
The Influence of Economic Activity on the Money Stock

This bank has, on previous occasions, presented arguments and evidence with respect to what has been called the "strong" monetarist position – that changes in the money stock are the best indicator of monetary influences on the economy, and that these influences have a significant impact on the course of economic activity over the business cycle. It is further contended that through its control of the monetary base, the Federal Reserve dominates movements in money.

One of the major counter-arguments presented against the strong monetarist position is the so-called "reverse-causation" argument. This states that actions of the public, as they respond to current economic conditions, so influence observed movements in the money stock that measurements of the relation between money and economic activity give no evidence with respect to the direction of causality. Therefore, it has been contended that the close statistical relation observed between money and economic activity, which is one of the major empirical bases supporting the strong monetarist position, is spurious.

The following three articles deal with various aspects of the reverse-causation argument. The first article, "Comments on the 'St. Louis Position'" by Emanuel Melichar, Economist, Board of Governors of the Federal Reserve System, states this argument, and maintains that the evidence presented in support of the strong monetarist position leads to erroneous conclusions. Melichar contends that once the money stock is made statistically free of reverse-causation influences stemming from the behavior of the public, this "neutralized" money stock gives an entirely different and more accurate interpretation of Federal Reserve actions than the actual money stock.

Michael Keran's "Reply" analyzes the statistical and theoretical underpinnings of Melichar's argument. He concludes, on the basis of Melichar's own criteria, that the actual money stock is superior to the neutralized money stock as an unbiased measure of Federal Reserve actions. In addition, because no rationale is given linking the neutralized money stock to the rest of the economy, he states it is not possible to interpret its significance.

The third article, "Additional Empirical Evidence on the Reverse-Causation Argument" by Leonall C. Andersen, investigates some other aspects of the reverse-causation argument. He presents empirical evidence that although the reverse-causation argument cannot be rejected, it is of relatively minor importance in explaining movements in the money stock. Moreover, to the extent that reverse-causation can be measured, it is due to Federal Reserve behavior rather than to behavior of the public. Andersen concludes that the statistical evidence relating changes in GNP to changes in the money stock cannot be viewed as spurious.

These three articles are available as Reprint No. 44.

COMMENTS ON THE "ST. LOUIS POSITION"

by EMANUEL MELICHAR*

OVER THE PAST YEAR or so, the *Review* of the Federal Reserve Bank of St. Louis has provided a forum for exponents of a "monetary view" of economic activity and stabilization. A number of articles, both theoretical and empirical, have discussed indicators of monetary policy, relations between monetary policies and the money stock, and relations among the money stock, Gross National Product, and components of GNP such as residential construction. With an assist from the press, the general nature of the view consistently expressed in these articles has become widely known.¹

The purpose of this note is to suggest that empirical research published in the last few years increasingly discredits a central proposition in the analytical framework set forth and employed in these articles. This research has received scant recognition thus far in the *Review*. In his guest article, in fact, Karl Brunner decried the lack of empirical research by others, specifically Federal Reserve respondents, on the crucial propositions underlying his "monetarist's" position; in countercritique of his and other previous

critical research, various Federal Reserve writers were said to have merely produced:

... an array of specific conjectures advanced without analytical or empirical substantiation. Also, not a single paper of the countercritique developed a relevant assessment of the Monetarist's empirical theories or central propositions.²

To this observer, the research situation seems much different; or perhaps Brunner's net was not large enough. In the same interval other Federal Reserve economists were publishing, after years of effort, substantial and relevant empirical evidence. This evidence, while supporting some contentions of the monetary view, tends to reveal a major defect in the analytical framework of that view, and thereby in procedures and conclusions of empirical analyses using that framework.

The Crucial Issue

Much of the theoretical framework constructed by contributors to the *Review*, and thus their empirical approach as well, depends on the answer that is given to a seemingly simple question: to what extent are observed cyclical fluctuations in the growth of the money stock the result of action by the monetary authority, and to what extent are they the result of cyclical changes in other factors?

* Emanuel Melichar is an Economist in the Division of Research and Statistics, Board of Governors of the Federal Reserve System. Views expressed in the paper are those of the author and do not necessarily concur with those of other members of the research staff or with those of the Board of Governors.

