How Controllable is Money Growth?

ANATOL B. BALBACH

IT is becoming increasingly popular to assert that money growth cannot be controlled and, therefore, that monetary policy should stop targeting monetary growth and try to control other variables that may affect economic activity and the rate of inflation. Many argue that, although excessive long-run monetary growth is clearly the dominant cause of inflation, attempts to control it are so weak and uncertain that they create more problems than benefits. Even casual observation seems to support these arguments: in the United States, the Federal Reserve System has announced monetary growth targets since 1973, but has achieved only questionable success in reaching them; in many foreign countries, such as the United Kingdom and Germany, targets were established, but were either persistently or occasionally violated; in Switzerland, monetary control has been successful, but is viewed as an aberration due to the country's small size and other uniquely favorable conditions.

For most of the '70s, this lack of success was caused by the monetary authorities' desire to simultaneously stabilize short-term interest rates and control money growth. Whenever interest rate and money growth targets became inconsistent, most central banks preferred to abandon money growth targets, producing erratic and generally excessive monetary growth. In October 1979, however, the Federal Reserve heralded a change in operating procedure, announcing that it would place more emphasis on the control of monetary aggregates as opposed to the stabilization of the federal funds rate.[1] Still, during 1980, U.S. money growth turned out to be both considerably more erratic and somewhat higher than originally desired.

It is not surprising, therefore, that many analysts have become convinced that a monetary policy designed to stabilize the growth of monetary aggregates is neither desirable nor achievable.[2] This criticism usually has taken four separate lines of thought:

1. Money growth doesn't matter. The relationship between the growth of gross national product (whose steady expansion is the ultimate goal of any macroeconomic stabilization policy) and monetary growth is too variable; successful control of monetary growth cannot mitigate fluctuations in economic activity and the rate of inflation.

2. Money growth does matter, but should not be controlled because it would cause greater volatility in other crucial economic variables (such as interest or exchange rates). This, in turn, would produce economic disruptions far worse than those created by rapid and erratic money growth.

3. Monetary base growth doesn't matter. The relationship between the monetary base (which consists of bank reserves and currency held by the public, and which the central bank can control directly) and the quantity of money in the economy is both highly variable and unpredictable; tight control of the base will not produce stable growth of money.

4. Monetary base growth cannot be controlled. This is so, either because the central bank must supply currency on demand or because some of the Federal Reserve balance sheet items are determined by transactions outside its control. Since base growth underlies money growth, money growth cannot be controlled.

Assertions 1 and 2 address the issue whether monetary growth *should* be controlled; there is a substantial body of literature already dealing with the issue.[3]

[1]The federal funds rate is the interest rate at which depository institutions borrow reserves from each other.

[2]"The Pitfalls of Mechanical Monetarism," *The Morgan Guaranty Survey* (February 1981), pp. 8-13.

[3]Examples of literature dealing with the relationships between money growth and income growth include: Milton Friedman, ed., *Studies in the Quantity Theory of Money* (Chicago: University of Chicago Press, 1956); Lyle E. Gramley and Samuel B. Chase, Jr., "Time Deposits in Monetary Analysis," *Federal Reserve Bulletin* (October 1965), pp. 1380-1404; Karl Brunner and Allan H. Meltzer, "Predicting Velocity: Implications for Theory and Policy," *Journal of Finance* (May 1963), pp. 319-54; Bryon Higgins and V. Vance Roley, "Monetary Policy and Economic Performance: Evidence From Single Equation Models," Federal Reserve Bank of Kansas City *Economic Review* (January 1979), pp. 3-12; Charles R. Nelson, "Recursive Structure in U.S. Income, Prices and Output," *Journal of Political Economy* (December 1979), pp. 1307-27; Leonall C. Anderson and Keith M. Carlson, "A Monetarist Model for Economic Stabilization," this *Review* (December 1979), pp. 3-14.

This article addresses the question whether monetary growth *can* be controlled and thus deals with assertions 3 and 4 above.

What is Money and How is it Created?

Money is usually defined as those objects that are *generally* accepted in payment for goods, services and debts. In the United States, these consist of currency and checkable deposits.[4] This definition of the money stock, which excludes U.S. Treasury and interbank deposits, is referred to as M1B. It consists of currency and checkable deposits in the hands of the private nonbank public, and state and local governments.

When the public wants more money, it obtains it from those institutions whose liabilities are acceptable as money. These consist of commercial banks, whose liabilities include demand deposits, automatic transfer accounts (ATS) and negotiable orders of withdrawal (NOW); thrift institutions, which issue NOW accounts; and credit unions, which issue credit union share drafts. Federal Reserve Banks, whose liabilities also include money, do not deal with the public and, therefore, do not *directly* contribute to the creation of money.

