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ABSTRACT

The experience of U.S. monetary policy during 1979-82 provided useful and potentially important new evidence about how monetary policy affects economic activity. This paper considers, in the light of that evidence, six familiar propositions supporting the use of monetary aggregate targets for monetary policy. These propositions deal with money and nominal income, with price inflation and real economic growth, and with long-term interest rates. The evidence from the 1979-82 experiment leads to doubt rather than confidence in each of these six propositions, and hence doubt rather than confidence in the use of monetary aggregate targets.

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Macroeconomics is not a laboratory science. Economists must learn about macroeconomic behavior from the events that occur in the real world, rather than from controlled experiments which they can design and implement themselves. Especially when they represent potentially substantial breaks from prior experience — in other words, when they greatly increase the range and variance of the available data — such real-world "experiments" can provide important information about how economies, and the households and firms that comprise them, behave. The quadrupling of oil prices in the early 1970s was one example, and economists have been quick to learn from it. The experience of U.S. monetary policy at the outset of the 1980s has now provided another such opportunity.

The latest monetary policy experiment in the United States lasted almost precisely three years. On October 6, 1979, the Federal Reserve System announced a new policy orientation in which it would henceforth place renewed emphasis on growth targets for the major monetary aggregates, and also implement new operating procedures to help achieve those targets. The principal motivation for these changes was an economic situation marked by rising price inflation, already at or near record post-war levels, and a deteriorating international value of the dollar. On October 9, 1982, the Federal Reserve chairman announced a "temporary" abandonment of the stated growth target for the narrow M1 money stock, up to then by far the most important monetary aggregate for policy purposes. The economic situation motivating this reversal was a deepening business recession, with unemployment at record levels, despite money growth in excess of targeted ranges.

The object of this paper is to survey the lessons to be drawn from this three-year monetary policy experiment. The focus is on lessons associated with the overall use of monetary aggregate targets, rather than the specific operating procedures used to achieve them. The plan of the paper is to consider a series of familiar propositions often (but certainly not universally) associated with the use of monetary aggregate targets for monetary policy, in light of various forms of evidence from these three years ranging as seems appropriate (given space limitations) from simple inspection of data series to more elaborate statistical procedures. To anticipate, the evidence from the 1979-82 experiment leads to doubt, rather than confidence, in each of these propositions.

I. Money and Nominal Income

To begin, targeting monetary aggregates requires deciding what monetary aggregates to target. In the short run — say, a year or so — shifts in the portfolio preferences of the nonbank public may change the relationships defining mutually consistent growth rates for different deposit-type aggregates. Over longer time horizons, however, like those relevant for "gradualist" proposals to slow money growth by, say, 1% per annum until price inflation is eliminated, it would be convenient for policy purposes to believe

Proposition #1: The major monetary aggregates move roughly together over substantial spans of time, so that the central bank can simply pick one aggregate and target it appropriately without having to worry about mixed signals.

Table 1 shows the annual growth rates (fourth quarter over previous fourth quarter, as the Federal Reserve formulates its targets) for the three major monetary aggregates during 1978-1982. Even over a half-decade, the basic directions indicated respectively by M1, M2 and M3 disagreed. Given the inherited history of 1978, the Federal Reserve under the new policy did approximately achieve a 1% per annum slowing in M1 growth over 1979, 1980 and 1981. By contrast, M2 growth became consistently faster during these years, while M3 growth fluctuated without

TABLE 1

Growth of Money and Nominal Income, 1978-1982

	M1	M2	M3	Nominal Income
1978	8.1%	8.0%	11.2%	14.7%
1979	7.4	8.1	9.6	9.7
1980	7.2	9.0	9.7	9.3
1981	5.1	9.4	11.7	10.8
1982	8.5	9.3	10.1	2.6

discernable trend. Even in 1982, the year in which the experiment ended, the widely discussed easing of monetary policy is apparent in a quickening of M1 growth but not M2 growth, while M3 growth slowed sharply.

