

MONETARY POLICY AND ECONOMIC PERFORMANCE, SUMMER 1976-NOVEMBER 1980: AN OVERVIEW*

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In May 1975, pursuant to House Concurrent Resolution 133, passed in March 1975, the Federal Reserve began to set and disclose in Congressional hearings that were held four times a year money supply growth targets for the four quarters immediately ahead. Now, under the Hawkins-Humphrey Act, the hearings are held only twice a year—February and July. In July, preliminary targets are disclosed for the next calendar year. Also in July, and in February as well, the targets are set (or, if desired, revised) for the current calendar year.

Initially, May 1975, plans were announced to increase what was then the basic measure of the nation's supply of exchange media or money, M1, between 5 and 7½ percent per year. The lower end of the range was reduced to 4½ percent effective beginning in the fourth quarter of 1975. The upper end of the range was reduced to 7 percent effective the following quarter, and further reduced to 6½ percent effective in the summer or third quarter of 1976.

Early 1975 to Late 1976: Recovery with Declining Inflation In association with lowering its sights, the Federal Reserve kept M1 growth at the bottom or below the planned ranges until the third quarter of 1976. During the year and a half from March 1975 through the third quarter of 1976, measured between the same quarters from one year to the next, M1 growth ranged between 4.5 and 5.2 percent. (Later, beginning with our discussion of events from late 1976 on, M1B is used to measure the nation's supply of exchange media or money. Here, it suffices to note that its growth ranged be-

tween 5.0 and 5.8 percent during the earlier period now under discussion.)

In retrospect, the economy performed exceptionally well during the early 1975 to late 1976 period.

- The recession that began late in 1973 ended in the second quarter of 1975. The nation's output, measured by constant dollar GNP, increased 6.5 percent between the second quarter of 1975 and the second quarter of 1976 and 4.7 percent between the third quarter of 1975 and the third quarter of 1976. Unemployment fell from the recession peak of 8.9 percent in May 1975 to 7.7 percent in September 1976.
- Inflation, measured by the rise in the GNP deflator dropped from 11.6 percent in the four quarters ending with the first quarter of 1975 to 4.8 percent in the four quarters ending with the third quarter of 1976.

Few believed, in early 1975, that our economy could achieve vigorous recovery of production from the 1973-1975 slide, and realize a substantial decline in unemployment, if money growth was held below 6 percent per year. And not many persons believed that this could happen while at the same time the rate of inflation fell sharply. Rather, it was widely believed that money growth substantially higher than 6 percent per year was essential to a strong recovery, and that a strong recovery was sure to prevent inflation from falling sharply. However, the events of 1975-1976 contradicted both beliefs. First, vigorous recovery of production took place even though money growth measured over 12-month periods was maintained near the economy's long run growth potential, which is estimated to be 3½ to 4 percent yearly. Second, inflation dropped nearly 60 percent together with the recovery of growth of constant dollar GNP.

Recovery The recovery of 1975-1976 was made possible by (and indeed required) the erosion and elimination of the forces that caused the 1973-1975 recession. The recession resulted from a combination of factors. The acceleration of domestic inflation beginning in 1973, the quadrupling of imported oil

* Extracted from the author's report

The Impact of the Federal Reserve System's Monetary Policies on the Nation's Economy, (Second Report), Staff Report of the Subcommittee on Domestic Monetary Policy of the Committee on Banking, Finance and Urban Affairs, House of Representatives, 96th Congress, Second Session, December 1980,

presented at a research seminar at the Federal Reserve Bank of Richmond, April 17, 1981. The views expressed herein are those of the author and not necessarily those of the Federal Reserve Bank of Richmond or of the Board of Governors of the Federal Reserve System.

prices between the end of 1972 and the spring of 1974, and the cutback of fiscal stimulus in 1973 and the first half of 1974 all played important parts in depressing production in 1973-1975. The sharp deceleration of money growth that began in mid-1973 and was speeded up in the second half of 1974 was another contributing factor. All of these forces had eroded or were eliminated by the spring of 1975. Their erosion and elimination acted to halt the decline in the nation's output. The recovery was then able to start.

Beginning in the spring of 1975, constant dollar GNP grew strongly. It was propelled upward by the natural resiliency of the economy's private sector, a modest boost in the 12-month rate of money growth from the low reached in the recession, and the input in 1975 of strong incremental fiscal stimulus. Increased money growth was only one of several contributing factors. It was hardly crucial. However, it was crucial that the sharp decline of M1 growth that began in mid-1973 and speeded up in the second half of 1974 be stopped, and that the 12-month rate of M1 growth be maintained at or near a rate commensurate with the economy's long run potential to increase constant dollar GNP. And this much was done.

The Decline of Inflation There remains the question of the decline of the rate of inflation that occurred together with the rise of constant dollar GNP and the corollary fall of unemployment in 1975 and 1976. Many attribute it to the lagged effects of the loosening of labor and other input markets and easing of cost pressures that accompanied the 1973-1975 recession, including the leveling-off of imported oil prices after the spring of 1974. However, the recession and leveling-off of imported oil prices were not unrelated to the course of money growth. The view that we hold is that the sharp deceleration of the rate of growth of the money supply that began in mid-1973 and continued until early 1975 was a common cause of (1) the 1973-1975 recession, (2) the leveling-off of imported oil prices after the middle of 1974, and (3) the decline of the rate of inflation in 1975-1976. It played a crucial role in the slowing of inflation.

This is not to say that inflation is always and everywhere a purely monetary phenomenon. Certainly, in periods as short as a year it is not. Measured quarter to quarter, over four-quarter periods, or year on year, and even over longer periods, inflation can be triggered or worsened by any of a large number of events. An occasion of severe inflation was initiated in the United States by the buying spree

that followed the invasion of South Korea in June 1950. A temporary inflationary impact was given by the OPEC oil price increases of late 1973 and early 1974 and again in 1979. Because of the influences of such shocks, any particular rate of growth of the money supply is not related with mathematical precision to the accompanying or following rate of inflation. But it is a basic and demonstrable reality that in the post-Korean War era in the United States the rate of inflation measured over four-quarter periods, or year on year, and over longer periods, has been profoundly affected by the rate of growth of the money supply.

However, it is past money growth, not the accompanying growth of the money supply, that matters most. Changes in money growth can change the rate of growth in expenditures on assets and even GNP goods and services relatively rapidly. Rates of rise of some prices (financial and other asset prices, commodity prices, and prices of shelf goods) adjust quickly, but a number of factors combine to slow the adjustment of the rate of rise of prices in general.

