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CONTENTS

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The Monetary Economics of Gold

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IN THE last two years there have been two changes in the official dollar price of the U.S. gold stock. In May 1972 Congress approved a change in the official price of gold from $35 an ounce to $38 an ounce; Congress approved a further change effective in October 1973 from $38 an ounce to $42.22 an ounce. The act of changing the official dollar price of gold, under the situation in recent years where the United States has not bought or sold gold at the official price, does not by itself have monetary consequences. However, subsequent transactions between the Treasury and the Federal Reserve do have important monetary effects.

This article analyzes the monetary effects of the two recent changes in the official price of gold. As will be shown, a change in the price at which the United States does not buy or sell gold can have an influence on aggregate demand in the economy, and does have implications for the level of the national debt.

Before beginning the analysis, it should be emphasized that this article is concerned only with the monetary effects of changing the *official* price of the gold held by the United States. During the last five years the market price of gold has changed daily and has been much higher than the official gold price.[1] Also, the change in the dollar value of the U. S. gold stock on the two occasions discussed in this article resulted solely from official revaluation of the gold stock, not from changes in the amount of gold owned by the United States. In the analysis that follows, it is assumed that the Federal Government did not alter its spending plans as a result of the changed official price of gold.

In this article the term "gold stock" will refer to the "monetary" or "Treasury" gold stock of the United States. The Treasury gold stock consists of monetized gold (gold against which gold certificates have been issued to the Federal Reserve Banks) plus nonmonetized gold (gold against which no gold certificates have been issued). The Treasury gold stock differs from the total gold stock of the United States. The total gold stock also includes gold in the Exchange Stabilization Fund, a Treasury account that has been used for stabilization operations in foreign exchange markets and for official purchases and sales of gold. Both the Treasury and the total gold stock exclude the U.S. gold subscription to the International Monetary Fund.[2]

First, Treasury actions subsequent to the two recent changes in the official dollar price of gold are examined; then Federal Reserve actions and the monetary consequences of the combined Treasury and Federal Reserve actions are discussed; and finally the effects of Treasury and Federal Reserve actions on the national debt are analyzed.

Treasury Actions

Given an increase in the official dollar value of the gold stock, the Treasury may decide to hold the increased value of its assets as more "cash," in which case, there is no effect on bank reserves or the monetary base. On the other hand, the Treasury may de-

[1] In March 1968, the United States and major European governments agreed to discontinue intervention in the private gold market to stabilize the price of gold. In effect, this decision established a so-called "two-tier" system under which central banks agreed to buy and sell gold only at the official price of $35 an ounce. The two-tier system separated the official price of gold for transactions among central banks from the market-determined price. In August 1971, the President announced that temporarily the United States would no longer redeem dollars for gold. Finally in November 1973, the United States along with six European countries agreed to abandon the two-tier gold system. According to Arthur Burns, Chairman of the Board of Governors of the Federal Reserve System, at a press conference held on November 13, "the practical upshot of all this is, that from the standpoint of the American Government, the U.S. may henceforth sell gold from its stockpile but the U.S. Government will not buy gold either from other central banks or from the market, in present circumstances and in foreseeable circumstances."

[2] Federal Reserve Bank of New York, *Glossary: Weekly Federal Reserve Statements*, "Factors Affecting Bank Reserves" (September 1972), pp. 19 and 20.

Table I

SOURCES OF THE MONETARY BASE

I. Factors Supplying Monetary Base
- Federal Reserve holdings of Government securities[1]
- Loans
- Federal Reserve float
- Gold stock plus Special Drawing Rights certificate account[2]
- Treasury currency outstanding
- Other Federal Reserve assets

II. Factors Absorbing Monetary Base
- Treasury cash holdings
- Deposits with Federal Reserve Banks
  - Treasury
  - Foreign
  - Other[2]
- Other Federal Reserve liabilities and capital

III. Reserve Adjustments[3]

IV. Monetary Base (I—II+III)

[1]Includes acceptances held.

[2]On January 1, 1970, the United States received an initial allocation of $866.9 million of Special Drawing Rights (SDRs) from the International Monetary Fund. The Treasury, through its Exchange Stabilization Fund, monetized $400 million of this allocation within a few months. In monetizing, the Treasury issued $400 million of SDRs to the Federal Reserve Banks and in return received an equal credit, initially, to its Exchange Stabilization Fund at the New York Federal Reserve Bank which is included in other deposits.

[3]Computed by this Bank. It includes the effects of reserve requirement changes and shifts in deposits where different reserve requirements apply.

cide to "monetize" the increased dollar value of the gold stock. In this case the Treasury engages in transactions with the Federal Reserve Banks.

May 1972 Change in the Official Price of Gold – In early May 1972 Congress approved an 8.6 percent increase in the official price of gold from $35 an ounce to $38 an ounce. As a result, the official dollar value of Treasury gold holdings rose by about $800 million.[3] Initially, in the accounts of the monetary authorities, Treasury cash holdings, which include nonmonetized gold, also rose by $800 million, the amount of the increase in the official dollar value of the Treasury gold stock.

An increase in the gold stock is a factor that increases the monetary base, as shown in Table I.[4] Increases in Treasury cash holdings decrease the monetary base. Since the $800 million increase in the dollar value of the gold stock was absorbed into Treasury cash holdings,[5] there was no net increase in monetary base which would have provided more bank reserves to support additional private deposits.

On May 15, 1972, the Treasury took steps to monetize the increased value of the gold stock. This occurred as follows: the Treasury issued to the Federal Reserve Banks gold certificates equal to the increased official dollar value of the gold stock and, in return, the Treasury received from the Federal Reserve an increase of an equal amount in its deposits at the Federal Reserve Banks. These results are shown in Illustration I.

Illustration I

Monetization of Gold

Treasury

Assets	Liabilities
+$800 million Treasury deposits at Federal Reserve	+$800 million gold certificates

Federal Reserve

Assets	Liabilities
+$800 million gold certificates	+$800 million Treasury deposits

The Treasury does not buy goods and services directly with gold. The Treasury disburses its payments for goods and services from its accounts at the Federal Reserve Banks. Hence, the Treasury converted the increased dollar value of gold, a non-spendable item, into a spendable item, deposits at the Federal Reserve Banks. Meanwhile, the increased value of the gold stock became a 100 percent backing for the gold certificates which the Treasury issued to the Federal Reserve.

Referring back to Table I, it can be seen that the monetary base would still be unchanged. The expansionary effect on the base of a decrease in Treasury cash holdings was offset by the contractionary effect of an increase in Treasury deposits at the Federal Reserve Banks. The amount of base money held by the public and the commercial banks was still unchanged.

[3]The actual change in the official value of the Treasury gold stock was $822 million. For expositional ease, this figure is rounded to $800 million. As a result of the change in the official price of gold, total reserve assets of the United States rose by $1,016 million on May 8, 1972; this consisted of $822 million Treasury gold stock, $6 million in gold holdings in the Exchange Stabilization Fund, $33 million in the reserve position at the International Monetary Fund, and $155 million in SDRs.

[4]For a discussion of the monetary base, see Leonall C. Andersen and Jerry L. Jordan, "The Monetary Base – Explanation and Analytical Use," this *Review* (August 1968).

[5]Treasury cash holdings represent the funds that the Treasury technically has at its disposal without drawing on its deposits at the Federal Reserve or Tax and Loan accounts at commercial banks. This account includes any currency and coin held by the Treasury in its own vaults plus nonmonetized gold and silver bullion, silver dollars, and nonsilver coinage metal. Federal Reserve Bank of New York, *Glossary: Weekly Federal Reserve Statements*, "Factors Affecting Bank Reserves" (September 1972), p. 20.

The monetary base expanded only as the Treasury subsequently used its newly acquired $800 million to pay for goods and services. In the week ended May 17, Treasury deposits at the Federal Reserve Banks decreased by over $800 million. The effects of these transactions are shown in Illustration II. As the Treasury bought goods and services from the private sector of the economy, there was an increase in demand deposits of the public at commercial banks. Reserves of commercial banks (member bank deposits at the Federal Reserve Banks) increased as deposits of the Treasury at the Federal Reserve Banks decreased. Referring again to Table I, on the sources side of the monetary base, Treasury deposits decreased, and therefore the previously increased dollar value of the gold stock resulted in an equal rise in the monetary base, other factors remaining constant.