When the public as a whole desires more money (and the monetary authorities supply the necessary reserves), it sells a variety of assets, including promissory notes (i.e., loans) to the banking system as a whole (all private institutions whose liabilities are money), receiving payment in currency or in checkable deposits. As these receipts are spent and respent, a portion winds up as someone's currency holdings or checkable deposits, and the money stock will increase.

It is crucial to understand, however, that an increase in loans by the banking system does not *necessarily* result in an increase in the money stock. For example, if an individual puts $100 from his checking account into his savings account, thus *decreasing* the stock of money by $100, and the bank lends the resulting excess reserves to a second individual who adds it to his checkable deposits, thus *increasing* the money stock, bank loans and the total amount of credit will have increased, but not the money stock.[5]

[4]Time deposits or money market mutual fund shares are not money since they cannot be spent without conversion into currency or checkable deposits. Credit cards represent either existing checkable deposits or deposits that will be created by a bank.

[5]If one were to deposit currency into a savings account, the resultant increase in excess reserves would cause an expansion of loans *and* money. But loans would increase by more.

Although the expansion of loans by the banking system is the mechanism through which the money stock increases, not all loans result in money growth.

Since bank loans and investments are a source of bank profits, and since banks are profit-maximizing institutions, we should and do observe that they make loans to the full extent that they are able. What then constrains their ability to make loans and expand the stock of money?

Bank Reserves and Their Role in Money Creation

In the United States, all financial institutions that create checking deposits are legally required to hold reserves against these deposits either in their vaults or in accounts with Federal Reserve Banks. These reserve requirements are imposed as a percentage of various deposits. Thus, if the average reserve requirement is 10 percent and the banking system wished to create new checkable deposits of $100, it must obtain reserves of $10. Since both currency and deposits with Federal Reserve Banks are Federal Reserve liabilities, the banking system can obtain reserves by selling securities to, or borrowing from, the Federal Reserve System.

In principle, the Federal Reserve could always refuse to buy securities or to make loans. It would thus restrict the availability of reserves and the banking system's ability to create new checkable deposits. Similarly, the Federal Reserve can buy securities at an attractive price or make loans on attractive terms, inducing the banking system to acquire excess reserves.[6] Since excess reserves do not produce income for the bank's stockholders, banks will expand their loans, creating deposits and adding to the money stock.

Currency in the hands of the nonbank public represents another source of bank reserves which may also account for the expansion of the money stock. For example, if an individual deposits $100 in currency into his checking account, the bank's vault cash (part of its reserves) rises by $100. Because the bank must hold only $10 as a reserve for the newly created $100 of deposits, it now has $90 of excess reserves with which to expand its loans and deposits. Thus, the constraint on monetary expansion is not only the availability of bank reserves (deposits at Federal Reserve Banks and vault cash), but also the amount of cur-

[6]Excess reserves are reserves over and above required reserves.

rency in the hands of the public. The sum of these two is referred to as the *monetary base.*[7] It will be viewed as *the* constraining magnitude of bank deposit expansion or contraction for the remainder of this article.

Problems in Controlling the Monetary Base and Money Growth

The discussion so far seemingly implies that control of money growth is a relatively simple matter. Since the monetary base is a liability of the Federal Reserve System, it can be tightly controlled by the System; since monetary expansion is dependent on the availability of monetary base, money growth can be expected to follow a desired path. Yet much of the criticism leveled at monetary policy rests on the premise that money growth cannot be controlled.

Given the prior description of the mechanics of money creation, monetary control problems will exist only if the monetary base cannot be controlled with sufficient precision or, given a specific path of monetary base growth, if money growth is unpredictable. For instance, analysts often argue that many items on the Federal Reserve balance sheet vary with the vagaries of bank and public behavior. Or, that the relationship between the monetary base and the money stock is so volatile, that even if the monetary base *is* controlled, money growth will refuse to behave in the desired manner.

It is true, of course, that the use of an additional dollar of reserves is determined by banks and the public. Banks, through their willingness to hold excess reserves, and the public, through its willingness to hold currency, time deposits or checkable deposits, both affect the amount of money created out of each additional dollar of reserves.

Whether these are serious problems is an empirical issue. If the Federal Reserve System cannot control certain items on its balance sheet, can it offset these items with relative ease? If bank and public decisions *can* vary substantially, *do* they in fact do so? Are these changes offsetting? Are they predictable? These questions must be answered before one can decide if money stock control is impossible.