To begin with, there is no assurance that regulated prices, including rents and utilities, will be allowed to rise quickly and commensurately in the wake of an acceleration of money growth and corollary rise in the growth of spending on GNP goods and services. Also, it is a sticky problem to raise prices that have been advertised or "established" such as tuition, hotel room rates, brand-name product prices, doctors' fees, and theater ticket prices. In the event of declines in the growth rates of the money supply and spending on GNP goods and services, it is equally sticky to cancel or scale down planned price increases of advertised goods. And it is highly unlikely that requests for increases of regulated prices will be withdrawn quickly in such case.

Further, price adjustments to changes in economic conditions often are delayed by agreements reached in the past under different conditions. Wage rates are set ahead by collective bargaining in important economic sectors. Forward contract prices are the norm in the provision of such financial services as term loans and insurance, and in the supply of diverse raw materials and energy. Price and wage increases contracted for in the past ordinarily are put into effect whether new conditions warrant scaling them down, or up. Finally, the post-1932 tradition of using monetary and fiscal stimulus to end recessions acts to deter adjusting wage and price demands downward in renegotiating contracts to conform to current recession conditions. This is because, in the post-1932 tradition, ongoing declines in spending or

its growth are expected to be reversed reasonably soon by new monetary and fiscal stimulus.

As a result of these diverse factors it takes time for changes in money growth to change the rate of rise of the general level of prices, i.e., the rate of inflation. However, by 1975 and 1976, enough time had elapsed for the rate of inflation to substantially adjust to the slowdown of money growth that began in mid-1973 and continued to early 1975.

Late 1976 to October 1979: Money Growth Accelerates As was noted in discussing events from early 1975 to late 1976, during the year and a half from March 1975 through the third quarter of 1976, measured between the same quarters from one year to the next, M1 growth ranged between 4.5 and 5.2 percent. Because M1 growth was kept at the bottom of the Federal Reserve's planned ranges for M1 growth, and because the target ranges had been reduced, we had high hopes in 1976 that inflation would be permanently checked and that another recession could be avoided. Unfortunately, M1 growth was accelerated sharply beginning in the fourth quarter of 1976.

Quarter-to-quarter M1 growth, which had been kept between 2.9 and 5.8 percent per year and averaged 4.4 percent per year in the four quarters ending with the third quarter of 1976, was suddenly increased to 7 percent per year in the fourth quarter of 1976. In 1977, it ranged between 6 and 8.8 percent per year and averaged 7.5 percent per year.

The story is virtually the same for M1B. Quarter-to-quarter M1B growth ranged between 3.2 and 6.3 percent per year and averaged 4.8 percent per year in the four quarters ending with the third quarter of 1976. It was increased to 7.6 percent per year in the fourth quarter of 1976. In 1977, it was allowed to range between 6.5 and 9.3 percent per year and averaged 7.9 percent per year.

M1B is one of the Federal Reserve's two new measures of the supply of exchange media, replacing M1. The other is M1A. The two series were first published in February 1980. They were constructed to start in 1959. They can be extended back in time by assuming they are identical to the old M1 series in years before 1959. M1A excludes the demand deposits of foreign banks and official institutions in U. S. banks, but otherwise is identical to old M1. M1B equals M1A plus commercial bank ATS accounts and checking accounts in depository institutions other than commercial banks. (See Glossary.) Reasonably accurate data have been available on ATS accounts and checkable accounts in depository institutions other than commercial banks as they

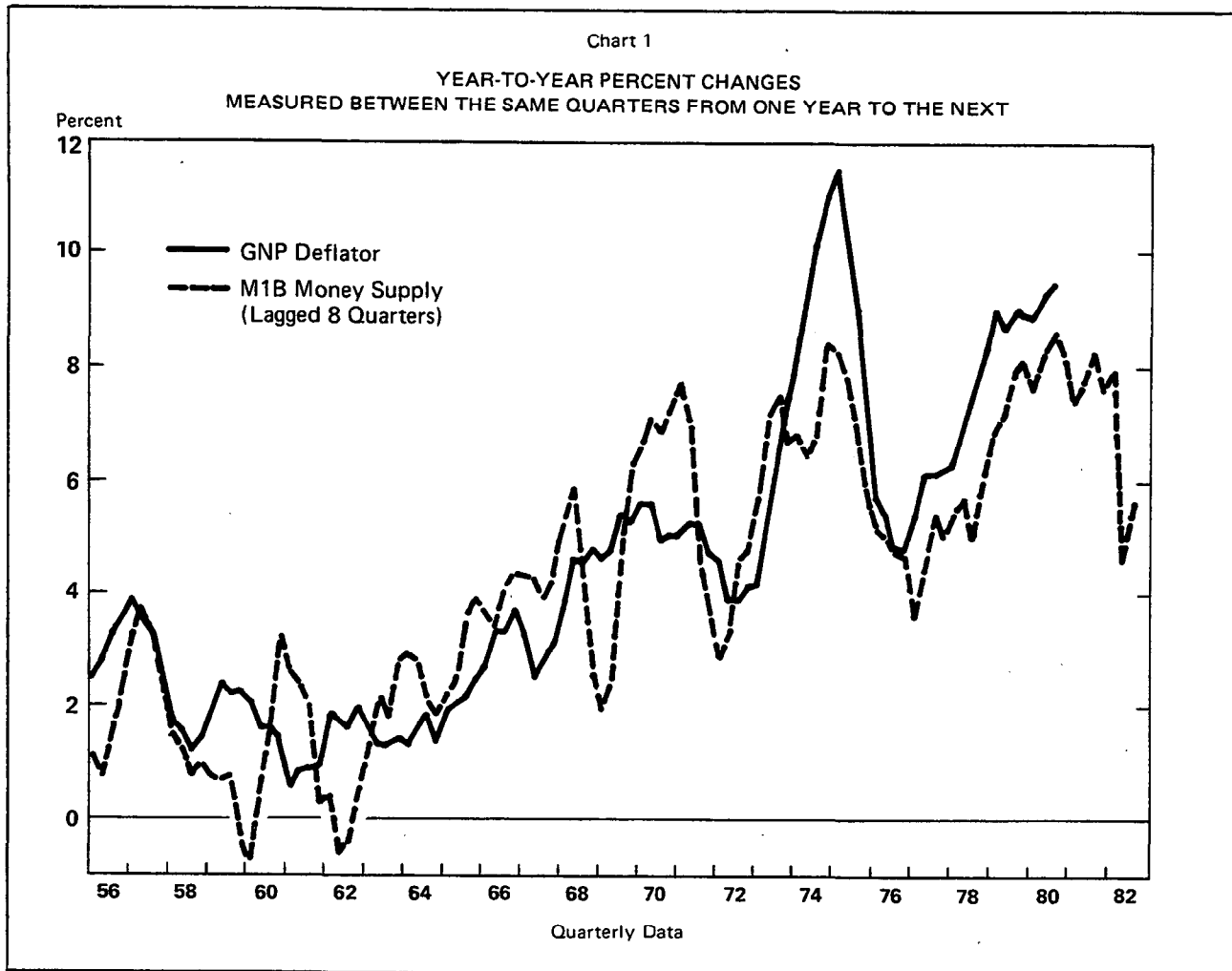
grew. Thus it is legitimate to use the M1B series for years before 1980, when the series was first published. It also is logically correct to count all checkable accounts in all depository institutions as exchange media. Accordingly, M1B is used to measure the U. S. money supply in this article from here on.

