

# FEDERAL RESERVE BANK OF ST. LOUIS

APRIL 1975



# REVIEW



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# The FOMC in 1974: Monetary Policy During Economic Uncertainty

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**D**URING 1974 many uncertainties existed in the implementation of monetary policy. Foremost was the likely course of economic activity during the year. Economic forecasters, both private and government, badly misjudged actual economic developments. Forecasts throughout the year were quite varied and were frequently revised.

Another uncertainty involved the question of the appropriate rate of growth of the monetary aggregates. Some analysts viewed the downturn in output to be the result of supply constraints, and concluded that, in view of the accelerating rate of inflation, a slower rate of growth of money was appropriate. Other analysts held the view that the cause of the decline in real output was inadequate aggregate demand, and thereby urged more rapid monetary expansion.

The Federal Open Market Committee (FOMC) was thus faced with an unusually high degree of uncertainty in adopting monetary actions which were considered consistent with the agreed-upon goals for the economy.<sup>1</sup> Monetary actions were taken which the Committee considered consistent with long-run objectives for monetary growth. Specific instructions were given to the Trading Desk to achieve, over periods of two months, growth of RPDs and the money stock (both  $M_1$  and  $M_2$ ) within specified ranges, and to maintain the Federal funds rate within specified limits until the subsequent meeting of the Committee.<sup>2</sup> Money, however, frequently did not grow as was planned, which was another problem which plagued the FOMC throughout much of 1974.

This article first reviews forecasts of private and government economists, including the staff of the FOMC, throughout the year and traces the gradual deterioration in the outlook. Next, the question of uncertainty regarding the appropriate growth of the money stock is examined. Finally, the uncertainty

regarding the response of the money stock to policy actions is discussed.

## UNCERTAINTY REGARDING THE STATE AND DIRECTION OF THE ECONOMY

### *Initial Predictions*

In the closing days of 1973, forecasters were hedging their predictions more than usual because of the uncertain impact of the oil embargo and the associated "energy crisis." Most economists believed that the U. S. economy would grow more slowly in 1974 than it did in 1973, with most of the rise in gross national product (GNP) accounted for by prices rather than output. This was the consensus among the eleven economists assembled by the Conference Board late in 1973, and was typical of the forecasts of other leading economists.

While many foresaw much slower growth in output, on average, in 1974, few accurately predicted the extent of the actual decline. The Conference Board forecasted a rise in nominal GNP of just under 8 percent — 5.3 percent in prices and 2.3 percent in real growth. Actual growth in GNP during the year ending fourth quarter 1974 was 6.5 percent — a 12 percent increase in prices and a 5 percent *decline* in real output.

Herbert Stein, then Chairman of the President's Council of Economic Advisers, predicted late in 1973 that unemployment would approach 6 percent in 1974, but not exceed that figure. James Meigs, then vice president and economist for Argus Research Corporation, projected an unemployment rate that would peak at about 5.5 percent. The actual level of unemployment in December 1974 was 7.1 percent of the labor force.

Most people were forecasting a slowdown rather than a recession for 1974. In December 1973 the FOMC staff was also inclined to accept this view, but in less specific terms: "Staff projections suggested that economic activity would weaken further in the first half of 1974 and that prices would rise appreciably, in part because of curtailment in oil supplies."

As the first quarter was drawing to a close, there was still no agreement among private economists as

<sup>1</sup>The "Record of Policy Actions", which in 1974 was released to the public usually three months after each FOMC meeting and subsequently published in the Federal Reserve *Bulletin*, contained a brief outline of observed and projected economic conditions as well as a description of the monetary actions taken by the FOMC.

<sup>2</sup> $M_1$  is demand deposits and currency held by the nonbank public.  $M_2$  is  $M_1$  plus net time deposits. Because of the discontinuities of the series, reserves available to support private nonbank deposits (RPDs) are omitted from the discussion presented here.



to the extent of the slowdown in the economy. Lionel D. Edie & Co., Investment Counselors and Economic Consultants, estimated that real output in the first quarter would decline at a 6.6 percent annual rate, while econometric forecasters at Georgia State University anticipated a decline of only 1 percent.

### *Forecast Adjustments During 1974*

Projections made in March for the second half of 1974 continued to substantially overestimate growth in the economy. Wharton economists had one of the "gloomiest" views, but still considerably understated price increases and overstated real economic growth. Recession would persist in the first half of the year, according to Wharton, but during the second half there would be real growth of about 1 percent. Other private forecasters were even farther off-target than Wharton. Data Resources expected a substantial dip in first quarter real product growth, but forecasted a rise at a 1.9 percent rate in the second quarter, and by fourth quarter they foresaw real output *rising* at a 6.4 percent annual rate.

The FOMC staff projections at the March meeting were somewhat more cautious than the other projections cited above. "Staff projections, like those of 4 weeks earlier, suggested that real output would change little in the second quarter and that the rise in prices would remain rapid." The termination of the embargo on oil shipments to the United States was expected to have no more than a marginally expansive impact on overall real output until the summer, although the automobile and housing markets were expected to strengthen sooner.

At midyear most forecasters were still apprehensive about the prevailing economic situation. GNP had increased at only a 6 percent annual rate during the first half of 1974, with prices rising at almost an 11 percent rate and real output *declining* at over a 4 percent annual rate.

Most private forecasters continued to believe that real output would rise slightly and that the rate of increase in prices would slow somewhat during the remainder of the year. First National City Bank predicted a rise in the unemployment rate to possibly 6 percent by the end of 1974, with no growth in output during that period.

At the July meeting, the FOMC staff presented projections suggesting that in the second half of the year "real economic activity would grow at a minimal pace and that prices would increase less rapidly than in the first half." Since an upturn in residential con-

struction was no longer expected, and a somewhat greater decline in net exports was now anticipated, real economic activity was projected to grow somewhat less than had been projected four weeks earlier.

In early August, Gerald Ford replaced Richard Nixon as President. The change in Administrations appeared to give the country a psychological lift, especially since President Ford had indicated that high priority would be given to bringing inflation under control.

Despite the psychological lift, the Argus Research Corporation commented in early August that "we now expect the consumer price index to be rising at a 10.3 per cent annual rate in the fourth quarter," instead of the 7.2 percent forecasted earlier. Michael Evans, chief economist for Chase Econometrics, contended that recession "will stay with us for the rest of the year."

Even as late as mid-October, forecasters were still underestimating inflation and overstating the level of economic activity. Herbert E. Neil, Jr., vice-president and economist at Harris Trust and Savings Bank, Chicago, forecasted an unemployment rate of 6 percent of the work force by the end of 1974. He also predicted that automobile sales would decline sharply in the fourth quarter.

Even as pessimistic as they appeared throughout the year, most forecasters were continually more optimistic than proved to be warranted. Special factors causing the declines in real output were accurately estimated by few, if any, economists. Thus, throughout 1974 the Federal Open Market Committee, in establishing monetary policy, was faced with great uncertainty regarding the economic outlook.

### **UNCERTAINTY REGARDING APPROPRIATE MONETARY GROWTH**

The inaccuracies in economic forecasts left many uncertainties regarding appropriate growth of monetary aggregates during 1974. Much of the disagreement among analysts regarding growth of the aggregates stemmed from disagreement regarding the basic causes of the inflation-recession situation. Those who believed the contraction in output was induced by insufficient demand called for more rapid monetary growth. These analysts based their judgment on movements in such measures as real money balances, income velocity, and market interest rates.

Another school of thought contended that for the most part the recession was supply-induced; continu-



## Organization of the Committee in 1974

The Federal Open Market Committee (FOMC) consists of the seven members of the Federal Reserve Board of Governors and five of the twelve Federal Reserve Bank Presidents. The Chairman of the Board of Governors is also, by tradition, Chairman of the Committee. The President of the New York Federal Reserve Bank is a permanent member of the Committee and, also by tradition, is its Vice-Chairman. All other Federal Reserve Bank Presidents attend the meetings and present their views, but votes may be cast by only four of these Presidents, who serve as members for one-year terms on a rotation basis.

Members of the Board of Governors for 1974 included Chairman Arthur F. Burns, Vice Chairman George W. Mitchell, Andrew F. Brimmer, Jeffrey M. Bucher, Robert C. Holland, John E. Sheehan, and Henry C. Wallich. Mr. Wallich assumed his duties March 8, replacing J. Dewey Daane whose term expired January 31. On October 29, Philip E. Coldwell succeeded Andrew F. Brimmer, who resigned effective August 31 from the Board of Governors. In addition to Alfred Hayes, President of the Federal Reserve Bank of New York, the following Presidents served on the Committee during January and February 1974: John J. Balles (San Francisco), Darryl R. Francis (St. Louis), Robert P. Mayo (Chicago), and Frank E. Morris (Boston). In March the Committee was reorganized and the four rotating positions were filled by the following members: Robert P. Black (Richmond), George H. Clay (Kansas City), Monroe Kimbrel (Atlanta), and Willis J. Winn (Cleveland).

The Committee met regularly once each month during 1974 to discuss economic trends and to decide upon the future course of open market operations. As in previous years, occasional telephone or telegram consultations were held between regular meetings. Additional policy actions for subsequent weeks and months were generally discussed at these interim meetings. During each regular meeting, a directive was issued to the Federal Reserve Bank of New York stating the general economic goals of the Committee and providing general guidelines as to how the Manager of the System Open Market Account<sup>1</sup> at the New York Federal Reserve Bank should conduct open market operations to achieve these goals. Each directive contained a short review of economic data considered and the general economic goals sought by the Committee. The last paragraph gave operating instructions to the Account Manager. These instructions were stated in terms of bank reserve and money market conditions which were considered consistent with the achievement of desired growth rates of monetary aggregates. Any special factors, such as Treasury financing operations, were also taken into account.

<sup>1</sup>The Manager of the System Open Market Account may be referred to as the "Account Manager" and the Trading Desk of the New York Federal Reserve Bank as the "Desk."

The decisions on the exact timing and amount of daily buying and selling of securities in fulfilling the Committee's directive are the responsibility of the System Open Market Account Manager at the Trading Desk of the New York Bank. Each morning, the Account Manager and his staff decide what open market operations, if any, are to be undertaken that day. In developing this program, money and credit market conditions and aggregate targets desired by the Committee are considered, as well as other factors which may be of concern at that time. Each morning in a conference call, the Account Manager informs one voting President and staff members of the Board of Governors about present market conditions and open market operations which he proposes to execute that day. Other members of the Committee are informed of the daily program by wire summary.

A summary of the Committee's actions is presented to the public in the "Record of Policy Actions" of the Federal Open Market Committee. In 1974 the "Record" for each meeting was released about 90 days after the meeting and was published in both the Annual Report of the Board of Governors of the Federal Reserve System in spring and in the Federal Reserve *Bulletin* each month. The "Record" for each meeting generally includes:

- 1) a staff summary of recent economic developments, such as prices, employment, industrial production, and components of the national income accounts; projections concerning real output growth for one or two quarters ahead; and prospective financial developments;
- 2) a discussion of the U.S. balance of payments and international financial developments;
- 3) a discussion of interest rate movements;
- 4) a discussion of open market operations and growth of reserve aggregates since the last meeting;
- 5) a discussion of the movements of monetary aggregates such as  $M_1$  and  $M_2$ , and the adjusted credit proxy;<sup>2</sup>
- 6) conclusions of the FOMC;
- 7) a policy directive issued by the FOMC;
- 8) a list of the voting position of members and any dissenting comments;
- 9) a description of any actions and consultations that may have occurred between the regularly scheduled meetings.

<sup>2</sup> $M_1$  refers to the money stock, defined as private demand deposits plus currency in the hands of the nonbank public.  $M_2$  refers to money stock plus net time deposits. Net time deposits are defined as total deposits at all commercial banks minus large time certificates of deposit at large weekly reporting commercial banks. Adjusted credit proxy is defined as member bank deposits subject to reserve requirements plus bank-related commercial paper, Euro-dollar borrowings of U. S. banks, and certain other non-deposit items.



ing inflation indicated excessive aggregate demand, and therefore called for less rapid monetary growth. They cited the many shocks to the economy which occurred during the year and in the immediately preceding year as factors limiting the output of goods and services.

The January 1974 issue of First National City Bank's *Monthly Economic Letter* highlighted the conflict faced by policymakers last year: "To prevent inflation from making the slowdown or recession even deeper in this country, the growth of the money stock would have to be accelerated to a rate substantially higher than that of 1973. More rapid monetary expansion, to be sure, promotes and validates inflation." First National City Bank also pointed out that the task of the Federal Reserve was especially difficult during the cyclical currents that existed then. They contended that, historically, undue monetary expansion during recessions has proved to be the "ultimate folly." Also, in the short run, a recession caused by supply constraints would probably not respond to rapid growth in the money supply.

This conflict of views was evident in the FOMC deliberations. For example, in their dissents to the directive adopted at the February 20 meeting, Governors Bucher and Sheehan and President Morris "... expressed concern about current and prospective weakness in aggregate economic demands." On the other hand, President Francis in dissenting "... expressed the view that the over-all economic situation was stronger than suggested by the staff projections and that inflation remained the major long-term economic problem."