The point here is not to determine whether these dissimilar growth rates are explainable in terms of accepted portfolio-theoretic behavior in conjunction with the financial innovations and regulatory changes affecting the U.S. banking system during these years. It is instead that, even over a five-year period, the answer to so basic a question as whether money growth is speeding up or slowing down depends on which among the major monetary aggregates is doing the answering. The implication for monetary policy is that "monetary aggregates" — that is, the major aggregates collectively — are of limited usefulness as a central focus for policy. To use monetary aggregates in this way, the central bank must have a clear view of which specific aggregates it is using, and why.

At a more basic level, placing monetary aggregates at the center of the monetary policy process depends not just on their relationships among themselves but on their connection to nonfinancial economic activity. An important line of thinking has argued that it is appropriate to think about this connection, at least at the outset, in terms of a relationship between money and nominal income. Once again, for most policy purposes it is not important — or, given feasible monetary control, even very relevant — to have a tight relationship over short time periods. Nevertheless, for time horizons like those involved in the recent experiment, it is difficult to motivate the use of monetary aggregate targets for monetary policy without claiming

Proposition #2: The movement of at least some monetary aggregate roughly explains the movement of nominal income over substantial time spans.

Table 1 also shows the annual growth (again, fourth quarter over previous fourth quarter) of nominal gross national product. Even after making allowance for plausible time lags, it is difficult to examine the data in Table 1 as a whole and conclude that the movement of any one monetary aggregate has even roughly accounted for the movement of nominal income over these years. The best candidate for explaining the 5% fall in income growth in 1979 is M2 growth, which declined from 11.2% in 1977 (not shown) to 8.0% in 1978.[1] By contrast, M1 growth is the only one of the three to have declined in 1981, and even that decline is small in comparison with the more than 8% fall in income growth in 1982.

In sum, the movement of nominal income during these years has been difficult to reconcile with the respective movements in the major monetary aggregates, at least without going well beyond the usual arguments for monetary aggregate targets based on the presumption of a stable (and, usually, a relatively interest insensitive) money-income relationship.

II. Price Inflation and Real Economic Growth

Presumably policy makers care not just about nominal income growth but also about price inflation and real growth separately. One of the most interesting developments in macroeconomics within the past decade has been a line of reasoning implying that, because of effects due to expectations, the use of pre-announced monetary aggregate targets may favorably affect the respective impacts of monetary policy on inflation and real economic activity. In the context of a disinflation through monetary policy like that begun in the United States in 1979, the idea is that a slowing of monetary growth that is widely publicized in advance, as in October 1979 and thereafter, would affect the expectations on which households and firms act, and thereby cause a given slowing of nominal income growth to consist of more rapid slowing of inflation, and less slowing of real activity, than would otherwise be the case.

If valid, this role of monetary aggregate targets would be valuable indeed.

Just as the idea of the stable Phillips curve held out the prospect of solving the chief macroeconomic policy problem of the 1950s and 1960s, unemployment, without the cost of accelerating inflation, the "new classical macroeconomics" has more recently offered the prospect of solving the chief macroeconomic problem of the 1970s, inflation, without the conventionally associated costs of foregone output, employment and income.

This view of the potential contribution of pre-announced monetary aggregate targets involves several elements on which the 1979-82 experiment in U.S. monetary policy can shed light. One, following familiar criticisms of the standard Phillips curve literature, is

Proposition #3: A pre-announced slowing of money growth will lead to a more rapid slowing of price inflation than would be consistent with prior historical correlations.

The actual path of U.S. price inflation since October 1979, in comparison to forecasts from equations based on prior data, shows just the opposite. The small "structural" macroeconometric model estimated using quarterly 1961:1-1979:3 data in Clarida and Friedman (1983) includes a simple linear function relating price inflation to lagged values of real growth, changes in the terms of trade, and inflation itself.[2] Although the relevant F-test for the null hypothesis of stable coefficients provides marginally significant evidence of a break with the onset of the new monetary policy regime in 1979:4, the equation's dynamic forecast for 1979:4-1983:2 indicates that this break has been in the opposite direction to that implied by the new classical macroeconomics. The equation underpredicts inflation in fourteen of the fifteen forecast quarters, with an overall average predicted inflation rate of only 5.0% per annum versus the actual 7.0%. The slowing of price inflation since October 1979 has been not more rapid but more sluggish than would have been consistent with the correlations exhibited by prior experience, given the subsequent two business recessions and the sharp appreciation of the exchange rate. In other words, what has been surprising about inflation during this period was how sluggishly, not how rapidly, it slowed. Similar price equations — see, for example, Perry (1983) — show similar results.