M1B growth remained high in 1978 and through the summer or third quarter of 1979, just before the October 6, 1979 change in the Federal Reserve's focus which is discussed later. Quarter-to-quarter M1B growth ranged between 4.8 and 10.7 percent per year and averaged 8.2 percent per year during this period.

Charting the Year-on-Year Relation of Inflation to Money Growth In the wake of the acceleration of money growth, inflation, which had been checked and reduced, increased again. The GNP price deflator increased 6.2 percent in the four quarters ending with the fourth quarter of 1977, 8.2 percent in the four quarters ending with the fourth quarter of 1978, 8.9 percent in the four quarters ending with the fourth quarter of 1979, and 9.6 percent in the four quarters ending with the third quarter of 1980.

The 1977-1980 record confirms the evidence accumulated since the Korean War ended. Specifically, by and large and on average, the four-quarter rate of inflation follows closely the rate of money growth two years earlier. The relation of the four-quarter rate of inflation to the four-quarter rate of M1B growth two years earlier during the post-Korean War period is mapped in Chart 1.

The chart maps percentage increases, measured between the same calendar quarters from one year to the next, in the GNP deflator and M1B. The solid line maps the percentage rise of the deflator; the dashed line maps M1B percentage growth. To capture the lag between changes in money growth and changes in the rate of inflation, the growth of M1B, which is represented by the height of any point on the dashed line, refers to the percentage growth that occurred in the four quarters ending two years earlier than the date shown directly below that point on the horizontal axis. For example, the height of the dashed line directly above the first quarter of 1956 on the horizontal axis shows the percentage growth of M1B from the first quarter of 1953 to the first quarter of 1954. Unlike this lagged mode of timing, the rate of inflation, which is represented by the height of any point on the solid line, refers to the percentage change in the GNP deflator in the four quarters ending in the quarter indicated by the date directly below this point on the horizontal axis.



Inspection of the solid and dashed lines mapped in Chart 1 shows that, measured over four-quarter periods, percentage increases in the GNP price deflator from 1956 to the third quarter of 1980, closely track percentage increases in M1B two years earlier. However, this visual approximation of the relationship of inflation to money growth in the U. S. since 1956 captures only part of the power of changes in M1B growth to change the GNP rate of inflation. Only the part that is centered on price behavior two years after the change in M1B growth is captured.

The Long-Run Adjustment Changes in the dollar value of the economy's GNP always can be attributed to changes in M1B or its velocity or turnover in relation to the dollar value of GNP. This proposition has nothing to do with economics. It is a matter of arithmetic. As a useful approximation, the percentage change in the dollar value of GNP in any given time period can be expressed as the sum of the same period's percentage changes in M1B and its velocity.

Mathematically,

- 1) the percent change in M1B
- +2) the percent change in M1B's velocity
- =3) the percent change in the dollar value of GNP.¹

Because percentage changes in velocity can vary from period to period, percentage changes in M1B will not result in proportional changes in the dollar value of GNP in the same period, except by accident. Thus, a crucial question is: How do percentage changes in M1B's velocity vary?

Measured from one quarter to the next, percentage changes in M1B's velocity vary substantially. However, as the unit of time used to group the data is

¹ The exact relationship is:
 $(1 + (\text{the percent change in M1B}/100))$
 $\times (1 + (\text{the percent in M1B's velocity}/100))$
 $- 1$
 $= \text{the percent change in the dollar value of GNP}/100.$

lengthened, the variance falls. For example, in the twelve years from 1956 to 1967, on average, velocity increased 3.45 percent measured year on year. In the next 12 years, from 1968 to 1979, the year-on-year or yearly increase of velocity averaged 2.97 percent, a difference of less than ½ percentage point.

Table I sets forth yearly average percentage changes of—

- M1B's velocity in relation to the dollar value of GNP,
- the dollar value of GNP, and
- M1B

for eight consecutive nonoverlapping 3-year periods in the post-Korean War era, beginning with 1956-1958 and ending with 1977-1979. The data show that in the post-Korean War period, measured as yearly averages for 3-year periods, percentage changes in velocity have been fairly stable. Over the full twenty-four years from 1956 to 1979, velocity increased, on average, 3.2 percent per year. In the eight 3-year periods into which 1956-1979 divides, the average yearly percentage increase in velocity never exceeded 4 percent or fell below 1.62 percent, a range of only 2.4 percentage points. Except for the 1968-1970 period, the average yearly 3-year increase was well within 1 percentage point of the full 24-year period average rise. In 1968-1970, it was 1.58 percentage points below the full-period average rise.

In sharp contrast to the rate of rise in velocity, 3-year percentage changes in both M1B and dollar spending on GNP varied considerably in the 1956-1979 period. Measured as yearly averages for 3-year periods, percentage changes in M1B ranged from a low of 0.97 percent to a high of 7.81 percent, or nearly 7 percentage points, and changes in the dollar value of GNP ranged between 4 and 11.58 percent, a range of more than 7½ percentage points.

Moreover, grouped in the 3-year periods into which 1956-1979 divides, there is no relationship between the yearly rate of rise in velocity and either the yearly rate of rise in M1B or the year-on-year growth of the dollar value of GNP. However, 3-year average yearly percentage changes in the dollar value of GNP closely match 3-year averages of yearly percentage changes in M1B. The relationship between the two is depicted in Chart 2.