### *Insufficient-Aggregate-Demand View of Downturn*

One group of observers advised that rapid money growth was appropriate last year because their analyses led them to attribute the downturn to insufficient growth of aggregate demand. A continuing decrease in real money balances, a slower growth in income velocity, and high market interest rates were cited by various analysts as evidence in support of the weak-aggregate-demand view.

**Real Money Balances Argument** — Real money balances (money stock divided by some index of the price level,  $M/P$ ) decreased in the last half of 1973 and continued to decrease throughout 1974. Some analysts argued that such a decrease had a marked retarding effect on growth of aggregate demand last

year. Their argument is as follows: People desire to hold some given level of "real" money balances as part of their asset portfolio. When *actual* real money balances decline, and if there is no change in *desired* real balances, spending on goods and services will be restricted in an attempt to restore real money balances to the desired level. Efforts to do so would cause a decline in total spending, output, and, ultimately, the price level. The proponents of this view argued such was the case in 1973 and 1974.

A decline in real money balances can occur through changes in either the numerator or denominator of this expression: either the growth of nominal money balances slows relative to the rate of change of prices, or the rate of inflation accelerates while growth of the money stock is relatively steady. During most of 1974 the decline in the ratio of the money stock to the price level was due to prices accelerating sharply relative to growth of the money stock. In other periods since World War II when real money balances declined preceding a recession, the money stock was declining or was growing at a rate slower than previously, but prices were relatively stable.

The real balance argument presents a fundamental policy dilemma. On the one hand, in order to avoid a severe economic contraction the monetary authorities should increase the money stock rapidly so as to restore growth in real balances. On the other hand, since the growth of money determines the rate of inflation, an infusion of "unwanted" money would only add fuel to the inflation.<sup>3</sup> In essence, the crucial question is whether an observed decline in real balances is the result of a voluntary action on the part of the public.

**Income Velocity Argument** — Income velocity (nominal GNP divided by the money stock) in 1974 grew at a rate about half that of 1973. A group of analysts argued that given actual money growth, this decline in velocity growth depressed growth of aggregate demand. This argument is similar to the real money balances one, in which these measures are used as indicators of slackening aggregate demand. Since both measures incorporate prices and money, they often lead to similar conclusions.

Those who advance the velocity argument assert that velocity is a proxy measure for desired money balances. A slower growth of velocity is said to re-

<sup>3</sup>For further explanation see Denis S. Karnosky, "Real Money Balances: A Misleading Indicator of Monetary Policy Actions," this *Review* (February 1974).



fect an increase in desired money balances relative to income. It is argued that if the level of actual money balances is constant, but individuals want to increase their holdings of money, they will decrease their spending on goods and services so as to achieve their desired level of money balances.

The slower growth in velocity last year represented, according to proponents of this view, an increase in *desired* money balances relative to income; thus a more rapid growth in the money supply should have occurred last year if growth of aggregate demand was not to slow down. On the other hand, the slower growth in measured velocity during 1974 may have been a temporary phenomenon resulting from the increased economic and political uncertainty prevailing in this period. In such a case, a faster growth in money would have led to even greater inflation as velocity returned to its previous trend.

**Interest Rate Argument**—From mid-March to early July, market interest rates climbed at a steady pace. Then, from midyear through the end of the year, short-term interest rates declined sharply, while long-term interest rates fell very slowly. A large group of economists argued that such a rise in interest rates, particularly long-term rates, represented an overly restrictive monetary policy tending to curtail future aggregate demand. As a result of this type of analysis, they argued for faster money growth in order to achieve lower interest rates than the levels prevailing during early 1974.

A counter argument is that the rapidly rising long-term interest rates in the first half of 1974, and their failure to decline significantly in the last half of the year, was primarily the result of a high and increasing rate of inflation which led to a larger inflation premium in market interest rates. This argument contended that faster money growth would add to the already excessive rate of inflation and, ultimately, result in even higher interest rates.

The proponents of the interest rate view were not impressed by the inflation premium view of high market interest rates. For example, in analyzing monetary policy in mid-1974 Professor James Tobin of Yale University stated, "I have only tried to indicate that the policy [of the Federal Reserve] contains more bite and cost and risk than one might suspect from superficial comparisons of interest rates and rates of inflation."<sup>4</sup>

<sup>4</sup>James Tobin, "Inflation, Interest Rates, and Stock Values," *The Morgan Guaranty Survey* (July 1974), pp. 4-7.

## Supply-Constraint View of Downturn

In contrast to those holding the insufficient-aggregate-demand view of the downturn, another group of analysts argued that aggregate demand was strong, as indicated by the accelerating inflation, but there existed many special factors tending to limit production of goods and services last year. This group argued that the downturn mainly reflected the influence of these supply factors during the first three quarters of the year.

Early in 1974, Chairman Arthur F. Burns presented the following analysis to the Joint Economic Committee:

The current economic slowdown, however, does not appear to have the characteristics of a typical business recession. To date, declines in employment and production have been concentrated in specific industries and regions of the country rather than spread broadly over the economy. In some major sectors the demand for goods and services is still rising. Capital spending plans of business firms remain strong and so do inventory demands for the many materials and components in short supply.

Chairman Burns then concluded:

A highly expansive monetary policy would do little to stimulate production and employment; but it would run a serious risk of rocking financial markets, of causing the dollar to depreciate in foreign exchange markets, and of intensifying our already dangerous inflationary problem.

At midyear President Darryl R. Francis, in an address to the Steel Plate Fabricators Association, argued that

... the economy is fundamentally very strong and there is more than adequate aggregate demand to promote real expansion. I view the slower growth in real output after the first quarter of 1973 as being attributable to the economy operating 'flat-out' at full capacity in an environment where price and wage controls severely reduced the efficiency of the market system in allocating resources in the production process.

I do not see how the existence of wide-spread shortages of commodities and sharply rising prices can be viewed as characteristics of weak aggregate demand. The sharp drop in real output in the first quarter of this year was clearly the result of the oil boycott and related developments such as the truckers' strike, the allocation program, and the presence of controls on both prices and resource movements. Only a few industries were affected and all of them were energy related. Furthermore, unemployment in the first few months of this year was much smaller than one would have expected if the sharp drop in real output had been widespread and had resulted from fundamental weakness in the economy.



## UNCERTAINTY REGARDING RESPONSE OF MONEY TO POLICY ACTIONS

Throughout the year the FOMC outlined its objectives concerning open market operations to the System Account Manager in the domestic policy directive issued at each meeting. The policy consensus and operating instructions, as well as the dissents for each meeting, are presented in Exhibit I. Specifically, the directions to the Desk were in terms of a Federal funds range during the intermeeting period and a range of tolerance for growth of  $M_1$  and  $M_2$  over the subsequent two months. These ranges were considered to be consistent with the FOMC's longer-run growth of money. The ranges set at each meeting, in addition to the actual growth of the variables, are shown in accompanying charts, p. 10.

Growth of  $M_1$  was very rapid in the first half of 1974, but decelerated sharply in the second half. Short-run growth of money was frequently outside the specified ranges during the last half of the year, which raised questions regarding the degree of responsiveness of money stock to Federal Reserve actions.

### *First Half of 1974*

At the January meeting of the FOMC, a staff analysis suggested that "growth in the demand for money over the first half of 1974 was likely to be somewhat greater than had been expected earlier." It appeared likely to the Committee that if  $M_1$  were to grow at a rate consistent with the longer-run objectives for monetary aggregates,<sup>5</sup> money market conditions would tighten somewhat in the period immediately ahead. In response to these observations, the Committee adopted ranges of tolerance for growth rates of  $M_1$  and  $M_2$  over the January-February period of 3 to 6 percent and 6 to 9 percent, respectively. They also decided that "in the period until the next meeting the weekly average Federal funds rate might be permitted to vary in an orderly fashion from as low as 8¾ per cent to as high as 10 per cent, if necessary, in the course of operations."

Noting the decline in  $M_1$  in January, the Committee adopted ranges of tolerance for the February-March period which were considerably greater than the ranges set for the January-February period. Two special consultations occurred between the February and March meetings. On March 1, "a majority of the available Committee members concurred in the Chair-

man's recommendation that, in light of the marked rise in short-term interest rates that had occurred since the February meeting and of the highly sensitive state of the financial markets, reserve-supplying operations for the time being should be conducted in a manner expected to be consistent with maintenance of the Federal funds rate at about the 9 per cent level that had prevailed over the preceding 3 weeks."

On March 11 the FOMC consensus was that "in response to evidence that strong growth in the monetary aggregates was persisting, . . . the Account Manager was instructed to proceed very cautiously in operations thought likely to be consistent with a rise in the weekly average Federal funds rate above 9 per cent."

The regular meeting in March was the first following the election of new voting members of the FOMC. The staff analysis suggested the following at this meeting: ". . . estimates of the likely strength of money demands over the spring and summer and of the relationships between monetary growth rates and market interest rates were subject to larger margins of error than usual because of the greater uncertainty attached to projections of nominal GNP . . ." The ranges of growth for the aggregates for the March-April period were lower than for the February-March period. The Federal funds range established at the March meeting was higher than the range set at the February meeting.

While the Desk was supplying reserves to maintain the Federal funds rate as desired, the money stock was expanding at an extremely rapid rate. During the two months prior to the April FOMC meeting, the money stock expanded at an 11 percent annual rate.<sup>6</sup> Also, during the intermeeting period, the prime rate at most large commercial banks rose from 8¾ percent to 10 percent.

The range of tolerance for  $M_1$  for the April-May period was 3 to 7 percent, which was lower than the band set for  $M_1$  for the March-April period. The range for  $M_2$  was 5½ to 8½ percent. A one percentage point range was adopted for Federal funds, with the upper limit at 10¾ percent. "The longer-run growth rate for  $M_1$  accepted by the Committee was revised upward slightly. . . ."

"Subsequent to the meeting it appeared that in the April-May period the annual rates of growth in the monetary aggregates would be above the upper limits

<sup>5</sup>The longer-run objectives for the monetary aggregates are never explicitly stated in the "Record of Policy Actions."

<sup>6</sup>Compounded annual rate of change for the 4 weeks ending February 13 to the 4 weeks ending April 10.



## EXHIBIT I

## FOMC ECONOMIC POLICY DIRECTIVE — 1974

Date of FOMC Meeting	Policy Consensus	Operating Instructions	Dissents
January 21-22	In light of the foregoing developments, it is the policy of the Federal Open Market Committee to foster financial conditions conducive to resisting inflationary pressures, cushioning the effects on production and employment growing out of the oil shortage, and maintaining equilibrium in the country's balance of payments.	To implement this policy, while taking account of the forthcoming Treasury financing and of international and domestic financial market developments, the Committee <u>seeks to achieve bank reserve and money market conditions consistent with moderate growth in monetary aggregates over the months ahead.</u>	. . . Mr. Hayes and Mr. Francis indicated that they favored no change in the Committee's longer-run objectives for growth in the monetary aggregates. . .
February 20	. . . to foster financial conditions conducive to resisting inflationary pressures, cushioning declines in production and employment that are being induced in large part by the oil situation, and maintaining equilibrium in the country's balance of payments.	. . . while taking account of international and domestic financial market developments, the Committee <u>seeks to achieve bank reserve and money market conditions consistent with moderate growth in monetary aggregates over the months ahead.</u>	Messrs. Bucher, Morris, and Sheehan expressed concern about current and prospective weakness in aggregate economic demands. . . Mr. Francis expressed the view that the over-all economic situation was stronger than suggested by the staff projections. . .
March 18-19	. . . to foster financial conditions conducive to resisting inflationary pressures, supporting a resumption of real economic growth, and maintaining equilibrium in the country's balance of payments.	. . . while taking account of international and domestic financial market developments, including the prospective Treasury financing, the Committee <u>seeks to achieve bank reserve and money market conditions that would moderate growth in monetary aggregates over the months ahead.</u>	NONE
April 15-16	NO CHANGE	. . . while taking account of the forthcoming Treasury financing and of international and domestic financial market developments, the Committee <u>seeks to achieve bank reserve and money market conditions that would moderate growth in monetary aggregates over the months ahead.</u>	NONE
May 21	. . . to foster financial conditions conducive to resisting inflationary pressures, supporting a resumption of real economic growth, and achieving equilibrium in the country's balance of payments.	. . . while taking account of developments in domestic and international financial markets, the Committee <u>seeks to maintain about the prevailing restrictive money market conditions, provided that the monetary aggregates appear to be growing at rates within the specified ranges of tolerance.</u>	NONE
June 18	NO CHANGE	. . . while taking account of developments in domestic and international financial markets, the Committee <u>seeks to maintain about the prevailing restrictive money market conditions, provided that the monetary aggregates appear to be growing at rates within the specified ranges of tolerance.</u>	Mr. Clay dissented from this action because he thought that for too long the Committee had accepted rates of growth in the monetary aggregates that would result in a continuing and growing inflation.  Absent and not voting: Mr. Hayes. (Mr. Debs voted as alternate for Mr. Hayes.)