¹ For instance, "Banks and Economics: First National City and Chase Involved Ironically in Economists' Raging Debate," by Albert L. Kraus, *The New York Times*, December 4, 1968, pp. 65 and 67.

² Karl Brunner, "The Role of Money and Monetary Policy," this *Review*, July 1968, p. 11.

Contributors to the *Review* claim that:

. . . System actions through their impact on high-powered money (or monetary base) can have a significant bearing on movements in the money stock.³

. . . the behavior of the monetary authorities dominates movements in the money stock over business cycles.⁴

But their Federal Reserve opponents, according to Brunner:

. . . contend that cyclical fluctuations of monetary growth cannot be attributed to the behavior of the Federal Reserve authorities. . . . the money stock and bank credit are dominated by the public's and the bank's behavior. . . . cyclical fluctuations of monetary growth result primarily from the responses of banks and the public to changing business conditions. . . . the persistent association between money and income could be attributed to a causal influence running from economic activity to money.⁵

Brunner and Andersen claim that empirical studies completely reject these contentions of their opponents:

. . . preliminary investigations yield no support for the contention that the behavior of banks and the public dominates cyclical movements in the money stock. . . . our present state of knowledge rejects the notion that the observed association [between money and income] is essentially due to a causal influence from income on money.⁶

. . . three studies conclude that behavior of the public (except for its behavior regarding currency) is of minor importance in explaining short-run movements in money.⁷

The validity of this empirical answer to our crucial question, reached by the contributors to the *Review*, is vital to the validity of the further empirical work they have published. It can be recognized readily, for instance, that the validity of using the actual money stock or monetary base as an indicator of the direction and degree of monetary policy depends directly on this answer.⁸ Similarly, some models used

in *Review* articles to study relationships between money and other economic variables are appropriate only if this conclusion is valid, that is, if the business cycle does not affect the money stock.

Extensive new work favors an alternative view. Hendershott has published a detailed empirical investigation of our crucial question and its implications.⁹ He concludes that both the monetary authority and the business cycle exerted significant and important influences on the course of the money stock during 1952-64. The same conclusion appears to be reached implicitly by the builders of the Federal Reserve-MIT econometric model.¹⁰ The equations of this model reveal significant effects of monetary policy actions on money and other financial stocks as well as on interest rates, of these stocks and rates on various components of GNP, and also of GNP on money and other financial stocks as well as on interest rates.

From these extensive studies, this observer, at least, concludes that neither extreme view expressed in the preceding quotations from the *Review* can be accepted. Inquiries using models that ignore *either* the influence of the monetary authority *or* the influence of the business cycle make, in effect, a specification error that leads to erroneous conclusions. A *Review* article that erred by ignoring the latter influence is examined next.

Money and Housing

In June 1968, the *Review* published a "tentative analysis" by Norman Bowsher and Lionel Kalish, which found that post accord monetary restraint did not exert the depressing effect on residential construction that most people think it did.¹¹ The analytical

monetary policy itself. However, empirically demand is highly stable, if we exclude the effect of monetary policy . . ." Milton Friedman, "The Role of Monetary Policy," *The American Economic Review*, March 1968, p. 7.

⁹ Patric H. Hendershott, *The Neutralized Money Stock: An Unbiased Measure of Federal Reserve Policy Actions*, Richard D. Irwin, Inc., Homewood, Illinois, 1968. Early results were presented to the Econometric Society in December 1964, while the author was employed by the Board of Governors. A useful summary of Hendershott's work is also found in George Horwich, "The Proper Role of Monetary Policy," *Compendium on Monetary Policy Guidelines and Federal Reserve Structure*, Committee on Banking and Currency, House of Representatives, December 1968, pp. 294-304.

¹⁰ Frank de Leeuw and Edward Gramlich, "The Federal Reserve-MIT Econometric Model," *Federal Reserve Bulletin*, January 1968, pp. 11-40.

¹¹ Norman N. Bowsher and Lionel Kalish, "Does Slower Monetary Expansion Discriminate Against Housing?", this *Review*, June 1968, pp. 5-12.

³ Leonall C. Andersen, "Three Approaches to Money Stock Determination," this *Review*, October 1967, p. 12.