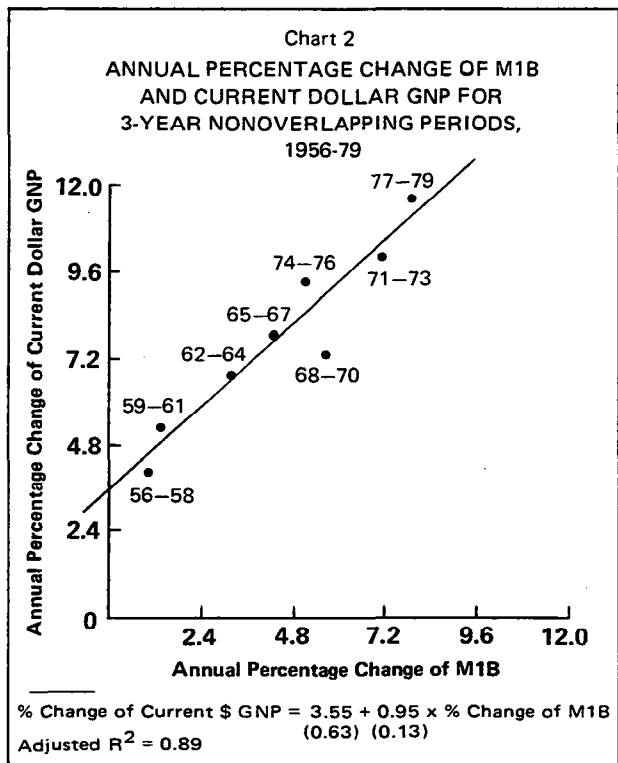
For each 3-year period, the chart relates the average yearly percentage growth of M1B, which is measured on the horizontal axis, and the average yearly percentage rise in the dollar value of GNP, which is measured on the vertical axis. The chart shows that

Table I
3-YEAR YEARLY AVERAGE PERCENTAGE CHANGES
IN VELOCITY, NOMINAL GNP AND M1B,
NONOVERLAPPING PERIODS

Period	1956-1979		
	Yearly average percentage change in		
	Velocity	Nominal GNP	M1B
1956 to 1958	3.00	4.00	0.97
1959 to 1961	3.90	5.27	1.32
1962 to 1964	3.48	6.71	3.13
1965 to 1967	3.41	7.81	4.25
1968 to 1970	1.62	7.27	5.55
1971 to 1973	2.74	9.98	7.04
1974 to 1976	4.00	9.23	5.02
1977 to 1979	3.56	11.58	7.81

the two are very closely related. For the 3-year periods into which 1956-1979 divides, changes in M1B are matched by nearly proportional concurrent changes in the dollar value of GNP. As a convenience, the least squares regression equation of the 3-year average yearly percentage change in the dollar value of GNP regressed on the 3-year average yearly percentage change in M1B is drawn in the chart, and its relevant statistics provided below.

Accelerations in the growth of dollar spending on



GNP goods and services which accompany accelerated money growth can result in faster inflation, accelerated output growth, or some combination of the two. A short-lived increase in the growth of output is likely in the short run. However, over the long haul, accelerated money growth tends to be fully dissipated in faster inflation. This is the fundamental lesson of the data.

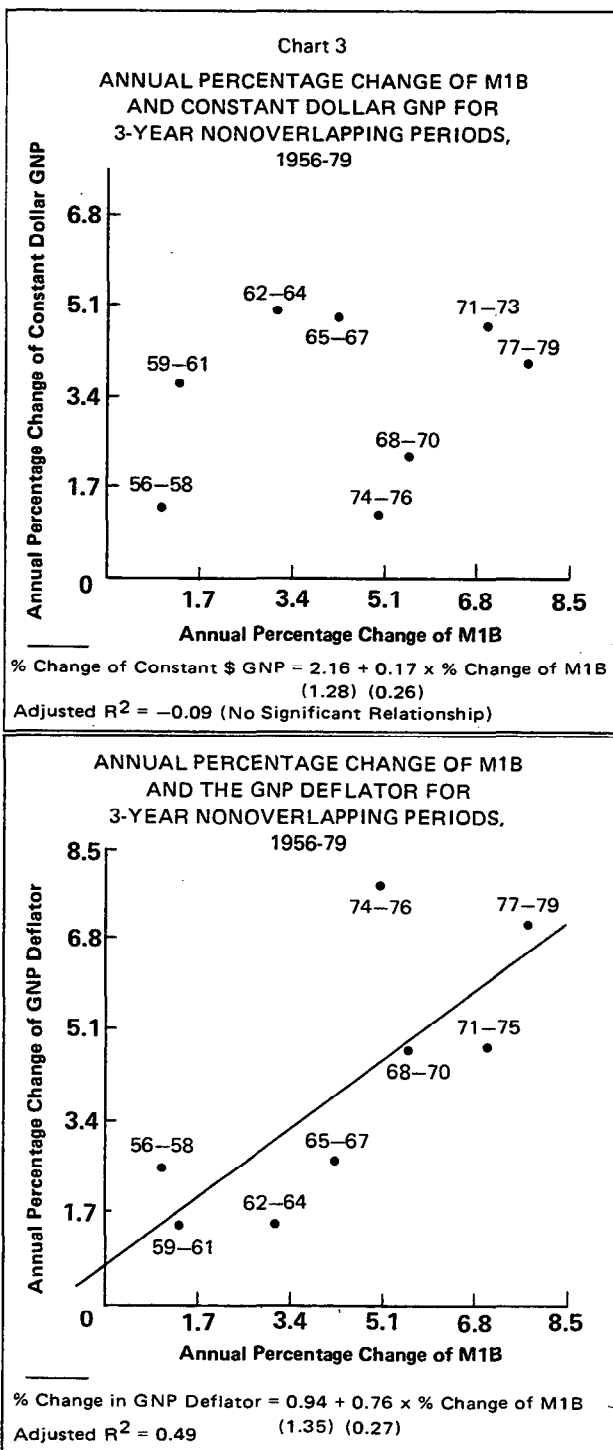
There is nothing mysterious about this conclusion. Money facilitates production only when it is introduced into a market. Unlike in the cases of labor and material input, increases in the input of money (in full-fledged money economies such as ours) do not increase the potential to produce. In the long run, measured real GNP growth is neutral with respect to money growth.² This does not mean living standards are unaffected; via inflation, rapid money growth generates deadweight losses in real GNP.

Because the limits on production cannot be changed by changing money growth, the acceleration of spending that results from accelerating money growth ultimately is registered in faster inflation. It is only a question of how long it takes.