July 16	NO CHANGE	<p>. . . while taking account of the forthcoming Treasury refunding and of developments in domestic and international financial markets, the Committee seeks to achieve bank reserve and money market <u>conditions that would moderate growth in monetary aggregates</u> over the months ahead.</p>	<p>. . . Mr. Bucher said he favored maintaining a generally restrictive policy stance in order to combat inflation. However, he thought that that longer-run objective would be best served by seeking in the short run to maintain growth in the monetary aggregates at recent rates; in his view, further efforts to moderate monetary growth at this point would involve an unduly high risk of creating economic conditions that would necessitate a marked relaxation of policy.</p> <p>Absent and not voting: Mr. Brimmer.</p>
August 20	NO CHANGE	<p>. . . while taking account of developments in domestic and international financial markets, the Committee seeks to achieve bank reserve and money market <u>conditions consistent with moderate growth in monetary aggregates</u> over the months ahead.</p>	<p>NONE</p> <p>Absent and not voting: Mr. Brimmer.</p>
September 10	NO CHANGE	<p>. . . while taking account of developments in domestic and international financial markets, the Committee seeks to achieve bank reserve and money market <u>conditions consistent with moderate growth in monetary aggregates</u> over the months ahead.</p>	<p>Mr. Hayes . . . observed that inflation and inflationary expectations continued unabated whereas the probabilities, in his view, were against the development of a severe recession.</p>
October 14-15	NO CHANGE	<p>. . . while taking account of the forthcoming Treasury financing and of developments in domestic and international financial markets, the Committee seeks to achieve bank reserve and money market <u>conditions consistent with resumption of moderate growth in monetary aggregates</u> over the months ahead.</p>	<p>Mr. Clay . . . expressed the opinion that the recent shortfalls in growth of <math>M_1</math> were not due entirely to the weakness in economic activity but were, at least in part, a lagged response to the high levels of short-term interest rates prevailing in the spring.</p>
November 19	NO CHANGE	<p>. . . while taking account of developments in domestic and international financial markets, the Committee seeks to achieve bank reserve and money market <u>conditions consistent with moderate growth in monetary aggregates</u> over the months ahead.</p>	<p>NONE</p>
December 16-17		<p>. . . to foster financial conditions conducive to resisting inflationary pressures, cushioning recessionary tendencies and encouraging resumption of real economic growth, and achieving equilibrium in the country's balance of payments.</p> <p>. . . while taking account of developments in domestic and international financial markets, the Committee seeks to achieve bank reserve and money market <u>conditions consistent with somewhat more rapid growth in monetary aggregates</u> over the months ahead than has occurred in recent months.</p>	<p>Messrs. Mitchell and Wallich . . . both believed that the economic situation and outlook called for a more stimulative monetary policy.</p>



of the ranges that had been specified by the Committee." During late April the rate at which Federal funds were trading seemed likely to exceed the range set at the April meeting and the System Account Manager reported that "in order to bring the funds rate back within the range of tolerance he would have to expand reserve-supplying operations, thus stimulating further growth of the monetary aggregates."

On April 24, in view of the continued pressure in the money market, and given the increase in the discount rate announced that day by many Reserve Banks, a majority of the Committee concurred in the Chairman's recommendation to raise the upper limit of the Federal funds constraint  $\frac{1}{4}$  percentage point to 11 percent. Then, on May 17 "Chairman Burns recommended that the Committee take note of the difficulties faced by the System Account Manager in recent days and, in view of the likelihood that those conditions would persist over the next few days, that it change the ceiling guideline for the funds rate from 11 to 11 $\frac{1}{4}$  per cent."

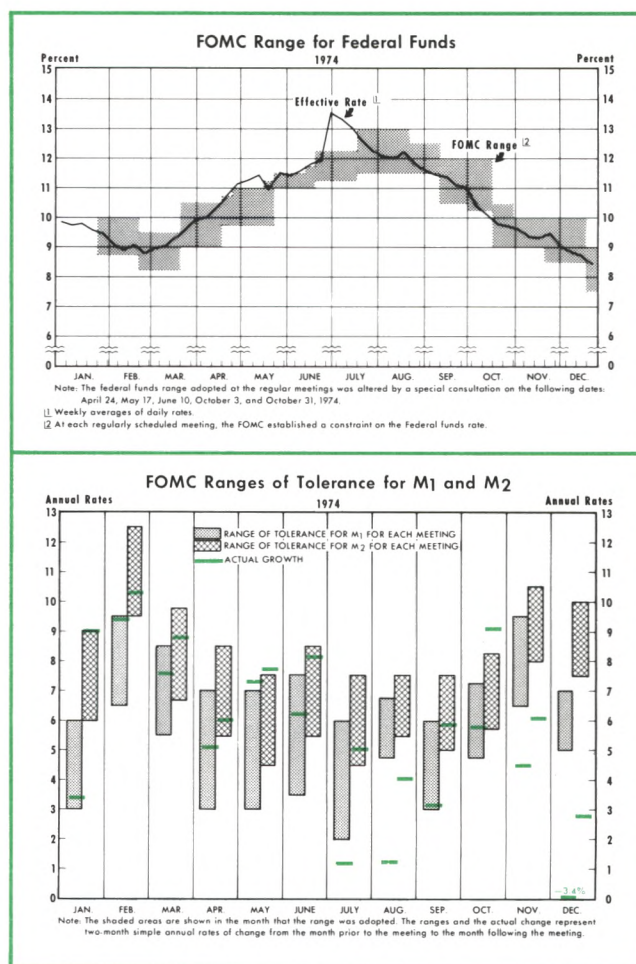
Between the April and May FOMC meetings, the prime bank loan rate increased 6 times, rising from 10 to 11.5 percent. Interest rates on commercial paper and large CDs also rose substantially during the inter-meeting period. The steady rise in interest rates, which began in late February, continued despite an increase in the money stock at an 8.7 percent annual rate in the three months immediately preceding the May meeting.<sup>7</sup> Member bank borrowings increased almost \$1.5 billion in the two weeks prior to the May meeting.<sup>8</sup>

The Federal funds constraint adopted at the May meeting permitted only a one-half of one percentage point variance. The Committee "decided that—in view of the sensitive state of financial markets and the considerable tightening in money market conditions that had occurred over recent months—greater emphasis than usual should be placed on money market conditions during the period until the next meeting . . . ."

A staff analysis at the May meeting suggested that "the maintenance of prevailing money market condi-

<sup>7</sup>Compounded annual rate of change for the 4 weeks ending February 13 to the 4 weeks ending May 15.

<sup>8</sup>In hearings before the Committee on Banking and Currency of the House of Representatives in July 1974, Alfred Hayes, President of the Federal Reserve Bank of New York, stated "taking the period from mid-May to mid-July, System open market operations added approximately \$1.2 billion to reserves and coincidentally Franklin's borrowings from the Federal Reserve Bank increased in about the same order of magnitude."



tions would be associated with a dampening in the rate of growth of money because the demand for money was likely to be restrained by the lagged effects of the sharp rise in short-term market rates of interest" that had occurred recently. The Federal funds range was widened to  $\frac{3}{4}$  percentage point on June 10, as the upper limit was raised to 11 $\frac{3}{4}$  percent.

At the June meeting, the staff observed that the existing money market conditions "would be associated with some slowing in the rate of growth of the narrowly defined money stock over the months ahead, because the demand for money was likely to be restrained by the lagged effects of the rise in short-term market rates of interest that had occurred over the past few months." In view of these conditions the Federal funds rate was allowed to vary between 11 $\frac{1}{4}$  percent and 12 $\frac{1}{4}$  percent in the period until the next meeting. The ranges of tolerance adopted for M<sub>1</sub> and M<sub>2</sub> for the June-July period were 3 $\frac{1}{2}$  to 7 $\frac{1}{2}$  percent and 5 $\frac{1}{2}$  to 8 $\frac{1}{2}$  percent, respectively.

During the first half of 1974, the accompanying charts indicate that the FOMC was successful in



achieving both the Federal funds rate and money growth targets. The error in May in the aggregates was very slight, especially when the four data revisions during the year are considered. Also during May, the Federal funds rate slightly exceeded its range. The notable error in achieving the Federal funds target came in late June and early July, but the Committee tolerated this deviation. In a telephone consultation on July 5 the Committee noted the Manager's report that "... the high level of the funds rate was a reflection of the great uncertainty prevailing in both domestic and foreign financial markets, compounded by the effects of market transactions related to the midyear statement date for banks and by the July 4 holiday. In view of the likelihood that the high level of the rate was primarily a consequence of technical factors that might well prove temporary, the Committee concluded that there was no immediate need to press hard to bring the funds rate down within the specified range of tolerance."

### *Second Half of 1974*

Chairman Arthur Burns commented before the Joint Economic Committee in early August that "clearly, the American economy is not being starved for funds. On the contrary, growth of money and credit is still proceeding at a faster rate than is consistent with general price stability over the longer term." Based on current data, the growth of the money stock was at a 10.9 percent annual rate during June. According to the "Record of Policy Actions" a major part of the step-up was attributable to a temporary increase in foreign official deposits arising from payments to oil exporters.<sup>9</sup>

At the August meeting, "a staff analysis suggested that the unusually slow pace of monetary growth in July was not likely to persist in view of the continued sizable rate of growth in prospect for nominal GNP; in fact, data available for early August indicated that some strengthening had occurred already." The range of tolerance for  $M_1$  and  $M_2$  was only 2 percentage points for the August-September period, compared with the 4 percentage point spread for  $M_1$  during the July-August period.

The Board of Governors announced on September 4 the removal of its 3 percent marginal reserve requirement on certificates of deposit in denominations of \$100,000 or more with maturities of four months or

longer. The action reduced the volume of required reserves by about \$400 million.

Although many of the economists at the White House Summit Conference in early September called for monetary ease, Edwin L. Dale, Jr., of the *New York Times* reported that "high Federal Reserve officials have gone out of their way to point out, for the first time, that the Reserve's highly restrictive monetary policy has already been eased to a significant degree, and they add that no 'substantial' further easing is to be expected." The money stock grew at a 1.5 percent annual rate from June to August compared to the 6.7 percent growth in the first half of the year. The ranges for  $M_1$  and  $M_2$  were 3 and 2½ percentage points wide, respectively, for the September-October period. The Federal funds range established at the September meeting was less than the range established at the August meeting.

At the October meeting the one-month range of tolerance for the Federal funds rate was lowered considerably, and the October-November ranges for  $M_1$  and  $M_2$  were somewhat higher than the ranges set for the September-October period. In November the two-month ranges of tolerance for the aggregates were somewhat higher than they were in October. Throughout the last three months of 1974, the one-month range of tolerance for the Federal funds rate was reduced.

### ALTERNATIVE EXPLANATIONS FOR MONEY DEVIATIONS

The growth rates of both  $M_1$  and  $M_2$  were within the desired ranges in only one month during the second half of the year. The Federal funds rate, however, followed closely the ranges established at each meeting (see accompanying charts).

There are two alternative, but not necessarily inconsistent, reasons for the frequent failure of the growth rates of  $M_1$  and  $M_2$  to be within their specified ranges last year. One reason was the complication of having a Federal funds constraint as well as a monetary aggregate growth target. The other was an unanticipated change in the relationship of the growth of  $M_1$  and  $M_2$  to growth of the monetary base.

### *Federal Funds Rate Constraint*

The problem created by having specified ranges of tolerance for both the monetary aggregates and the Federal funds rate is illustrated in Figure I. Line I represents a hypothetical projected relationship be-

<sup>9</sup>As stated, this statement implies that domestically-owned U. S. demand deposits did *not* simultaneously decline as a result of the transactions with foreign oil producers.



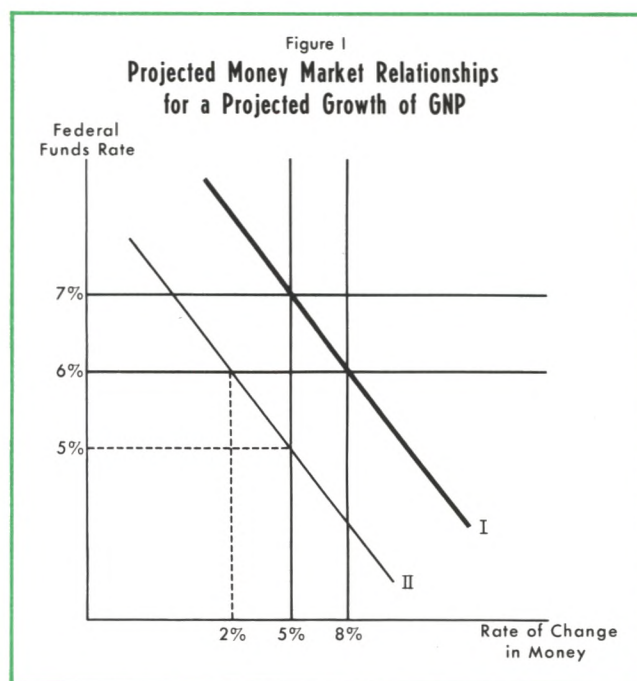
tween the Federal funds rate and the associated rate of change in money made by the FOMC staff and considered in the Committee's deliberations.<sup>10</sup> This relationship is based mainly on a projection of growth of GNP. According to the relationship, given the projected growth of GNP, the level of the Federal funds rate and the growth of money are inversely related.

