Monetary Aggregates and Monetary Policy in the Twenty-First Century

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This is a special conference for the Federal Reserve Bank of Boston, and for me personally. The role of monetary aggregates in monetary policy was intensely controversial when I joined the staff of the Board of Governors in May 1969. I was immediately asked to join the staff of the newly formed FOMC Committee on the Directive. Governor Sherman Maisel chaired that committee; the other two members were Frank Morris and Eliot Swan, then President of the Federal Reserve Bank of San Francisco. So, I met Frank shortly after I joined the Board staff and in the context of a careful review of the role of the monetary aggregates.

A few years later, in 1973, I was considering leaving the Board and Frank invited me to join the Boston Fed staff for a year, which I did. Toward the end of that year, I accepted an offer from Brown University; however, I commuted from Providence to the Boston Fed about once a week to serve as a consultant until I went on sabbatical in 1980. I recount these facts to emphasize that over the course of the 1970s Frank and I had numerous conversations about the role of the aggregates in monetary policy.

Frank had an abiding interest in this subject. Not only did he serve on the 1969–70 Committee on the Directive, but the Boston Fed also organized three important conferences on the role of monetary aggregates in monetary policy. The Bank's monetary conference topic in June

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1969 was *Controlling Monetary Aggregates*; the conference topic in September 1972 was *Controlling Monetary Aggregates II: The Implementation*; and the topic in October 1980 was *Controlling Monetary Aggregates III*.

The organizers of this conference asked me to recount the role of the monetary and financial aggregates in making monetary policy. The basic story is pretty familiar, and I will hit the highlights and not elaborate. Instead, I want to reflect on what we have learned from these events, and on why things turned out as they have. I will proceed by discussing first the debate circa 1970, and then particular elements of that debate. The issues I plan to take up concern the relevance for monetary targeting of the following: 1) money data revisions; 2) money control errors; 3) the lack of clarity over policy objectives; 4) the Phillips curve; and 5) the optimal control framework for analyzing policy.

The Debate circa 1970

Both inside and outside the Fed, views about the importance of money and monetary policy were beginning to change in 1970, but the change had not gone very far. This was the era of digesting the work by Friedman and Schwartz, especially their seminal *Monetary History of the United States* (1963). While some criticized their methodology, others found their evidence and arguments persuasive. Friedman and Schwartz provided evidence linking inflation to money growth, as economic theory suggested. Moreover, they showed that the monetary collapse in the early 1930s was not only catastrophic but also preventable. While variations in bank borrowing and other things may weaken the link between Fed actions and money growth in the short run, in the long run money growth was clearly something that the central bank could significantly influence, if not control.

To gain a deeper perspective on the state of the debate within the FOMC in 1970, I have spent quite a few hours reading the FOMC minutes—then called the "Memorandum of Discussion"—for that year. (The "Memorandum" is the detailed record, attributing positions to individuals, and released with a five-year lag.) I chose 1970 as a key year because the FOMC adopted a monetary aggregates directive that year based on the work of the Directive Committee.

I think the Directive Committee members (Maisel, Morris, and Swan) and the staff of that committee were driven by two observations that had become widely, although not universally, accepted. First, money growth had often or even typically been procyclical. Fed policymakers had not increased interest rates rapidly enough when the economy was booming to prevent money growth from rising, aggravating the boom. Likewise, policymakers had failed to reduce interest rates quickly enough during recessions to prevent money growth from falling, which exacerbated the recessions. The facts seemed clear, but there was no consensus about how

much the behavior of money growth mattered. Second, the simple monetary model produced at the St. Louis Fed suggested that money growth had substantial predictive content for nominal GNP.[1]

Milton Friedman's dictum that *inflation is always and everywhere a monetary phenomenon* was by no means generally accepted. However, many economists were beginning to believe that Fed policy had at least contributed to the 1967–69 inflation. The Directive Committee, along with everyone else, wanted a lower rate of inflation. The Committee was aware of the possibility that the highly restrictive monetary policy in 1969, whether measured by interest rates or money growth, could lead to a recession. Should the economy weaken, the Directive Committee did not want money growth to weaken as it had so often in similar circumstances in the past.