The longer term relationships between money growth rates and rates of constant dollar GNP growth and inflation are pictured in Chart 3. The top panel of Chart 3 relates M1B growth to the growth of constant dollar GNP; the lower panel relates M1B growth to the rate of rise in the GNP deflator. The data are again grouped in the eight consecutive, nonoverlapping 3-year periods that comprise the 1956-1979 period.

For each 3-year period, the top panel relates the average yearly percentage growth of M1B, which is measured on the horizontal axis, to the average yearly percentage increase in constant dollar GNP, which is measured on the vertical axis. The lower panel relates average yearly M1B percentage growth, again measured on the horizontal axis, to the average yearly percentage increase in the GNP price deflator, which is measured on the vertical axis. The chart shows that the long-run growth of constant dollar GNP or output is essentially independent of the rate of rise in M1B, while the rate of inflation is closely related to M1B growth. Again for convenience, regression equations fitting rates of rise of constant dollar GNP and the GNP deflator, respectively, to M1B growth are drawn in the appropriate

² This statement is valid assuming full employment only at the start of the run. It need not be assumed at points in the run. What happens is that shortfalls in output growth during recessions are matched by output growth above full employment potential growth in recovery periods.



panels of Chart 3, and their relevant statistics provided alongside.

Finally, because, as was earlier discussed, the rate of inflation changes in response to changes in money growth only with a lag, which in the post-Korean War period has averaged two years, we also have mapped, in Chart 4, the 1956-1979 3-year relation-

ships of average yearly constant dollar GNP growth and the average yearly rate of rise in the GNP deflator, respectively, against earlier average year-on-year M1B growth. This evidence confirms that in the longer run, constant dollar GNP growth is unaffected by M1B growth. It also confirms that the rate of inflation is powerfully influenced by M1B growth, and that, on average, changes in the rate of GNP inflation have lagged changes in M1B growth by about two years in the post-Korean War period.

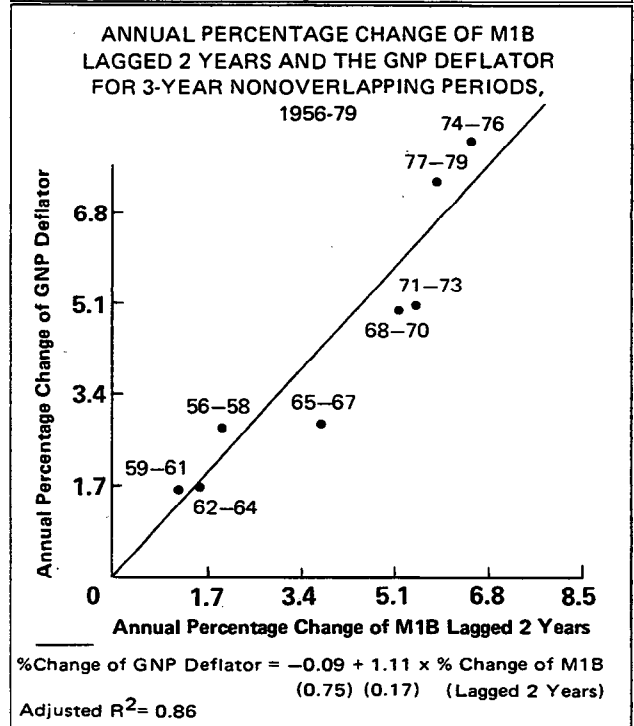
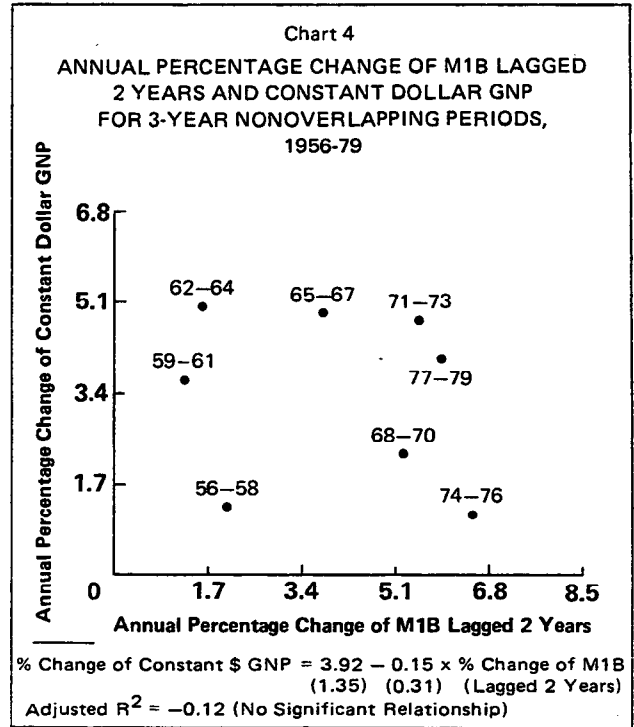
In view of the evidence described and discussed above, it was a dreadful mistake to accelerate money growth beginning in October 1976. The question that is examined next is why the Federal Reserve did this.

Late 1976 to Late 1979: What Went Wrong

The acceleration of M1B growth that began in October 1976 and led inexorably to the acceleration of inflation, and in turn to the recession that now afflicts the economy, does not appear to have resulted from a deliberate decision to accelerate money growth. The Federal Reserve's targets for money growth were not raised when the acceleration began. They were not raised later. What happened was not planned or even projected. However, given the Federal Reserve's policy, it was a predictable event. The acceleration of M1B growth that began in October 1976 was the predictable corollary of the Federal Reserve's deemphasizing money supply control and placing more emphasis on resisting changes in interest rates beginning around April 1976.

Federal Reserve monetary policy is reviewed and determined roughly once a month by the System's Open Market Committee. The Committee is comprised of the seven members of the Board of Governors of the Federal Reserve System and five of the twelve Reserve Bank presidents who, apart from the president of the New York Reserve Bank, who serves as a permanent Open Market Committee member, serve in rotation. At its monthly or near-monthly meetings, the Committee sets inter-meeting or immediate targets for both money growth and the Federal funds rate (see Glossary). These targets are used to guide and constrain the manager of the System's open market accounts in the New York Reserve Bank until the next Open Market Committee meeting. From March 1975 through March 1976, the manager usually (12 out of 13 times) was directed to keep per year money growth within a band 2½ to 4 percentage points wide and the Federal funds rate within a band 1 to 1¼ percentage points wide.