October 1973 Change in the Official Price of Gold — In the week ended October 24, 1973, following Congressional approval, the official dollar price of gold was again increased, this time by slightly over 11 percent. The Treasury gold stock, which had been officially valued at about $10.4 billion in the previous week, was now valued, with the new official price of gold, at about $11.6 billion. The official dollar value of the gold stock rose by about $1.2 billion.[6]

The U.S. Treasury again, as in May 1972, had a choice of actions — either neutralize the effect on the monetary system of this increase in the dollar price of gold or monetize the $1.2 billion and use it to pay for goods and services, hence increasing bank reserves by this amount.

In the week ended October 24, 1973 the dollar value of the gold stock rose by about $1.2 billion, and Treasury cash holdings also increased by $1.2 billion. At this point there was no net effect on the monetary base. On October 25 the Treasury issued gold certificates to the Federal Reserve Banks and Treasury deposits at Federal Reserve Banks increased $1.2 billion. Thus the increase in the official value of the gold stock was monetized, or, in other words, was available for the Treasury to use to pay for goods and services produced by the private sector.

So far, there still had been no net effect on the monetary base. Then, over the three-week period from October 24 through November 14, as the Treasury made payments, Treasury deposits at the Federal Reserve decreased by $1.2 billion, and deposits of the public, the monetary base, and bank reserves were increased by $1.2 billion (assuming other factors affecting reserves and deposits were unchanged).

Illustration II

Treasury Purchases Goods and Services

Treasury

Assets	Liabilities
—$800 million Treasury deposits	no change
+$800 million goods and services	

Federal Reserve

Assets	Liabilities
no change	—$800 million Treasury deposits
	+$800 million member bank deposits

Banks

Assets	Liabilities
+$800 million reserves	+$800 million demand deposits of public

Public

Assets	Liabilities
+$800 million demand deposits	no change
—$800 million goods and services	

Federal Reserve Response to the Monetization of Gold

The analysis of the effect of the change in the official price of gold has proceeded up to this point with the assumption that Federal Reserve actions did not offset the expanding effects of the Treasury's actions on the monetary base. By altering its holdings of Government securities, the Federal Reserve can offset any other factors operating to change the monetary base.

The following analysis is not intended to ascribe any policy intent to Federal Reserve actions. The analysis is only concerned with whether Federal Reserve open market actions, regardless of the reason for which they were conducted, offset the effects of the monetization of gold and subsequent Treasury actions on the monetary base.

Following the May 1972 change in the official price of gold and the subsequent actions by the Treasury, initially the monetary base rose by $800 million. The

[6]As a result of the change in the official price of gold, total reserve assets of the U.S. rose by $1,436 million on October 18, 1973. The total increase consisted of the following: $1,157 million Treasury gold stock, $8 million in gold holdings in the Exchange Stabilization Fund, $54 million in reserve position at the International Monetary Fund, and $217 million in SDRs.

$800 million effect on the monetary base was not offset by Federal Reserve sales of Government securities. From the week ended May 10 through the week ended May 31, 1972, the Federal Reserve's average holdings of Government securities remained unchanged.

The private sector had exchanged $800 million of goods and services for $800 million of noninterest-bearing debt (monetary base) of the monetary authorities (assuming other factors affecting the supply of base were unaffected by the transactions following the change in the official price of gold). In the process by which commercial banks adjusted their portfolios to the increased amount of monetary base, the money stock expanded by a multiple of the increase in the monetary base. Given the prevailing value of the money multiplier, an increase of about $800 million in the monetary base supported about a $2 billion higher level of the money stock.

The Treasury was able to pay for $800 million of goods and services without using tax revenues or putting additional upward pressures on market interest rates by increasing the stock of Government securities held by the public. However, this does not mean that the Government sector was able to acquire goods without any effects on the real disposable income of consumers. Since the effect on the monetary base was not offset by Federal Reserve actions, there was a resulting expansion of the money stock, an expansion of total demand, and ultimately upward pressures on prices.

Following the October 1973 monetization of gold, the expansionary effect on the monetary base of the subsequent Treasury actions was offset by Federal Reserve sales of Government securities. From the week ended October 24 through the week ended November 14, the Federal Reserve reduced its average holdings of Government securities by about $1.2 billion, an amount equal to the increased dollar value of the gold stock.

The complete process by which Federal Reserve actions offset the effect of the monetization of gold is shown in Illustration III. In the first stage, gold certificates held by Federal Reserve Banks and Treasury deposits at the Federal Reserve Banks both rose by an equal amount. In the second stage, the Treasury paid the public for goods and services by writing checks on its accounts at Federal Reserve Banks. Demand deposits of the public rose, demand deposits of the Treasury at the Federal Reserve Banks fell, and bank reserves rose.

In the third stage, the rise in bank reserves was offset as the Federal Reserve sold securities to the public. U.S. Government securities held by the public rose and, as they paid for these securities, demand deposits of the public fell and bank reserves contracted. The final result is also shown in Illustration III. The public had exchanged goods for interest-bearing Government debt. The monetary base was unchanged and the money stock was either unchanged or somewhat higher, depending upon the interest rate effects necessary to induce the public to hold a larger stock of interest-bearing Government debt.

Federal Reserve open market operations offset the effect of the Treasury actions on the monetary base and hence nullified the possible multiple expansion of the money stock. However, the stock of Government securities held by the public was increased as a result of the Federal Reserve open market sales.

The Effect of Monetization of Gold on the National Debt

For the operations of the Treasury, one of the main effects of the two increases in the dollar value of the gold stock was that the Treasury now had an alternative means, in addition to using tax revenues or the proceeds from the sale of Government securities, to finance its planned expenditures. By monetizing the increased dollar value of the gold stock the Treasury was able to pay for $800 million of goods in the spring of 1972 and $1.2 billion of goods in the fall of 1973 without using tax revenues or issuing more Government securities, and hence increasing the amount of Federal debt subject to the statutory debt limit set by Congress. This result holds regardless of whether Federal Reserve actions offset the effects of the Treasury actions on the monetary base.

In the case where the Federal Reserve did not sell Government securities to the private sector as the Treasury bought goods and services from the private sector, as appears to be the case after the May 1972 gold price change, the amount of noninterest-bearing Government debt (monetary base) held by the private sector increased. There was no increase in the amount of interest-bearing debt (Government securities) held by the private sector, as would have been the case if the Treasury had financed its $800 million expenditure through proceeds obtained by selling Government securities to the private sector. Hence, the amount of outstanding Government debt subject to the national debt ceiling was less than it otherwise would have been for the same amount of Government expenditures.

Illustration III

MONETIZATION OF GOLD — OCTOBER 1973

(Dollar Amounts in Billions)

STAGE I — GOLD REVALUATION IS MONETIZED

TREASURY

Assets	Liabilities
Treasury deposits at Federal Reserve $+1.2	Gold certificates $+1.2

FEDERAL RESERVE

Assets	Liabilities
Gold certificates $+1.2	Treasury deposits $+1.2

BANKS

Assets	Liabilities
No Change	

PUBLIC

Assets	Liabilities
No Change	

MONETARY BASE

Sources	Uses
Gold stock $+1.2 Treasury deposits at Federal Reserve $(—)1.2*	

STAGE II — TREASURY DISBURSES MONETIZED FUNDS

TREASURY

Assets	Liabilities
Treasury deposits at Federal Reserve $—1.2 [Goods and services] $+1.2	

FEDERAL RESERVE

Assets	Liabilities
	Treasury deposits $—1.2 Member bank deposits $+1.2

BANKS

Assets	Liabilities
Member bank deposits at Federal Reserve $+1.2	Demand deposits of public $+1.2

PUBLIC

Assets	Liabilities
Demand deposits $+1.2 [Goods and services] $—1.2	

MONETARY BASE

Sources	Uses
Treasury deposits at Federal Reserve $(+)1.2*	Member bank deposits at Federal Reserve $+1.2

STAGE III — FEDERAL RESERVE OFFSETS EXPANSIONARY TREASURY ACTIONS

TREASURY

Assets	Liabilities
No Change	

FEDERAL RESERVE

Assets	Liabilities
U. S. Government securities $—1.2	Member bank deposits $—1.2

BANKS

Assets	Liabilities
Deposits at Federal Reserve $—1.2	Demand deposits of public $—1.2

PUBLIC

Assets	Liabilities
Demand deposits $—1.2 U. S. Government securities $+1.2	

MONETARY BASE

Sources	Uses
Federal Reserve holdings of Government securities $—1.2	Member bank deposits at Federal Reserve $—1.2

FINAL RESULT

TREASURY

Assets	Liabilities
[Goods and services] $+1.2	Gold certificates $+1.2

FEDERAL RESERVE

Assets	Liabilities
Gold certificates $+1.2 U. S. Government securities $—1.2	

BANKS

Assets	Liabilities
No Change	

PUBLIC

Assets	Liabilities
U. S. Government securities $+1.2 [Goods and services] $—1.2	

MONETARY BASE

Sources	Uses
No Change	

*The signs on these entries reflect the impact on the monetary base, not the direction of change in those entries. See Table I for further explanation.

