THE BEHAVIOR OF THE MONETARY AGGREGATES:
THE PREDICTABILITY OF THE PAST AND SOME PROGNOSTICATIONS FOR THE FUTURE

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I. A Retrospective Analysis of 1981

Judging by the hand wringing and gnashing of teeth on the part of Federal Reserve officials in the course of recent speeches, 1981 represents a year of historically unprecedented difficulties for monetary management. A representative sampling of the anguish can be culled from the recent sayings of President Solomon of the Federal Reserve Bank of New York:

"The ongoing process of financial innovation seems to have produced a sharp and largely unexpected divergence this year in the performance of the narrow money measures (such as M-1B) and the broader measures (such as M-2 and M-3). In the eleven months through November, M-1B, adjusted for the effects of the introduction of nationalized NOW accounts at the beginning of the year, rose at a 2.8 percent annual rate. The comparable rates for the broader measures M-2 and M-3, however, were 10.1 percent and 11.3 percent, respectively. ...Perhaps just as important, we did not anticipate, and almost certainly could not have anticipated, the extent of these divergencies. In terms of the midpoints of our 1981 targets for M-18 and the broader measures, the divergencies allowed for were far smaller than the divergencies that have actually materialized. ...Thus the very large gap between M-2 and M-18 in 1981 represents an extremely unusual, if not actually unique situation that has complicated the task of setting policy as the year has proceeded."

The basic message of this report to the Shadow Open Market Committee is that we find no substantive basis for these contentions. There was nothing particularly unusual about the differential behavior of the various monetary

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aggregates during 1981 (adjusted for the regulatory change allowing for nationwide NOW accounts; the behavior was certainly not unique; and while the behavior obviously was unexpected by the Federal Reserve System, there is no reason why it should have been unexpected. The current bewilderment within the Federal Reserve System about the events of 1981 is yet another demonstration of the old proverb that "you can lead a horse to water, but you can't make him drink" or even more appropriately "you can't teach an old dog new tricks."

In spite of all the talk about the behavior of the different monetary aggregates in 1981, there has been pitiful little analysis of what actually happened. This problem is easily analyzed within the Brunner-Meltzer non-linear money multiplier framework, and thus the empirical question raised by President Solomon in the quotations above can be addressed using our money multiplier component forecasting models.

First consider the money multipliers for two monetary aggregates (indexed by i) with respect to any of the various reserve or monetary base aggregates (indexed by j). We can express this relationship as:

\[
\ln M_i = \ln m_{ij} + \ln R_j \quad i = 1, I, \quad j = 1, J. \tag{1}
\]

The relative behavior of two monetary aggregates, \(i_1\) and \(i_2\), is completely determined by the behavior of the two money multipliers, since, given an \(R_j\),

\[
\ln M_{i_1} - \ln M_{i_2} = \ln m_{i_1j} - \ln m_{i_2j}. \tag{2}
\]

In addition, the multipliers for the various monetary aggregates can be written as the ratio of a numerator which depends only on the monetary aggregate (i.e. is indexed only by i) and a denominator that depends only on the reserve aggregate selected (i.e. indexed only by j). Thus we can write
and regardless of the reserve aggregate we can rewrite (2) as:

\[ \ln M_{1j} - \ln M_{2j} = \ln \text{Num}_{1j} - \ln \text{Num}_{2j}. \]

(4)

In the case of M1 and M2, the numerators of the respective multipliers are \([1 + k(1 + tc)]\) and \([1 + k(1 + tc) + c_1]\) using the notation of our previous reports to this committee. The convenient part of this analysis is that the result, (4), is invariant to our choice of reserve aggregate on which to base the multiplier.

Our predictions of the relative behavior of M1 and M2 and M1 to M3, based on our multiplier component forecasts over a one month horizon for the 12 months of 1981 are presented in Table 1. The forecasts for January through June are those that are prepared on an ex post basis for the September, 1981 Shadow committee meeting, and reflect the data available as of August, 1981. The forecasts for July through December are new and reflect the data that is available as of January 1982. It is important to note that these forecasts of the component ratios include intervention terms to allow for the extension of NOW accounts nationwide in January, 1981. These intervention terms are those described in our last report to this committee and reflect a simple log linear adjustment for the months of January through April, 1981. The models used

\[ \text{NOW account adjustment is as described in the "Shadow Open Market Committee Policy Statement and Position Papers, September 13-14, 1981," Center for Research in Government Policy and Business, Graduate School of Management, University of Rochester, FPS-81-8, p. 42-46.} \]
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Mean error

Standard deviation of errors
to generate the forecasts are estimated over sample periods ending in December, 1979. It should also be noted that no adjustments have been made to the models or forecasts for the introduction of All Savers Certificates in October, 1981.

