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July 13, 1978

To: Members of the Board of Governors
All FRB Presidents
Mr. Stephen H. Axilrod
Mr. Arthur L. Broida

From: Frank E. Morris

I commend to your attention the attached memorandum by Bill Poole concerning our one year money growth targets. In it, Poole argues for the shift to a single M_2 target with our related expectations for M_1 and M_3 given as M_2 memorandum items. He also argues for a shift to his "band proposal" in order to deal with the base drift problem in our current procedures and to give the FOMC a longer-term perspective on monetary policy.

While it would not be realistic to expect the Committee to consider the "band proposal" at the forthcoming meeting, I think it would be timely for the Committee to shift at this meeting to a single M_2 target, tying the change to the prospective introduction of automatic transfers and the unpredictable consequences of that change for the growth rate for M_1 .

I will be sending to you in the next few weeks an alternative proposal for dealing with the base drift problem suggested by another member of our Research staff, Geoffrey Woglum.

Enclosure

TO: Mr. Morris
FROM: Mr. Poole

DATE: July 12, 1978
SUBJECT: One Year Money Growth Targets

The purpose of this memorandum is to explore alternative specifications for the one year money growth targets the Fed announces every quarter. The first major section contains an analysis of the problems generated by the fact that over the past two years the target growth ranges have been reduced while the actual rate of money growth has tended to rise. It is argued that if the present formulation of the targets is retained the target growth ranges should be better aligned with prospective money growth. The relationship between the M_1 and M_2 target ranges is also discussed.

The second major section analyzes a proposal for a revised formulation of the money growth targets. This proposal--the "band" proposal--is designed to avoid the problem of "base drift." However, while the band proposal would avoid the base drift problem it is argued that the proposal would probably require that either M_1 or M_2 be selected as the primary monetary target variable.

Revision of Current Money Growth Targets

Table 1 reports money growth targets and actual money growth for M_1 and M_2 since 1975. The targets and actual growth for M_3 will not be analyzed because the major issues can be explained without reference to M_3 and because M_3 has had a peripheral role in monetary policy-making. From the table it is clear that money growth has tended to outrun the targets.

There is a strong case for the proposition that money growth--either M_1 or M_2 --at the midpoint of the most recently announced target ranges for the next four quarters is unlikely to be consistent with the needs of the economy. Money growth at this rate would involve a very substantial deceleration

TABLE I
Money Growth Targets and Actual Money
Growth, 1975 I - 1978 I

	<u>M₁</u>			<u>M₂</u>		
	<u>Target</u>		<u>actual</u>	<u>Target</u>		<u>actual</u>
	<u>range</u>	<u>midpoint</u>		<u>range</u>	<u>midpoint</u>	
75 I - 76 I	5.0 - 7.5	6.25	5.0	8.5 - 10.5	9.50	9.5
75 II - 76 II	5.0 - 7.5	6.25	5.2	8.5 - 10.5	9.50	7.5
75 III - 76 III	5.0 - 7.5	6.25	4.5	7.5 - 10.5	9.00	9.3
75 IV - 76 IV	4.5 - 7.5	6.00	5.7	7.5 - 10.5	9.00	10.9
76 I - 77 I	4.5 - 7.0	5.75	6.3	7.5 - 10.0	9.75	10.9
76 II - 77 II	4.5 - 7.0	5.75	6.6	7.5 - 9.5	8.50	10.7
76 III - 77 III	4.5 - 6.5	5.50	7.8	7.5 - 10.0	8.75	11.0
76 IV - 77 IV	4.5 - 6.5	5.50	7.9	7.0 - 10.0	8.50	9.8
77 I - 78 I	4.5 - 6.5	5.50	7.5	7.0 - 9.5	8.25	8.8
77 II - 78 II	4.0 - 6.5	5.25		7.0 - 9.5	8.25	
77 III - 78 III	4.0 - 6.5	5.25		6.5 - 9.0	7.75	
77 IV - 78 IV	4.0 - 6.5	5.25		6.5 - 9.0	7.75	
78 I - 79 I	4.0 - 6.5	5.25		6.5 - 9.0	7.75	

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from the rate of the past two years; the evidence suggests that a policy adjustment of this magnitude would almost surely generate a recession.

Assuming that a sharp monetary deceleration is not desirable, it would seem sensible to align the announced targets with prospective money growth. One possibility would be to raise the money growth targets; another would be to leave the announced targets unchanged for several years while gradually reducing actual money growth.