In the case where the Federal Reserve engaged in open market operations and sold Government securities as the Treasury disbursed the funds it acquired from monetizing gold, the national debt was also less than if the Treasury had financed its purchases by selling securities to the private sector. This situation occurred in the fall of 1973 and was shown in Illustration III. Federal Reserve sales of Government securities offset the influence of Treasury actions on the monetary base. The stock of Government securities held by the Federal Reserve Banks fell and the stock of Government securities held by the private sector rose by an equal amount. Government securities held by the Federal Reserve Banks are also counted in the Federal debt subject to the debt ceiling. Therefore, on balance, there was no additional upward pressure on the national debt ceiling.

Whenever the Treasury finances its expenditures by selling Government securities to the private sector, then clearly the net nominal interest cost to the Treasury rises. When the Treasury finances its expenditures through monetization of gold, the effect on the *net* interest cost to the Treasury depends upon subsequent Federal Reserve actions. Net interest payments made by the Treasury are affected by whether Federal Reserve actions offset the monetary effects of Treasury actions following the changed dollar value of the gold stock.

To understand the effects on the net interest cost to the Treasury it is necessary to understand that the proportion of the national debt held by the Federal Reserve Banks affects the *net* interest cost to the Treasury. Interest earned by the Federal Reserve Banks on their holdings of Government securities, except for a small percentage used for operating expenses, is returned to the Treasury.[7]

Hence, as the proportion held by the Federal Reserve of the total outstanding stock of Government securities rises, the *net* interest cost to the Treasury falls. Essentially, the Treasury makes interest payments to the Federal Reserve on the Government securities it holds, just as to any other holder of Government securities. Then, the Federal Reserve transfers most of the interest payments back to the Treasury. For all practical purposes, the amount of Government securities held by the Federal Reserve represents interest free debt to the Treasury. Therefore, when the Federal Reserve sells Government securities to the private sector, net interest costs of the Treasury rise. The Treasury must then make interest payments to the private holders of its securities, and the interest payments are not directly returned to the Treasury.

When net interest costs to the Treasury rise this means that Treasury financing requirements also rise to meet the increased net interest payments. Therefore, the Treasury must seek to have Congress raise taxes or must issue more Government securities with the attendant upward pressures on market interest rates.

During the most recent monetization of gold, as discussed earlier, Federal Reserve holdings of Government securities decreased by about the same amount as Treasury actions subsequent to the monetization of gold added to the monetary base. Government securities held by the private sector rose by about $1.2 billion, just as they would have if the Treasury had issued securities to finance its expenditures. Hence, the net interest cost to the Treasury increased by the same amount as if the Treasury had financed the purchases by sale of securities, although the total Government debt subject to the debt ceiling remained unchanged.

However, during the May 1972 monetization of gold, there was no decrease in Federal Reserve holdings of Government securities. In this case, the private sector's holdings of *non*interest-bearing Government debt was increased. Hence, not only was the amount of Government securities subject to the national debt ceiling lower, but, also, the net interest cost to the Treasury was reduced from what it would have been if the Treasury had financed its expenditures by selling Government securities. As stated earlier, however, this process, unless offset, results in an increase in the money stock and, ultimately, an acceleration in the rate of inflation.

[7]The Federal Reserve System returned to the Treasury an average of 89 percent of current earnings during the past five years. For an example, see "Earnings and Expenses of the Federal Reserve Banks in 1972," Federal Reserve *Bulletin*, January 1973, pp. 35 and 36.

Monetary and Fiscal Actions in Macroeconomic Models*

by KEITH M. CARLSON

CONTROVERSY persists in macroeconomics. This statement sounds trite and almost immediately prompts the response, "What else is new?" With reference to the "monetarist-fiscalist" controversy, this disinterested attitude is probably on the rise. Professor James Tobin, for example, has written:

> "If the monetarists and the neo-Keynesians could agree as to which values of which parameters in which behavior relations imply which policy conclusions, then they could concentrate on the evidence regarding the values of those parameters."[1]

In other words, if there were agreement on a common theoretical apparatus, the controversy about relative roles of monetary and fiscal policies could be reduced to an econometric debate about empirical magnitudes.

There are many who believe that the monetarist-fiscalist debate centers on empirical questions. For example, Professor Milton Friedman indicated his "belief that the basic differences among economists are empirical, not theoretical."[2] But Professor Tobin is not willing to accept this characterization of the debate. In fact, Tobin expresses disappointment in Friedman's theoretical framework, citing several cases where Friedman displays inconsistency with his earlier works.[3]

Since there is confusion as to the nature of the monetarist-fiscalist controversy, it is not surprising that the debate persists. Until there is at least agreement as to the nature of the controversy, we cannot expect much progress toward resolving the central issues.[4]

Professor Karl Brunner has grouped the central issues of macroeconomics under four topics: the nature of the transmission mechanism, the inherent stability of the economic system, the nature of impulses generating economic income fluctuations, and the approximate separation of allocative and aggregative forces.[5]

The focus of this paper is on the monetarist-fiscalist controversy primarily as it relates to (1) the nature of policy impulses and the business cycle and (2) the nature of the transmission mechanism. As background, the historical development of the controversy is traced, albeit cursorily. Next, the current nature of the controversy is examined in greater detail and the Brunner-Meltzer view of the transmission mechanism is discussed in juxtaposition with the well-known Hicksian model. Alternative views of the transmission mechanism can provide some insights into the issues relevant to the monetarist-fiscalist controversy.

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*This paper is essentially unchanged from its original form as prepared for the Fourth Annual Konstanzer Conference on Monetary Theory and Policy, Konstanz, West Germany, June 1973. Though not fully reflected in this paper, I since have benefited from comments by Professors John Pippinger, Ronald Sutherland, and Jai-Hoon Yang.

[1]James Tobin, "Friedman's Theoretical Framework," *Journal of Political Economy* (September/October 1972), p. 852.

[2]Milton Friedman, "A Theoretical Framework for Monetary Analysis," *Journal of Political Economy* (March/April 1970), p. 234. Many other examples could be cited suggesting that this view is common in the profession. Typical is the following statement by Professor Crouch [Robert L. Crouch, *Macroeconomics* (New York: Harcourt Brace Jovanovich, 1972), p. viii]: ". . . macroeconomists are separated only by the assumptions they make concerning price flexibility, money illusion, expectations, and distribution effects. Therefore, to the extent that macroeconomists are divided into factions, they are divided over empirical questions and not the theory."

[3]Tobin, "Friedman's Theoretical Framework."

[4]Several articles have appeared since this paper was first drafted which have attempted to identify the issues in the controversy. One is Axel Leijonhufvud, "Effective Demand Failures," *Swedish Journal of Economics* (March 1973), pp. 27-48, where he argues that the central issue concerns the self-regulatory capabilities of market systems. Another is Robert H. Rasche, "A Comparative Static Analysis of Some Monetarist Propositions," this *Review* (December 1973), pp. 15-23, where he suggests that the issues revolve on the assumptions about price perceptions by economic units. Professor Rasche concludes that the debate over the relative stability of monetary velocity vs. the autonomous expenditure multiplier has been misdirected. Also see Leonall C. Andersen, "The State of the Monetarist Debate," and the accompanying commentary by Lawrence R. Klein and Karl Brunner, this *Review* (September 1973), pp. 2-14. Important earlier surveys of the issues are Karl Brunner, "A Survey of Selected Issues in Monetary Theory," *Schweizerische Zeitschrift fur Volkswirtschaft und Statistik*/(Winter 1971), pp. 1-146, and David I. Fand, "Some Issues in Monetary Economics," this *Review* (January 1970), pp. 10-27.

[5]See Karl Brunner's review of Bert G. Hickman, ed., *Econometric Models of Cyclical Behavior, Journal of Econometric Literature* (September 1973), pp. 927-33, and "A Survey of Selected Issues in Monetary Theory."

DEVELOPMENT OF THE CONTROVERSY: AN OVERVIEW

Development of the controversy between monetarists and fiscalists during the post-World War II period is divided into four periods.[6] Though these periods are not precise and well defined, it is useful to associate evolving opinions and beliefs with the passage of time. Central to the discussion is the interplay of economic experience with economic thinking. Specific economic episodes are capable of having pronounced effects on prevailing macroeconomic thought which rival in importance the effects of carefully prepared theoretical analyses or detailed econometric studies.