Control of the Monetary Base

A simplified balance sheet of the Federal Reserve System is shown in table 1.

Because the balance sheet must balance, it can be rewritten as:

Monetary base = Gold certificates
+ Foreign currencies
+ Security holdings
+ Loans to financial institutions
+ Float
+ Other assets
− Treasury deposits
− Foreign central bank deposits
− Other liabilities and capital

Any change in the monetary base must equal the change in the sum of all other items. Thus, the control of the monetary base depends upon the ability to control the sum of the remaining items.

Consider, first, those items that change only at the discretion of the Federal Reserve:

(a) Foreign currencies

(b) Security holdings

(c) Loans to financial institutions

(d) Other assets

(e) Other liabilities and capital.

Clearly, the Federal Reserve can decide the amount of foreign currencies or securities it wishes to buy or sell.[8] It can decide, except as a lender of last resort in a national liquidity crisis, the amount that it will

[7]For more detailed discussions of the definition and use of the monetary base, see Karl Brunner and Allan H. Meltzer, "A Credit Market Theory of the Money Supply and an Explanation of Two Puzzles in U.S. Monetary Policy," *Essays in Honour of Marco Fanno,* (Padua, Italy: Cedam, 1966), pp. 151-76; Karl Brunner and Allan H. Meltzer, "Some Further Investigations of Demand and Supply Functions for Money," *The Journal of Finance* (May 1964), pp. 240-83; Albert E. Burger, *The Money Supply Process* (Belmont, California: Wadsworth Publishing Co., 1971); and Anatol B. Balbach and Albert E. Burger, "Derivation of the Monetary Base," this *Review* (November 1976), pp. 2-8.

[8]Of course, there are those who maintain that since sales and purchases of foreign currencies temporarily affect foreign exchange rates, and since sales and purchases of securities, including bank promissory notes, temporarily affect interest rates, the Federal Reserve is not free to engage in these transactions at will. But this is irrelevant to the issue whether the Federal Reserve *can* control the monetary base. These arguments would be relevant in a discussion whether the Federal Reserve *should* control monetary base and money growth, as contrasted with control of exchange and interest rates, but it is of no concern here.

Table 1

Simplified Federal Reserve Balance Sheet (in millions of dollars)

Assets	Level Nov. 5, 1980	Average weekly variation in 1980	Net average weekly variation in 1980
Gold certificates	$ 11,163	$ .28	$-.21
Foreign currencies	3,158	103	50
Federal Reserve credit:			
Security holdings	130,674	3,271	36
Loans to financial institutions	3,371	1,777	– 5
Float	5,217	1,271	–83
Other assets	7,235	267	22

Liabilities	Level Nov. 5, 1980	Average weekly variation in 1980	Net average weekly variation in 1980
Monetary base:			
Deposits of financial institutions	$ 33,177	$3,510	$–142
Federal Reserve notes	119,416	563	207
Treasury deposits	3,064	746	– 17
Foreign central bank deposits	236	59	.62
Other liabilities and capital	4,922	257	– 28

lend to financial institutions.[9] And it can certainly control the other assets it wishes to acquire and the other liabilities it wishes to incur.[10]

Balance sheet items that are *not* subject to Federal Reserve discretionary actions are:

(a) Gold certificates

(b) Float

(c) Treasury deposits

(d) Foreign central bank deposits.

Gold certificates are issued by the U.S. Treasury and must be bought by the Federal Reserve System. Whenever the gold stock changes, the Treasury issues or withdraws gold certificates at some prescribed official price. Since, for the past decade, there have been few official transactions in gold, this account is virtually dormant.

Float represents an interest-free loan from the Federal Reserve to financial institutions. It arises from the time difference between the Federal Reserve schedule for crediting banks for checks in the collection process and the actual flow of checks. Once the check is deposited and placed in the clearing system, the payee's bank is credited with a deposit on a certain schedule. If the payer's bank is not yet debited within that same scheduled time, the banking system has more reserves until the check actually clears. Thus, the level of float fluctuates with transportation, computing and other problems. Fluctuations in Treasury and foreign central bank deposits result from Treasury and foreign central bank decisions, just as individuals' bank deposits are affected by their decisions.

The controllability of the monetary base depends primarily on the fluctuations of these nondiscretionary accounts and the degree to which the Federal Reserve can offset these fluctuations through changes in its discretionary accounts. In other words, are weekly changes in nondiscretionary accounts sufficiently great that they cannot be offset by transactions in discretionary accounts?