Neither of these alternatives is especially attractive. Raising the announced targets has the clear disadvantage of the appearance of a public announcement of a more inflationary policy. Leaving the announced targets unchanged while gradually reducing money growth over a period of years requires acceptance of above-target money growth for some period of time. A string of quarters of above-target money growth will not increase public confidence in the Fed's willingness to do what it says it is going to do, and may generate pressures for lower-than-desirable money growth.

If the decision is to retain the current targets formulation, my judgment is that it is probably best to retain the current numerical targets for both M_1 and M_2 for the next several quarters and to plan on permitting actual M_1 and M_2 growth near or moderately above the upper target growth rates but near or below the growth rates of the past two years. At the same time, the FOMC should be prepared to raise the announced targets to better align them with actual money growth as soon as the political environment permits.

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When the growth targets are adjusted attention should be paid to the relationship between the M_1 and M_2 targets. Figure 1 provides a way of viewing this problem.

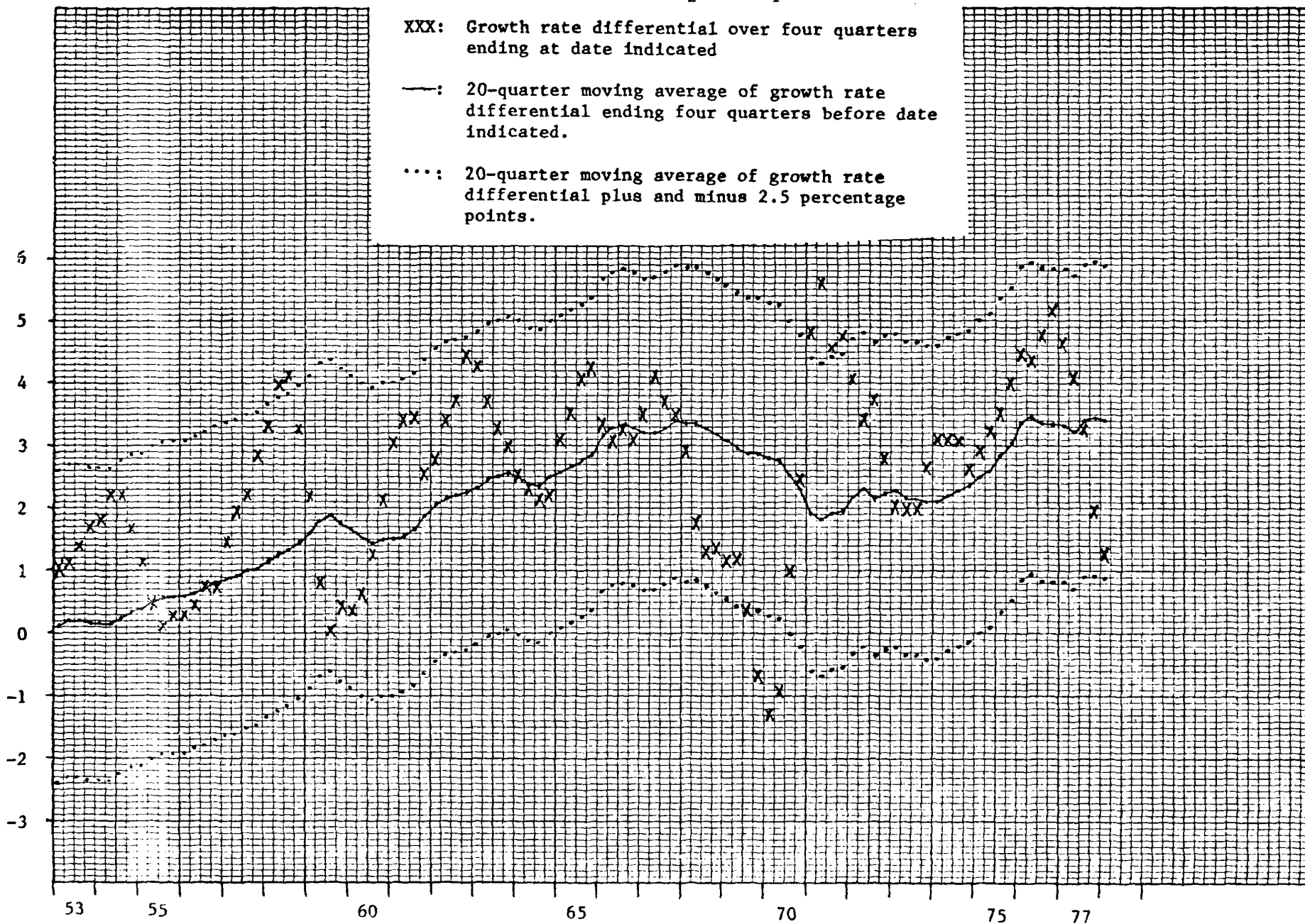
The X's in Figure 1 show the differential between the M_2 and M_1 growth rates over four-quarter spans since 1953. For example, the last X plotted shows that M_2 grew 1.25 percentage points faster than M_1 over the 1977I - 1978I period, using quarterly average money stock data. The solid line is a 20-quarter moving average of the growth rate differential, plotted with a four-quarter lag. Thus, the last observation plotted is the growth rate differential for the 20 quarters ending 1977I.