Pre-1961

The post-World War II period prior to 1961 can be characterized as the period marking the development of the Keynesian orthodoxy. This orthodoxy centers on the income-expenditure model as the basic analytical framework of macroeconomic analysis.[7] That is, the "C + I + G" approach tended to dominate macroeconomic thinking, and paralleled closely the development of the national income accounts.

This school of macroeconomic thought developed quite independently of economic experience. For example, during the middle and late 1950s economic policy involved very little experimentation in efforts to achieve the goals of the Employment Act of 1946. As a result, there were few direct tests of macroeconomic propositions on the economic policy front. As near as economists could tell, monetary and fiscal policies were being conducted on the basis of certain established patterns of behavior, with little interplay between economists and policymakers.[8] One of the great "missions" of macroeconomists seemed to be that of convincing policymakers that there were other goals besides balancing the Federal budget. The reasons underlying this lack of interplay between policy and economic thought can be traced to the state of development of economic information at the time and the relatively undeveloped means of processing what information was available. Inability to monitor closely economic conditions contributed to a division between economic thought and policy.

The development of macroeconomic thought prior to 1961 was decidedly Keynesian in the "C +I + G" sense, with little emphasis on monetary policy. The notion of compensatory fiscal policy became a fixture in textbooks long before it was considered at all seriously by policymakers. About the only dissenting voices during this period were those of Clark Warburton and Milton Friedman.[9] Insofar as the Keynesian model and the ascending role for fiscal policy was concerned, this dissenting challenge was not a serious one. Even though the Warburton-Friedman challenge was strongly supported with statistical evidence, the developing Keynesian orthodoxy was not about to backstep to an analysis with classical underpinnings.

1961 to 1966

The year 1961 is chosen as the beginning of the next era in macroeconomic thinking primarily because of two significant developments – one dealing with economic policy and the other with a controversial contribution to the economic literature. The policy development was the formation of the "Heller Council," and the "sale" of the Keynesian model to Congress and the public.[10] A significant development in the literature was the publication of a study on quantity theory vs. Keynesian theory for the Commission on Money and Credit by Professors Friedman and Meiselman.[11]

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[6]For a very readable summary of the development of the controversy, see A. James Meigs, *Money Matters: Economics, Markets, Politics* (New York: Harper and Row, 1972), esp. part 4. See also Beryl W. Sprinkel, *Money and Markets: A Monetarist View* (Homewood, Illinois: Irwin, 1971), esp. pp. 1-17.

[7]The Keynesian orthodoxy, or tradition, is defined in the sense of Axel Leijonhufvud, *On Keynesian Economics and the Economics of Keynes* (New York: Oxford University Press, 1968). In contrast to Leijonhufvud, whose book focuses on specific theoretical issues, the purpose of this section of the paper is to discuss the interplay between economic policy experience and macroeconomic thought in a very general way.

[8]For discussion of the role of the economist in the evolution of economic policy in the post-World War II period up to 1961, see Herbert Stein, *The Fiscal Revolution in America* (Chicago: University of Chicago Press, 1969), pp. 197-371. See also Hugh S. Norton, *The Role of the Economist in Government: A Study of Economic Advice Since 1920* (Berkeley: McCutchan Publishing Corporation, 1969).

[9]The most relevant contributions can be found in Milton Friedman, *The Optimum Quantity of Money and Other Essays* (Chicago: Aldine Publishing Company, 1969) and Clark Warburton, *Depression, Inflation and Monetary Policies, Selected Papers 1945-53* (Baltimore: Johns Hopkins University Press, 1969). There were, of course, others who questioned developing trends in macroeconomic theory during this period.

[10]See Stein, *The Fiscal Revolution*, pp. 372-453. The state of prevailing opinion among macroeconomists as of 1961 is probably best summarized in U.S. Congress, Joint Economic Committee, *Current Economic Situation and Short-Run Outlook Hearings*, 86th Congress, 2nd Session (December 1960), and *January 1961 Economic Report of the President and the Economic Situation and Outlook: Hearings*, 87th Congress, 1st Session (1961).

[11]Milton Friedman and David Meiselman, "The Relative Stability of Monetary Velocity and the Investment Multiplier in the United States, 1897-1958," in Commission on

With reference to applied Keynesian economics, the record and contributions of Professor Walter Heller and his colleagues are familiar.[12] The notion of "fiscal drag" was developed and eventually Congress was sold on the need for a tax cut to eliminate this "drag." There were few dissenting views within the economics profession during this period of applied Keynesianism. Almost all macroeconomists felt the time was ripe for stimulative policy, and recommendations for expansionary fiscal policy assumed "matter-of-factly" that monetary policy was to be accommodative, maintaining stable money market conditions when the Federal Government required funds to finance the deficit.[13]

The 1964 tax cut was considered an unqualified success by most analysts at that time, and the stabilization potential of fiscal policy was enhanced by the acceleration of depreciation allowances and the implementation of an investment tax credit, both in 1962.[14] In fact, by late 1965 the faith in fiscal policy was apparently so strong that it was felt that any significant move toward restraint could be postponed until the last possible moment so as to get maximum advances in output before turning to the problem of checking inflation.[15]

The other development, the Friedman-Meiselman (F-M) study, was creating substantial discussion in academic circles during the 1961 to 1966 period.[16] The F-M study represented a statistical challenge to the Keynesian orthodoxy. The F-M study really did not present evidence which was inconsistent with Keynesian theory, but, rather, the statistical evidence was presented as also being consistent with quantity theory.

The F-M study prompted a reaction in defense of the Keynesian model, as well as a challenge to the methodology of the F-M study. In general, after the smoke had cleared and scores of words had appeared, both sides emerged believing they had won.[17] And until 1965 or 1966, Keynesian supporters could cite apparent successes in applied Keynesianism as additional evidence buttressing their position.

Late 1965 could be characterized as a low point for quantity theorists, or more generally for anyone who believed in the potency of monetary actions.[18] It was not that economic conditions were inconsistent with the tenets of the quantity theory, but rather that fiscal policy appeared to be so successful that monetary policy was cast in a minor supporting role. For example, the 1966 article by Professor Allan Meltzer challenged the success of the 1964 tax cut, but there is no evidence in the literature indicating that Meltzer's challenge was taken seriously.

1966-1968

This brief period is noted primarily because of economic events and not the development of economic literature.[19] Late 1965 and early 1966 marked a significant shift in economic policy. Fiscal policy was stimulative in late 1965. In fact, there was an overt move toward stimulus with an excise tax cut as well as an unplanned stimulus from Vietnam War expenditures. As the fiscal stimulus continued and the economy approached capacity, the Federal Reserve moved independently, announcing a policy of restraint and increasing the discount rate in December 1965. Monetary restraint became effective by spring 1966 when growth in the money stock came to a halt. The result of this combination of stimulative fiscal actions and restrictive monetary actions is well known; in late 1966 the economy slipped into a mini-recession.

Money and Credit, *Stabilization Policies* (Englewood Cliffs, N.J.: Prentice-Hall, Inc. 1963), pp. 165-266.

[12]For an informative accounting of the accomplishments of the Heller Council, see Walter W. Heller, *New Dimensions of Political Economy* (Cambridge, Mass.: Harvard University Press, 1966).

[13]See any of the Annual Reports of the Council of Economic Advisers from 1962 through 1966.

[14]For an example of one of the few dissenting views at that time, see Allan H. Meltzer, "The Money Managers and the Boom," *Challenge* (March/April 1966), pp. 5-7.

[15]The following quotation is typical: "Consultations between the Federal Reserve and the Administration continue, helping to assure that monetary and fiscal policy together will provide appropriately for sustained and balanced expansion. Both are keenly aware of uncertainty in the outlook and are prepared to respond to emerging developments." *The Annual Report of the Council of Economic Advisers* (Washington: U.S. Government Printing Office, 1966), p. 60.

[16]For the relevant references, see Ronald L. Teigen, "A Critical Look at Monetarist Economics," this *Review* (January 1972), pp. 10-25.

[17]For example, in Teigen, "A Critical Look," p. 10, says, "The empirical evidence presented in support of this 'quantity theory' viewpoint was subjected to criticism so severe that the evidence has never been taken very seriously."

[18]Note the following statement from Heller, *New Dimensions*, p. 9: "The basic structure of the Keynesian theory of income and employment – and even the basic strategies of Hansenian policy for stable full employment – are now the village common of the economics community. When Milton Friedman, the chief guardian of the *laissez-faire* tradition in American economics, said not long ago, 'We are all Keynesians now,' the profession said 'Amen.'"

[19]Given normal publication lags, as well as recognition lags by economists, it is probably impossible to detect any trends in economic literature for a period as short as two or three years. To gain insights into economic thinking on policy issues during short periods, testimony before Congressional Committees is probably the best source, rather than the professional journals.