In table 1, column 1 shows the dollar amounts for each of the accounts in the week ending November 5, 1980. Column 2 shows the average absolute weekly variation in each of the accounts during 1980. Column

[9]It is frequently argued that because of lagged reserve accounting, in any given week the Federal Reserve *must* make loans to financial institutions if they are deficient in required reserves. This indeed has been the tradition. But to say that this is *necessary* assumes that there are no deficiency and carryover provisions, and that banks are incapable of learning that the extension of loans must be based, among other things, on the availability of reserves. If such an argument is pushed to its logical conclusion, then the central bank has no control over money growth.

[10]Other assets are the sum of: special drawing rights certificates, coin, loans to other than depository institutions, acceptances, federal agency obligations, bank premises, and miscellaneous assets. Other liabilities are the sum of: deposits of international organizations, the Exchange Stabilization Fund and miscellaneous private and governmental agencies, accrued dividends and payables, and capital accounts.

Table 2
Annual Movements in the M1B Multiplier

Year	Average level of monthly M1B multiplier	Year-to-year changes of column 1	Maximum multiplier in the year	Minimum multiplier in the year	Difference between maximum and minimum
1970	2.913		2.950	2.891	.059
1971	2.881	–.032	2.900	2.862	.038
1972	2.875	–.006	2.897	2.862	.035
1973	2.852	–.023	2.891	2.822	.069
1974	2.763	–.089	2.817	2.706	.111
1975	2.685	–.078	2.717	2.649	.068
1976	2.636	–.049	2.675	2.612	.063
1977	2.622	–.014	2.640	2.606	.034
1978	2.596	–.026	2.619	2.583	.035
1979	2.583	–.013	2.599	2.568	.031
1980	2.543	–.040	2.573	2.504	.069
1970-79		Average = –.037			Average = .061

3 depicts the average weekly *net* variation (where decreases are subtracted from increases).

The Federal Reserve's ability to offset variations in nondiscretionary accounts on a weekly basis depends on the variability of the *sum* of all nondiscretionary accounts. In 1980 this sum varied on average, in absolute terms, $1,409 million per week. Since the average weekly absolute variation in security holdings alone was $3,271 million, it is clear that changes in nondiscretionary accounts can be easily offset. Moreover, one need not be concerned that these nondiscretionary accounts may vary all in one direction, thus producing a need for large *cumulative* offsetting transactions. The average *net* weekly variation in the sum of nondiscretionary accounts was a decrease of $71 million, again, a trivial change in the Fed's security portfolio.[11]

This discussion demonstrates that the Federal Reserve can control the monetary base *even on a weekly basis* if it so desires. There is, of course, no question that it can do so over longer periods of time.

Does Control of the Monetary Base Imply Control of Money Growth?

As indicated previously, the banking system and the nonbanking public decide how each additional dollar of the monetary base will be used. The banking system may hold it as excess reserves or lend it to borrowers. The public may hold all of the newly generated loans in time deposits, or as currency or checkable deposits. Each of these decisions affect money growth differently. The magnitude that describes the net result of these decisions is referred to as the *monetary base multiplier* and is measured by the ratio of the money stock to the monetary base.[12] If the multiplier is highly variable and unpredictable, then a tight control of the monetary base may still produce highly variable money growth. As an example, let us look at the variability of this multiplier, and what it would have implied about money growth in 1980.

Table 2 shows the annual behavior of the monetary base multiplier from 1970 to 1980. Column 1 lists annual average levels of the monthly multiplier, column 2 presents year-to-year changes of these averages, columns 3 and 4 show the maximum and minimum levels of the monthly multiplier in any given year, and column 5 lists the differences between these maximum and minimum levels.

Suppose that M1B is $384.8 billion in the fourth quarter of 1979, and we want it to grow at a 5.5 per-

[11]The Federal Reserve knows its daily balance sheet with a one-day lag. Thus, knowledge of changes in nondiscretionary accounts can initiate offsetting transactions the next day.

[12]This can be expressed as $M = mB$, where M and B are the levels of M1B and monetary base, respectively, and m is the monetary base multiplier. It is clear from this relationship that if m is stable or predictable, control of monetary base implies control of the money stock.