The FOMC did change the Directive in its meeting of January 15, 1970, by adopting an explicit money growth objective, indicated by added italics in the passage below.

> To implement this policy, while taking account of the forthcoming Treasury refunding, possible bank regulatory changes *and the Committee's desire to see a modest growth in money and bank credit*, System open market operations until the next meeting of the Committee shall be conducted with a view to maintaining firm conditions in the money market; provided, however, that operations shall be modified if money and bank credit appear to be deviating significantly from current projections.

This FOMC meeting, by the way, was Chairman Martin's last; I have no personal knowledge of the inside story of the extent of his involvement in the change in the Directive.[2]

Despite the new Directive, the FOMC continued to instruct the Open Market Account Manager to hold the federal funds rate in a narrow range. As others noted years ago, the FOMC changed the form of the Directive without changing the substance of the way policy was implemented. I do not believe that there is any convincing evidence that the behavior of money growth or interest rates changed as a consequence of the change in wording of the Directive. Why, given the concern over inflation and recognition that monetary policy had often been procyclical, was the Directive Committee unsuccessful in its effort to change the substance of policy?

The answers to this question can be derived from reading the "Memorandum of Discussion" for 1970 through today's eyes. Many of

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[1] The seminal paper was one by Leonall Andersen and Jerry Jordan in the Federal Reserve Bank of St. Louis *Review* (Andersen and Jordan 1968).

[2] Sherman Maisel discusses the event in his book (Maisel 1973, pp. 248–50).

the answers are directly relevant to monetary policy today. I will discuss the issues in order of increasing importance.

Data Revisions

By the spring of 1970, the FOMC had adopted a 5 percent M1 growth objective. By midsummer, it appeared that money growth was below target. Given that the FOMC recognized that a recession was under way, it appeared that once again the Fed was permitting money growth to sag as the economy weakened. But by early fall, revisions in the M1 data had brought the reported growth rate up to 5 percent.

Those opposed to aggregates targeting seized on the data revision to reinforce their opposition. I thought then and still think that the data revision problem is less serious than many make it out to be. The problem arose in 1970, at the outset of monetary targeting, largely because the FOMC expressed the money target in terms of a growth rate over a relatively short interval, such as a quarter. Month by month, small dollar misses translate into large misses in percentage terms expressed at an annual rate. The FOMC could have expressed its money target in terms of a growth path from a base period, and target misses and data revisions in terms of percentage deviations, or dollar deviations, from the target path. I suspect that the members of the Directive Committee simply failed to understand the perception problem that would be created by data revisions and control errors when the money target was expressed in terms of short-run growth at an annual percentage rate.

Still, data revisions do complicate the task of relying on a monetary aggregate. Revisions create a perception problem because the FOMC appears unable to control its own stated policy instrument. Moreover, data revisions complicate the relationship between the Manager of the Open Market Account and the FOMC. The Manager wants to implement the policy determined by the FOMC, not to make the policy. What should the Manager do when, as was the case in the summer of 1970, evidence arises that the money stock may be mis-measured? Should the Manager continue to seek to achieve the target expressed in the official data, or make allowance for the possibility of data revisions? Should the FOMC give a clear instruction to the Manager in this regard, getting itself tangled up in technical discussions of where measurement errors may be arising and how large they might be? My view is that the FOMC should give a general instruction to the Manager and then from time to time evaluate how well the Manager is doing given the uncertainties he faces. The FOMC should not, in this or any other matter, try to second-guess the Manager's detailed decisions.