To understand why the figure was drawn in this way, consider the problem of determining the 1977I - 1978I growth rate targets which were announced May 3, 1977. Suppose the average growth rate differential for the preceding 20 quarters had been used to determine the differential between the M_1 and M_2 targets for 1977I - 1978I. The figure shows that this differential--plotted at 1978I--was 3.42 percentage points. As noted above, the actual growth rate differential over the 1977I - 1978I period was 1.25 percentage points, or 2.17 percentage points below the average differential for the preceding 20 quarters.

The Federal Reserve has very little control over the growth rate differential. One of the purposes of announcing target ranges rather than target points for M_1 and M_2 is to allow for the fact that the Fed can neither control nor accurately predict the growth differential. Given the past variability in the differential, how wide should the M_1 and M_2 target ranges be if there is to be a reasonable chance of staying within both ranges?

Figure 1

Growth Rate Differential, M_2 less M_1 , 1953I - 1978I



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During the period in which target ranges have been announced the width of the ranges has generally been 2.5 percentage points for both M_1 and M_2 . For example, the 1978I - 1979I ranges are 4 - 6.5 percent for M_1 and 6.5 - 9 percent for M_2 . Given these ranges, the maximum possible differential consistent with hitting both the M_1 and M_2 targets is 5 percentage points. This differential would occur if M_1 growth were 4 percent and M_2 growth were 9 percent. Similarly, the minimum possible differential consistent with hitting the targets is zero percentage points. This minimum would occur if M_2 grew at its lower target rate of 6.5 percent and M_1 grew at its upper target rate of 6.5 percent. The difference between the minimum and maximum is 5 percentage points, or 2.5 percentage points on either side of a central value.

The dotted lines in Figure 1 are drawn 2.5 percentage points on either side of the 20-quarter moving average differential which is shown by the solid line. As can be seen from Figure 1, if M_1 and M_2 target ranges each 2.5 percentage points wide had been announced every quarter since 1953, and if the differential in the announced target had equaled the 20-quarter moving average differential, then the maximum and minimum target differentials would have been wide enough to encompass the realized differential in all but a few cases. This analysis shows that in spite of the large and frequently-noted M_1 and M_2 growth differentials of recent years, the M_1 and M_2 target range widths of 2.5 percentage points would have been wide enough to hit both M_1 and M_2 targets simultaneously if the target differentials had matched the 20-quarter moving average differential.

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If the present targets formulation is retained, it is suggested that the M_1 and M_2 ranges be aligned to reflect the 20-quarter moving average differential. While it is surely true that forecasts of the differential could improve upon the mechanical 20-quarter moving average specification, the forecasts would be of less value than might appear since it is unlikely that the Federal Reserve will feel free to make large changes in the target ranges. Because the 20-quarter moving average moves slowly over time, only small changes in the M_1 and M_2 target ranges are required quarter by quarter to keep the target differential aligned with the 20-quarter moving average.

Returning to the immediate problem of determining the 1978II - 1979II target ranges, the 20-quarter moving average differential is now about 3.25 percentage points. The differential between the M_1 and M_2 targets for 1978I - 1979I is 2.5 percentage points. The target differential could be aligned with the moving average differential either by raising the M_2 target range or by reducing the M_1 target range, or by a combination of both adjustments. Because average money growth over the past two years has exceeded the current target ranges by a substantial margin, aligning the M_1 and M_2 target ranges by reducing the M_1 range will exacerbate the problem of a significant divergence between targets and prospective money growth. If there is to be an adjustment in the target ranges, it should probably take the form of an increase in the M_2 target range.