However, beginning in April 1976, the Open



Market Committee narrowed the band in which the manager was instructed to keep the Federal funds rate and widened the inter-meeting target range for money growth. Thereby, the Committee deemphasized control of the money supply as an operating goal and increased the importance of resisting interest rate movements. Money growth subsequently

emerged primarily as the incidental corollary of the Committee's Federal funds interest rate goals. The pertinent policy record is presented in Table II.

The results of this mode of operating proved to be unwelcome. Strong credit demands put upward pressure on the Federal funds rate almost continuously from April 1976 until early 1980. These pressures should have been allowed to dissipate by keeping money growth and hence spending on GNP goods and services from rising. Instead, they were fueled. Given its policy of resisting short-term changes in interest rates, the Federal Reserve was obliged to supply banks with increasing input of reserves. This input provided the base for accelerated money growth and ultimately resulted in faster inflation and weakness of the dollar on foreign exchange markets. With faster inflation, credit demands and interest rates rose higher and higher. The Federal funds rate climbed from a daily average of 4.82 percent in April 1976 to a daily average of 10.29 percent in June 1979.

In the summer of 1979, the rise of interest rates became intolerably difficult to contain even between Open Market Committee meetings. At its July 1979 meeting, the Open Market Committee set the inter-meeting Federal funds rate target at $9\frac{3}{4}$ to $10\frac{1}{2}$ percent. However, it proved necessary to raise the upper limit to $10\frac{3}{4}$ percent before the August meeting. At its August meeting, market conditions compelled the Committee to set the inter-meeting Federal funds rate at $10\frac{3}{4}$ to $11\frac{1}{4}$ percent, but before the September meeting it became necessary to raise the

upper limit to $11\frac{1}{2}$ percent. At the September Open Market Committee meeting, conditions compelled still another boost in the targeted range to $11\frac{1}{4}$ to $11\frac{3}{4}$ percent. By the end of September it was clear, even inside the Federal Reserve, that interest rates had not been kept from rising by focusing open market operations on keeping them from rising, and subordinating control of money growth to that end. A new approach was needed.

From October 6, 1979 Until November 1980 On October 6, 1979, the Open Market Committee announced an historic change in the object and method of open market operations. First, control of the growth of the monetary aggregates was made the primary object. Second, to achieve better control of the growth of the monetary aggregates, the Committee shifted the method of open market operations "to an approach placing emphasis on supplying the volume of bank reserves estimated to be consistent with the desired rates of growth in monetary aggregates, while permitting much greater fluctuations in the Federal funds rate than heretofore." Immediately, the Committee instructed the Manager of the System's open market account "to restrain expansion of bank reserves to a pace consistent with growth from September to December at an annual rate on the order of $4\frac{1}{2}$ percent in M1 . . . provided that in the period before the next regular meeting the Federal funds rate remained generally within a range of $11\frac{1}{2}$ to $15\frac{1}{2}$ percent."

Table II

**SPREAD IN PERCENTAGE POINTS OF INTER-OPEN MARKET COMMITTEE MEETING
TARGET RANGES FOR M1 GROWTH AND THE FEDERAL FUNDS RATE
APRIL 1976 TO SEPTEMBER 1979**

	Funds rate range				M1 growth target range			
	1976	1977	1978	1979	1976	1977	1978	1979
January	....	0.75	0.50	(1)	....	4	5.0	(1)
February	....	.75	.50	(2)	....	4	5.0	4
March	....	1.00	.50	0.75	....	4	4.0	4
April	0.75	.75	.75	.75	4.0	4	4.5	5
May	.75	.50	.50	.75	3.5	4	5.0	5
June	.50	.50	.50	(1)	4.0	4	5.0	(1)
July	1.00	.50	.25	.75	4.0	4	4.0	4
August	.50	.50	.50	.50	4.0	5	4.0	4
September	.75	.50	.50	.50	4.0	5	4.0	5
October	.75	.50	.50	....	4.0	5	6.5	....
November	.75	.50	.25	....	4.0	6	5.0	....
December	.75	.50	.75	....	4.0	6	4.0	....

¹ No meeting.

² No range was specified. The Committee directed that the Federal funds rate be maintained "at about the current level (10 percent)."

The Summary Records of the Committee's meetings since October 6, 1979 display policy statements indicating a continuing commitment to achieving close control of the growth of the monetary aggregates and considerable willingness to allow wide fluctuations in the Federal funds rate. The immediate or inter-meeting target range for the Federal funds rate has been at least 4 percentage points wide and as much as 8½ percentage points wide in the period since October 1979. In the case of money growth, the immediate target, which was expressed in terms of per annum growth of M1 until January 1980 and M1B from then on, was specified—

- in October 1979 as “on the order of 4½ percent” for the September-December 1979 period,
- in November 1979 as “about 5 percent” for the November-December 1979 period,
- in January 1980 (there was no December 1979 meeting) as “between 4 and 5 percent” over the first quarter of 1980,
- in February 1980 as “about 5 percent” over the first quarter,
- in March and April 1980 as “5 percent . . . or somewhat less” over the first half of 1980,
- in May 1980 as “7½ to 8 percent” until the next meeting,
- in July 1980 (there was no June meeting) as “8 percent” until the next meeting, except that “in view of the shortfall in monetary growth over the first half of the year, moderately faster growth would be accepted if it developed in response to a strengthening in the public's demand for money balances (i.e., falling velocity rates). . . .”, and
- in August 1980 as “9 percent” until the next meeting.

Unfortunately, despite the Federal Reserve's new willingness to let the Federal funds rate fluctuate over a wide range, money growth has not been stabilized as intended since October 6, 1979. The pertinent record is set forth in Table III. It shows wide fluctuations both in the Federal funds rate and M1B growth from October 1979 until November 1980.

From October 1979 to October 1980, per year M1B growth—

(1) was allowed to fall below the Federal Reserve's target growth range in November 1979,

(2) was propelled close to the top of the range in February 1980,

(3) was allowed to fall sharply below it in the April-May 1980 period, and then

(4) was propelled near the top again in August 1980 and over it in October 1980.

The miss in the April-May 1980 period was especially large and undoubtedly exacerbated the recession that began in January 1980. The extraordinary reacceleration of money growth since May 1980, portends higher inflation and another recession ahead.

In light of the record, it is difficult to know whether to be pessimistic or optimistic about the Federal Reserve's actually achieving control of M1B growth in the months and years ahead. Our inclination at this time is to wait and see.