Table 3

M1B Growth Resulting from Injection of Constant Amounts of Base (billions of dollars)

Month	Desired M1B levels	Resultant base levels	Actual multiplier	Resultant M1B levels monthly	Resultant M1B growth rate monthly	Resultant M1B growth rate quarterly	Actual M1B growth rate monthly	Actual M1B growth rate quarterly
January	$388.2	$151.16	2.573	$388.9	6.4%		4.4%	
February	390.0	151.99	2.573	391.1	7.0	5.7%	10.0	5.8%
March	391.7	152.82	2.555	390.5	–1.8		–0.6	
April	393.5	153.65	2.517	386.7	–11.1		–14.0	
May	395.2	154.48	2.504	386.8	0.3	–2.0	–0.6	–2.4
June	397.0	155.31	2.518	391.1	14.2		17.4	
July	398.8	156.14	2.526	394.4	10.6		13.7	
August	400.6	156.97	2.546	399.6	17.0	11.8	24.2	15.5
September	402.4	157.80	2.556	403.3	11.7		17.0	
October	404.2	158.63	2.567	407.2	12.2		12.4	
November	406.0	159.46	2.552	406.9	–0.9	7.8	9.1	11.3
December	407.8	160.29	2.535	406.3	–1.8		–8.6	

Resultant M1B growth rate: 4th quarter 1979 through 4th quarter 1980 = 5.7 percent

Actual M1B growth rate: 4th quarter 1979 through 4th quarter 1980 = 7.3 percent

cent annual rate. This means that M1B should equal $406 billion in the fourth quarter of 1980, an increase of $21.2 billion. How much monetary base should be supplied in order to achieve this growth? Consider the results obtained by using two alternative, simple and "mechanistic" procedures. In the first procedure, monetary base is supplied at a *constant* monthly rate; in the second, monetary base growth varies each month to achieve a *monthly* M1B growth of 5.5 percent (at an annual rate).

Procedure I: Monetary Base Grows at Constant Amount Each Month

Table 2 indicates that the average multiplier in 1979 was 2.583, and that over the past 10 years, the multiplier declined on average by .037. Thus, let us "guess" that the multiplier will be 2.546 (2.583 – .037) for 1980. We would, therefore, want monetary base to grow to a level of $159.5 billion ($406.0 billion/2.546) in the fourth quarter of 1980. This translates to monthly growth of the base of $830 million in 1980. Let us further assume that the multiplier, instead of remaining constant at its "guessed" value of 2.546, fluctuated in the same manner as it actually did in 1980.[13]

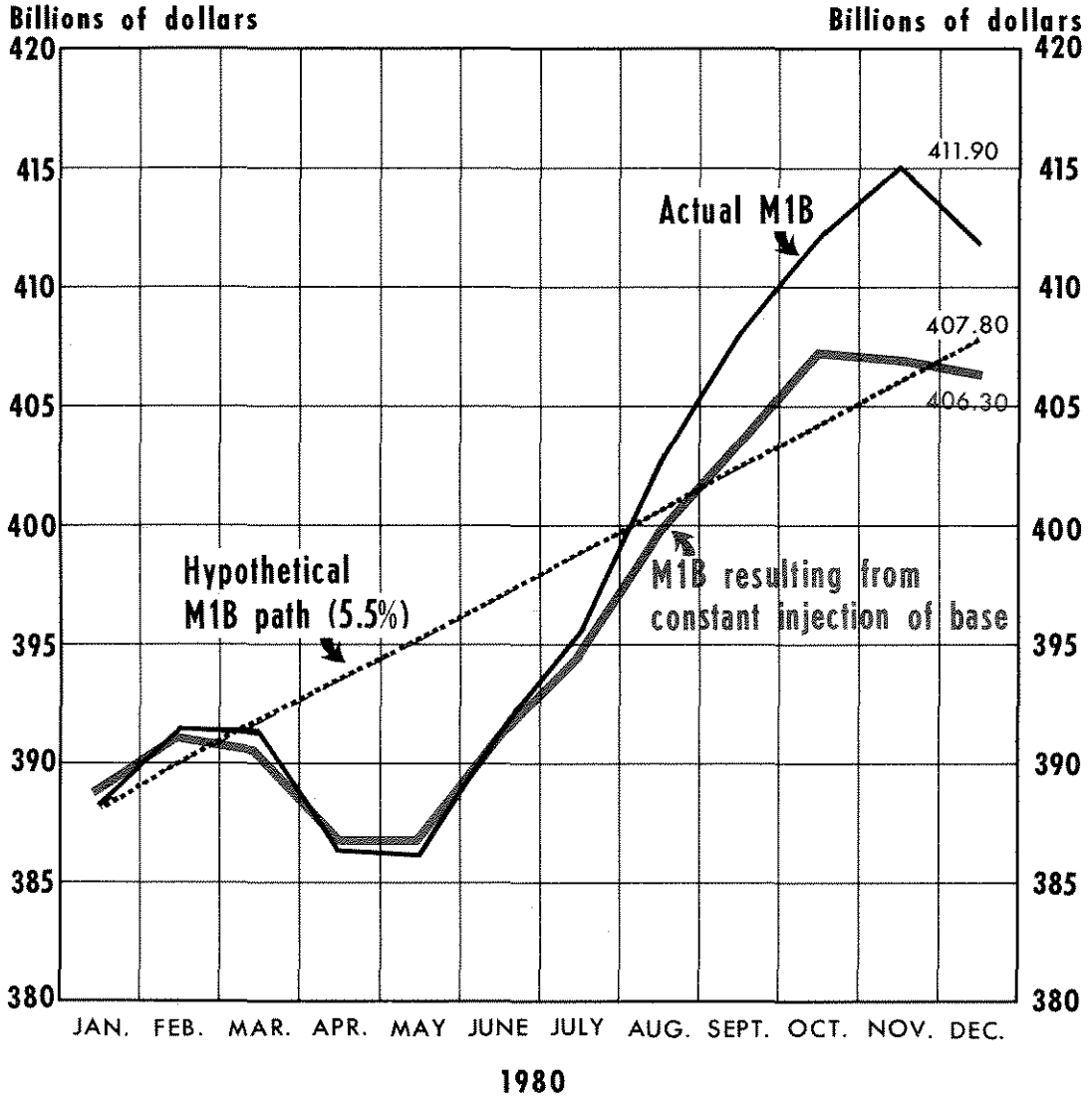
What would have been the resulting growth of M1B? Table 3 shows the resulting levels of monetary base, the resulting levels of M1B (which are computed by multiplying the base level by the *actual* monthly multiplier), and the resulting monthly and quarterly annualized rates of growth of M1B. For comparison, the actual monthly and quarterly annualized rates of growth of M1B in 1980 are also shown.