Control Errors

Opponents of monetary targeting argued that the central bank could not control the stock of money. There were a number of issues here, but one of the most important was the endogenous response of reserves to policy actions. Critics argued that the effect of open market operations on the money stock would be largely offset by changes in bank borrowing. For example, if the Fed reduced the supply of reserves through open market sales, banks needing to meet their reserve requirement would be forced to borrow from the Fed, but only after interest rates had risen sufficiently to induce banks to overcome their reluctance to borrow. The initial decline in reserves would be offset by a rise in bank borrowing.

The Fed could have taken a number of steps to enhance money stock control. The only one ever implemented was contemporaneous reserve accounting, and even this step came after the FOMC had de-emphasized aggregates targeting. The real problem, of course, was that few Fed officials had the stomach to permit much larger short-run fluctuations in the federal funds rate. I think the judgment of history on this issue is pretty clear: The Fed can control money growth with acceptable accuracy over horizons that matter through a federal funds rate control procedure. What matters is the FOMC's willingness to adjust the funds rate substantially over a period of several months—not its willingness to let the rate fluctuate day by day.

Willingness to let rates adjust is critical, whatever may be the role of the monetary aggregates. I think it fair to say that the debates over the monetary aggregates sharpened and clarified this issue, and they did contribute to the Fed's understanding of the importance of moving rates earlier and by larger amounts than previously thought desirable.

Policy Objectives

The monetarist case thirty years ago for maintaining low and steady money growth rested on the view that low inflation was an extremely important policy objective for society and that only the central bank could achieve this objective. Although this view was widely disputed thirty years ago, today no serious economist doubts that controlling the growth of any of the major monetary aggregates will prevent the inflation rate from becoming indefinitely large or small. Views differ on the side effects of steady money growth and on how elastic the relationship between money and prices is, but everyone agrees that the relationship is not indefinitely elastic.

An important problem in 1970 was the multiplicity of objectives. Unfortunately, the Directive Committee was no help here, as is well illustrated by the following passage from the Committee's report.

> The directive enables the FOMC to formulate its basic goals. Goals are primarily concerned with desirable future movements of aggregate spending in relationship to potential output, but they also encompass the impact of money and aggregate demand on employment and prices, and they may deal with sectoral results as on international reserves, income distribution, housing, State and local government, and other spheres greatly influenced by changes in money and credit.[3]

I do not think it too harsh from today's perspective to say that the 1970 FOMC's collective view on policy objectives was incoherent. Over the course of the year, there were vigorous expressions of concern over all the goals mentioned by the Directive Committee. In 1970, the FOMC simply refused to choose coherently among these objectives. Monetary policy could not possibly achieve all of them. Over the course of the year, the FOMC never had an organized discussion as to how to trade off among the various objectives. Indeed, quite a few members stated explicitly that they did not believe that the Fed *could* reduce inflation at an acceptable cost and that the government would have to adopt incomes policies to suppress inflation directly.

Monetary policy in 1970, if continued for several years, would in fact have been consistent with a gradual and permanent decline in the rate of inflation. If the Fed had stabilized M1 growth at a 5 percent annual rate, nominal GNP growth in that era would probably have settled at about 6 percent and inflation in the 2 to 3 percent range. These estimates are consistent with those discussed at that time. The problem was that the FOMC failed to commit itself to a long-run policy and hoped instead that its dilemma would be resolved by the Administration adopting incomes policies. Perhaps I am reading too much into the 1970 "Memorandum of Discussion" from my knowledge of later events, but I do think that the views expressed in the FOMC in 1970 are consistent with what actually happened between 1971 and 1973.