Moreover, this result is not simply due to an arbitrarily specified set of "structural" restrictions on the data. The vector autoregression model estimated using data through 1979:3 in Clarida and Friedman (1984) includes the inflation rate, the respective growth rates of real income, money (M1) and total credit, and the changes in the Treasury bill rate and the federal deficit. The dynamic forecast generated by this completely non-structural way of summarizing the correlations in the pre-1979:4 data overpredicts inflation (8.4% per annum) on average during 1979:4-1983:2, but the forecasting exercise which most closely corresponds to the proposition relating the slowing of inflation to the use of pre-announced monetary targets does the opposite. In particular, using a technique due to Doan et al. (1983) to forecast inflation during each quarter of 1979:4-1983:2 on the basis of the historical correlations as summarized by the model as well as the actual values of money growth in all quarters of this period raises the mean forecast by an absurd amount (to 24%) in comparison to either the actual experience or the unconditional forecast.[3]

The other side of the coin of favoring the use of pre-announced monetary aggregate targets because the associated expectations effects may make disinflation more rapid is that they may make it less costly. Conventional estimates, like those summarized by Okun (1978), have indicated that the cost of each one percentage point reduction in the ongoing rate of price inflation achieved via monetary policy is between two and six "point-years" of unemployment, with a median estimate of three point-years (or, equivalently, 6-18% of a year's total output, with a median of 9%). Such pessimistic estimates have often discouraged advocates of disinflationary monetary policy. By constrast, the same reasoning associating a pre-announced slowing of money growth with unexpectedly rapid disinflation suggests

Proposition #4: A pre-announced slowing of money growth will cause a given slowing of price inflation to be accompanied by less foregone output, employment and income than would be consistent with prior historical correlations.

Table 2 shows the annual rates of change of real gross national product and the associated price deflator, and the annual average unemployment rate during 1978-83. The final column of the table also shows, for 1980-83, the cumulative excess of the unemployment rate above 6% (the approximate average for the two prior years). The slowing of inflation from nearly 10% in 1980-81 to 5% in 1982 has, just during 1980-83, required some 10 point-years of excess unemployment — about at the 2-to-1 lower end of the range surveyed by Okun. Stopping the accounts at 1983 makes no sense, however. Even the optimistic view that the U.S. economy will return to full employment fairly quickly, with no reversal at all in the disinflation already achieved, puts the likely final tally closer to Okun's 3-to-1 median. If the current economic recovery falters, or if inflation speeds up, the final tally could easily be nearer the 6-to-1 upper end.

Whether this ratio ultimately turns out to be somewhat above or somewhat below Okun's median is beside the point. What matters is that the real costs of disinflation achieved by monetary policy have been about in line with earlier conventional estimates, notwithstanding the use of monetary aggregate targets.

III. Monetary Policy and Long-Term Interest Rates

Price inflation and real growth are not the only dimensions of economic activity for which the impact of monetary policy depends importantly on expectations. Perhaps the most familiar aspect of this subject is the behavior

TABLE 2

Inflation, Growth and Unemployment, 1978-1983

	Price Inflation	Real Growth	Unemployment Rate	Cumulative Excess Unemployment
1978	7.4%	5.0%	6.1%	—
1979	8.6	2.8	5.8	—
1980	9.3	-0.4	7.1	1.1%
1981	9.4	2.6	7.6	2.7
1982	6.0	-1.9	9.7	6.4
1983	5.0[a]	3.4[a]	9.7[b]	10.1

[a]First three quarters at annual rate.

[b]First eleven months.

of the yields on (prices of) assets which represent explicit future claims, and which therefore explicitly involve expectations about future events. A standard distinction in this context is that between the respective effects of monetary policy on short- and long-term interest rates. While a tightening of monetary policy might well lead to higher short-term rates (unless the new classical macroeconomics arguments discussed above are valid), it need not lead to higher long-term rates if those rates embody expectations of lower price inflation (and hence lower short-term rates) in the future. More specifically,

Proposition #5: A pre-announced slowing of money growth will lead to lower long-term interest rates than would ordinarily be consistent with the prevailing levels of short-term rates, given prior historical correlations.