This procedure would have resulted in a fourth-quarter-to-fourth-quarter M1B growth of 5.7 percent, a shade above the desired growth of 5.5 percent in-

[13]Some analysts allege that one cannot assume that the multiplier would have been the same as it actually existed. They argue that tight control of the monetary base would have produced much larger fluctuations in interest rates, thus affecting bank and the public's behavior, which in turn affects the multiplier. Thus, the multiplier would have been much more volatile. One cannot reject this argument out of hand; however, interest rate fluctuations in 1980 were as large as any experienced over a similar period of time, and the multiplier remained remarkably stable. Until a base stabilization procedure is put into effect, there is no empirical evidence to support the assertion that the multiplier would be more volatile. For a contrary view, see David Lindsey and Others, "Monetary Control Experience Under the New Operating Procedures," *New Monetary Control Procedures*, Federal Reserve Staff Study, Volume II (Board of Governors of the Federal Reserve System, February 1981).

Chart 1

Levels of M1B Resulting from Monetary Control Procedure I



Latest data plotted: December

stead of the actual 1980 growth of 7.3 percent (see chart 1).[14] This indicates that although the multiplier may fluctuate from month to month, it remains relatively stable and predictable on a yearly average basis.

Even such a simple monetary base control procedure would have allowed for the relatively tight control of money growth *over a year.*[15]

[14]Comparisons with actual money growth should not assume that Federal Reserve actions also aimed at 5.5 percent M1B growth (close to the midpoint of the 4-6.5 percent range). The Federal Reserve could have aimed at 6.5 percent or 4 percent; or, after assumed adjustments for shifts into ATS and NOW accounts, at 7.25 or 4.75 percent; or, anywhere in between.

[15]It should be noted, however, that as table 2 indicates, the change in the multiplier from 1979 to 1980 was very close to the average. Our predictions of the multiplier and resultant money growth would not have been as successful in 1972 or 1974 (in those years this procedure would have produced M1B growth of 6.6 percent and 3.5 percent, respectively). Nevertheless, this simple procedure, if used, would have avoided the cumulative increases in money growth that actually occurred.

