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INNOVATIONS IN MONETARY POLICY

Remarks by

Henry C. Wallich
Member, Board of Governors of the Federal Reserve System

at the
meeting of the

Southern Economic Association

Atlanta, Georgia

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Central banks in numerous countries today have established money supply growth targets. The Reserve Bank of Australia, the Bank of Canada, the Bank of England, the Federal Reserve, the German Bundesbank, and the Swiss National Bank have adopted this approach in one form or another. While I believe that such targets can make valuable contributions under present inflationary conditions, I do not view them as wholly exogenous improvements in central bank technique. They are the consequence, rather, of high rates of inflation.

Historically, central banks have relied primarily on interest rates as their principal guide. In a severe inflation, however, interest rates cease to be a good guide. Nominal rates may rise very high, but they do not convey an accurate measure of the degree of restraint or stimulation implied. To the non-economist, high nominal rates probably convey an impression of excessive restraint and so may generate political

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pressure against the anti-inflationary use of monetary policy. To the economist, nominal rates of inflation present the puzzle of translation into real rates. Short-term rates, which must be measured against actual more than expected inflation, often become negative. Long-term real rates must be derived from expectations of inflation, which may differ among lenders as well as borrowers. Since the inflation premium is taxable to the lender and deductible to the borrower, after-tax real rates become largely indeterminate. For a wide range of taxable lenders and borrowers they probably have at times been negative in the United States.

The money supply and its rate of growth, on the other hand, are variables that intuitively relate to inflation. It is easy to see -- and perhaps, therefore, more readily possible to convince the public and the legislature -- that a 10 per cent rate of growth of the money supply over considerable periods will tend to raise prices. Real balances can be computed on the basis of observed rather than expected inflation. But, in any event, real balances play a less important role than real interest rates, in an analysis that consists principally in relating the nominal money supply to nominal GNP and its price and volume components. Thus inflation gives a monetarist -- or near-monetarist -- tinge to nearly all monetary policy making. This is particularly so when, as has been the almost universal experience so far, inflation rates are highly variable and, therefore, hard to predict.

Sticking to a money supply target does not mean that the policymaker has necessarily changed his view of the transmission mechanism of monetary policy. In particular, it does not mean that he now subscribes to some sort of "direct" effect of money on the real sector. A money supply target is perfectly consistent with the belief that money works through interest rates and rates of return in a broad sense. For this very reason, under conditions of price stability, the policymaker may have thought it appropriate to work on interest rates directly instead of via the money supply. During inflation, however, he finds that the interest rates his policies produce will have a more predictable effect if he calibrates his action by the money supply and allows interest rates to take on such values as interaction between the money supply and the rest of the economy may determine. To recognize this principle, however, is only to posit a number of questions, both theoretical and statistical, that must be resolved for its application. Today I want to speak about some of these problems as they seem to have presented themselves in American experience.

Definitional Problems

Debates about the proper definition of the monetary aggregates are as old as the effort to quantify these aggregates. I need merely list some currently important issues. M_1 is beset by problems such as the appropriate inclusion or exclusion of government deposits, of

foreign deposits, and transit items. In addition, the demand for M_1 has recently been affected by institutional changes that have increased the moneyness of time and savings deposits, such as telephone transfers, NOW accounts, and savings deposits for business. These institutional changes as well as others may jointly have accounted for a reduction in the growth rate of M_1 of as much as two percentage points over the past year. Partly for this reason, the relationship of M_1 to income seems to have changed sufficiently to cause ordinary money demand equations to currently overpredict, in a simulation beginning in mid-1974, by something like \$25 billion.

M_2 , which has had a good record of stability in relation to income over the last 10 years, nevertheless suffers from a variety of frailties. Savings deposits are increasingly serving as transactional balances. Thanks to Regulation Q, changes in market rates of interest lead to disintermediation and reintermediation. Furthermore, while large negotiable certificates of deposit are excluded for weekly reporting banks, they are not excluded for nonweekly reporters. Non-negotiable large CDs are included for all banks, although banks freely switch one type to the other at the holders request. Some \$20-25 billion of large CDs, along with an increasing volume of consumer CDs with maturities of up to six years, now are included in M_2 . Thus M_2 is spreading in two directions -- becoming more monetary at one end and less so at the other.