For illustration, assume that the consensus of the meeting is that a Federal funds rate between 6 and 7 percent will be sought. According to the projected relationship this implies that the growth of money during the two-month interval will be between 5 and 8 percent. Assuming that such a range of money growth is deemed acceptable, open market operations which maintain the Federal funds rate within its range would be expected to result in money growth within its range of tolerance.

A problem associated with this approach is that the projected relationship between alternative Federal funds rates and associated growth rates of money (Line I) is not known with certainty. Suppose that the actual growth of GNP is not as high as projected, and that the actual growth would yield a set of relationships represented by Line II. If such were the case, adherence to the 6 percent lower limit for the Federal funds rate would be expected to result in only a 2 percent rate of money growth — 3 percentage points below its lower range of tolerance. Or, adherence to the 5 percent lower limit for growth in money would be expected to result in a 5 percent Federal funds rate, which is less than its lower limit of tolerance. In such a situation, a choice must be made regarding which range of tolerance is to be achieved.

The existence of such a situation, as depicted in Figure I, may account in part for the failure of money growth rates to be within their ranges of tolerance in the second half of 1974. Most forecasters did not project the decrease in the rate of growth of GNP, with the result that a wrong projection would be made of the money market relationships. Consequently, a choice had to be made regarding which of the two ranges of tolerance was to be achieved. The actual outcome was achievement of a Federal funds rate within its' range, but the monetary aggregates were outside of their ranges.

<sup>10</sup>This relationship is discussed in Stephen H. Axilrod and Darwin L. Beck, "Role of Projections and Data Evaluation with Monetary Aggregates as Policy Targets," *Controlling Monetary Aggregates II: The Implementation*, Federal Reserve Bank of Boston, pp. 81-102.



### Change in Money-Base Relationship

Normally, the growth of the money stock is about the same as the growth of the monetary base over periods of one year or more, but in 1974 the 5.3 percent growth of money was considerably slower than the 8.4 percent growth of the base.<sup>11</sup> Part of the divergence in these rates of growth can be attributed to the 15 percent growth of time deposits during the year. When reserves are supplied to the banking system, they may be used to support either time or demand deposits. The expansion of time deposits in 1974 absorbed a large volume of reserves, leaving fewer reserves available to support an expansion of demand deposits. Some growth in time deposits occurs regularly, but the more-rapid-than-usual growth of time deposits in 1974 resulted in a smaller-than-expected multiplier between monetary base and the money stock.

An additional factor contributing to the discrepancy in the growth rates of the monetary base and the money stock was the exceptionally large increase in the volume of currency held by the public. Although the money stock increased only about 5.3 percent in 1974, the currency component increased almost twice as fast as  $M_1$ , while demand deposits grew at only a 3.9 percent rate.

Currency is the largest use of monetary base and, by itself, has a multiplier of unity in "creating money."

<sup>11</sup>Percentages were calculated from fourth quarter 1973 to fourth quarter 1974.



Table 1

Comparison of Original and Revised Series  
Seasonally Adjusted

1974	M <sub>1</sub> First Published	M <sub>1</sub> Current Series	M <sub>2</sub> First Published	M <sub>2</sub> Current Series
January	\$269.7	\$270.9	\$573.8	\$575.5
February	272.6	273.1	580.1	580.9
March	274.9	275.2	584.3	585.5
April	276.7	276.6	588.0	589.4
May	279.3	277.6	592.9	591.6
June	280.9	280.0	597.4	597.1
July	281.2	280.5	600.2	599.7
August	280.8	280.7	602.2	602.2
September	280.9	281.1	603.3	603.8
October	281.9	282.2	608.1	608.1
November	283.3	283.8	612.7	613.0
December	283.6	284.3	613.8	614.3

The Current Series includes the February 20, 1975 revision of money stock and related measures. The First Published column indicates data for that month as first released by the Board of Governors. The dotted lines indicate a benchmark and, in one case, a seasonal revision. Data above and below the dotted line are not comparable because of these revisions.

A dollar increase in the monetary base that is matched by a dollar increase in currency also increases the money stock (currency plus demand deposits), but only by one dollar. An increase in currency creates no multiple expansion between monetary base and the money stock. To the extent that the extraordinary increases in currency and the resulting fall in the multiplier were unanticipated last year, growth of money was less than one would have expected.

### Data Revision

A purely technical uncertainty regarding growth of the money stock also occurred last year. This uncertainty stems from the fact that data on the money stock were revised four times during 1974. Policy-makers took actions based on the reported growth of the money stock, but later revisions in the data may have indicated different conclusions than preliminary figures. One major source of revision in the data on the money stock is that actual nonmember bank data are available only four times a year, and must be estimated during the remainder of the year. Table I presents the revisions in the money stock data for 1974.

### CONCLUSION

Few, if any, economic analysts foresaw the 5 percent decline in real output which occurred during 1974. Few predictions in late 1973 indicated a 12 percent increase in prices or over a 7 percent unemployment rate by year's end. The FOMC staff did no worse of a job projecting economic activity than most private forecasters. Controversies and uncertainties existed last year regarding the appropriate growth of monetary aggregates. Those who viewed the downturn as demand-induced recommended faster money growth, while others, who viewed the recession as supply-induced and recognized the seriousness of accelerating inflation, argued for slower money growth.

In the first half of last year M<sub>1</sub> increased at a 6.7 percent rate and M<sub>2</sub> at a 9.3 percent rate. The Federal funds rate increased during the same period from 9.65 percent in January to 11.93 percent in June, on a monthly average basis. The growth of the monetary aggregates and the rise in the Federal funds rate were almost consistently within the ranges of tolerance specified by the FOMC.

In the second half of 1974, the rates of growth for M<sub>1</sub> and M<sub>2</sub> were 3.9 and 6.5 percent, respectively. The Federal funds rate fell from 11.93 percent in June to an average of 8.53 percent in December. The growth rates of the monetary aggregates were, for the most part, well below the FOMC two-month ranges of tolerance, while the Federal funds rate again was almost always within the specified ranges.

Even in retrospect, analysts are uncertain as to how to evaluate monetary policy last year. Such an evaluation depends on the measure used as an indicator of the influence of policy on the economy. Those who believe that the Federal funds rate is a good indicator concluded last year that the thrust of policy was restrictive in the first half, but less so in the second half. On the other hand, those who use growth of money as an indicator would conclude that monetary actions were expansionary in the first half and restrictive in the second.

Last year was unlike any previous year. Inflation and recession both became more severe than anyone foresaw early in the year. With the array of different analyses that existed, it is only fitting that 1974 be labelled the "year of uncertainty".





# A Monetary View of the Balance of Payments

DONALD S. KEMP

IN surveying the body of research dealing with the balance of payments, two major shortcomings are immediately apparent.<sup>1</sup> First, there are no widely accepted theories of the balance of payments which simultaneously incorporate both the current and capital account. The great majority of models used in payments theory consider either the capital account or the current account separately. Second, there have been very few attempts to include even the fundamentals of portfolio choice theory in balance-of-payments models. This is particularly surprising in view of the essentially monetary nature of payments theory.

This article presents an approach to payments theory which addresses both of these shortcomings. Since this essentially involves an extension of the rudiments of monetary theory to the area of the balance of payments, it is henceforth referred to as a monetary view of the balance of payments (MBOP).<sup>2</sup>

## An Overview of the Theory

The MBOP may be summarized by the proposition that the transactions recorded in balance-of-payments (BOP) statistics reflect aggregate portfolio decisions by both foreign and domestic economic units. Under

a system of fixed exchange rates, such as the gold standard or the type of arrangement set up in 1944 at Bretton Woods, overall net surpluses (deficits) in the trade and capital accounts are viewed as flows associated with either an excess demand for money on the part of domestic (foreign) economic units or an excess supply of money in foreign economies (the domestic economy). Consequently, in analyzing the rate of change of international reserves (the money account<sup>3</sup>) the monetary approach focuses on the determinants of the excess demand for or supply of money. According to this view, surpluses (deficits) in the money account measure the rate at which money balances are being accumulated (reduced) domestically. That is, a BOP flow is one of the mechanisms by which actual money balances are adjusted to their desired levels.

Suppose, for example, there is an autonomous increase in the money supply of country *j*, which leads to an increase in the demand for goods, services, and securities in that country. Under a system of fixed exchange rates, any such increase in domestic demand will result in a tendency for prices of domestic real and financial assets in country *j* to rise, in the short run, relative to those in foreign markets. Economic units in country *j* will react by decreasing their demands for domestic real and financial assets in favor of foreign assets while domestic suppliers of these

<sup>1</sup>For a lucid analysis of the current state of payments theory, see Anne O. Krueger, "Balance-of-Payments Theory," *The Journal of Economic Literature* (March 1969), pp. 1-26.

<sup>2</sup>The theoretical foundation of this approach to payments theory may be found in Robert A. Mundell, *Monetary Theory: Inflation, Interest, and Growth in the World Economy* (Pacific Palisades, California: Goodyear, 1971). The formal model, presented later in this article, draws extensively on work done at the University of Chicago Workshop in International Economics and the analysis presented in Harry G. Johnson, "The Monetary Approach to Balance-of-Payments Theory," *Further Essays in Monetary Economics* (Cambridge: Harvard University Press, 1973), pp. 229-49. This article is essentially a synthesis and extension of these previous works.

<sup>3</sup>The overall net balance in the trade and capital accounts will henceforth be referred to as the money account. This reflects the fact that all transactions recorded below the line in this account have a direct impact on a nation's money supply. Under a pure gold standard, changes in official gold holdings are the only item below the line in this account. Under a Bretton Woods type system changes in official holdings of gold, SDRs, and foreign exchange and changes in the reserve position at the IMF are all included below the line in the money account.



assets will seek to sell more at home and less abroad. At the same time, foreign economic units will decrease their demands for the assets of country *j* and foreign suppliers will attempt to sell more of their own assets in country *j*. All of these factors work in favor of an increase in imports and a decrease in exports in country *j*. The resultant deterioration of the BOP reflects the exchange of money balances for real and financial assets by economic units of country *j*. The foreign recipients of these money balances will convert them into their own currencies at their respective central banks. These foreign central banks will then present the balances to the central bank in country *j* in return for international reserves. Since international reserves are one of the components of a country's monetary base<sup>4</sup>, the effect of this transaction will be a decrease in the money supply of country *j* towards its level prior to the autonomous increase and an increase in the money supplies of its surplus trading partners.

Under a system of freely floating exchange rates, the required adjustment of money balances is accomplished through movements in the exchange rate. Under such a system the BOP (on a money account basis) equals zero by definition and there are no intercountry movements of international reserves. As such, required adjustments in money balances cannot be accommodated through balance-of-payments flows. In this case the adjustment of actual money balances to their desired levels is accomplished by changes in domestic prices and exchange rates (which change concomitantly with and accommodate the required movement in domestic price levels).

The above approach is in sharp contrast with what amounts to the current conventional wisdom of payments theory; namely, the elasticities and absorption approaches. Implicit in both of these approaches is the assumption that either there are no monetary consequences associated with the BOP, or that to the extent the potential for such consequences exists, they can be and are absorbed (sterilized) by domestic monetary authorities.<sup>5</sup>

<sup>4</sup>For a detailed discussion and analysis of the concept of the monetary base, see Leonall C. Andersen and Jerry L. Jordan, "The Monetary Base — Explanation and Analytical Use," this *Review* (August 1968), pp. 7-11.

<sup>5</sup>The elasticity and absorption approaches are theories of the trade account alone and they neglect the issue of capital flows. For a discussion of the essentials of the elasticities approach, see Joan Robinson, "The Foreign Exchanges," *Readings in the Theory of International Trade*, Committee of the American Economic Association (Philadelphia: The Blakiston Company, 1949), pp. 83-103. For a discussion of the absorption approach, see Sidney S. Alexander, "Effects of

The MBOP regards all BOP deficits and surpluses and movements in floating exchange rates as phases in a stock adjustment which are the result of a disparity between the demand for and supply of money. This approach asserts that, under a system of fixed exchange rates, there are inflows (outflows) of international reserves associated with BOP surpluses (deficits) and that these flows cannot be sterilized in the long run. Furthermore, because of the impact of these reserve flows on a country's monetary base, they will result in variations in the supply of money relative to the demand for it and thus have an equilibrating impact on the level of money balances and the BOP. According to this view, the only way to obtain persistent deficits or surpluses is to construct a model in which the need for stock adjustments is being continuously recreated.

The only solutions to these reserve flows are processes which facilitate the return of actual money balances to their desired levels. This adjustment can be accomplished either automatically, through inflows or outflows of international reserves, or through appropriate actions by the domestic monetary authorities which change some other component of the monetary base by the same amount. Under a system of freely floating exchange rates the adjustment is also accomplished either automatically by changes in domestic price levels and the concomitant changes in the exchange rate, or again by the appropriate actions on the part of the monetary authorities. The only other potentially successful policy actions available are those which, in the end, have the same effect on money balances as those just mentioned.