Within the economics profession, but chiefly among policymakers, the power of monetary restraint was quickly recognized.[20] In fact, out of fear of a major recession, monetary actions turned stimulative in early 1967. The response of the economy was very rapid. In combination with continuing fiscal stimulus, the turn to monetary stimulus very quickly led to a re-emergence of inflation.

This short experience of about two years resulted in a more eclectic view of monetary and fiscal policy among macroeconomists. General belief in the power of fiscal policy continued, but now monetary policy was recognized for its potential contribution. This experience, however, was not viewed as a defeat for fiscal policy and the Keynesian model. Rather, the experience suggested that the economy had moved into the "classical range" of the LM curve – the range in which monetary actions have their greatest potency relative to fiscal actions.

This short period from 1966 to early 1968 can be dubbed as the "emergence of eclecticism." Interest in the Friedman-Meiselman controversy waned because that controversy implied that one of two extreme positions should be accepted. The experience of 1966 to 1968, though demonstrating a dominant role for monetary actions, led to the general conclusion that *both* monetary and fiscal policy "mattered." The development of the FRB-MIT model at this time was consistent with such an eclectic position.[21]

1968-1973

The final period of review begins with the implementation of the tax surcharge of 1968, which was also accompanied by legislated controls on Federal spending. Faith in the success of this fiscal action was so great that monetary policy was shifted toward ease to avoid "overkill." Monetary expansion was rapid well into 1969, and inflation accelerated. Accelerating inflation in the face of fiscal restraint was a setback for the advocates of fiscal policy. If monetary restraint could slow the economy in 1966 in the face of fiscal stimulus, why could not the tables be turned? After the fact, the explanation offered by the supporters of Keynesian theory was that the surcharge was viewed by economic units as temporary.[22] The damage to the "fiscalist position" was especially significant because it marked the first policy setback for Keynesianism since its serious application began in 1961.

At about the same time that doubt was beginning to emerge as to the effectiveness of the 1968 tax surcharge, the Andersen-Jordan (A-J) study was published.[23] The initial reaction by Keynesians was that the A-J results were simply a rerun of the Friedman-Meiselman estimates, except that more sophisticated procedures were used in estimating the lags in the response of economic activity to monetary and fiscal actions.[24] But controversy started building up as the success of the 1968 surcharge became more and more suspect.

The A-J results were impressive, and to the limited extent that Keynesians attempted to "beat" them at their own game, the A-J results stood up remarkably well.[25] As it became difficult to counter the A-J results on statistical grounds, the "black box" notion developed.[26] That is, the old "correlation is not causation" argument appeared, and Keynesians said, "Where is your theory?" Such criticism had been lingering unused among the Keynesians for several years, but the new challenge to the Keynesians provoked a reincarnation of the black box.

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[20] "In particular, the power of tight money as a tool of restraint – as well as its uneven impact – was demonstrated beyond any reasonable doubt." *The Annual Report of the Council of Economic Advisers* (Washington: U.S. Government Printing Office, 1967), p. 38.

[21] Frank deLeeuw and Edward M. Gramlich, "The Federal Reserve – MIT Econometric Model," Federal Reserve *Bulletin* (January 1968), pp. 11-40, and "The Channels of Monetary Policy: A Further Report on the Federal Reserve - MIT Econometric Model," Federal Reserve *Bulletin* (June 1969), pp. 472-91.

[22] See Teigen, "A Critical Look," footnote 4 and the references cited therein.

[23] Leonall C. Andersen and Jerry L. Jordan, "Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization," this *Review* (November 1968), pp. 11-24.

[24] Frank deLeeuw and John Kalchbrenner, "Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization – Comment," this *Review* (April 1969), pp. 6-11.

[25] See E. Gerald Corrigan, "The Measurement and Importance of Fiscal Policy Changes," Federal Reserve Bank of New York *Monthly Review* (June 1970), pp. 113-45. More significant, however, were probably the corroborative studies of Michael W. Keran. See his "Monetary and Fiscal Influences on Economic Activity – The Historical Evidence," this *Review* (November 1969), pp. 5-24, and "Monetary and Fiscal Influences on Economic Activity: The Foreign Experience," this *Review* (February 1970), pp. 16-28. The reader is also referred to Thomas O. Nitsch, "A Further Adjustment in a Test of the Relative Importance of Monetary and Fiscal Actions in Economic Stabilization," *Nebraska Journal of Economics and Business* (Winter 1972), pp. 11-24.

[26] See Meigs, *Money Matters: Economics, Markets, Politics*, for an expanded discussion. Also see Richard G. Davis, "How Much Does Money Matter? A Look at Some Recent Evidence," Federal Reserve Bank of New York *Monthly Review* (June 1969), pp. 119-31, and Edward M. Gramlich, "The Usefulness of Monetary and Fiscal Policy as Discretionary Stabilization Tools," *Journal of Money, Credit, and Banking* (May 1971), pp. 506-32.

The nature of the controversy has continued along these lines up to the present. There have been no periods since 1968 when monetary and fiscal actions have moved sharply and persistently in opposite directions, so direct tests of the relative potency of monetary and fiscal actions are generally unavailable from late 1969 to early 1973.[27]

RESEARCH METHODOLOGY AND THE CONTROVERSY

Over the last five years there has been considerable confusion as both monetarist and fiscalist factions have been guilty of distorting the opposing faction's model in order to make a point. For example, the discussion has run from "money doesn't matter vs. money matters" to "money matters vs. money only matters," and recently it has been suggested that the issue is really "fiscal matters vs. fiscal doesn't matter."[28]

Associated with the development of the monetarist-fiscalist controversy has been the question of appropriate research methodology. The evidence in support of monetarist propositions has been based in large measure on a reduced-form approach to the estimation and testing of statistical relationships between monetary and fiscal variables and economic activity. The fiscalist participants in the controversy, on the other hand, have relied on a structural model approach to the estimation and testing of relationships regarding the economic impact of policy variables.[29] The purpose of this section is to discuss these methodological questions as they bear on the controversy.

Side Issues in the Debate

Several side issues have developed in the controversy over the Andersen-Jordan article. The A-J study consisted of the formulation and testing of several macroeconomic propositions. These hypotheses involved various characteristics of the response of nominal GNP to monetary and fiscal actions. The test included direct estimation of equations with changes in GNP as the dependent variable and measures of monetary and fiscal actions as independent variables. This method of testing was called the reduced form approach.

Use of the term "reduced form" is unfortunate, because the term has an alternative meaning in applied econometric analysis. To most of the profession, "reduced form" is automatically associated with a structural model, that is, a set of equations serving as a representation of the behavior of the economic system. Commonly accepted procedure in macroeconometric analysis in 1968, and continuing to the present is to:

(1) Collect data and make point estimates of the parameters in the structural equations;

(2) Assume (a) the model is correct, (b) the background conditions are true, and (c) the point estimates of the structural parameters are the true values;

(3) Use data for the exogenous variables, outside of the sample period, and generate values for the endogenous variables;

(4) Compare forecasted values of the endogenous variables with actual values;

(5) Draw conclusions about the validity of the model on the basis of this comparison.[30]

The Andersen-Jordan study, on the other hand, did not follow commonly accepted procedure in applied econometrics. Their study reported the results of several tests of hypotheses concerning the characteristics of the response of GNP to monetary and fiscal actions. They did not test a particular model depicting the operation of the economic system. Their estimated equations were reduced forms in that they were relationships between one endogenous variable and a number of exogenous variables, but the form of these equations was not derived from an explicitly stated structural system.

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[27] Sprinkel, *Money and Markets: A Monetarist View*, pp. 15-16, indicates there were two other episodes of contrasting policy change in 1969 and 1970, but these cases are not as clearcut as the episodes of 1966 and 1968.

[28] For discussion of "money" issues see Paul Samuelson, "The Role of Money in National Economic Policy," in *Controlling Monetary Aggregates* (Proceedings of the Monetary Conference Held on Nantucket Island, Sponsored by Federal Reserve Bank of Boston, June 8-10, 1969), pp. 7-13. For discussion of "fiscal" issues, see Ronald L. Teigen, "Some Observations on Monetarist Analysis," *Kredit und Kapital*, 3 (1971), pp. 243-63, and Warren L. Smith, "A Neo-Keynesian View of Monetary Policy," in *Controlling Monetary Aggregates*, pp. 105-26, and Corrigan, "Measurement and Importance of Fiscal Policy Changes."