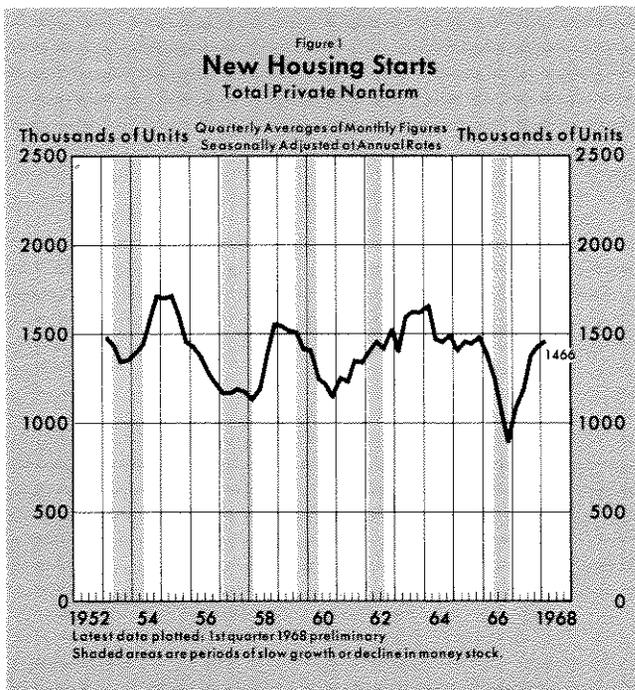
⁴ Brunner, p. 9.

⁵ *Ibid.*, pp. 9, 13, and 20.

⁶ *Ibid.*, pp. 18 and 20.

⁷ Andersen, p. 13.

⁸ For instance, Friedman states, "In principle, 'tightness' or 'ease' depends on the rate of change of the quantity of money supplied compared to the rate of change of the quantity demanded excluding effects on demand from



procedure of the article was to compare cyclical turning points in growth of the money stock with cyclical turning points in housing, based on examination of the chart reproduced here as Figure 1. Using a money stock consisting of demand deposits and currency:

The shaded areas are periods of relatively slow (or negative) money growth. . . . Throughout . . . this article these periods are considered to be ones of monetary restraint.¹²

Examination of Figure 1 reveals that:

. . . relatively slow rates of monetary growth do not cause excessive cutbacks in spending for homes. . . . All marked and sustained declines in housing starts began in periods of monetary expansion. In several cases the decline in starts was reversed after three to six months of monetary restraint, and the number of housing starts actually increased.¹³

The generalized conclusion is:

During the first three to six months of a period of slow monetary expansion, the housing sector has tended to continue its relative decline begun during a previous period of monetary expansion; but then as monetary restraint continued, housing tended to level off or start rising relative to other activities.¹⁴

However, Hendershott shows that because of the business cycle's influence on the money stock, periods of restrictive monetary policy actions do not neces-

¹²*Ibid.*, p. 6.

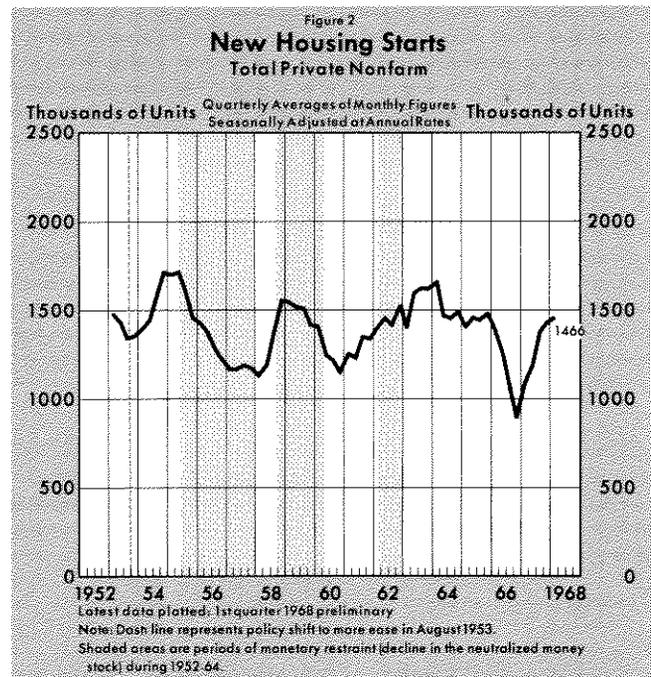
¹³*Ibid.*, pp. 6 and 7.