Given the uncertainties attaching to both M_1 and M_2 and likewise to the higher M's, a possible remedy would be to give some weight to both instead of making a choice, and over time perhaps to vary these weights, as the Federal Reserve has done. It must be remembered, however, that such weighting systems in effect count M_1 twice, since it is contained in M_2 .

Looking beyond M_1 and M_2 , it becomes clear that some liabilities of nonbanks included in M_3 and even of nonfinancial institutions are sufficiently similar to some components of M_2 to make the drawing of a strict dividing line implausible. If one wishes to attribute a special quality to bank liabilities, one must consider also the advisability of paying special attention to bank credit as against nonbank credit. This would compel one to consider the asset side of bank balance sheets. It would raise the question, for instance, whether the fact that in the present expansion a large part of money creation has been against government securities rather than against business loans significantly reduces the expansionary power of the money supply thus created.

Finally, all aggregates are subject to the difficulties of seasonal adjustment. Monthly data would be difficult to interpret without adjustment. But different adjustment procedures, even though individually plausible, may give significantly different results in the short run. A study of 30 alternative M_1 adjustments, even after eliminating extremes, showed an average range for monthly adjustments

of 4 percentage points in terms of annual growth rates. Annualized monthly rates of growth of the aggregates, therefore, must be treated with considerable reserve.^{1/}

So much for a small sampling of the conceptual, definitional, and statistical difficulties in establishing a money supply target. A few comments may be in order also with respect to the level at which the policymaker may want to set his target or targets, although this is more a question of objectives than of techniques.

Strategy of Target Setting

The money supply growth targets of all central banks today are far higher than is consistent with long-run price stability. In the absence of a trend in velocity, the growth of money over time would thus have to equal that of real GNP in order to maintain stable prices. Given a moderate upward trend in M_1 velocity, the noninflationary annual increase might be of an order not much above zero. It is perfectly obvious, then, that rates of money growth must be brought down over time if ending inflation is a goal of policy. The question is whether this should be done by a unidirectional reduction of the money supply targets, albeit perhaps a very slow one, or whether anti-cyclical considerations should be allowed, at times, to cause a reversal of this downward tendency. A steady downward path poses the risk of undesirable cyclical effects, such as a slowing of money growth in the face of a cyclical contraction. The alternative of upward and downward adjustments runs the risk that the intended long-term

downward trend will, in fact, never materialize. It also reduces the credibility of the exercise and creates pro-inflationary expectations. During a cyclical expansion, when an anti-cyclical stance requires restraint, this potential conflict, however, may lose relevance.

Specification of One-Year Targets

Once basic decisions have been made about rates of money growth, problems arise concerning the manner of specifying the targets. There is the choice between a single number and a range. A single number virtually guarantees a miss but by virtue of that fact also provides a reasonable excuse for missing. The uncompromising character of a single-number target, however, is also more apt to provoke controversy. A target range is easier to hit but, by the same token, a miss may be more severely criticized. At the same time, a range is likely to be less controversial because it is less specific.

Next, there is the phenomenon of "base drift" that is invited by periodic targets set in terms of growth rates as required by Concurrent Resolution 133, rather than absolute levels. Base drift occurs when the level attained after three months is not precisely on the mid-point growth path of the range but must nevertheless be used as the base for the next quarter's annual target range. Base drift could, of course, be corrected by adjusting the new growth ranges so as to bring the projected path back onto the old track with a lag of some months or quarters. This procedure, however, would lead to targets

that change quarterly and might involve odd fractions, possibly confusing the public. Alternatively, the midpoint of the original growth path might be chosen for the location of the base of any new target range. It should be remembered, however, that base drift simply increases the flexibility already injected into the target procedure by the use of a range. It is to some extent an arbitrary decision whether to incorporate that flexibility in a wider range or in a less rigid determination of the base.

The degree of flexibility inherent in a target expressed as a range of growth rates increases with the passage of time as the upper and lower limits increasingly diverge in dollar terms. Thus, in the initial weeks after the setting of a target range the policymaker has less room for maneuver -- or for error -- than he has later on. This could be remedied by using the distance between the lower end and the upper limit achieved after six months or a year as the standard and allowing the policymaker the same degree of latitude early and late in the target period. Graphically, this would imply representing the target ranges by bands of constant widths instead of by cones. Such a procedure, however, would probably allow excessive latitude during the early period following the setting of the target range. This matter is better dealt with by appropriate handling of the two-month targets that the Federal Reserve also employs. This topic, therefore, will be examined next.

