor anyone else,
has a clear idea about what the growth rate of money will be next month, next quarter or next year. A policy of fixing the growth of money eliminates one source of uncertainty and in this way appears to increase stability in an uncertain world.

Control of money growth has not been shown to be the best of all possible policies. It may be true that, in the presence of uncertainty about the persistence of change, the best we can do is eliminate confusion between real and nominal changes and between persistent and transitory changes in money. To prove that monetary control is optimal one must show that control of money growth reduces variability of present and future consumption relative to alternative policies.

**Tactics**

Tactical issues arise because the decision to control money can be implemented in a number of different ways. A decision to control the monetary base has the advantage that the central bank can control the base by controlling the size of its balance sheet. Control of the base, however, will not produce identical growth rates in money and bank credit -- the earning assets of the banking system -- if there are changes in intermediation.

Neither the central bank, nor the market, can forecast changes in intermediation. Consequently, the central bank cannot completely and reliably control the growth of most of the monetary aggregates daily or weekly. Changes in Euro-currency holdings, and other time deposits, changes in currency relative to deposits, and changes in banks' demand for reserves affect the various money multipliers relating the monetary base to other monetary aggregates. Although
recent work shows that the multipliers can be predicted with sufficient accuracy to be useful for monetary control, errors cannot be avoided. 5

Control of the monetary base is not difficult to achieve. The monetary base is computed by rearranging the balance sheet of the monetary authority. The principal asset items are the portfolios of domestic and international assets. The principal liabilities are bank reserves and currency. In addition, there are usually a large number of relatively small accounts. The items in many of these accounts, and the borrowing of commercial banks from the central bank, cannot be controlled or predicted daily. The central bank can, however, offset the effects of float and other essentially random daily changes by buying or selling domestic earning assets or foreign exchange.

Central bankers often argue that the principal liabilities of the monetary authority -- reserves and currency -- cannot be controlled on a daily basis because currency must be provided on demand and reserve flows are not entirely predictable. This argument is incorrect. Fluctuations in currency change the composition of the base but do not change the total. Fluctuations in reserves, arising from changes in float and other random factors can be offset. The main problem in controlling the base arises because of the way in which central banks operate. Control of the base can be improved if central banks shift from control of liabilities to control of assets. The principal items on the asset side of the base reflect decisions of the central bank about the amount of domestic and foreign assets held. The central bank can offset all changes in float, bank borrowing, exchequer deposits and other random or variable items by buying

or selling in the open market. Each day, the central bank must either forecast or observe the random factors and offset that amount in the market. Any small error can be eliminated at the end of the day, or early the next day, when the value of total central bank assets is known.

Precise control of the base is impossible if the central bank offers to lend freely at a rate below the market. In this case bank borrowing expands and the base rises. If the government insists on large loans from the central bank, or sets a ceiling on market interest rates, the central bank cannot control the size of its balance sheet. The base is uncontrolled.

Control of the monetary base works best if the discount or Bank rate is a penalty rate. This gives the central bank greater control of bank borrowing. A penalty rate is one of several institutional reforms that enable the central bank to improve control of monetary aggregates.

Implementing Control

I have long believed that a four step procedure is an effective way to implement policy. Firstly, the monetary authority -- or the government -- develops a medium-term objective for the growth of nominal income or for inflation. Secondly, the monetary authority announces the rate of growth of money, or the path of money growth, that is consistent with the medium-term objective. Thirdly, the central bank determines the rate of growth of the monetary base believed to be consistent with the rate of money growth. The rate of growth of the base is adjusted to reflect changes in intermediation, in currency relative to deposits and in other factors affecting money growth. Fourthly, the central bank estimates the effects of float, Exchequer deposits, bank borrowing and other short-term changes on the growth of the base. The
desired amount of base money is obtained by purchases and sales in the open market. The discount rate, or minimum lending rate, is a penalty rate.

These steps permit the central bank to keep the base very close to the announced target. The stock of money is not under the direct control of the monetary authority, so weekly control of money is not feasible. Experiences in several countries suggest that the average rate of money growth during a 3 to 6 month period can be held within narrow limits, if the central bank adheres to the control procedure.

Postscript

The paper is an edited version of a talk given in London, in May 1980, under the auspices of the Centre for Banking and International Finance of the City University. The three months between the oral and final written presentation have given more opportunity to observe the way in which the system of monetary control has worked during the first year of the Thatcher government.

The results are not encouraging. The stock of money -- sterling $M_3$ -- rises and falls in direct relation to the central government borrowing requirements. Months in which the borrowing requirement is relatively large are, on average, months of larger, some would say excessive, increases in $M_3$.

The reason for the association is traditional. The Bank of England sets the interest rate. The demand for credit by the private sector determines the amount of public debt that banks and the public absorb at the posted

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6 A rank correlation is .53 for the 13 months June 1979 through June 1980 between non-seasonally adjusted CGBR and $M_3$. I have intentionally excluded the jump of $M_3$ in July.
interest rate. If the public chooses to borrow more, the Bank of England lends more, at the posted interest rate, and stocks of base money, money and bank credit expand. If the public reduces borrowing or the government deficit is smaller than anticipated, base money, money and credit fall or rise less than expected.

If the Bank of England controlled the quantity of base money, interest rates would rise and fall with the central government borrowing requirement, but the growth of $M_3$ would be more closely controlled. The prospects for meeting monetary targets would be increased. With the increase in monetary control, the prospect of reducing inflation and increasing the credibility of the anti-inflation policy would improve.

It would be a shameful waste, if the current high unemployment is borne without achieving a substantial permanent reduction in inflation. Yet the traditional practice of monetary policy by the Bank increases uncertainty about the ability of the Bank to meet the monetary target and about the ability of the government to achieve a sustained reduction in the rate of inflation.

Current uncertainty about past and future growth of $M_3$ show that neither the Bank nor the market knows whether the minimum lending rate is currently too high or too low to reduce inflation at lowest cost. Indeed, there is considerable uncertainty and much skepticism about whether the sustained rate of inflation will be brought below ten or even fifteen per cent in the foreseeable future. Wage increases and interest rates reflect the prevalent skepticism.

Perhaps it will all work out. Perhaps money growth will be controlled and inflation will be reduced quickly and substantially. Perhaps anticipa-
tions of inflation will decline fast enough to reduce the number of unemployed and the duration of unemployment. One cannot fail, however, to question the rationale for a policy that imposes large costs on society without reducing to the attainable minimum the risk that the policy will fail.