[29] For a readable account of the distinction between statistical estimation and hypothesis testing, which seems to be a relevant issue underlying the reduced form vs. structural controversy, see R. L. Basmann, "The Role of the Economic Historian in Predictive Testing of Proffered 'Economic Laws,'" in Ralph L. Andreano, ed., *The New Economic History: Recent Papers on Methodology* (New York, John Wiley and Sons, 1970), pp. 17-42.

[30] This method of evaluating an econometric model is called the "method of forecasting test." See James L. Murphy, "An Appraisal of Repeated Predictive Tests on an Econometric Model," *Southern Economic Journal* (April 1969), pp. 293-307, and *Introductory Econometrics* (Homewood, Ill.: Irwin, 1973). Basmann comments on the procedure as follows: "The tendency of policy-oriented econometricians has been to formulate models, to argue in a more or less Aristotelian fashion for the plausibility of the underlying assumptions, and to trust to the efficacy of asymptotically efficient (viz., large-sample) methods of statistical estimation to bring them somewhere near knowing the true values of economic parameters." [Basmann, "The Role of the Economic Historian," p. 161.]

The nature of the A-J results caused considerable confusion. At the time, there were certain notions (or vague hypotheses) about the operation of the economic system that prevailed among macroeconomists. These notions were, of course, carryovers from the Friedman-Meiselman controversy earlier in the decade. The A-J results appeared to be consistent with the quantity theory and not consistent with the Keynesian theory. The "implications" of the Keynesian theory were that fiscal actions were more powerful than monetary actions, so the A-J results were viewed as a challenge to the existing Keynesian orthodoxy.

In retrospect, this association of the A-J results with tentative acceptance or rejection of particular models, though probably inevitable, was also unfortunate. These results set off discussions which were not relevant to the issues at hand, namely, "How can we accept your results until we see your theory?"

To isolate the issues which are relevant, consider first the irrelevant issues. One irrelevant issue is whether the A-J test is a test of a quantity theory vs. a Keynesian theory. Andersen and Jordan did not develop and test explanatory models of the mechanism describing the transmission of monetary and fiscal impulses to the economic system. The A-J tests yielded some interesting implications for the quantity vs. Keynesian theory question, but as presented, the A-J article did not represent a direct test of these alternative theories.

A second irrelevant issue is whether structural or reduced forms are the appropriate methodology. The terms "structural form" and "reduced form" do not represent competing methodologies. If the model builder is interested in describing one possible system that is useful in forecasting and simulating economic experience, then a structural form may be most appropriate. On the other hand, if the model builder is interested in policy recommendations or evaluations, a theoretical interpretation of parameters is required. And such an interpretation requires the formulation and testing of hypotheses; an integral part of this procedure is the definition of regions of acceptance and rejection in terms of the reduced form parameters.[31]

It is certainly true that the A-J study did not follow procedure that was commonly accepted at the time. But this point is fundamental: the A-J study reflected dissatisfaction with existing procedures in assessing the impact of monetary and fiscal actions. Over the years, monetary and fiscal multipliers, which were derived from models assumed to be true, had come to be accepted as approximations of reality.[32] The A-J propositions, simple as they were, were direct tests of alternative hypotheses about the response of the economic system to monetary and fiscal actions.

What issues relating to the A-J study are relevant? First, the statistical properties of the estimated equations used in the A-J study require close scrutiny. To a considerable extent this scrutinizing has been done by examining in detail the choice of combinations of monetary and fiscal variables.[33] Also, the "endogeneity of money" issue is relevant to the extent that a bias is present in the estimated coefficients. Though it should be pointed out that the question of money endogeneity has little to do with the formulation of the hypothesis about monetary influence.[34]

A second issue that seems relevant to the discussion is an examination of the derived reduced form multipliers for the Keynesian models in light of the directly estimated A-J multipliers. In other words, once the estimated A-J equations have been checked out for their statistical properties, it seems logical for the Keynesians to develop their systems in such a way that they could be tested as an interdependent unit, rather than accepting point estimates of structural parameters as a basis for calculating policy multipliers. Rigid attachment to this method of calculating policy multipliers has been a stumbling block to raising the level of discussion relating to the A-J results.[35] The

[31]For extensive discussion of this alternative method of evaluating econometric models, which is called the "method of predictive testing," see Murphy, "Repeated Predictive Tests on an Econometric Model," and the references to Basmann's other works cited therein.

[32]For further discussion of this point, see Meigs, *Money Matters: Economics, Markets, Politics,* and John Deaver, "Monetary Model Building," *Business Economics,* (September 1969), pp. 29-32.

[33]See deLeeuw and Kalchbrenner, "Monetary and Fiscal Actions – Comment," Davis, "How Much Does Money Matter," and Corrigan, "Measurement and Importance of Fiscal Policy Changes."

[34]See Christopher A. Sims, "Money, Income, and Casuality," *American Economic Review* (September 1972), pp. 540-52; an interesting unpublished paper by J. W. Elliott, "The Influence of Monetary and Fiscal Actions on Total Spending: The St. Louis Model Re-visited" (December 1972), presents evidence supporting the notion that government spending is "endogenous" rather than money. For further discussion of endogenous stabilization actions, see Stephen M. Goldfeld and Alan S. Blinder, "Some Implications of Endogenous Stabilization Policy," *Brookings Papers on Economic Activity,* 3(1972), pp. 585-640.

[35]For an example of the serious misuse and misinterpretation of the A-J equation, the reader is referred to Franco Modigliani, "Monetary Policy and Consumption: Linkages via Interest Rate and Wealth Effects in the FMP Model,"

Keynesian model had been used so often and so long by macroeconomic analysts that it evolved into conventional wisdom without being tested except on a piece-meal basis.

Suggestion for Further Research

Given the confusion that has arisen in connection with the A-J study, as well as the resulting upheaval of emotions, what might represent an appropriate direction for future research? One possible effort, given the interest in the monetarist "black box," would be for monetarists to develop and test theories relating to the mechanism whereby monetary and fiscal impulses are transmitted to the economy. Such studies could shed light on the meaning and significance of the monetarist propositions.[36]

The following list of steps as outlined by Professor James Murphy could serve as a guide to testing the model, since the objective is to understand the *modus operandi* of the effect of monetary and fiscal actions rather than to replicate economic experience:

(1) Specify the model in structural form and formulate postulates about its parameters;

(2) Derive the reduced form parameters as functions of the structural parameters;

(3) Derive the acceptance region for the reduced form parameters to satisfy the identifiability hypothesis;

(4) From the structural parameters and identifiability conditions, derive the acceptance region for the model;

(5) Define the appropriate tests for acceptance or rejection, then obtain estimates of the reduced form parameters;

(6) Determine whether the relevant background conditions hold, and accept or reject the model.[37]

This stands as an ambitious list, and is, of course, much easier said than done. Attempted use of this method of predictive testing of alternative models could shed considerable light on the monetarist-fiscalist controversy, especially as it relates to the transmission mechanism.

THE TRANSMISSION MECHANISM AND THE CONTROVERSY

One of the more interesting issues relating to the monetarist-fiscalist controversy is the assumed nature of the transmission mechanism. Even though Brunner lists the transmission mechanism as a separate issue in macroeconomics, it seems that the transmission issue is in a focal position so far as the controversy is concerned. Clarification of the assumed nature of the transmission mechanism can provide a better understanding of the other macroeconomic issues, in particular, the dominant impulse and aggregative vs. allocative issues.

Hicksian IS-LM Models

The Hicksian IS-LM model is the fundamental expository framework for virtually everyone who works and teaches in the field of macroeconomics.[38] A basic characteristic of this model is that the channels of monetary influence are restricted to interest rates and wealth. The primary channel of influence for fiscal actions, on the other hand, is via a direct effect on income. The IS-LM model is seldom used in its simplest form, but it does serve as a core model that helps to maintain order among the thought processes of the investigator. Its simplicity, as well as adaptability to a large number of problems, has accounted for its almost universal acceptance. Continued use of the IS-LM analysis in a form almost identical to that published in 1937 attests to its durability as a tool of macroeconomic analysis.

Attacks on the IS-LM model have been few and far between over the past 36 years. What is even more

Consumer Spending and Monetary Policy: The Linkages (Proceedings of a Monetary Conference Held on Nantucket Island, Sponsored by Federal Reserve Bank of Boston, June 1971), esp. pp. 59-74. Modigliani performs what he calls a Monte Carlo experiment (1) assuming that the solution values of the Federal Reserve-MIT-Penn (FMP) model are a true representation of the economic system, then (2) using these solution values as "data" and running an A-J type equation. The results of this experiment are an A-J equation of the usual type, i.e., a money multiplier equal to about 6 and a fiscal multiplier near zero. Modigliani's interpretation of his experiment is that reduced forms are subject to the danger of severe bias. An alternative interpretation is that the experiment demonstrates only that the FMP model is a "good" forecasting model, capable of generating simulated values very close to actual values. Until the FMP model is tested and confirmed as an explanatory economic model, such experiments carry little meaning.