Some monetarists believed that the Fed could be maneuvered to accept lower inflation as an important goal by getting the Fed to commit to a money growth target. I was a member of this group in the 1970s. A test of this proposition began in March 1975 when House Concurrent Resolution 133 directed the Chairman of the Federal Reserve to appear quarterly before congressional banking committees to testify concerning money growth goals for the upcoming year. Those supporting this approach expected that the requirement that the Fed publicly announce its money growth target would constrain actual money growth and thereby hold inflation in check. For reasons amply discussed elsewhere,

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[3] Report of the Committee on the Directive (March 2, 1970), p. 3. This report has not been published but is publicly available at the Board of Governors.

this approach did not work and monetary stimulus contributed to the rise in inflation once again in the late 1970s.

Despite the congressional mandates of House Concurrent Resolution 133 and the Humphrey-Hawkins legislation of 1978,[4] it is arguable that monetary aggregates did not play an important role in the conduct of monetary policy until the Fed modified its operating procedure in October 1979. Even then, a debate arose as to whether the new procedures reflected a genuine commitment to monetary aggregates or were more a cover for a determined Fed attack on inflation. Whatever one's views on this debate, what seems clear to me is that under Paul Volcker's leadership the Fed's attitude toward inflation really did change, as did the attitude in the country as a whole. In the absence of a conviction that inflation was indeed costly and had to be reduced, the operating procedure would not have mattered. What is not controversial, however, is that by 1983 everyone agreed that restrictive monetary policy had succeeded in bringing inflation under control. Some argued that the cost, in the form of the 1981–82 recession, was excessive but no one any longer argued that monetary policy was incapable of reducing inflation.

An important lesson from this experience is that there is no substitute for an explicit central bank commitment to low and stable inflation. Although a firm commitment to a money growth path would in principle amount to much the same thing, no effective way has been found to enforce such a commitment. Genuine professional differences exist about the best definition of "money"; moreover, regulations of various sorts affect the growth of particular liabilities issued by financial institutions, distorting the economic significance of the money growth rate measured by a particular statistical definition. These two facts taken together mean that a central bank that does not want to be bound by a money growth target cannot in fact be bound.

To a considerable extent, then, the argument over the monetary aggregates thirty years ago was really an argument over the importance of the goal of low inflation and the responsibility of the central bank for the realized rate of inflation on the average over a period of several years. The debate arose from the fact that in that era many—perhaps most—economists believed that inflation was substantially independent of money growth and that central banks could not control inflation. *Cost-push inflation* was the result of rising labor and material costs. *Demand-pull inflation* was a consequence of excess aggregate demand.[5] Money growth,

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[4] Formally, the *Full-Employment and Balanced Growth Act of 1978*.

[5] Many thought that cost-push inflation was not controllable. For example, in his sixth edition Samuelson (1964, p. 345) suggested that "if both demand-pull and cost-push elements are present, monetary and fiscal policy aimed at creating a zero inflationary gap may not end price creep: to end it, varying amounts of unemployment may be needed, depending upon how unlucky a nation is in its Phillips curve . . ."

many argued, played at best a limited role in creating, or controlling, excess aggregate demand. Fiscal policy was king.

Progress over the last thirty years has been enormous. A combination of developments in macroeconomic theory, formal evidence, and experience has convinced nearly all economists and policymakers that the central bank can and should control the rate of inflation. Central bankers today accept the goal of low inflation and believe that it is their responsibility to achieve the goal. Whereas central bankers thirty years ago typically fuzzed up inflation issues and the role of the central bank in the inflation process, most central bankers today are quite outspoken in advocating low inflation and in accepting central bank responsibility for achieving that goal.

Debates today about the role of the monetary aggregates are less about the inflation goal than about the technical procedures for achieving the agreed-upon goal. Those technical debates are not unimportant, but clearly secondary to the issue of the inflation goal itself.

The Phillips Curve

The Phillips curve was front and center in the 1970 FOMC debates. As far as I can tell, every member of the 1970 FOMC, except for Darryl Francis of St. Louis and possibly New York Fed President Alfred Hayes, believed that there was a Phillips curve trade-off. Different members had different views as to what the trade-off looked like, but as the economy weakened in the recession of 1970, pressure grew to reduce unemployment by accepting less progress on inflation if necessary.