The actual path of U.S. long-term interest rates since October 1979, in comparison to forecasts from equations based on prior data, shows the opposite. The "structural" model estimated using 1961:1-1979:3 data in Clarida and Friedman (1983) includes a simple linear function relating the bond rate to current and lagged values of the Treasury bill rate, lagged changes in the maturity composition of outstanding federal government debt, and the lagged bond rate.[4] As with the model's price equation, there is significant evidence of a break after 1979:3, but here too the observed shift has been in the opposite direction to that implied by the proposition about the use of monetary aggregate targets. The equation underpredicts the bond rate in every quarter during 1979:4-1983:2, with an overall average predicted rate of only 10.91% versus the actual 14.81%. Given short-term rates, long-term rates have been surprisingly high, not surprisingly low. Other term structure equations — see, for example, Shiller et al. (1983) — show similar results.

Finally, ever since the Federal Reserve began to focus such attention on its monetary aggregate targets, a familiar argument has been that market participants' expectations have rendered it a "prisoner" to its own announcements. The basic reasoning involved has been just the inverse of that examined above, again denying the ability of monetary policy to affect long-term interest rates except by affecting expectations of future price inflation. Any easing of monetary policy involving money growth significantly in excess of the targeted range would lead long-term interest rates to rise rather than fall. In the extreme case, the expectation associated with the abandonment of such targets is

<u>Proposition #6</u>: Abandonment of monetary aggregate targets for monetary policy, especially in conjunction with money growth in excess of previously targeted ranges, will cause long-term interest rates to rise.

The movement of U.S. long-term interest rates that accompanied the end of 1979-82 monetary policy experiment was just the opposite. The Federal Reserve began its move toward a degree of ease not warranted by the money growth targets shortly after midyear 1982, and on October 9 the chairman publicly announced the "temporary" abandonment of the M1 target. The Baa bond yield declined from 16.78% in 1982:2 to 16.25% in 1982:3, as market participants began to infer that policy had changed, and the further decline to 14.39% in 1983:4 constituted the largest one-quarter rally in the post-war experience of the U.S. fixed-income seucirities market. The decline continued further, to 13.25% in 1983:2, as money growth became still faster.

Participants in the U.S. securities markets are apparently more sensible than to hold monetary policy prisoner to a counterproductive policy structure. When the Federal Reserve abandons a policy that is not working, the market records its approval.

Footnotes

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1. Neither M1 growth nor M3 growth showed much slowing in 1978.

2. The equation is

$$\Delta P_t = \underset{(3.4)}{.0895}\ \Delta X_{t-1} + \underset{(3.9)}{.0542}\ \Delta I_{t-1} + \underset{(25.2)}{.8700}\ \Delta P_{t-1}$$

$$SE = .00347 \qquad \overline{R}^2 = .88 \qquad \rho = -.1$$

where P is the GNP deflator, X is real GNP, I is the dollar price of imports, and all variables are in natural logarithms.

3. A crucial question, of course — here and below — is whether households and firms believed that monetary policy would take the course it did 1979-82. Perhaps the best that can be said is that, if the experiment of these years was not an example of the kind of "regime change" to which new classical macroeconomics arguments are supposed to be relevant then it is not clear to what real-world event they ever would be relevant. Sargent and Wallace (1981) have made a potentially important qualification to the usual result as stated above, noting the necessity of a consistent accompanying fiscal policy; but the federal government's budget on a high-employment basis showed only small deficits in 1980 and 1982, and a surplus in 1981.

4. The equation is

$$r_{Lt} = \underset{(1.4)}{.0472} + \underset{(1.1)}{.1441}\ r_{St} \underset{(-0.5)}{-.0579}\ r_{S,t-1} + \underset{(2.3)}{.1376}\ (L-S)_t + \underset{(37.0)}{.9100}\ r_{L,t-1}$$

$$SE = .020 \qquad \overline{R}^2 = .98 \qquad \rho = .4$$

where r_L is the Baa bond rate, r_S is the 3-month Treasury bill rate, L and S are the respective amounts of long- and short-maturity federal government debt outstanding, and all variables are in natural logarithms. The coefficients on current and lagged r_S are highly significant jointly, though not individually.

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