[36]An example of an effort in this direction is Rasche, "Analysis of Some Monetarist Propositions." Though Rasche has not tested his model, he has developed hypotheses about economic behavior which appear to provide a basis for further investigation of monetarist propositions. See also an unpublished paper by Ronald J. Sutherland, "On The Effectiveness of Monetary and Fiscal Actions" (November 1973).

[37]Murphy, "Repeated Predictive Tests on an Econometric Model," also notes that if the model contains lagged endogenous variables, dynamic stability conditions are also a part of step (4).

[38]J. R. Hicks, "Mr. Keynes and the 'Classics': A Suggested Interpretation," *Econometrica*, Vol. 5 (1937), pp. 147-59. See also Karl Brunner and Allan H. Meltzer, "Mr. Hicks and the 'Monetarists,'" *Economica* (February 1973), pp. 44-59.

surprising is that the IS-LM model has not been tested as a unified set of hypotheses. This is not to say that individual relations embodied in the model have not been tested and estimated, but this procedure is a far different matter than applying the Basmann-Murphy method of predictive testing.

One critique of the IS-LM analysis is found in a comment by Professor David Meiselman at the first Federal Reserve Bank of Boston Monetary Conference in 1969.[39] Meiselman raises the following questions:

(1) Are IS and LM curves independent of each other?

(2) Is the IS curve negatively or positively sloped?

(3) How are price expectations effects taken into account in the IS-LM analysis?

Meiselman's criticisms apply to the IS-LM analysis as traditionally used. As a theoretical construct, the Hicksian model is not criticized. Rather, Meiselman tends to level his attack on users of the model, not on the model itself.

In summary, it appears that the Hicksian IS-LM model provides a convenient starting point for analyzing macroeconomic problems, even if it has never been subjected to predictive tests. If it is found that the traditional use and interpretation of the model leads to incorrect conclusions with respect to the formulation and implementation of stabilization policy, then there is good reason to question the usefulness and validity of the model in its simplest form. Unfortunately, it is difficult to point to a particular piece of published work that gets specific and forms a policy recommendation on the basis of the Hicksian model. This model almost always seems to be invoked after the fact.[40] One would think if a model is so universally applicable in *ex post* explanation, it would be used more widely as a predictive tool.

[39]David Meiselman, "Discussion," in *Controlling Monetary Aggregates* (Proceedings of the Monetary Conference Held on Nantucket Island, Sponsored by the Federal Reserve Bank of Boston, June 8-10, 1969), pp. 145-51. Milton Friedman was also critical of some aspects of the IS-LM analysis in "Interest Rates and the Demand for Money," *Journal of Law and Economics*, (October 1966), pp. 71-85. There are, no doubt, other critiques, but the fact so few come to mind suggests that such critiques have been rare over the last 36 years.

[40]For example, Teigen, in "A Critical Look," pp. 19-20, argues that observed parallel movements between money and interest rates are quite consistent with the basic IS-LM structure. This is very common procedure: manipulating the IS-LM model in such a way as to explain economic events after they happen. More often than not, these "explanations" are *not* logical implications of the model itself.

The Brunner-Meltzer Framework

For a number of years Professors Brunner and Meltzer have been critical of the traditional usage of the IS-LM model. The general nature of their objections is contained in their comment on Friedman's theoretical framework.[41] These objections are given more specifically in their presentation of an alternative framework.[42] In this article, Brunner and Meltzer develop a model that they propose as an alternative to the IS-LM framework.

The deficiencies of the IS-LM framework, according to Brunner and Meltzer, are as follows:[43]

(1) Bonds and real capital are treated as a single asset. Money substitutes only for bonds, not for existing assets or output.

(2) The theory has not been successfully confirmed.

(3) The only simultaneous solution for the price level and real output is the full-employment solution. The problem of persistent unemployment is not explained.

Brunner and Meltzer's objective in their article was to correct two of these three deficiencies, omitting consideration of (2).

Before examining Brunner and Meltzer's effort to correct these deficiencies, consider the possible reaction to this short list of deficiencies. Not enough time has passed for comments on the Brunner-Meltzer paper to appear, but it is not difficult to formulate a possible reaction to their characterization of the "standard model."

(1) True, the original Hicksian article focused on money-bond substitution, but the work of Professor Tobin represents an important extension of the Hicksian model to include substitution between money and real capital.[44]

[41]Karl Brunner and Allan H. Meltzer, "Friedman's Monetary Theory," *Journal of Political Economy* (September/October 1972), pp. 837-51. See also their "Mr. Hicks and the 'Monetarists.'"

[42]Karl Brunner and Allan Meltzer, "Money, Debt, and Economic Activity," *Journal of Political Economy* (September/October 1972), pp. 951-77. The work of Brunner and Meltzer relating to this alternative framework goes back many years. An early discussion of this framework, though not the first, is "The Place of Financial Intermediaries in the Transmission of Monetary Policy," *American Economic Review, Papers and Proceedings* (May 1963), pp. 372-82.

[43]A comparison of this list with the first two pages of their article, "Money, Debt, and Economic Activity," indicates a difference in the listing. In their article, deficiency (3) is listed under (1), and their third deficiency is that standard macro theory has not incorporated developments in monetary and price theory of the past two decades.

[44]See the relevant articles in James Tobin, *Essays in Macroeconomics*, Volume I (Chicago: Markham, 1972).

(2) This statement is not true because currently existing econometric models are essentially complex and detailed extensions of the IS-LM framework, and these models have proven successful.

(3) The inability of the IS-LM model to explain persistent unemployment is well-known. This model has long since been extended to determine the price level, output, and employment. "Extended" models, permitting determination of prices and output have become standard material in macroeconomic textbooks.

It is not hard to imagine the barrage of charges and countercharges that could be set in motion if this type of rejoinder appeared. And in the process, the significance of the Brunner-Meltzer contribution could easily be lost in the smoke of the argument.

The purpose of this section of the paper is to clarify a fundamental difference between the IS-LM model and the alternative framework developed by Brunner and Meltzer. First, the question of whether the IS-LM model has been confirmed is set aside in an effort to focus on the differences in specification of the two models. Second, the problem of output and employment determination is set aside for expository purposes. This procedure simplifies the problem by focusing on the differences between the two models as they relate to the determination of the demand for output at a given price level. To ignore these issues is not to say that they are unimportant; there should be general agreement to the contrary.

By the process of elimination we are left with the deficiency relating to the assumption of substitution between only money and bonds. The interpretation offered here is that this assumption is a key one differentiating the aggregate demand portion of the Brunner-Meltzer framework from the "traditional" IS-LM model.[45]

Why are Brunner and Meltzer so concerned with the money-bonds substitution assumption? The answer is that this assumption implies that the transmission mechanism from money to economic activity is limited to interest rates. The IS-LM model may be amended to include wealth effects, but the money-bonds substitution assumption places emphasis on a borrowing cost mechanism for transmitting monetary impulses. More generally, in an attempt to represent the essence of the operation of the economic system, limiting a model to only one relative price – the interest rate – is considered far too restrictive. The logical implications for the effects of monetary and fiscal actions, as well as other factors, are seriously limited if such impulses are permitted to be channeled to economic activity through the movement of only one relative price – the interest rate.

The procedure followed by Brunner and Meltzer to correct the "money-bonds" deficiency in the IS-LM model is to add a market for existing assets, or what they call the market for "existing real capital." By adding such a market, another relative price is added to the IS-LM model, broadening substantially its capabilities for testing hypotheses about the effects of monetary and fiscal actions and other exogenous impulses.[46]

By excluding the price of existing real capital, the traditional IS-LM model must either assume (1) that there is a perfect capital market whereby the price of existing real capital is always equal to the price of new production, or (2) that there is no market for existing capital.[47] The first assumption is a property of classical economic models where all costs of information and adjustment vanish, and defines what is generally known as long-run equilibrium. The second assumption, on the other hand, is more typical of Keynesian models.

By adding a market for existing real capital to the IS-LM model, the price relevant to that market is added to the list of variables that are potential arguments in each of the behavioral equations of the model. But the effect is much more significant than just adding another variable. One benefit is that the model can then be written in such a way as to separate the market for money from the market for

[45]The adjective "traditional" is used here to be representative of that class of IS-LM models which is used in macroeconomic textbooks. With very few exceptions, textbook IS-LM models build in the assumption of "money and bonds only" substitution. Furthermore, with the exception of Tobin, recent published articles by neo-Keynesians continue to give little emphasis to this assumption. See, for example, Teigen, "A Critical Look."