### *Some Fundamental Propositions*

In order to facilitate the development of a model later in this article, there are some fundamental propositions associated with the MBOP that should be discussed.

1) The MBOP maintains that the transactions recorded in the balance of payments are essentially a reflection of monetary phenomena. As such, it places emphasis on the direct influence of an excess demand for or supply of money on the BOP.

Implicit in this approach is the assumption that the demand for and supply of money are stable functions

a Devaluation on a Trade Balance," *Readings in International Economics*, Committee of the American Economic Association (Homewood, Illinois: Richard D. Irwin, Inc., 1968), pp. 359-73. For a discussion of the differences between the monetarists' approach and both the elasticities and absorption approaches to payments theory, see Johnson, "The Monetary Approach to Balance-of-Payments Theory," pp. 229-49.



of a limited number of variables. The MBOP does not imply that changes in the money supply are the only factors which affect the BOP. It nevertheless does say that the primary channel by which changes in any real variable affect the BOP is through their effects on the demand for or supply of money.<sup>6</sup> Thus, any analysis of the impact of a policy or other change must begin with an analysis of how this change generates a divergence between actual and desired money balances or affects such a divergence that already exists.

2) In the analysis presented in this article, the crucial BOP concept is that which captures all transactions reflecting the adjustment of actual money balances to their desired levels. That is, the only transactions considered below the line are those which have an influence on domestic and foreign monetary bases and thus on domestic and foreign money supplies.<sup>7</sup>

The analysis presented here does not attempt to provide a theory of the individual subaccounts; it merely lumps the individual components (goods, services, transfers, short- and long-term capital) into a single category — “items above the line.” This approach recognizes that an excess supply of or demand for money may be cleared through the markets for either goods, services, or securities.<sup>8</sup> Furthermore, if the BOP is viewed within this framework, the pitfalls of placing emphasis on any particular subaccount are obvious. For example, the effects on aggregate economic activity of a deficit in the merchandise trade account could be neutralized by a surplus in one of the capital accounts. In this case, any negative aggregate demand effects resulting from an increase in imports of goods would be offset by an inflow of capital and thus an increase in investment demand. The two ef-

fects would offset each other and aggregate money balances would be unchanged.

3) The MBOP relies on the assumption of an efficient world market for goods, services, and securities.<sup>9</sup> Under a system of fixed exchange rates, the price of any good or service in one country relative to its price in any other country can change only in the short run. Likewise, the rate of return on any asset can differ from the rate of return on assets of comparable risk and maturity in any other country only in the short run. It follows that in the long run price levels and interest rates in all countries must move rigidly in line with one another. In fact, in a fixed exchange rate regime it is the attempts to arbitrage intercountry price and interest rate differentials that are the driving force leading to the reduction or accumulation of money balances and a concomitant temporary BOP deficit or surplus.

Under a system of freely floating exchange rates, price levels may move at different rates between countries. However, the impact of these differential rates of change on individual relative prices between countries is offset by opposite movements in exchange rates. The same arbitrage opportunities that lead to reserve flows under fixed rates lead to exchange rate adjustments that exactly compensate for differential price level changes between countries.

4) The MBOP is a theory of an automatic adjustment process. According to this theory, any BOP disequilibrium or exchange rate movement reflects a disparity between actual and desired money balances and will automatically correct itself. While the adjustment process is different under different exchange rate regimes, the implication is that the process is automatic and that its effects cannot be neutralized in the long run. Any BOP imbalance or exchange rate change is a phase in the automatic adjustment process and attempts to counter these processes merely increase the forces which give rise to the adjustment ultimately required for a return to equilibrium.

5) The MBOP is concerned primarily with the long run. The approach recognizes that short-run analysis is often complicated by the fact that the postulated adjustment behavior is incomplete in the short run. For example, the adjustment of actual

<sup>6</sup>For an analysis of the BOP effects of changes in a real variable (a change in tariff) within a monetarist's framework, see Michael Mussa, “A Monetary Approach to Balance-of-Payments Analysis,” *Journal of Money, Credit and Banking* (August 1974), pp. 333-51.

<sup>7</sup>For a review of balance-of-payments concepts and their meaning, see John Pippenger, “Balance-of-Payments Deficits: Measurement and Interpretation,” this *Review* (November 1973), pp. 6-14. For a discussion of which transactions to include below the line, see footnote 3 of this article.

<sup>8</sup>This is not to say the MBOP framework would not be useful in analyzing individual subaccounts. However, such analysis would require a rigorous specification of the channels of monetary influence. For a survey and analysis of the literature pertaining to these channels, see Roger W. Spencer, “Channels of Monetary Influence: A Survey,” this *Review* (November 1974), pp. 8-26. For an example of how this framework could be applied to the analysis of the capital account alone, see Pentti J. K. Kouri and Michael G. Porter, “International Capital Flows and Portfolio Equilibrium,” *Journal of Political Economy* (May/June 1974), pp. 443-67.

<sup>9</sup>While it is acknowledged that there are some goods that are not traded internationally, there are limits to relative price changes between these non-traded goods and other (traded) goods. The higher the elasticities of substitution between these two classes of goods in both production and consumption, the smaller the scope for relative price changes and the more direct the international price interdependence.



money balances to their desired levels does not occur instantaneously, but rather requires the passage of time. As another example, it is possible that the monetary authorities may attempt to neutralize the impact of international reserve flows on their respective money supplies in the short run.<sup>10</sup> However, the MBOP asserts that governments cannot follow such policies in the long run. This seems reasonable because, in the long run, success in neutralizing the effects of international reserve flows implies that the governments of some (surplus) countries are willing to trade investment and consumption goods for foreign currency balances. The accumulation of these balances by surplus country governments represents a nonmarket induced transfer of wealth away from domestic to foreign consumers. For whatever reason, it is unrealistic to suppose that a government would pursue such policies in the long run.

6) An implication of this theory is that, under a system of fixed exchange rates, domestic monetary policy does not control a country's money supply. Excessive monetary expansion (contraction), via expansion (contraction) of some controllable component of the monetary base, will result in an outflow (inflow) of international reserves (an uncontrollable component of the monetary base) and a tendency for the money supply to return to its former level.<sup>11</sup> The resulting BOP deficit (surplus) is only a reflection of these uncontrollable international reserve outflows (inflows). Through this process, the inflationary or deflationary impact of domestic monetary policy is mitigated with respect to the domestic economy and is imposed on the rest of the world via inter-country flows of international reserves. At the same time, however, the domestic economy is subject to the influence of inflationary or deflationary monetary actions taken in other countries.

Under a system of freely floating exchange rates, the domestic monetary authorities retain dominant control over the money supply, while the interaction of domestic and foreign monetary policies determines the exchange rate rather than the BOP (which is now zero by definition). In this case, a country neither imports nor exports international reserves. As a result, the domestic economy is subjected to the full consequences of inflationary or deflationary domestic

monetary policies and is insulated from the effects of monetary actions taken in other countries.

7) Another feature of the MBOP is that it provides a framework within which one is able to assess the differential impact of monetary disturbances which occur in a world in which there is at least one reserve currency country (RCC) as opposed to those occurring in a world with no RCCs. An RCC is a country whose currency is held by others as a form of international reserves. It is this special status afforded to the currency of the RCC which leads to a slightly altered adjustment process for the world and the RCC itself.

### *The Special Case of a Reserve Currency Country*

Because international reserves and reserve currencies exist only under a system of fixed exchange rates, the following analysis applies only to that case. For all non-RCCs, expansionary (contractionary) monetary policies are offset by a BOP deficit (surplus) and the resulting contraction (expansion) of the international reserve component of the monetary base. However, for an RCC this need not be the case. An expansionary (contractionary) monetary policy in the RCC may have no effect on its BOP as defined in this article. However, the RCC's trading partners will always experience a BOP surplus (deficit) and an inflow (outflow) of international reserves as a result of such RCC policies.<sup>12</sup> The reason for this is that the RCC currency is held by foreign central banks as a form of international reserves. While non-RCC monetary authorities are not willing to accumulate large balances denominated in other non-RCC currencies, they are willing to accumulate large balances denominated in the RCC currency. Because these balances are themselves a type of international reserves, non-RCC monetary authorities may not be inclined to present them to the RCC authorities in exchange for other international reserves.

However, to the extent that the RCC loses no international reserves as a result of an increase in other components of its monetary base, it does experience an accumulation of liquid liabilities to foreign official holders.<sup>13</sup> As these liabilities of the RCC are re-

<sup>10</sup>For an analysis of West German attempts to neutralize the effects of reserve flows, see Manfred Willms, "Controlling Money in an Open Economy: The German Case," *this Review* (April 1971), pp. 10-27.

<sup>11</sup>While this is true for most countries, it is not necessarily the case for a reserve currency country. The special case of a reserve currency country will be discussed in the next section.

<sup>12</sup>Recall that the BOP concept used in this article is the balance in the money account. That is, the only items recorded below the line are those that affect the domestic money supply.

<sup>13</sup>While the accumulations or reductions of the holdings of liabilities do not affect the RCC balance of payments as defined in this article, they do affect some RCC balance-of-



garded as assets by foreign official holders, their accumulation represents an inflow of international reserves and a BOP surplus for RCC trading partners.

The how and why of all of this can be brought out by reference to the balance sheets of the world's monetary authorities. While the following analysis applies to the case of expansionary monetary policy in the RCC, it is equally applicable to the analysis of contractionary monetary policy. In addition, in order to simplify the analysis we will assume that foreign central banks invest *all* of their RCC currency holdings in government securities issued by the RCC. However, we fully recognize that this need not be the case. Non-RCC central banks can and frequently do invest their RCC currency holdings in other assets or simply allow them to accumulate as deposits at the RCC central bank. Whatever the non-RCC authorities decide to do, however, all that is crucial for our analysis to hold is that they do not accumulate deposits at the RCC central bank.

Illustration I indicates what happens to the monetary bases of all countries as a result of an attempt by the RCC monetary authorities to increase the domestic money supply in the face of a fixed demand for money. Tier (A) illustrates that the initial impact of such an undertaking is to increase the monetary base of the RCC only. Tier (B) illustrates what happens to the respective monetary bases as a result of the forthcoming intercountry reserve flows. Non-RCCs accumulate international reserves (R) in the form of deposits denominated in the RCC currency held at the RCC central bank. As long as these R are held in this form, the RCC monetary base decreases towards its initial level and the non-RCC monetary bases increase, just as in the case of a world in which there are no RCCs.

Since the non-RCCs view these reserve currency balances as R, they are willing to accumulate them in the same manner that they accumulate other R. However, these R differ from others in one significant aspect — namely, they can be invested in government securities issued by the RCC. When non-RCCs choose to do this, the effects are as illustrated in tier (C). When non-RCC monetary authorities purchase RCC government securities, the OL entry in the RCC balance sheet is drawn down. This has the effect of increasing the monetary base of the RCC without causing a decrease in the monetary bases of the non-RCCs.

payments concepts. For example, such transactions would affect the Official Settlements Balance in the United States.

## ILLUSTRATION I

Tier	RCC Monetary Authority's Balance Sheet		Collective Balance Sheet for all Non-RCC Monetary Authorities	
	R(O) D(+) -OL(O)	DR(+) C(O)	R(O) D(O) -OL(O)	DR(O) C(O)
(A)	R(O) D(+) -OL(O)	DR(+) C(O)	R(O) D(O) -OL(O)	DR(O) C(O)
(B)	R(O) D(O) -OL(+)	DR(-) C(O)	R(+) D(O) -OL(O)	DR(+) C(O)
(C)	R(O) D(O) -OL(-)	DR(+) C(O)	R(O) D(O) -OL(O)	DR(O) C(O)
(NET)	R(O) D(+) -OL(O)	DR(+) C(O)	R(+) D(O) -OL(O)	DR(+) C(O)

where: R = official holdings of international reserves

D = domestic credit; this consists of central bank holdings of securities, discounts and advances, and float.

-OL = other liabilities of the monetary authorities (including foreign deposits at Federal Reserve Banks). These items conventionally appear on the source side of the base as a negative item. They are subtracted from other items in calculating the source base.<sup>1</sup>

C = currency held by the public

DR = reserves of the domestic banking community

<sup>1</sup>See Albert E. Burger, *The Money Supply Process* (Belmont, California: Wadsworth Publishing Company, 1971), p. 38.

The net effect of all of this is that the monetary bases of all countries have increased (as shown in the NET tier).

In view of the above analysis, a world in which there exists at least one RCC differs significantly from a world in which there are no RCCs. In a world with RCCs, BOP deficits and surpluses may by themselves decrease and increase the level of R in the world and in individual countries. In a world with no RCCs, BOP deficits and surpluses result in a redistribution of an existing stock of R among countries, but produce no change in the overall level. As a result, in a world with RCCs, the world and each individual non-RCC will ordinarily experience much more difficulty in controlling its money supply. Thus, the existence of RCCs compounds the problems of money stock control which are already inherent in any system of fixed exchange rates.