A Reason for Optimism Monetary policy should aim in the years ahead at reducing M1B growth from the nearly 8 percent rate of this (1980) and recent years to 2½ to 3½ percent per year, which we estimate would be consistent with inflation of 1 to 3 percent per year. This can be done (1) if, upon observing M1B to be growing faster or slower than targeted for the current year, corrective action is taken and this year's target is hit, and (2) if the target is steadily reduced from year to year until the desired 2½ to 3½ percent range is reached. The corrective action required to get M1B growth back on course when it is off is not difficult to implement and carry out. All that is required is to scale open market purchases up when M1B has been growing

Table III
MONTHLY AVERAGES OF THE FEDERAL FUNDS RATE AND PERCENT PER YEAR GROWTH OF M1B OCTOBER 1979 TO NOVEMBER 1980

Date	FFR	M1B Growth
October 1979	13.77	2.20
November 1979	13.18	4.07
December 1979	13.78	6.87
January 1980	13.82	5.28
February 1980	14.13	9.89
March 1980	17.19	-.31
April 1980	17.61	-14.11
May 1980	10.98	-1.24
June 1980	9.47	14.60
July 1980	9.03	11.05
August 1980	9.61	21.60
September 1980	10.87	15.84
October 1980	12.81	11.21
November 1980	15.59	....

Note: FFR is the interest rate on Federal funds, monthly average. M1B growth is the percent per year rate of rise in M1B.

too slowly, and down when it has been growing too fast, and to persist until it is brought back on track; if one scalar doesn't work another will.

The saw-tooth pattern of M1B growth from October 1979 to October 1980 described above provides some reason for believing that the Federal Reserve now takes its announced target for M1B growth seriously; that deviations engender responses designed to hit it. In December 1979, the Federal Reserve acted promptly to accelerate M1B growth because it had been growing too slowly in the October-November 1979 period. In March 1980, actions were taken to slow money growth because it had grown too rapidly in the December 1979-February 1980 period. As a result of these actions, M1B growth was stopped completely in March 1980; it actually fell \$100 million. The following month, April 1980, it fell \$4.6 billion. Measured from September 1979, M1B growth moved below the target range in April 1980. It dropped even further below in May 1980. Once again, the Federal Reserve moved to change course. By June 1980, M1B was again growing rapidly and it continued to grow at very rapid rates in the July-November 1980 period. Now there are signs that the Federal Reserve is again moving to reduce M1B growth.

In summary, since October 1979, M1B growth has not been allowed to careen up and down for very long, as was the case in past years, and most recently from October 1976 to September 1979. This provides a reason for optimism.

Reasons for Pessimism We would be more optimistic about the future if the Federal Reserve completely stopped trying to minimize short-run fluctuations in the Federal funds rate, and revised its regulations with respect to the assessment of reserve requirements. Currently the assessment is delayed two weeks so that required reserves are matched against deposit liabilities of two weeks ago.

The events of 1980 show the damage that can be done, at least in the short run, by the combination of lagged reserve accounting and the setting of short-run ceilings and floors, no matter how far apart, for the Federal funds rate.

Beginning in late March the public suddenly and substantially increased its demand for coin and currency vis-a-vis demand (checking) accounts. This was not an accident. Switching from checking accounts to currency was impelled by the higher costs of using credit cards that were imposed by new regulations that were issued by the Federal Reserve pursuant to the President's invoking of the Credit Control Act of 1969 on March 14, 1980. Currency and

credit cards are easily and commonly used in discharging on-the-spot payments obligations. Checking deposits are not so easily or commonly used for this purpose. As a result, deposits were drawn down, and banks were subjected to a loss of reserves which forced a sharp contraction of the money stock—i.e., negative money growth for a time. M1B fell \$6.6 billion from the four weeks ending March 12, 1980 to the four weeks ending May 14, 1980, or at an annual rate of nearly 10 percent.³

No harm would have resulted, indeed the money supply would have continued to grow, if the Federal Reserve had made open market purchases in sufficient volume to replace the reserves that banks lost at this time because of the currency drain that resulted from the higher costs of using credit cards. But until late May the Federal Reserve failed to replace the reserves that were drained as a result of the imposition of credit controls. It did not supply replacement reserves because it was afraid that doing so would cause the Federal funds rate to fall precip-

³ To capture the impact of the imposition of credit controls on the public's demand for coin and currency, the 4-week moving average series of the public's holdings of coin and currency measured as a percent of its checking deposits (including NOW accounts et al.) was regressed on an internally generated time scale for the period from the twenty-seventh week of 1979 to the eleventh week of 1980, just before the imposition of credit controls, and the values of the regression equation's predictions were compared to actual 4-week moving average values of coin and currency expressed as a percent of checking deposits. The regression equation is—

$$\begin{aligned} \text{Coin and currency as a percent of checking deposits} \\ = 37.347 + .0280 \text{ time scale} \\ (.037)(.0017) \end{aligned}$$

The standard error of the regression equation is .110 percent, data are seasonally adjusted.

Between the twenty-seventh week of 1979 and the eleventh week of 1980, just before credit controls were imposed, the value of the regression equation's prediction of coin and currency measured as a percent of checking deposits averaged .02 percent less than the actual value. The two were never more than .23 percent apart. In the eleventh week of 1980, the predicted value was .08 percent below the actual value. In the fifteenth week, four weeks after credit controls were imposed, the predicted value was .19 percent higher than the actual value. In subsequent weeks the gap widened to .30 percent, .46 percent, .86 percent, 1.06 percent, 1.18 percent, and 1.22 percent. This latter is more than eleven times larger than the regression's standard error. The gap then drifted down to .85 percent, still nearly eight times larger than the standard error, in the twenty-seventh week of 1980—i.e., about the same time that credit controls were relaxed and eliminated. By the thirty-seventh week of 1980, the predicted value was only .02 percent higher than the actual value and since then it has fallen below the actual value. In the forty-fifth week it was .37 percent less than the actual value.

The results strongly support the contention that the imposition of credit controls caused the public to suddenly and substantially increase its demand for coin and currency relative to its demand for check money, thereby paving the way for the sharp contraction in the money supply which occurred last spring (1980).

itously. As put by Federal Reserve Board Governor, Emmet J. Rice, in a New York City speech on May 7, 1980—

With the aggregates registering growth substantially below their target ranges, we could, of course, increase reserves by an amount sufficient to bring them within the announced target ranges. However, the increment in reserves necessary to achieve this could imply a federal funds rate that is far lower than seems prudent under present conditions.