[46]The question may naturally arise as to how this price is measured, and measurement problems have no doubt been a factor underlying the neglect of this variable in macroeconomic analysis. In principle, such problems should be little greater than measuring "the price" applicable to new production. The development of the national income accounts to the neglect of balance sheet considerations has no doubt contributed to the development of theory in the direction of focusing on new production and its related price. But lack of data on the price of existing capital does not negate its role in the transmission mechanism. For a recent discussion of prices and price indices, see Armen A. Alchian and Benjamin Klein, "On a Correct Measure of Inflation," *Journal of Money, Credit and Banking* (February 1973), pp. 173-91.

[47]See the unpublished paper, Karl Brunner and Allan H. Meltzer, "The Inflation Problem" (March 1973), for discussion of this point.

credit.[48] In the opinion of Brunner and Meltzer, the relative role of these two markets has been one of the chief contributing factors to the confusion surrounding the monetarist – neo-Keynesian controversy.[49] And it is this separation that leads to logical implications which differ substantially from those derived from the traditional IS-LM analysis.

In the traditional IS-LM analysis, the credit market is the hidden, or "left-out," market. Or in Patinkin's work it is the bond market.[50] On occasion, failure to examine the implied credit market has resulted in the development of some very peculiar conditions which do not become obvious until the hidden market is explicitly derived.[51]

Brunner and Meltzer do not question the existence of the hidden credit market; rather, they are concerned with the limited nature of the transmission mechanism whereby monetary and fiscal actions affect economic activity in traditional IS-LM models. Every multimarket model has at least one redundant market, as long as Walras' law of markets is accepted. Brunner and Meltzer, after adding an additional asset – existing real capital – retain the option of maintaining the credit market as the redundant market. However, they choose to make the credit and money markets explicit, making the market for existing real capital the redundant market. With this choice they are able to examine thoroughly the factors which contribute to the nature of economic response to monetary and fiscal actions.

By examining the expanded model, the deficiencies implicit in the use of the traditional IS-LM model become apparent. Very generally, Brunner and Meltzer conclude that the effect of monetary and fiscal actions, as well as other exogenous impulses, depends on the price of existing real capital as well as the interest rate and the price of new production. (Recall that throughout this discussion the price of new production has been treated as a given, and its determination requires further extension of the model. This extension, of course, is provided by Brunner and Meltzer.) What is implied is that the nature of the response of the economy to monetary, fiscal, and other stimuli is conditioned by an enlarged number of considerations.

More specifically, the Brunner and Meltzer conclusions, as they relate to the aggregate demand portion of their model, can be summarized as follows:

(1) The interest elasticities (or slopes) of the traditional IS and LM curves are neither necessary nor sufficient for determining the response of aggregate demand for output (at a given price level for such output) to monetary and fiscal actions.

(2) The role of wealth or real balance effects in macroeconomic models is substantially changed when a market for existing real capital is introduced. In particular, the response of aggregate demand to monetary impulses need not depend on wealth effects (or interest elasticities of IS and/or LM).

(3) A maintained government deficit financed by issuing debt raises interest rates and the price of existing real capital. Consequently, fiscal multipliers are conditioned by considerations other than interest elasticities and wealth effects.

This is a partial restatement of Brunner-Meltzer's own summary. Their conclusions are more far-reaching than the above summary suggests. But the nature of these statements is interesting in that their conclusions, for the most part, list those factors that are relevant in testing hypotheses. For example, virtually all of the macroeconomic textbooks characterize the monetarist model as the "extreme" case where the interest elasticity of money demand is zero, for this is the only way to get a fiscal multiplier of zero. Acceptance of such a characterization of the monetarist model implies that the statistical significance of the interest elasticity of money demand becomes the crucial test of the monetarist model (at least with respect to its implications for fiscal policy). If this elasticity is not significantly different from zero, the hypothesis as it relates to fiscal impact has to be rejected. Brunner and Meltzer, in contrast, show that a zero interest elasticity of money is not necessary in order that the fiscal multiplier be zero.

Summary

The Brunner-Meltzer macroeconomic framework has been discussed at some length, but certainly not in detail, and contrasted with the traditional IS-LM

[48] It should be pointed out, however, that the term "money market" is a misnomer. In a money economy money is traded in every market; there is no "market" for money. For further discussion, see R. W. Clower, "A Reconsideration of the Microfoundations of Monetary Theory," *Western Economic Journal* (December 1967), pp. 1-8.

[49] For a comprehensive discussion of this essential distinction, see Albert E. Burger, *The Money Supply Process* (Belmont, California: Wadsworth Publishing Company, Inc., 1971).

[50] Don Patinkin, *Money, Interest, and Prices,* second edition (New York: Harper and Row, 1965).

[51] Carl Christ, "Monetary and Fiscal Policy in Macroeconomic Models," in *The Economic Outlook for 1969* (Papers presented to the Sixteenth Annual Conference on the Economic Outlook at the University of Michigan, November 14-15, 1968), pp. 93-112, and Bent Hansen, *A Survey of General Equilibrium Systems* (New York: McGraw Hill Book Company, 1970), esp. pp. 134-37.

analysis. However, it should be emphasized that only the short-run aggregate demand aspect of the Brunner-Meltzer model has been discussed here. This focus is very limited, for they have devoted substantial effort to delineating price and quantity adjustments in the output market and to longer-run considerations. As indicated earlier, such considerations are ignored here, but in no way is this meant to denigrate their importance.

CONCLUDING OBSERVATIONS

The focus of this paper is on recent macroeconomic controversy. A brief review of economic events and economic thinking in the period since World War II serves as background for elaboration of the nature of the controversy as it presently exists. A general observation developing out of this review is that particular economic events or experiences do have a substantial impact on the development of economic thought. A likely consequence of this immediacy of response to recent experience is that the profession can be misled for a considerable period of time. At all times the experience of economic history should be kept clearly in perspective.[52] It is in this connection that the extensive work by Friedman and Schwartz serves as a significant contribution to macroeconomics relative to that of econometric studies based on only 15 or 20 years of data.[53] However, studies with a long historical perspective tend to be ignored by policymakers who are preoccupied with solving short-run problems of economic stabilization.[54] Apparent lack of immediate relevance does not negate the operation of longer-run principles.

The second part of this paper identified those factors which appear relevant to the present controversy on the relative impact of monetary and fiscal actions. Several side issues were shown not to be directly relevant to the issues at hand. A gap has developed between monetarists and fiscalists that has tended to impede rather than advance the level of understanding relating to the role of monetary and fiscal actions.

It was concluded that methodological issues have been confused with the hypotheses. Specifically, questions of "reduced forms vs. structure" have sidetracked the discussion as well as introduced confusion as to just what a hypothesis is. Tracing the source of confusion to one side or the other is difficult and not particularly useful. It is probably to be expected that the advance of knowledge is almost always accompanied by confusion as the conventional wisdom comes under attack.[55]

In an attempt to clarify the issues, the final section of the paper discussed a portion of an alternative framework for macroeconomic analysis. This framework has been developed by Professors Brunner and Meltzer, and stands in contrast to the traditional IS-LM model. A market for existing real capital is explicitly incorporated in the Brunner-Meltzer model and the stabilization implications of monetary and fiscal actions are shown to be substantially broader than those of the IS-LM model.

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[52]For an example of perspective on the relation between money and prices covering the period from 500 B.C. to the early 1930s, see Anna J. Schwartz, "Secular Price Change in Historical Perspective," *Journal of Money, Credit and Banking* (February 1973), pp. 243-69.

[53]Milton Friedman and Anna Jacobson Schwartz, *A Monetary History of the United States: 1867-1960* (Princeton: Princeton University Press, 1963).

[54]Note the following statement by Fritz Machlup in Emil Claasen and Pascal Salin, eds., *Stabilization Policies in Interdependent Economics* (Proceedings of a conference held at the University of Paris-Dauphine, March 1972), p. 34: "While we are on the distinction between the short run and the long, I may be allowed to comment on the famous dictum by Keynes to the effect that we always live in the short run, and in the long run we'll all be dead. My counter-dictum is that the short run is awfully short and before long we'll all be terribly sick. This does not mean that we should forget about the short run, but it does mean that serious economics should deal chiefly with the long-run consequences of our public policy actions."

[55]This statement is not attributable to Harry Johnson, but the reader is referred to Harry G. Johnson, "The Keynesian Revolution and the Monetarist Counter-Revolution," *American Economic Review, Papers and Proceedings* (May 1971), pp. 1-14.

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