As evidence accumulated on the Phillips curve after 1970, policymakers gradually abandoned the view that monetary policy could buy a lower unemployment rate in the long run by accepting higher inflation. The Phillips curve debate is far from over, however. The extent to which there is a short-run trade-off relevant for monetary policy is a live and unsettled issue. Quite frankly, reading the 1970 "Memorandum of Discussion" is enough to make any policymaker today squirm, for the FOMC may again face the difficult circumstances of rising unemployment and persistent, or even rising, inflation.

I do not think the 1970 FOMC ever made a conscious decision to pick a particular point on an estimated Phillips curve, but the views of individual members led to policy outcomes reflecting some sort of average view within the FOMC on this issue. As with the more general debate over policy objectives, the debate over monetary aggregates was wrapped up in the debate over whether the long-run Phillips curve was vertical.

The Optimal Control Framework

Thirty years ago, monetarists often talked of the importance of maintaining a long policy horizon and of holding money growth steady for a period of years. The prevailing policy paradigm, however, was that of optimal control, the framework I employed in my 1970 *QJE* paper (Poole 1970). I mention that paper because I think it had some influence in the debates within the Directive Committee and perhaps within the FOMC.[6] A strength of the paper was that it made the debate over the choice between controlling money growth and interest rates less ideological and more dependent on parameters that could in principle be measured.

The optimal control approach, however, suffers from a severe defect that is painfully evident in reading the 1970 "Memorandum of Discussion." The defect was that, at any given time, policy was determined without regard to what policy might be in the future.[7] The FOMC was vaguely uneasy with this approach, as evidenced by frequent references to "market psychology" and concern that FOMC actions and statements on money growth and interest rates might lead to expectations that would be counterproductive. With the exception of Darryl Francis, who talked about the desirability of a strategy of maintaining steady money growth for several years, the FOMC discussed policy meeting to meeting, with no discussion as to how today's policy actions might fit into a longer-run strategy.

Although Francis talked about steady money growth, he did not articulate why a strategy was necessary for a successful outcome. In 1970 the FOMC did not have a clear conception that long-term interest rates, for example, *had* to reflect market expectations about future inflation and, therefore, about future monetary policy.

Part of the resistance to a monetary aggregates policy in and around 1970 arose precisely because advocates of such a policy eschewed the optimal control outlook. Central bankers just did not accept the view that it was impossible, politically or practically, to beat a policy of constant money growth. The optimal control framework provided not only an intellectual foundation for policy performance superior to constant money growth but also the promise of being able to *calculate* the optimal policy from an econometric model. Such calculation was certainly the thrust of an enormous research effort at the Board of Governors in those days.

The rational expectations revolution of the early 1970s forever

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[6] In 1969 I completed a less technical version of the *QJE* paper for the Directive Committee. The Board published this and the other staff papers in 1971. See Poole (1971).

[7] Jordan (1986) argues that one of the unfortunate side effects of the St. Louis Equation was the perception that monetary policy could be used to fine-tune nominal spending.

changed the way economists think about monetary policy. This view provides the intellectual foundation for a policy of steady money growth or for some policy feedback rule defined over a period of years. It is simply not possible to close a rational-expectations macro model without considering future monetary policy; today's behavior in the markets depends on expectations about the future. Model builders realized that all that was formally necessary to close a rational expectations model was some clear policy prescription, but no one demonstrated much confidence that a reactive money growth rule could be designed that would in fact outperform steady money growth. An interest-rate rule seemed impossible because there was no obvious way to determine the price level without a monetary anchor to the system.

Over the course of the 1970s, more and more economists embraced the rational expectations paradigm. The transition to rational expectations models increased the attractiveness of defining policy in terms of money growth, because that seemed to be the only possible way to close the models. Later, of course, John Taylor (1993) showed clearly how to define a satisfactory interest-rate rule—satisfactory at least in the sense of closing formal models in a way that promised reasonably good economic performance.