Table 4
M1B Growth Resulting from Injection of Varying Amounts of Base (billions of dollars)

Month	Desired M1B levels	Base injections	Resultant base levels	Actual multiplier	Resultant M1B levels	Resultant M1B growth rate: monthly	Resultant M1B growth rate: quarterly	Actual M1B growth rate: monthly	Actual M1B growth rate: quarterly
January	$388.2	$ 0.52	$150.82	2.573	$388.0	3.5%		4.4%	
February	390.0	0.75	151.57	2.573	390.0	6.4	4.4%	10.0	5.8%
March	391.7	0.66	152.23	2.555	389.0	–3.0		–0.6	
April	393.5	1.78	154.01	2.517	387.6	–4.2		–14.0	
May	395.2	3.00	157.01	2.504	393.2	18.8	4.5	–0.6	–2.4
June	397.0	1.54	158.55	2.518	399.2	19.9		17.4	
July	398.8	–0.17	158.38	2.526	400.1	2.7		13.7	
August	400.6	0.21	158.59	2.546	403.8	11.7	9.8	24.2	15.5
September	402.4	–0.54	158.05	2.556	404.0	0.6		17.0	
October	404.2	0.09	158.14	2.567	405.9	5.8		12.4	
November	406.0	0.02	158.16	2.552	403.6	–6.6	2.3	9.1	11.3
December	407.8	1.64	159.80	2.535	405.1	4.6		–8.6	

Resultant M1B growth rate: 4th quarter 1979 through 4th quarter 1980 = 5.2 percent

Actual M1B growth rate: 4th quarter 1979 through 4th quarter 1980 = 7.3 percent

What about money growth fluctuations within the year? While most economists agree that month-to-month fluctuations in money growth have no impact on economic activity, some believe that quarterly fluctuations do. Using this criterion, Procedure I did not produce an appreciably better performance. Neither monthly nor quarterly money growth resulting from supplying a constant amount of base would have been substantially smoother than actually transpired during 1980.[16]

Procedure II: Adjusting Multiplier Estimates Monthly

Let us assume again that we want money to grow at the same annual rate as before. In the first procedure, we assumed that the multiplier would remain constant over the year and, thus, we supplied a constant amount of monetary base each month. Suppose, instead, we assume that next month's multiplier will be exactly as it was last month and that we want to have M1B grow at a 5.5 percent annual rate each month. For each month we must now calculate an appropriate level of M1B, then supply a corresponding level of monetary base. This level is determined using last month's multiplier. In effect, this procedure requires that we attempt to return to the desired money growth path each month. As before, for comparison, we will assume that actual monthly levels of the multiplier in 1980 would have prevailed.

Table 4 and Chart 2 present the results. The amount of monthly base injection was calculated as follows: In January the *desired* level of M1B was $388.2 billion; in December 1979 the multiplier was 2.574. Thus, the level of base in January should be $150.82 billion ($388.2/2.574), an injection of $520 million. This calculation was repeated for every subsequent month, thus determining the appropriate injection of monetary base. The resulting *monthly* M1B growth again is not substantially better than the actual 1980 outcome, but the *quarterly* growth is significantly more stable. Moreover, the annual M1B growth would have been 5.2 percent instead of the desired 5.5 percent and actual 7.3 percent.[17]