Such a provision of reserves would run the risk of creating too much liquidity too soon. Moreover, it might be interpreted by market analysts as indicating an abrupt shift by the Federal Reserve towards monetary ease, possibly thereby encouraging inflationary expectations.

Given its lagged reserve accounting system, the Federal Reserve's fear was not unfounded. In a two-week lagged reserve accounting regime, if deposits fell two weeks ago, required reserves necessarily must fall this week. In turn, this means that if total reserves are increased this week or even kept unchanged from the total of two weeks ago, excess reserves will rise and cause a sharp drop in the Federal funds rate. The banking system cannot easily eliminate excess reserves, but most banks with excess reserves will try to do so. Banks with excess reserves sell them in the Federal funds market, and the Federal funds rate tends to fall with these sales.

Because the Federal Reserve chose to put a floor under the Federal funds rate, reserves were allowed to fall and M1B growth became negative (—10 percent per year) in the mid-March to May 1980 period. This greatly aggravated the recession then underway. It need not have happened. It wouldn't have happened if the Federal Reserve had not put a floor under the Federal funds rate at the time and focused on controlling M1B growth.

The Federal Reserve also continues to set ceilings on the Federal funds rate and keeps the discount rate below market interest rates when market rates are rising. In combination with lagged reserve accounting, the ceilings often produce explosive money growth. This is because, in periods when the economy and deposits are growing, the Federal Reserve, to avoid reserve deficiencies and increases in interest rates, provides new reserves regardless of the implications for money growth. The June-November 1980 period shows that explosive money growth can result if this is done, despite the best intentions. As stated by Federal Reserve Board Governor, Lyle E. Gramley, in a Denver, Colorado speech on July 17, 1980—

... during the earlier phase of economic recoveries, growth in supplies of money and credit has often begun to accelerate because the Federal Reserve

did not let credit markets tighten sufficiently while unemployment and excess capacity were still relatively high. That is the mistake we must be particularly careful to avoid when the current recession bottoms out and recovery begins again.

The record shows that the same mistake was made again this year. In the six months ending in November 1980, M1B grew at an annual rate of 15 percent, the highest in any six-month period since World War II. And the events of the past 25 years warn, in turn, that explosive money growth results in time in the acceleration of inflation, elevation of the Federal funds rate ceiling, and recession.

Conclusion Clearly, it would help in the management of M1B growth if the Federal Reserve did not subordinate achievement of planned M1B growth to minimizing fluctuations in the Federal funds rate (or in the value of the dollar on foreign exchange markets) even for a week or a day. Widening of the Federal funds rate control band, as was done beginning in October 1979, is not enough. When the Federal funds rate is bumping the top of the control band, it doesn't matter whether the interval from the top of the band to the bottom is one percentage point or eight. What matters is that the Federal funds rate is not allowed to rise any further, or alternatively, pressure on the Federal funds rate is relieved by keeping the discount rate constant and the discount window open wide. As a result, the input of reserves, whether through open market purchases or discounting, must be accelerated. In turn, this accelerates money growth. The end results are faster inflation and, ironically, even higher interest rates than would occur if there were no Federal funds rate control band whatever.

In the same way, when the Federal funds rate is pressing the floor of the control band, it doesn't matter how high the top of the control band is. Preventing the floor from being broken requires slowing M1B growth, and the end result is recession and lower interest rates than would occur in the absence of any Federal funds rate constraint.

It also would help in the management of M1B growth if required reserves were matched against current deposit liabilities. In this case the Federal Reserve could supply or withdraw reserves consistent with achieving its money growth plans without having to worry about creating excess reserves or a reserve deficiency, and thereby providing pressure for sharp changes in the Federal funds rate. The Report from which this article is extracted emphasizes the importance of achieving close continuing control of M1B growth.

GLOSSARY

Money—Money is defined conventionally, as the dollar quantity of exchange media.

Measures of the supply of exchange media:

M1—M1 was used to measure the supply of exchange media until 1980. It was comprised of (1) checkable (demand) deposit liabilities of commercial banks other than domestic interbank and U. S. Government less cash items in the process of collection and Federal Reserve float; (2) foreign demand deposits in Federal Reserve Banks; and (3) coin and currency outside the Treasury, Federal Reserve Banks, and vaults of commercial banks. In essence, M1 measured holdings by the public (other than commercial banks), and by state and local governments, and foreign banks and official institutions of demand deposits in commercial banks, coin and currency, and foreign demand deposits in Federal Reserve Banks.

M1A—M1A is one of the two measures which the Federal Reserve adopted in 1980 to replace M1 in measuring the supply of exchange media. M1A equals M1 less the demand deposits of foreign banks and official institutions. Through 1979, year-to-year percentage changes of M1A tracked those of M1 except in 1959 when, following the restoration of convertibility of pounds and francs into dollars, there was a large input of demand deposits by foreign banks.

M1B—M1B is the other measure adopted in 1980 to replace M1. M1B equals M1A plus automated transfer service and negotiable order of withdrawal accounts and other checkable deposits in depository institutions, including commercial banks, credit unions, savings and loans, and mutual savings banks.

Federal funds rate—The Federal funds rate is the interest rate charged on inter-bank loans. Banks short of reserves can and do borrow from banks with excess reserves. Usually the loans are repaid the next business day. Because the funds involved are deposits in Federal Reserve Banks, they are called Federal funds, and the interest rate on transactions of Federal funds is called the Federal funds rate.

Monetary or current dollar GNP—The current dollar value of Gross National Product is the economic cost of producing the nation's output in a given year plus certain adjustments. Specifically, it equals the year's sum of

- wages, salaries and supplements,
- corporate profits (before taxes),
- rental income,
- net interest, and
- proprietary income;
- plus business transfers, indirect business taxes, subsidies less surpluses accruing to government enterprises, and depreciation allowances.

Constant dollar or real GNP—Real GNP is the inflation-adjusted or deflated value of current dollar GNP.

GNP deflator—This is the price measure used in this article. The GNP deflator is the index of the prices of all the goods and services that make up the Gross National Product. It is used instead of the Consumers' Price Index because it measures the inflation rate for domestically produced goods and services. The prices of imports, including oil, affect it only indirectly and marginally. Using the GNP deflator allows us to focus on inflation born and bred here at home. In addition, consistency with using constant dollar GNP to measure the nation's production or output requires its use.

Velocity—Velocity is simply the dollar value of GNP divided by stock of money however defined. Every monetary aggregate has its own velocity. M1B's velocity equals the average dollar value of GNP in a given period divided by the average amount of M1B outstanding in the same period.