Short-Run Targets

Federal Reserve policy techniques -- not, of course, its major objectives -- are significantly influenced by the decentralized structure of the system. The Federal Open Market Committee (FOMC) meets monthly. In terms of travel time and competing demands upon the members' working time at their home base, this seems not an unreasonable frequency, although other arrangements obviously are possible. One month, therefore, is the natural interval for formulating and executing policy decisions. The Open Market Manager at the Federal Reserve Bank of New York, who is in the market every day, must be given instructions for this period. A centralized monetary authority would not be so constrained. It could conceivably make minor policy decisions from day to day, although it might not find that very convenient.

Given the instability of the aggregates over short periods of time, however, a month would be a very short period over which to confine the aggregates to a narrow range. Efforts to do so, aside from producing large jumps in the Federal funds rate, might well cause the Fed to over-react to preliminary indications of changes in the rate of growth that more complete figures could disavow. The money supply figures do not come into being fully known and accurate on a certain day. They evolve gradually from fragmentary reports.

Reasonably hard data are available -- and are published -- eight days after the end of the statement week. A first revision appears 15 days after the statement week and further revisions follow quarterly as data on non-member banks become available.

There are several options for dealing with the problem of short-run instability of the aggregates. One would be to set a very wide range for a monthly growth rate. A second would be to ignore short-term variations in the growth of the aggregates altogether. A third, which the System has chosen, is to average the growth of two successive months in order to get a little more stability into the growth rate. A further variant of this approach would be to lengthen this averaging period. The resulting greater stability of the averaged data would, of course, be purchased at the cost of reduced sensitivity to new data.

Further options are offered by the possibility to employ not only past but estimated data. The FOMC's present procedure, in fact, relies primarily upon estimated data. Of the two-months' averages which are employed for formulating short-term targets, only one week is reasonably firm and has been published. The rest of the two months is estimated, though some fragmentary data are available. It would be possible also to lengthen the averaging period forward by including more distant estimates, as well as backward, again trading stability for sensitivity. The longer the averaging period, the more

closely must the aggregates be tied to the one-year targets in order to avoid the need for subsequent drastic readjustments. Here again, a problem of base drift presents itself.

Implicit in the various options cited is the question how quickly and strongly the Fed should react to new incoming data, at the risk that they may represent only "noise." By chasing the data, the Fed runs the risk of making false starts, of having to reverse frequently, of misleading the market and whipsawing it. By ignoring new data, it runs the risk of acting too late, of having to act more forcefully than if action had been timely, and perhaps of being pushed off track altogether. Optimal control theory tells us that all new information, in this case particularly the incoming aggregates, should be considered, but that it should be filtered to eliminate noise as far as possible. One possible way of approximating this principle would be to give a lower weight to newer and more uncertain data. Establishing the weights remains a problem however.

The question whether it is wise for the Fed to watch and follow the data closely is often coupled with the question whether it is wise for the market to watch and follow the Fed. It is obvious that, if Fed operations have an influence on the market, the market is bound to engage in Fed-watching. But the nature of the Fed's influence on the market depends very much on the choice of instrument used by the Fed -- the Federal funds rate, as at present, or some

reserve aggregate. This consideration leads to the much discussed issue of the funds rate versus a reserve aggregate as the policy instrument.

Federal Funds Rate Versus Nonborrowed Reserves

The Federal Reserve policy strategy is based in large part on the monetary aggregates, but its short-run tactical instrument is the Federal funds rate. Under the funds rate approach, the Federal Reserve estimates the level of short-term interest rates, including the funds rate, at which the public, given projections of income, will want to hold the amount of money the Federal Reserve intends to supply. Then reserves are supplied in an amount that will maintain that level of the funds rate, and that will cause the banks to generate the targeted amount of money.