¹⁴*Ibid.*, p. 6.

sarily coincide with periods of slow or negative monetary growth. When current policy is neutral, the money stock tends to increase if business is expanding and to contract if business is declining.

To develop an unbiased indicator of current policy actions, the influences of the business cycle (including the effects of past monetary policy) were quantified for 1952-1964, and these influences were removed from the actual money stock. Turning points in the resulting series, which Hendershott labels the "neutralized money stock," reflect turning points in current monetary policy. This indicator shows, as periods of policy restraint, those periods in which current actions by the monetary authority were effectively restraining growth of the money stock. Periods of monetary ease are indicated as those in which the monetary authority was effectively promoting growth in money.

An opportunity is thus presented to contrast the Bowsler-Kalish housing results with those of a similar analysis using a more appropriate measure of monetary policy actions — neutralized money — a measure based on the revised framework that allows for influences from real to financial variables as well as from financial to real variables.



The shaded areas in Figure 2 indicate periods of restrictive monetary policy actions during 1953-64, as determined by Hendershott.¹⁵ The simple rela-

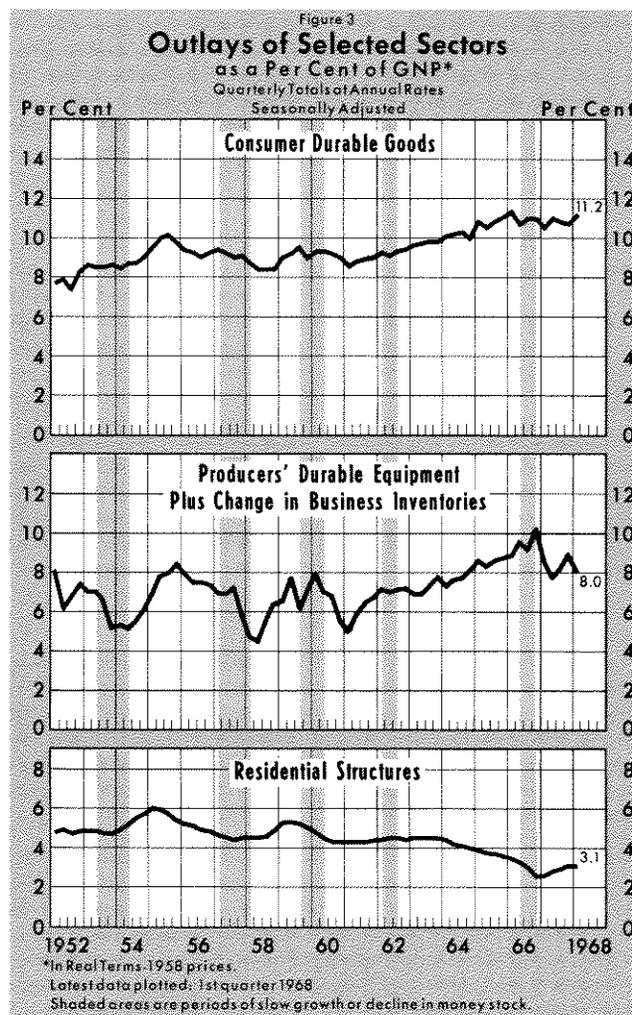
¹⁵Hendershott, pp. 120-123. Turning points in monetary policy actions during 1957-64 are shown as revised by Hen-

tionship between shifts in policy and turning points in housing starts is close and relatively consistent. In the two major housing declines during the period covered, starts fell soon after monetary policy shifted from ease to restraint and did not recover until after effective policy shifted back to ease. Hendershott also identifies a policy shift to "significantly more" ease in August 1953, and this shift also coincides with an upward move in housing starts. Housing activity continued upward during a short period of moderate restraint in 1962, and later fell somewhat in 1964, during monetary ease, probably because some areas were temporarily overbuilt. Another severe housing decline did not begin until 1966, which may be presumed to have been a period of restrictive policy actions, although the neutralized money stock series has not been calculated beyond 1964.