In addition, this analysis implies that the inflationary or deflationary impact of RCC monetary policy is spread over the entire world. Unlike the case of a non-RCC, however, there may be no mitigation of the



impact on the domestic economy since the RCC may neither gain nor lose reserves. As a result, prices in the RCC could change by the same amount as they would under a system of freely floating exchange rates. What's worse, however, is that the rest of the world will gain or lose international reserves and bear the same price level impact as the RCC. Thus, the potential for large BOP surpluses and deficits and for world wide inflations and deflations are greater under a fixed exchange rate system with RCCs than under any other system considered in this article.

### *A Monetary Model of the Balance of Payments*

Now that the essential features of the MBOP have been spelled out, let us turn to the derivation of a model in which these features are expressed by a set of equations.<sup>14</sup> First, the model is derived for a non-RCC under a system of fixed exchange rates. Second, the same model is applied to the case of an RCC under fixed exchange rates. Finally, the model is applied to the case of freely floating exchange rates.

The common elements in each of these models are stable money demand and money supply functions.<sup>15</sup> The money supply function for each country may be stated as

$$(1) MS_j = a_j [R_j + D_j]$$

where:  $MS_j$  = money supply in country j

$a_j$  = money multiplier in country j

$R_j$  = official holdings of international reserves in country j; hereafter referred to as the international component of the monetary base.

$D_j$  = all other components of the monetary base in country j; hereafter referred to as the domestically controlled component of the monetary base.

$D_j + R_j = MB_j$  = monetary base in country j

The demand for money in each country is assumed to be a function of real income, the nominal rate of interest, and prices.

$$(2) MD_j = f_j[y_j, r, P]$$

where:  $MD_j$  = demand for money in country j

$P$  = price index in the world and thus in country j<sup>16</sup>

<sup>14</sup>In order to simplify the presentation, many of the steps in the derivation of the model have been bypassed in the text. For the interested reader, a more thorough presentation of the model is provided in an appendix, which is available from this Bank upon request.

<sup>15</sup>For an analysis of the development of the money supply function employed in this article, see Jerry L. Jordan, "Elements of Money Stock Determination," this *Review* (October 1969), pp. 10-19.

<sup>16</sup>This reflects the assumption that under a system of fixed exchange rates, a country's price level and interest rates

$y_j$  = real income in country j

$r$  = nominal rate of interest in the world and thus in country j.

In accordance with the general monetarist framework of the model, country j is in equilibrium if and only if the growth of the supply of money equals the growth of the demand for money. We are able to specify the conditions necessary for fulfilling this requirement by expressing equations (1) and (2) in terms of rates of change and then equating the resulting expressions. This procedure allows us to derive an expression for the rate of growth of international reserves in country j.<sup>17</sup>

$$(3) \frac{R_j}{MB_j} g_{R_j} = g_p + \alpha_j g_{y_j} + \beta_j g_r - \frac{D_j}{MB_j} g_{D_j}$$

where:  $\alpha_j$  = income elasticity of demand for money in country j

$\beta_j$  = interest rate elasticity of demand for money in country j.

We are able to derive an expression for the growth rate of world prices [ $g_p$ ] by summing the expressions for the growth rates of the demand for and supply of money over all countries and equating the resultant expressions.

$$(4) g_p = \frac{\sum_{i=1}^N w_i g_{MS_i}}{\sum_{i=1}^N w_i} - \frac{\sum_{i=1}^N w_i [\alpha_i g_{y_i} + \beta_i g_r]}{\sum_{i=1}^N w_i}$$

where:  $w_i = \frac{MS_i}{\sum_{i=1}^N MS_i}$  = weights calculated on the basis of money supplies converted by exchange rates to equivalent units of currency j.

### *Fixed Exchange Rates in a World with no RCCs*

Recall that by definition  $g_{R_j} = \frac{1}{R_j} \frac{dR_j}{dt}$ . Under a system of fixed exchange rates in a world in which there are no reserve currency countries,  $\frac{dR_j}{dt}$  is the expression for the balance of payments in the money account. It represents the rate at which country j is either gaining or losing international reserves during a given time period (t). With this in mind, and upon making some simplifying assumptions regarding the interest and income elasticities of demand for money,

move in line with the world price level and interest rates. However, in the case of freely floating exchange rates the assumption regarding the price level is no longer valid. As such, the money demand function must be specified somewhat differently in that case.

<sup>17</sup>Henceforth in this article  $g_x = \frac{d \ln x}{dt}$ . That is,  $g_x$  is the expression for the continuous rate of growth of variable x.



we are able to substitute expression (4) into expression (3) and get an expression for the balance of payments in country  $j$ .<sup>18</sup>

$$(5) \frac{1}{MB_j} BOP_j = \sum_{i=1}^N w_i g_{MS_i} - \frac{D_j}{MB_j} g_{D_j} + [g_{Y_j} - \sum_{i=1}^N w_i g_{Y_i}]$$

Expression (5) is essentially an embodiment of the features of the price specie flow mechanism, which operates under a system of fixed exchange rates in a world in which there are no reserve currency countries.<sup>19</sup> That is, expression (5) states that the BOP is a function of:

1) the rate of growth of real income in country  $j$  relative to the average rate of growth of real income for all countries, and

2) the rate of growth of the domestically controlled component of the monetary base in country  $j$  relative to an average rate of money growth for the whole world.

### *Fixed Exchange Rates in a World with at Least One RCC*

In a world in which there is at least one RCC, expression (5) is still an appropriate representation of the forces giving rise to BOP flows in non-RCCs. However, for an RCC there may be no international reserve flows associated with the BOP accounts; in which case  $g_{R_j} = 0$ . In the case of an RCC, excessive expansion (contraction) of the domestically controlled component of the monetary base need not lead to an offsetting contraction (expansion) of the international reserve component. At the same time, however, excessive expansion (contraction) of the domestically controlled component of the monetary base

in the RCC will lead to an accumulation (reduction) of international reserves in all other countries. As mentioned previously, we will assume that these international reserves will be held in the form of securities issued by the RCC government to non-RCC official holders. For the RCC, it is the net accumulation or reduction of such liabilities that is determined by monetary actions in our model. This process can be captured in our model by setting  $g_{RCC} = 0$  (where the RCC is the  $j$ th country) and replacing the term  $\sum_{i=1}^N w_i g_{MS_i}$  in expression (5) with a more detailed formulation of the factors contributing to the growth of the money supply in all countries.

$$(6) \frac{1}{MB_w} BOL_{RCC} = \left[ \sum_{i=1}^N w_i \frac{D_i}{MB_i} g_{D_i} - \frac{D_{RCC}}{MB_{RCC}} g_{D_{RCC}} \right] + [g_{Y_{RCC}} - \sum_{i=1}^N w_i g_{Y_i}]$$

where:  $MB_w$  = the sum of the monetary bases of all countries in the world.  
 $BOL_{RCC}$  = the net accumulation of claims against the RCC by foreign official institutions during time period  $(t)$ .<sup>20</sup>

This expression states that the change in the level of the liabilities of the RCC to foreign official holders that results from domestic monetary policy in the RCC is determined by the following:

- 1) the rate of growth of the domestically controlled component of the monetary base in the RCC relative to a weighted average of its rate of growth in all countries.
- 2) the rate of growth of real income in the RCC relative to a weighted average of the rates of growth of real income in all countries.

### *Freely Floating Exchange Rates*

For the case of freely floating exchange rates, two modifications of the model are necessary. First, the model must be adapted to reflect the fact that there are no international reserve flows, so that the growth rate of a country's money supply is determined solely by domestic monetary policy  $[g_{D_j}]$ . Second, the money demand function must be modified to reflect the fact that the rate of price level change in one country may differ from the rate prevailing in the rest of the world.

<sup>18</sup>We have assumed that  $\alpha_i = 1$  for all  $i$  and that  $\beta_j = \sum_{i=1}^N w_i \beta_i$ .

Neither of these assumptions are crucial to the analysis at hand. They are invoked here mainly to simplify the presentation. The assumption that  $\alpha_i = 1$  is interpreted as assuming that the income elasticity of demand for money is unity in all countries. Assuming that  $\sum_{i=1}^N w_i \beta_i = \beta_j$  means that the interest elasticity of demand for money in country  $j$  is equal to a weighted average of the interest elasticities of demand for money in all countries. A more restrictive implication of this assumption would be that the interest elasticities are equal in all countries.

<sup>19</sup>The price specie flow mechanism is an attempt to explain international gold flows under the gold standard. It is associated primarily with the work of David Hume in the 18th century. However, in our case the BOP includes more than just gold flows. It includes flows of all international reserves — gold, SDRs, foreign exchange, and reserve positions at the IMF.

<sup>20</sup>For the United States this BOP concept closely resembles the balance on liabilities to foreign official holders. However, this account is distinctly different from the BOP concept utilized in equation (5). Equation (5) explains the balance in the money account, whereas the BOP concept used in equation (6) has no relation to the money supply.



Upon incorporating both of these modifications into the model, we are able to derive an expression for the determination of movements in the exchange rate.

$$(7) \ g_{E_j} = [g_{MS_{ROW}} - g_{MS_j}] + [g_{Y_j} - g_{Y_{ROW}}]$$

Where:  $E_j = \frac{P_{ROW}}{P_j}$  = the price of currency j in terms of foreign currencies

$P_{ROW} = \frac{\sum_{i=1}^{N-1} h_i P_i}{N-1}$  = the price level in the rest of the world; that is, a weighted average of the price levels in all other countries.

$h_i = \frac{Y_i}{\sum_{i=1}^{N-1} Y_i}$  = weights calculated on the basis of real GNP

$P_j$  = price level in country j

This expression states that the exchange value of currency j in terms of foreign currencies is determined by the rate of growth of the money supply and real income in country j relative to the rate of growth of the money supply and real income respectively in the rest of the world. As such, it implies that currency depreciations are the result of excessive monetary growth. It therefore supports the proposition that inflation causes depreciation of the domestic currency rather than vice versa.

## Summary and Conclusions

The MBOP may be summarized by the proposition that the transactions recorded in balance-of-payments statistics reflect aggregate portfolio decisions by both foreign and domestic economic units. The framework presented in this article suggests some important policy considerations that cannot be addressed within the framework which characterizes most of the currently accepted body of payments theory.

The analysis presented here casts the balance of payments in the role of an automatic adjustment mechanism. Balance-of-payments deficits and surpluses, or movements in freely floating exchange rates, are viewed as being simultaneously both the result of a divergence between actual and desired money balances and a mechanism by which such a divergence is corrected. As such, persistent balance-of-payments deficits (surpluses) or depreciations (appreciations) of the foreign exchange value of a currency reflect a continual re-creation of a situation in which excessive monetary expansion in the country in question is greater (less) than the worldwide average. Furthermore, the only solution to such international disturbances are policies which facilitate the equalization of actual and desired money balances.

The futility of tariff and non-tariff barriers to trade which attempt to alter balance-of-payments flows or exchange rate movements becomes readily apparent when one views them within the framework presented above. Suppose, for example, that an import tariff is imposed with the aim of reducing a balance-of-payments deficit in the money account. According to the MBOP, international reserve flows will assure that the balance-of-payments deficit disappears in the long run whether the tariff is imposed or not. That is, even if the tariff were not imposed, the excess money balances, and therefore the deficit, would disappear as a result of the outflow of international reserves. However, if the tariff is imposed, relative prices will be artificially altered from the levels consistent with the most efficient allocation of resources and maximum gains from trade. Furthermore, the situation is no better if the tariff is imposed in retaliation against restrictive trade practices on the part of other nations. In this case, all that the tariff accomplishes is to further distort relative prices and further reduce the welfare of all nations.

Another advantage of the MBOP is that it enables one to clearly evaluate the relative desirability of different exchange rate regimes in terms of their promotion of autonomy of domestic monetary policy and domestic as well as worldwide price stability. Under a system of freely floating exchange rates a country retains dominant control over its money growth, incurs the full consequences of its domestic monetary policy, and is not subject to the effects of inflationary or deflationary monetary policies undertaken in other countries. Under a system of fixed exchange rates in a world in which there are no reserve currency countries, a country loses control of its rate of money growth, has the domestic impact of its monetary policy mitigated, and is subject to the effects of monetary policies pursued by other countries. Under a system of fixed exchange rates in a world in which there is at least one reserve currency country, we have the potential for the worst of both of the above systems. While the impact of expansionary (contractionary) monetary policies in the reserve currency country is imposed on the rest of the world, there may be no mitigation of their domestic impact. As a result, the entire world is prone towards large changes in its money supply which are initiated by actions taken in the reserve currency country. This conclusion appears to be consistent with the inflationary experiences of the western world which began in the late 1960s.

Finally, if the balance of payments is viewed within the MBOP framework, the pitfalls of placing emphasis



on any particular BOP subaccount are obvious. A deficit (surplus) in any one account need not have any effect on domestic aggregate economic activity if its impact on money balances is offset by a surplus (deficit) in another account.