Under a nonborrowed reserves (NBR) approach, the Federal Reserve might estimate, via a multiplier approach, the amount of required reserves that would be related to the aggregates it intends to supply. In such an approach it would then be necessary to estimate the amount of excess reserves and borrowed reserves that would prevail at the short-term interest rates, including the funds rate, consistent with the targeted money supply. In this way it would thus be possible to arrive at an estimate of the volume of nonborrowed reserves that must be supplied to reach the target.

The principle for choosing between interest rates and aggregates as means of stabilizing income developed by William Poole^{2/} can be applied also, with appropriate modifications, to the objective of stabilizing money or its rate of growth. Given fully known and stable relationships, the choice of an interest rate or aggregates instrument, of course, becomes immaterial. Either instrument fully determines the other. When there are shocks to one or the other of the variables, a simple criterion applies.

When the objective is to keep the money supply (or its growth rate) constant, the policymaker finds himself dealing with a money demand and a money supply function. The selection principle then is:

(1) If the shock is to the money supply function, for instance by an increase in banks' demand for excess reserves, a constant interest rate will keep the money supply constant given a stable money demand function. An interest rate target, therefore, would be the appropriate one. The supply of reserves would have to be varied in order to accommodate the demand.

(2) Alternatively, if the shock is to the money demand function, a reserve aggregates target will minimize the impact on the money supply. Keeping the money supply function constant by, for instance, keeping nonborrowed reserves constant, would allow interest rates to rise as demand increases. This would dampen,

although not entirely prevent, an increase in the money supply in response to the increase in demand.*

There is a good deal of empirical evidence to indicate that the precision of the two procedures is broadly the same. For a period of one month, the standard error is about 4.5 percentage points of the annual rate of growth of M_1 , and 3 percentage points of the rate of growth of M_2 .^{3/} Over a period of six months, the standard error for both procedures reduces to about one-half of a percentage point for M_1 and one-third of a percentage point for M_2 . Thus, if we believe that short-run deviations from the aggregates targets are not important so long as longer run targets are hit, the issue of which of the two approaches is more precise loses much of its importance. If one believes, to be sure, that deviations even for relatively short periods have an impact upon the real sector and thus generate a feedback from the real sector upon the demand for money, greater attention to such short-run deviations would be necessary. In any event, however, the proposition that short-run deviations do not greatly matter does not imply that

*--A more precise statement of this principle is that the relative stability of the money demand function must be compared with the reduced form money stock equation, relating the equilibrium money stock to a reserve aggregate and to income. The stability of the reduced form equation depends both on the instability of the money demand and the money supply function. Because movements in interest rates partially offset shocks to either of these, the stability of a reduced form equation combining both is greater than the average stability of both, assuming their errors are independent. When both supply and demand functions are equally stable, therefore, a reserves aggregate instrument is still preferable to an interest rate instrument.

they can be ignored. They must be compensated for over the longer run. If no compensation for an overshoot or shortfall over one or two months is provided in the following months, the longer run result will be affected and must be expected to have its impact upon the real sector.

If all this is understood, it can fairly be said that the choice between the funds rate and the nonborrowed reserves procedure must rest, not on the degree of precision that can be attained in hitting the target, but on other aspects of these procedures.

The funds rate procedure offers an opportunity to limit the variability of the funds rate and other interest rates in the short run, since it automatically accommodates purely random and transitory shifts in the money demand schedule which should not, in any case, be transmitted to the real sector. For instance, it automatically provides a seasonal adjustment for the money supply. The funds rate procedure allows changes in rates to occur gradually and without frequent reversals. Avoidance of sharp interest rate instability means avoidance of the cost of such instability. Principally, these costs take the form of weakening the market mechanism by increasing the risks of dealing in and owning securities. Greater stability of interest rates reduces unpredictable flows into or out of thrift institutions triggered by Regulation Q ceilings. Transmission of these elements of instability to the real sector, to investment and savings decisions, in whatever degree they might occur, likewise is avoided if rates are more stable.

A second significant, albeit double-edged, gain from a more deliberate movement of the funds rate is the greater control that it provides over the entire rate structure. When the market knows that the monetary authorities use the funds rate to control the aggregates, it naturally will watch the aggregates closely for a tip-off on future movements of the funds rate. If, in addition, the market knows that the authorities try to avoid erratic movements in the funds rate, it will attribute policy significance to such movements. It then becomes logical for other short-term rates to move in response to changes in the aggregates that are expected to trigger a funds rate change. All short-term money market instruments are to some extent substitutes. Through term structure and expectation effects, longer rates may also be affected. Thus, by making the funds rate an important instrument of policy, the money authorities in effect are linking together the entire rate structure and are providing themselves with a lever to move that structure. The manner in which, in some European money markets of the past, the discount rate was linked by law or custom to other rates provides an analogy.