One hesitates to draw conclusions from this simple analytical procedure without further investigation. This housing model, like that of Bowsher and Kalish, provides no place, for instance, for expression of the effects of changes in the demand for housing or in institutional arrangements that govern the flow of funds into housing. But a simple relationship as strong and consistent as that found between turning points in housing starts and in the neutralized money stock during 1953-64, and also consistent with a body of theory, is probably unlikely to be completely upset by expansion of the analysis to include other pertinent variables. Thus, in contrast to Bowsher and Kalish, one might tentatively conclude that monetary restraint exerted such a strong depressing influence on residential construction, and monetary ease such a strong stimulus, that the direction of monetary policy was a principal determinant of the direction of housing activity in the period from 1953 to 1964.

A more general criticism of Bowsher and Kalish is also implied above. When a preliminary examination of simple relationships yields essentially negative results inconsistent with generally accepted theory, it is incumbent upon the analyst to investigate further before announcing a revision of theory. In this case, it was necessary that the authors explain variation in housing satisfactorily with variables other than the rate of money growth before concluding that the rate of money growth had no effect. It is entirely conceivable, for instance, that cyclical changes in the demand for housing could, in the simple model, have masked the effect of money growth on housing.

dershott in "A Quality Theory of Money," presented at the Money and Banking Breakfast of the Midwest Economics Association, Chicago, April 18, 1969.



Bowsher and Kalish are aware of these considerations. Observe their lack of compassion for others who blunder in the economic maze:

The widespread belief that housing has been seriously hurt by monetary restraint probably has resulted from mistakenly identifying rising market interest rates with monetary restraint. Interest rates, unadjusted for price developments and for Government borrowing, and unrelated to changing profit expectations of businesses, are usually a poor guide to either the rate of monetary expansion or its impact on economic activity.¹⁶

Thus are condemned those whose naive analysis founders on the reefs of the procyclical bias in rates of interest. But it is just as easy to come to grief on the shoals of the procyclical bias in the money stock.

Monetary Policy and the Business Cycle

Bowsher and Kalish, in Figure 3, also examine the behavior of expenditures for consumer durables and

¹⁶Bowsher and Kalish, p. 12.

for business equipment and inventories during periods of monetary ease and restraint. They observe that, for these sectors,

... declines or slower rates of increases during periods of slow money growth have been roughly equal to those in [residential construction]. Also, declines in the other two sectors sometimes actually began during the periods of slow monetary expansion. It appears that housing has not been any more adversely affected during periods of relatively slow monetary growth than have these other sectors.¹⁷

This may be about all that one can glean from Figure 3. But contrast these slim pickings with the insights transmitted by Figure 4, in which unbiased periods of policy ease and restraint are delineated.

One can see how monetary policy shifted to restraint after the proportion of outlays on business equipment and inventories had increased, accompanied by a shift of consumer spending into durables or housing, or both. One can almost sense the inflationary strains resulting from these spending shifts after productive resources become relatively fully employed. (Charts of spending totals, employment rates, and prices would help here. One can also ponder whether restraint appears to have been imposed too early in the 1958-59 upswing.) One can see that restraint hits housing first; a turnaround in the proportion of outlays spent on business equipment and inventories and on consumer durables takes more time, and a significant reduction takes even longer. But when the big drop in business spending does come, its speed is alarming, and one can visualize the monetary authorities bailing out of restraint and into ease as the fall is detected — and then waiting quite a while for the turn to come in relative outlays for both business and consumer durables. Is not a significant portion of the cyclical policy story of 1952-64 found in these simple charts?