This point is especially significant in view of the large merchandise trade deficits that many oil consuming countries have been experiencing. The analysis presented in this article indicates that the impact of these deficits on money balances, and there-

fore on aggregate economic activity in the deficit countries, will be substantially reduced as a result of large inflows of capital from OPEC members. Of course this does not mean that oil consuming countries are no worse off now than they were prior to the fourfold increase in oil prices. The MBOP merely states that the impact on GNP will be mitigated through subsequent inflows of capital. The distribution of a given GNP between the residents of oil consuming and oil producing countries however, is altered in favor of the oil producers.





# Revision of the Monetary Base

ALBERT E. BURGER

**D**ATA on the seasonally adjusted monetary base, as computed by this Bank, have been revised to reflect minor changes in the computation of the reserve adjustment magnitude and a change in the method of seasonally adjusting the monetary base. To compute the monetary base, the reserve adjustment magnitude is added to the source base (the uses of which are bank reserves and currency held by the public). The computation of the monetary base is illustrated in Table I.

The main purpose of the reserve adjustment magnitude is to take account of changes in reserve requirement ratios. Total reserves of the banking system are not changed when reserve requirement ratios are changed. However, the amount of deposits that can be supported by a given amount of total reserves is changed. This is taken into account by a change in the reserve adjustment magnitude, and hence the monetary base. For example, when reserve requirement ratios are lowered, the amount of deposits that the amount of total reserves held by the banking sys-

tem can support is increased, and hence the reserve adjustment magnitude is increased. The reserve adjustment magnitude is changed by the amount of reserves liberated or absorbed by the change in reserve requirement ratios. This amount is estimated by taking the change in the average reserve requirement ratio and multiplying it by the deposits in the period immediately preceding the reserve requirement change.

The reserve adjustment magnitude also takes account of the effects on required reserves of shifts in the same type of deposits from a bank in one reserve requirement category to a bank in another category. For example, a shift of demand deposits from banks with lower average reserve requirements on demand deposits to banks with higher average reserve requirements on demand deposits will lower the reserve adjustment magnitude. The effects on required reserves of shifts in deposits between demand and time deposits are *not* included in the reserve adjustment magnitude.

Table I

## Computation of the Monetary Base: February 1975 Sign Indicates Effect on the Monetary Base (Millions of Dollars)

<u>Sources</u>		<u>Uses</u>	
Federal Reserve Credit		Member Bank Deposits at	
U. S. Government Securities	\$ 85,523	Federal Reserve Banks	\$ 28,342
Loans	147	Currency Held by Banks	9,179
Float Plus Other Federal Reserve Assets	5,337	Currency Held by The Nonbank Public	67,800
Total	\$ 91,007		
Federal Reserve Credit Including Reserve Adjustment	\$ 97,789		
Other Factors			
Gold Stock plus Special Drawing Rights Certificate Account	\$ 12,026		
Treasury Currency Outstanding	9,284		
Treasury Deposits at Federal Reserve <sup>1</sup>	-2,374		
Foreign Deposits with Federal Reserve <sup>1</sup>	-317		
Treasury Cash Holdings, Other Liabilities and Capital Accounts and Other F. R. Deposits <sup>1</sup>	-4,305		
Total	\$ 14,314		
Source Base	\$105,321	Source Base	\$105,321
Reserve Adjustment <sup>2</sup>	6,782	Reserve Adjustment <sup>2</sup>	6,782
Monetary Base	\$112,103	Monetary Base	\$112,103

Data are not seasonally adjusted.

<sup>1</sup>These items absorb funds therefore an increase in them reduces monetary base.

<sup>2</sup>Adjustment for reserve requirement changes and changes in average requirements due to shifts in the same type of deposits where different reserve requirements apply. Reserve adjustment computed by this Bank.



## *Reasons for the Revision*

Data for the reserve adjustment magnitude have been revised (1) to correct a minor computational error in historical data, and (2) to incorporate a new method of seasonally adjusting the monetary base. The effect of the correction of the computational error has been to lower the level of the reserve adjustment magnitude by about \$150 million over the period from September 1969 to the present.

Prior to this revision, the seasonally adjusted monetary base was computed by first seasonally adjusting the source base (using the Federal Reserve Board version of the X-11 variant of the Census Method II seasonal adjustment computer program) and then adding the nonseasonally adjusted reserve adjustment magnitude. Under the new procedure the reserve adjustment magnitude (RAM) is added to the nonseasonally adjusted source base and then the total is seasonally adjusted.

The new seasonal adjustment procedure is appropriate under conditions where open market operations are used to offset the immediate impact of changes in reserve requirement ratios on the banking system. In such cases the source base would change more or less than it would have in the absence of the change in reserve requirements.

For example, in November and December of 1972, the combined effect of the Board of Governors changing Regulations D and J was the release of \$2 to \$2.5 billion of reserves to the banking system. The Federal Reserve did not buy Government securities during this period as it had in the same period of previous years. Thus, the source base, which does not include the effects of reserve requirement changes, did not rise as it normally had on a seasonal basis. In each of the eleven years prior to 1972, nonseasonally adjusted source base rose in the October-December period. From October to December of 1972 the source base *decreased* by \$583 million.

Reserve requirements were raised in July 1973 and October 1973. As a consequence, RAM decreased from \$6.950 billion in June to \$5.127 billion in October. Over the June-October 1973 period, the nonseasonally adjusted source base rose by about \$4 billion, compared to an average increase of \$2.1 billion over the same period in the previous three years and a \$2.2 billion change in the June-October 1974 period.

If there was only one period where the use of open market operations to offset changes in reserve requirement ratios resulted in movements in the source

base that were "unusual" according to previous seasonal behavior, then the seasonal adjustment program, when computing seasonal factors, would treat this "unusual" period as an irregular. Hence, seasonal factors would not be affected significantly. However, if changes in reserve requirements occur repeatedly in the same time periods of successive years, the seasonal factors for the source base would be affected. The change in the seasonal factors for the source base would not reflect a basic change in the seasonal pattern of the source base, but would reflect a seasonal pattern in reserve requirement changes.

From the end of 1966 through February 1975, there have been fifteen changes in reserve requirement ratios on either member bank deposits or other liabilities. Nine changes occurred since late 1972. Reserve requirement changes caused the reserve adjustment magnitude (RAM) to rise from \$3.8 billion in October 1972 to \$7.1 billion in December 1972, then fall to \$4.5 billion by August 1974 and then rise to \$6.8 billion for February 1975.

Twelve changes in reserve requirement ratios since the end of 1966 have occurred either in the early part or late part of these years. Of these twelve changes, ten changed required reserves by \$400 million or more. Since late 1972, six of the nine reserve requirement changes have occurred in the period from September through February.

Combining source base and RAM prior to seasonal adjustment offsets part of the apparent bias that has developed in the seasonal factors for the source base due to the recurring changes in reserve requirement ratios. On balance, over the 1969-74 period the seasonal factors for monetary base, seasonally adjusted in this manner, exhibit greater stability than the seasonal factors for the source base.

For the last three years, the effect of changing the method of seasonally adjusting the monetary base has been to leave the changes in levels for the December to April 1972-74 period about the same. The changes in levels from April to October on the new series are, on average, \$454 million higher. The changes in levels from October-December are, on average, \$475 million lower for the new series.

## *Rates of Change*

Tables showing rates of change of the quarterly-average seasonally adjusted monetary base data are presented on page 25. The revision did not significantly affect rates of change over four-quarter or longer periods. For example, from IV/73 to IV/74



MONETARY BASE - REVISED SERIES COMPOUNDED ANNUAL RATES OF CHANGE																				
TERMINAL QUARTER	INITIAL QUARTER																			MILLIONS OF DOLLARS
	1-70	2-70	3-70	4-70	1-71	2-71	3-71	4-71	1-72	2-72	3-72	4-72	1-73	2-73	3-73	4-73	1-74	2-74	3-74	
2-70	5.7																			79,869
3-70	6.7	7.6																		81,354
4-70	6.9	7.6	7.5																	82,835
1-71	7.5	8.1	8.3	9.2																84,679
2-71	7.5	7.9	8.0	8.3	7.3															86,187
3-71	7.7	8.1	8.2	8.4	8.0	8.7														88,007
4-71	7.2	7.5	7.5	7.5	6.9	6.7	4.7													89,032
1-72	7.2	7.5	7.4	7.4	7.0	6.9	5.9	7.2												90,583
2-72	7.3	7.5	7.5	7.5	7.2	7.1	6.6	7.5	7.9											92,319
3-72	7.3	7.4	7.4	7.4	7.1	7.1	6.7	7.3	7.4	6.9										93,881
4-72	7.5	7.7	7.7	7.7	7.5	7.5	7.3	7.9	8.2	8.3	9.6									96,068
1-73	7.6	7.8	7.8	7.8	7.6	7.7	7.5	8.1	8.3	8.4	9.2	8.8								98,109
2-73	7.6	7.8	7.8	7.8	7.7	7.7	7.6	8.0	8.2	8.3	8.7	8.3	7.8							99,975
3-73	7.6	7.7	7.7	7.7	7.6	7.6	7.5	7.9	8.0	8.0	8.3	7.9	7.5	7.1						101,699
4-73	7.5	7.6	7.6	7.7	7.5	7.5	7.4	7.7	7.8	7.8	8.0	7.6	7.2	6.9	6.7					103,350
1-74	7.5	7.7	7.7	7.7	7.6	7.6	7.5	7.8	7.9	7.9	8.0	7.7	7.4	7.3	7.4	8.1				105,377
2-74	7.6	7.8	7.8	7.8	7.7	7.7	7.6	7.9	8.0	8.0	8.2	7.9	7.8	7.8	8.0	8.7	9.2			107,728
3-74	7.6	7.7	7.8	7.8	7.7	7.7	7.6	7.9	8.0	8.0	8.1	7.9	7.7	7.7	7.8	8.2	8.3	7.4		109,677
4-74	7.7	7.8	7.8	7.8	7.7	7.8	7.7	8.0	8.0	8.0	8.2	8.0	7.9	7.9	8.0	8.4	8.5	8.1	8.8	112,003
1-70 2-70 3-70 4-70 1-71 2-71 3-71 4-71 1-72 2-72 3-72 4-72 1-73 2-73 3-73 4-73 1-74 2-74 3-74																				
INITIAL QUARTER																				

MONETARY BASE - OLD SERIES COMPOUNDED ANNUAL RATES OF CHANGE																				
TERMINAL QUARTER	INITIAL QUARTER																			MILLIONS OF DOLLARS
	1-70	2-70	3-70	4-70	1-71	2-71	3-71	4-71	1-72	2-72	3-72	4-72	1-73	2-73	3-73	4-73	1-74	2-74	3-74	
2-70	5.9																			80,121
3-70	6.1	6.3																		81,363
4-70	6.9	7.4	8.4																	83,025
1-71	7.5	8.0	8.9	9.3																84,892
2-71	7.5	7.9	8.4	8.4	7.4															86,423
3-71	7.4	7.7	8.0	7.9	7.2	7.0														87,907
4-71	7.1	7.3	7.6	7.3	6.7	6.3	5.6													89,114
1-72	7.3	7.5	7.7	7.5	7.1	7.0	7.0	8.4												90,930
2-72	7.3	7.5	7.7	7.5	7.2	7.1	7.2	8.0	7.6											92,600
3-72	7.1	7.2	7.3	7.2	6.8	6.7	6.6	7.0	6.3	5.0										93,742
4-72	7.4	7.6	7.7	7.7	7.4	7.4	7.5	8.0	7.8	8.0	11.0									96,217
1-73	7.6	7.8	7.9	7.8	7.7	7.7	7.8	8.2	8.2	8.4	10.2	9.3								98,385
2-73	7.6	7.8	7.9	7.8	7.7	7.7	7.8	8.2	8.1	8.3	9.4	8.5	7.8							100,242
3-73	7.4	7.6	7.7	7.6	7.4	7.4	7.5	7.7	7.6	7.7	8.3	7.4	6.5	5.3						101,543
4-73	7.5	7.6	7.7	7.6	7.5	7.5	7.5	7.8	7.7	7.7	8.3	7.6	7.0	6.7	8.0					103,522
1-74	7.6	7.7	7.8	7.7	7.6	7.6	7.6	7.9	7.8	7.8	8.3	7.9	7.4	7.3	8.3	8.6				105,691
2-74	7.6	7.8	7.8	7.8	7.7	7.7	7.8	8.0	8.0	8.0	8.4	8.0	7.8	7.8	8.6	8.9	9.1			108,016
3-74	7.5	7.6	7.7	7.6	7.5	7.5	7.6	7.8	7.7	7.7	8.1	7.6	7.4	7.3	7.8	7.7	7.2	5.4		109,443
4-74	7.7	7.8	7.8	7.8	7.7	7.7	7.8	8.0	7.9	8.0	8.3	8.0	7.8	7.8	8.3	8.3	8.2	7.8	10.2	112,136
1-70 2-70 3-70 4-70 1-71 2-71 3-71 4-71 1-72 2-72 3-72 4-72 1-73 2-73 3-73 4-73 1-74 2-74 3-74																				
INITIAL QUARTER																				