The Future Role of the Monetary Aggregates

To whatever extent the Fed practiced monetary aggregate targeting in the early 1980s, the experience was short-lived. Problems discussed in the 1970s remained and perhaps became even more visible. After 1980, the trend rate of growth of M1 velocity fell significantly; financial innovations and deregulation seemed to upset the statistical definition of money; the demand for borrowed reserves declined dramatically, upsetting the Desk's targeting procedures. The Fed reverted to a policy of directly targeting the federal funds rate.

Current FOMC policy is based on close control over the federal funds rate and timely adjustments in the funds rate target. If the FOMC continues to be as successful in maintaining reasonably low and reasonably steady inflation as it has been over the past ten years, then I predict that monetary aggregates will continue to play a minor role in most FOMC deliberations. After all, if the inflation rate does not vary, then money growth cannot possibly be useful in explaining the nonexistent variations![8] However, I also believe that if the United States does experience significant variability in the rate of inflation in coming years,

[8] This sentence is true by definition in a simple regression context. Obviously, money growth might still be useful in a fully articulated model. However, my guess (conviction, really!) is that money growth will not play an important role in the absence of a significant

we will look back, sadly, and see that variability in money growth would have provided forewarning, if only we had been paying attention. I continue to believe that the FOMC ignores money growth at its peril.

Concluding Comments

What have we learned from the debates about the aggregates over the past thirty years? These were, of course, debates about macroeconomics more generally and not just about monetary aggregates. Still, many of the debates did revolve around the aggregates and so I think it reasonable to emphasize five lessons.

First and foremost, everyone now agrees that inflation is controllable by central bank actions. Experience in the United States and elsewhere around the world has ended this debate.

Second, most agree that the primary goal of the central bank must be to control inflation.[9] The reason is not that full employment is unimportant for society, but that the central bank does not have policy tools that enable it to reliably increase the level of employment in the long run.

Third, in the academic literature, almost every writer now thinks of monetary policy in the context of a strategy. I also think that a strategic outlook now pervades FOMC discussions; policy actions are not viewed just FOMC meeting by FOMC meeting.

Fourth, achieving low and steady inflation may improve the economy's average rate of growth and level of employment, and it almost certainly increases the economy's stability. Central bank acceptance of the goal of low and steady inflation is an important consequence of accepting the view that the Phillips curve is vertical in the long run. We know that monetary policy affects the real economy in the short run, but that long-run performance cannot be improved by accepting moderate (above 5 percent, say) inflation. I think there is some evidence that the Phillips curve is actually positively sloped—that is, that the real economy grows at a higher rate when the rate of inflation is low and stable. Although the case for positive effects of low inflation on average economic performance is not entirely established in the literature, I think the evidence is strong that the economy is more stable when the inflation rate is low and stable.

Fifth, central banks now recognize that raising the target interest rate does not necessarily ensure that policy is restrictive; the market-clearing

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simple correlation because no one will have that much confidence in any particular fully articulated econometric model.

[9] I believe that the central bank can also improve the stability of the financial system, the real economy, and possibly the inflation rate by responding appropriately to shocks. The subjects of how to determine the "appropriate" responses and of how to ensure that short-run responses to shocks do not damage the primary goal are beyond the scope of this paper.

interest rate might be rising even faster. Similarly, a lower target rate does not ensure that policy is expansionary. The debates over monetary aggregates surely contributed enormously to clarifying this issue.

The lasting legacy of the monetary aggregates is that the macroeconomics debates swirling around the aggregates for the past thirty years and more have been largely resolved. I have pointed to five critical lessons from these debates, and these are far more important than the narrow issue of short-run monetary targeting. Obviously, much room remains for further development of macroeconomics and central-banking practice. But I also believe that it is terribly important that we do not forget the lessons already learned.

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