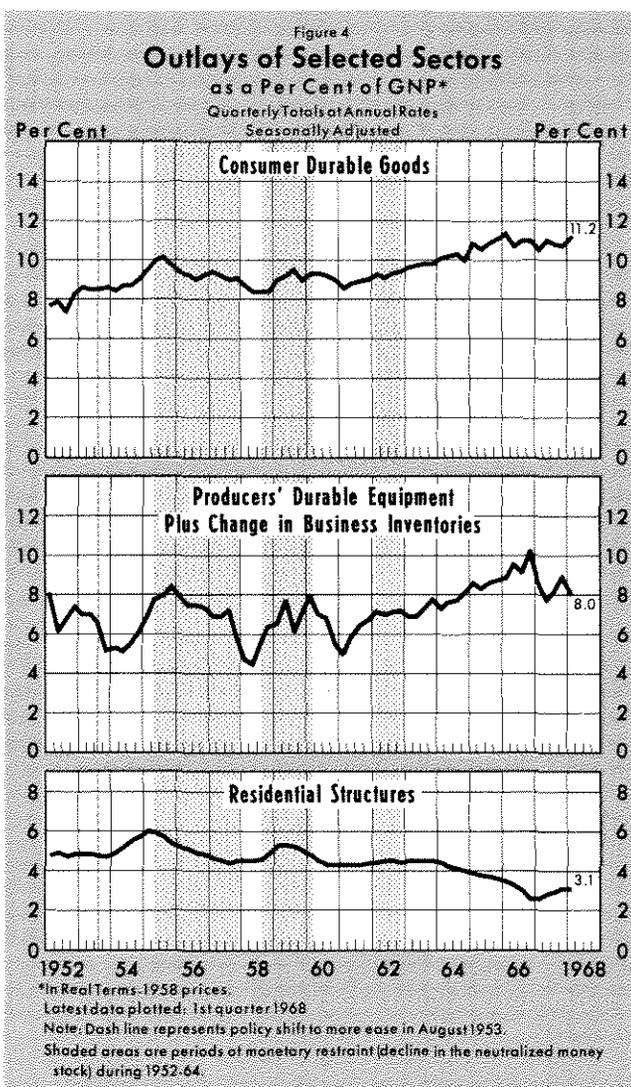
Brunner asks a question of “our monetary policymakers, their advisors and consultants: How do you justify your interpretation of policy, and how do you actually explain the fluctuations of monetary growth?”¹⁸ The neutralized money stock would seem to be a useful pedagogical tool.

Review of the Issues

On the issues frequently raised by contributors to the *Review*, what are the views that seem consistent with results of the recent empirical efforts we have cited?

¹⁷*Ibid.*, p. 9.

¹⁸Brunner, p. 24.



First, we agree with *Review* contributors that the monetary authority can exert and has exerted significant influence over fluctuations in the growth of the money stock. For instance, Hendershott's neutralized money stock exhibits large movements during 1952-64 that resulted mainly from current actions of the monetary authority.¹⁹ Also, simulation of a monetary policy action in the FRB-MIT model yields a quick and strong effect on demand deposits.²⁰

Second, in contrast to the *Review* position, the business cycle is also thought to exert significant influences tending to affect the growth of the money stock. Hendershott found large changes in money attributable to these influences. The FRB-MIT model provides implicit confirmation of such effects. For ex-

¹⁹Hendershott, p. 120. But also see cautionary note on pp. 105 and 106.

²⁰De Leeuw and Cramlich, pp. 15, 16, and 27.

ample, simulations show that changes in fiscal policies affect the volume of demand deposits.²¹

Third, in further empirical work on relationships between money and other economic variables, we prefer to start with models that provide for representation of the effects of real variables on financial variables. These models would tend to attribute some of the simple correlation between money and income to the influence of income on money. This procedure seems to leave more scope for findings that non-monetary variables also influence income, as well as for findings of longer lags in the effect of money on income, than is possible in the simpler models used by contributors to the *Review*.

In some investigations of the effects of monetary policy actions, it might be possible to retain simplicity in the models used by employing an unbiased measure of such actions, as was attempted in the housing analysis reported herein. The money stock is not appropriate for such use, as judged by Hendershott's evidence from 1952-64.

Fourth, we agree with the *Review* position that changes in monetary policy exert a significant impact

²¹*Ibid.*, pp. 27-29.

on GNP. With the FRB-MIT model, simulations of changes in monetary policies showed significant eventual effects on GNP.²²

Fifth, in looking for an indicator of the direction of monetary policy, the money stock and the monetary base are viewed with reservations similar to those that contributors to the *Review* express about interest rates. Further work on updating and refinement of an unbiased measure is needed.

Sixth, we note Hendershott's conclusion that the monetary authority was effectively able to translate a desire for monetary ease or restraint into an actual condition of ease or restraint, with discrepancies few in number and short in duration during 1952-64.²³ Brunner's notion that the monetary authority was unable or incompetent to carry out the direction of its policy wishes during most of this period is rejected.²⁴ This conclusion, however, leaves ample scope and need for study of the timing and magnitudes of policy actions, as recent events continue to demonstrate.

²²*Ibid.*, p. 27.

²³Hendershott, p. 134.

²⁴Brunner, p. 21.

The Reply to this Comment begins on next page.