MONETARY BASE - REVISED SERIES COMPOUNDED ANNUAL RATES OF CHANGE																				
TERMINAL MONTH	INITIAL MONTH																			MILLIONS OF DOLLARS
	6-73	7-73	8-73	9-73	10-73	11-73	12-73	1-74	2-74	3-74	4-74	5-74	6-74	7-74	8-74	9-74	10-74	11-74	12-74	
7-73	10.0																			101,345
8-73	6.7	3.4																		101,630
9-73	6.4	4.7	6.0																	102,121
10-73	6.7	5.7	6.8	7.7																102,751
11-73	6.7	5.9	6.7	7.1	6.6															103,302
12-73	7.0	6.4	7.1	7.5	7.5	8.4														103,996
1-74	7.3	6.8	7.5	7.9	8.0	8.8	9.1													104,757
2-74	7.4	7.0	7.6	7.9	8.0	8.5	8.5	7.9												105,426
3-74	7.2	6.9	7.4	7.6	7.6	7.9	7.7	7.0	6.1											105,948
4-74	7.9	7.7	8.2	8.5	8.7	9.1	9.2	9.3	10.0	13.9										107,107
5-74	7.8	7.5	8.0	8.3	8.4	8.7	8.7	8.6	8.8	10.2	6.6									107,681
6-74	7.8	7.6	8.0	8.3	8.4	8.6	8.6	8.5	8.7	9.6	7.4	8.3								108,396
7-74	7.8	7.6	8.0	8.2	8.3	8.5	8.5	8.4	8.5	9.1	7.5	7.9	7.6							109,056
8-74	7.7	7.5	7.8	8.0	8.1	8.2	8.2	8.1	8.1	8.5	7.2	7.3	6.9	6.2						109,604
9-74	7.7	7.6	7.9	8.1	8.1	8.3	8.3	8.1	8.2	8.5	7.5	7.7	7.5	7.5	8.7					110,371
10-74	7.7	7.5	7.8	8.0	8.0	8.1	8.1	8.0	8.0	8.2	7.3	7.5	7.3	7.2	7.6	6.6				110,957
11-74	8.0	7.8	8.1	8.3	8.3	8.5	8.5	8.4	8.5	8.8	8.1	8.3	8.3	8.5	9.3	9.6	12.7			112,064
12-74	8.1	8.0	8.3	8.4	8.5	8.6	8.6	8.6	8.7	9.0	8.3	8.6	8.7	8.9	9.6	9.8	11.5	10.4		112,988
1-75	7.2	7.1	7.3	7.4	7.4	7.4	7.3	7.2	7.1	7.2	6.5	6.5	6.2	6.0	6.0	5.3	4.9	1.3	-7.1	112,297
	6-73	7-73	8-73	9-73	10-73	11-73	12-73	1-74	2-74	3-74	4-74	5-74	6-74	7-74	8-74	9-74	10-74	11-74	12-74	
INITIAL MONTH																				

MONETARY BASE - OLD SERIES COMPOUNDED ANNUAL RATES OF CHANGE																				
TERMINAL MONTH	INITIAL MONTH																			MILLIONS OF DOLLARS
	6-73	7-73	8-73	9-73	10-73	11-73	12-73	1-74	2-74	3-74	4-74	5-74	6-74	7-74	8-74	9-74	10-74	11-74	12-74	
7-73	7.6																			101,381
8-73	3.8	0.3																		101,403
9-73	4.3	2.8	5.3																	101,844
10-73	5.7	5.2	7.7	10.1																102,662
11-73	6.7	6.5	8.7	10.4	10.8															103,542
12-73	7.3	7.2	9.0	10.3	10.4	9.9														104,363
1-74	7.5	7.5	9.1	10.0	10.0	9.6	9.2													105,134
2-74	7.4	7.4	8.7	9.4	9.2	8.6	8.0	6.8												105,709
3-74	7.3	7.3	8.3	8.8	8.5	8.0	7.3	6.4	6.1											106,229
4-74	8.0	8.0	9.0	9.6	9.5	9.2	9.1	9.0	10.2	14.4										107,426
5-74	7.9	7.9	8.8	9.2	9.1	8.8	8.6	8.4	9.0	10.5	6.7									108,011
6-74	7.8	7.8	8.6	9.0	8.8	8.5	8.3	8.1	8.5	9.3	6.8	6.9								108,611
7-74	7.5	7.5	8.2	8.5	8.3	8.0	7.7	7.5	7.6	8.0	6.0	5.6	4.3							108,992
8-74	7.2	7.2	7.8	8.0	7.8	7.5	7.2	6.9	6.9	7.1	5.3	4.8	3.9	3.4						109,297
9-74	7.3	7.3	7.8	8.0	7.9	7.6	7.3	7.1	7.1	7.3	5.9	5.7	5.4	5.9	8.5					110,041
10-74	7.3	7.3	7.8	8.0	7.9	7.6	7.4	7.2	7.2	7.4	6.3	6.2	6.0	6.6	8.2	7.9				110,740
11-74	7.9	8.0	8.5	8.7	8.6	8.4	8.3	8.2	8.4	8.7	7.9	8.1	8.3	9.4	11.4	12.9	18.1			112,289
12-74	8.2	8.2	8.7	9.0	8.9	8.7	8.6	8.6	8.8	9.1	8.4	8.7	9.0	9.9	11.6	12.7	15.2	12.3		113,379
1-75	7.4	7.4	7.8	8.0	7.8	7.6	7.4	7.3	7.3	7.5	6.7	6.7	6.7	7.1	7.8	7.7	7.6	2.7	-6.1	112,786
	6-73	7-73	8-73	9-73	10-73	11-73	12-73	1-74	2-74	3-74	4-74	5-74	6-74	7-74	8-74	9-74	10-74	11-74	12-74	
INITIAL MONTH																				



TOTAL FEDERAL RESERVE CREDIT - REVISED SERIES  
COMPOUNDED ANNUAL RATES OF CHANGE

TERMINAL MONTH	INITIAL MONTH																			MILLIONS OF DOLLARS
	6-73	7-73	8-73	9-73	10-73	11-73	12-73	1-74	2-74	3-74	4-74	5-74	6-74	7-74	8-74	9-74	10-74	11-74	12-74	
7-73	25.1																			89,396
8-73	4.7	-12.4																		88,419
9-73	0.3	-10.2	-8.0																	87,808
10-73	5.1	-0.8	5.6	21.1																89,222
11-73	5.2	0.8	5.6	13.1	5.6															89,626
12-73	5.4	1.9	5.8	10.8	6.0	6.3														90,086
1-74	5.9	3.0	6.4	10.3	6.9	7.6	8.9													90,731
2-74	6.4	4.0	7.0	10.2	7.7	8.4	9.4	9.8												91,442
3-74	6.2	4.0	6.6	9.3	7.0	7.4	7.8	7.2	4.6											91,783
4-74	5.9	4.0	6.2	8.5	6.5	6.7	6.7	6.0	4.1	3.7										92,063
5-74	7.3	5.7	7.9	10.1	8.6	9.1	9.6	9.8	9.8	12.5	22.0									93,600
6-74	7.4	5.9	7.9	9.8	8.5	8.9	9.3	9.4	9.3	11.0	14.8	8.0								94,200
7-74	7.9	6.5	8.4	10.2	9.1	9.5	10.0	10.2	10.3	11.7	14.5	11.0	14.1							95,242
8-74	8.2	7.0	8.8	10.4	9.4	9.9	10.3	10.5	10.6	11.9	14.0	11.5	13.3	12.4						96,177
9-74	8.1	7.0	8.7	10.2	9.3	9.6	10.0	10.1	10.2	11.1	12.7	10.5	11.3	10.0	7.6					96,763
10-74	7.4	6.3	7.8	9.1	8.2	8.4	8.7	8.6	8.5	9.0	10.0	7.7	7.6	5.5	2.3	-2.8				96,535
11-74	7.6	6.6	8.0	9.2	8.4	8.6	8.8	8.8	8.7	9.2	10.0	8.1	8.2	6.7	4.9	3.6	10.3			97,330
12-74	8.2	7.3	8.7	9.9	9.1	9.4	9.7	9.8	9.8	10.3	11.2	9.7	10.0	9.2	8.5	8.8	15.0	19.9		98,815
1-75	6.9	6.0	7.2	8.2	7.4	7.5	7.6	7.5	7.3	7.6	8.0	6.4	6.2	4.9	3.5	2.5	4.3	1.4	-14.3	97,549
6-73 7-73 8-73 9-73 10-73 11-73 12-73 1-74 2-74 3-74 4-74 5-74 6-74 7-74 8-74 9-74 10-74 11-74 12-74																				
INITIAL MONTH																				

TOTAL FEDERAL RESERVE CREDIT - OLD SERIES  
COMPOUNDED ANNUAL RATES OF CHANGE

TERMINAL MONTH	INITIAL MONTH																			MILLIONS OF DOLLARS
	6-73	7-73	8-73	9-73	10-73	11-73	12-73	1-74	2-74	3-74	4-74	5-74	6-74	7-74	8-74	9-74	10-74	11-74	12-74	
7-73	23.2																			89,415
8-73	1.7	-16.1																		88,119
9-73	1.0	-8.6	-0.5																	88,085
10-73	3.4	-2.4	5.2	11.2																88,869
11-73	5.0	0.9	7.3	11.4	11.6															89,686
12-73	6.0	2.9	8.2	11.3	11.3	11.1														90,474
1-74	6.2	3.6	8.1	10.3	10.0	9.2	7.4													91,016
2-74	6.8	4.6	8.5	10.4	10.2	9.8	9.2	10.9												91,806
3-74	6.3	4.4	7.7	9.1	8.7	8.0	6.9	6.7	2.6											92,003
4-74	6.2	4.4	7.3	8.5	8.0	7.3	6.4	6.1	3.7	4.9										92,367
5-74	7.6	6.1	8.9	10.1	10.0	9.7	9.4	10.0	9.6	13.3	22.5									93,940
6-74	7.4	6.1	8.6	9.7	9.5	9.2	8.9	9.2	8.7	10.8	14.0	6.1								94,402
7-74	7.6	6.4	8.7	9.7	9.5	9.3	9.0	9.3	8.9	10.6	12.5	7.9	9.7							95,135
8-74	7.6	6.5	8.6	9.5	9.3	9.1	8.8	9.0	8.7	10.0	11.3	7.9	8.8	7.8						95,732
9-74	8.3	7.3	9.3	10.2	10.1	9.9	9.8	10.1	10.0	11.2	12.6	10.2	11.6	12.6	17.7					97,038
10-74	6.9	5.9	7.7	8.3	8.1	7.8	7.5	7.5	7.1	7.7	8.2	5.3	5.4	4.0	2.1	-11.3				96,072
11-74	7.5	6.6	8.3	8.9	8.7	8.5	8.3	8.4	8.1	8.8	9.3	7.3	7.5	7.0	6.7	1.7	16.6			97,308
12-74	8.4	7.6	9.3	9.9	9.8	9.7	9.6	9.8	9.7	10.5	11.2	9.7	10.3	10.5	11.1	9.0	20.9	25.4		99,158
1-75	7.0	6.2	7.7	8.2	8.0	7.7	7.5	7.5	7.2	7.6	8.0	6.3	6.3	5.7	5.3	2.4	7.5	3.2	-15.0	97,822
6-73 7-73 8-73 9-73 10-73 11-73 12-73 1-74 2-74 3-74 4-74 5-74 6-74 7-74 8-74 9-74 10-74 11-74 12-74																				
INITIAL MONTH																				



the monetary base grew 8.3 percent on the old basis and 8.4 percent using revised data. The major effect on quarterly growth rates appears in the quarter-to-quarter rates of change for the last two quarters in the years 1972-74.

The revised growth rates for the last quarter of each of these years is lowered from those reported for the old series. For example, the growth rate of monetary base on the old basis in the period III/74-IV/74 was 10.2 percent, and on the new basis is 8.8 percent. Growth rates of the monetary base from second quarter to third quarter for 1972-74 were raised. For example, in the period II/74-III/74 the growth rate of base on the old basis was 5.4 percent, and with the revised data it was 7.4 percent.

Tables showing month-to-month rates of change of the monetary base are shown on page 26. Using monthly data, the revised monetary base in recent periods shows more of a deceleration in growth than did the previous data. For example, on a revised basis, the monetary base grew at about a 6 percent rate from July 1974 to January 1975, compared to an 8.4 percent rate over the previous six months. On the

old basis, the growth of the base showed very little deceleration over these same periods, from a 7.5 percent rate to about a 7 percent rate in the most recent period.

### *Federal Reserve Credit*

The series on Federal Reserve credit published by this Bank is also adjusted for the effects of changes in reserve requirement ratios and shifts in deposits. Like the source base, the seasonal factors on Federal Reserve credit were influenced by developments such as in November-December 1972. Federal Reserve credit has tended to show a substantial seasonal increase from October to December. The only year in the postwar period that Federal Reserve credit showed a marked decrease from October to December was 1972.

Therefore, the series on Federal Reserve credit has been revised to reflect the minor revisions in computation of RAM and the fact that RAM is now added to Federal Reserve credit and then the total is seasonally adjusted. Tables showing month-to-month rates of change of Federal Reserve credit on the revised and old bases are shown on page 27.