But this role of the funds rate, as noted, is two-edged. The impact of a funds rate change upon market rates may at times be undesirable to the authorities, even though the funds rate movement may be necessary to control the aggregates. There is a possibility that the authorities might become reluctant to move the funds

rate sufficiently fast and far, and if necessary to reverse earlier movements, when that should become necessary to prevent the aggregates from moving undesirably. Overshoots or shortfalls from the monetary targets could then develop. As an extreme case, the authorities might be tempted to regard the funds rate, not as an instrument to attain the aggregates, but as a policy objective in its own right. In that case, the shift from interest rates to monetary aggregates alluded to at the beginning of this paper would have been reversed.

These potential consequences of a funds rate approach would largely vanish if the authorities were prepared to move the funds rate frequently and sharply, without concern about reversals, false signals, and purely aiming at the closest possible control of the aggregates. In that event, the linkage between the funds rate and other market rates would weaken. If, for instance, the funds rate were expected to fluctuate randomly around some particular value over the next 90 days, Treasury bill rates presumably would take their cue from that expected average rather than from the day-to-day or week-to-week levels of the funds rate. This partial "uncoupling" of the rest of the rate structure from the funds rate would reduce its usefulness as a lever over other rates. It would also thereby reduce the sensitivity of the demand for money, to funds rates movements which work via short-term interest rates. But it would make the funds rate more maneuverable for the purpose of hitting the aggregates targets.

Use of the nonborrowed reserves target would probably have precisely this effect of in some degree uncoupling the funds rate from the rest of the rate structure. Over short periods the funds rate probably would move around in an erratic way. Other rates would take their cue from some expected average of these movements rather than from any particular move or level. To the extent that this happened, the potential usefulness of the funds rate as a lever on other rates would disappear, which in some respects would be a loss. Moreover, since some degree of linkage no doubt would remain, there would be a cost, although much diminished, from this hypothetical instability of the funds rate. But reasonably close control of the aggregates over the longer run would be automatically more assured, and the danger of inadvertently slipping from an aggregates to an interest rate strategy would disappear. The market might lose its interest in Fed-watching, or at least would have to change its method of watching. An incidental potential benefit of a nonborrowed reserves target would be realized in case the Federal Reserve should ever decide to publish its policy decisions immediately, since announcement of the intended future behavior of nonborrowed reserves obviously would produce fewer complications than announcement of the intended future behavior of the funds rate.

A lesser potential although minor disadvantage of a non-borrowed reserves approach is that at times the money supply and interest rates may move in inconsistent directions -- money and

interest rates both moving up or down together. More serious perhaps, the diminished link between the funds rate and the bill rate may make it more difficult to influence the demand for money which is guided, other things equal, by the bill rate. Unless the bill rate moves, holders of money balances have no portfolio motives to shift between balances and short-term instruments.

To summarize, there is not much that could be done under one regime that could not be done under the other. The aggregates could be effectively controlled, and the funds rate could be partly uncoupled from the rest of the interest rate structure by appropriate handling of the alternative instruments. It is with respect to the costs of such handling, and the risks involved in trying to avoid these costs, that the approaches differ.

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- 3/ See James L. Pierce and Thomas D. Thompson, "Some Issues in Controlling the Stock of Money," Controlling Monetary Aggregates II: The Implementation, Federal Reserve Bank of Boston Conference Series, No. 9, September 1972, Richard J. Davis and Frederick C. Schadrack, "Forecasting the Monetary Aggregates with Reduced-Form Equations," Monetary Aggregates and Monetary Policy, Federal Reserve Bank of New York, 1974. Somewhat larger monthly errors over the more recent years 1974 and 1975 under either a Federal funds rate or reserve aggregate procedure have been estimated by William R. McDonough, "Effectiveness of Alternative Approaches to Monetary Control," Federal Reserve Bank of Dallas Business Review, August 1976.