The forecast errors in Table 1 fail to indicate that anything unique, or indeed even highly unusual is going on with respect to the relative behavior of the various monetary aggregates in 1981, after allowance is made for the extension of NOW accounts nationwide. The average (one month ahead) forecast error for the M-3, M-1B differential is essentially zero. There is a small positive error on average for the M-2, M-1B differential, but it is this differential that would be most sensitive to the NOW account shift, and the largest positive errors are in the first four months of the year. Since our NOW account adjustment was not designed to be exact, but rather to replicate on average, with a very simple functional form, the type of shift that the Board of Governors found from its sampling information, we feel that it is safe to interpret the data in Table 1 as suggesting that the impact of financial innovation, as contrasted with the impact of changes in the regulatory environment, on the differential behavior of the various monetary aggregates was highly predictable during 1981.

It is one thing to claim that the behavior of the various monetary aggregates during 1981 is explainable with perfect hindsight as in Table 1. It is quite another thing to claim that they should have been foreseen. In this case, we feel that there is substantial evidence for even this stronger claim. Last March, we presented a set of forecasts to the Shadow Open Market Committee meeting that indicated our predictions of the behavior of the M-1B, M-2 and M-3 adjusted unborrowed reserves multipliers for the remainder of 1981, based

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3 For what follows it is interesting to note parenthetically that the models are nearly identical to models estimated through 1978. See ibid. p. 40.
on information available at the end of February, 1981. This included the
data on the monetary aggregates for January, 1981, and the initial results
of the Board of Governors survey data on shifts into NOW accounts from non-
demand deposit sources as reported in Chairman Volcker's testimony of February
25, 1981. These forecasts are a matter of public record. Using those fore-
casts, which incorporate only the NOW account shifts that occurred in January,
1981, and assume no subsequent shifts into NOW's from nondemand deposit sources,
we find an average forecast error of 2.4 percent for the fourth quarter of 1981
in the ratio of M-1B to M-2, and an average forecast error of 2.3 percent for
the fourth quarter of 1981 in the ratio of M-1B to M-3. Such errors are very
small when it is realized that the average forecasting horizon is 10 months!
Furthermore, the 2+ percent error is divided into an underestimate of fourth
quarter M-1B of approximately 1.6 percent and an overestimate of fourth quarter
M-2 and M-3 of .8 and .7 percent respectively. This is just the type of fore-
casting errors that are to be expected given our incomplete information on the
extent of the NOW account shifts. Given that by all estimates the NOW account
shift was completed by the end of April, 1981, there is no reason why anyone
should remain bewildered about the differential behavior of the monetary aggre-
gates after the middle of 1981.

II. Prognostications for 1982

At present, we are somewhat handicapped in making forecasts for 1982.
The Board of Governors has just released (February 5, 1982) revisions to the
monetary aggregates. Many of the revisions (changes in seasonal adjustment
techniques, new call report benchmarks, redefining M-1B as M-1) do not cause us

4Shadow Open Market Committee Policy Statement and Position Papers, op.
cit, pp. 61-64.
and difficulty. The consolidation adjustment for vault cash of thrift institutions in M-1 and the netting of CIPC of thrifts against transactions deposits also should not cause us severe problems, since they have negligible impact on growth rates of M-1. Unfortunately, the compositional changes involving the allocation of retail RP's and money market mutual funds between M-2 and M-3 have a substantial impact on our $r_1$ and $r_2$ component ratios. At the present (March 1, 1982) historical data for the revised series are not available. Thus we have not been able to reestimate our models with the new data, nor can we forecast with the existing models and the revised data.

We have chosen to use the old (1981) data and construct M-1 forecasts for 1982 based on a December, 1981 origin. While our forecasts for $r_1$ and $r_2$ obviously will be in error compared with the new data, the errors should be essentially offsetting and, since only the sum of $r_1$ and $r_2$ is involved in forecasting the various M-1 multipliers. Our M-1 multiplier forecasts should not be affected systematically by the recent revisions. Our current forecasts on the M-1 adjusted unborrowed reserves multiplier are:

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| Dec | 9.9757 | 9.7434| -2.2%