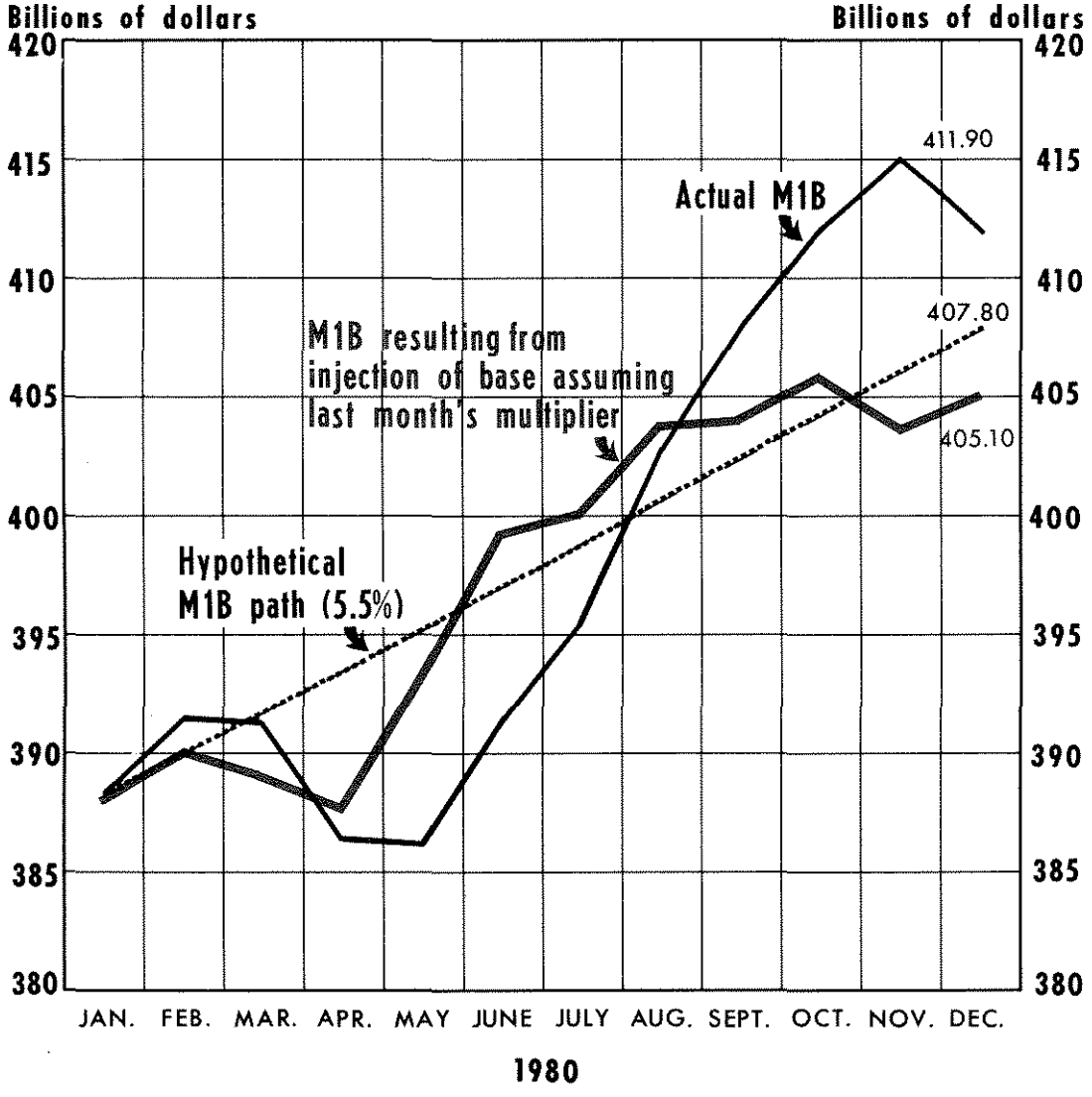
Here, if the multiplier had varied exactly as it actually did in 1980, a simple and "mechanistic" base control procedure would have produced a significantly

[16]In this procedure, the standard deviation of M1B growth declines from 1980 actual by 26 percent on a monthly basis and by 25 percent on a quarterly basis.

[17]Standard deviation of M1B growth declines 26 percent on a monthly basis and 59 percent on a quarterly basis.

Chart 2

Levels of M1B Resulting from Monetary Control Procedure II



Latest data plotted: December

closer achievement of annual targets *and* significantly more stability during the year.

Summary and Conclusions

It has been argued widely that, although excessive monetary growth is a cause of inflation, the tight "mechanistic" control of monetary aggregates is infeasible. This argument is based on allegations that the monetary base cannot be controlled, or that the base multiplier is too variable for the central bank to control monetary growth, particularly over short periods of time.

This article examines this argument by describing the mechanics of money creation, the constraints on money creation and the central bank's ability to impose these constraints. It demonstrates that the basic constraint on money growth — the monetary base — can be controlled with precision. Nondiscretionary accounts in the Federal Reserve's balance sheet are much

smaller, and vary less, than those which it can control directly.

The assertion that control of monetary growth is impossible because the monetary base multiplier behaves erratically is examined by using two simple and "mechanistic" monetary base control procedures and applying them to actual multiplier variations of 1980. Since the multiplier varied more in 1980 than it had on average over the past 11 years, such a simulation constitutes a reasonable test. The results indicate that by using base control and making *no adjustments* during the year, annual growth targets could have been achieved with greater precision although money growth stability *during* the year could have been improved only slightly. When simple adjustments were permitted, annual targets would have been reached with a lower error and greater stability. Since there are several more sophisticated monetary control procedures in existence than the two presented here, an even better method of money growth control can be developed.[18]

The article does not discuss whether tight control of the monetary base would produce larger variability in credit or other markets. However, if control of inflation is the paramount goal of the central bank, perhaps the nation would indeed be well served by "rigid mechanical monetarism."

[18]See for example, James M. Johannes and Robert H. Rasche, "Predicting the Money Multiplier," *Journal of Monetary Economics* (July 1979), pp. 301-25, and Albert E. Burger, Lionell Kalish III, and Christopher T. Babb, "Money Stock Control and Its Implications for Monetary Policy," this *Review* (October 1971), pp. 7-22.