A good case can be made, however, that the sharp recent decline in the $M_2 - M_1$ differential growth rate will continue for at least several more quarters. This observation suggests that there is no need at the present

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time to align the targets differential with the 20-quarter moving average differential. It would be a mistake, however, to compress the targets differential at this time. The wider differential will probably be appropriate 4 - 8 quarters from now; if the differential is compressed today it will have to be restored in the future. Assuming that the FOMC will continue to feel constrained to adjust the targets in small steps, it will not be possible to restore the differential quickly in the future.

In summary, if the current targets formulation is retained it should be recognized that the existing target ranges are below prospective money growth rates. In the current inflationary environment it is politically unattractive to raise the target ranges, but I am nevertheless inclined to favor an upward adjustment of the M_2 range to 6.75 - 9.25 percent for 1978II - 1979II. Reducing either or both of the M_1 and M_2 ranges seems highly undesirable. The ranges are already below prospective money growth, and any compression of the $M_2 - M_1$ targets differential is likely to produce a problem in the future.

An Alternative Targets Specification: The Band Proposal

As emphasized above, the money growth target ranges announced in recent quarters are significantly below prospective money growth. An analysis of how this situation arose will serve as background for the band proposal.

The period from early 1975 to late 1977 was characterized by a fully justifiable concern over high unemployment. In addition, there was considerable puzzlement over the wide differential between M_1 and M_2 growth and the surprisingly low level of M_1 growth in 1975 given the behavior of interest rates. In this situation it was natural for the FOMC to react

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relatively slowly to restrain money growth in 1976 and 1977. When M_1 growth was running low M_2 growth was permitted near or above the upper end of its target range. When M_1 growth revived starting late 1976, M_2 growth slowed somewhat, but still continued at rates near the upper end of its target range. In short, in 1976 M_2 growth was permitted to run high as long as M_1 growth was within its range, and then in 1977 M_1 was permitted to run high as long as M_2 was in its range.

The evidence is not strong enough to provide a clear case favoring M_1 over M_2 or vice versa, but it is strong enough to say that permitting the trend rates of growth of both M_1 and M_2 to accelerate is inconsistent with reducing inflation in the long run. By focusing on the lower of M_1 or M_2 over the 1975-77 period the FOMC inadvertently permitted the trend rates of growth of both M_1 and M_2 to accelerate.

There is nothing in the logic of the current formulation of money growth targets that requires such a result. Indeed, in constructing Figure 1 I was struck by the fact that the 1975-76 differential between M_2 and M_1 growth was not unusually large by post 1953 standards, at least as measured by the deviation of the differential from a 20-quarter moving average of the differentials. The lesson seems to be that when the differential changes in an unexpected way the FOMC needs to follow a policy that leads to M_1 growing near its lower limit and M_2 near its upper limit, or vice versa. Only if this policy is followed will it be possible to prevent the trend rates of growth of both aggregates from rising or from falling excessively rapidly.

As emphasized above, there is nothing in the logic of the current formulation of targets that leads to the result that the trend rate of

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money growth will depart from longer-run (two to three year) policy plans. However, the experience of the past two years suggests that it might be useful for the FOMC to adopt a formal targeting procedure that encourages consideration of the longer-run trend rate of money growth. The band proposal outlined below was constructed with this objective in mind.

The Band Proposal. For reasons discussed below the proposal will be presented in terms of M₂. Under the proposal the M₂ target would be expressed in terms of a target band that would be updated each quarter. The band would consist of a target growth rate applied to a M₂ base level plus or minus 1½ percent of that base level. It is suggested that the M₂ base level be the quarterly average of M₂ in 1977IV. That average is \$804.3 billion. The lower limit of the band would extend from a base of \$804.3 less 1½ percent, or \$792.2 billion; the upper limit of the band would extend from a base of 804.3 plus 1½ percent, or \$816.4 billion.^{1/}

The band, so defined, would be drawn for the four quarters of the target period. Each quarter the band would be updated. If there were no change in the target growth rate, then the existing band would be extended

^{1/} Using 1977IV as the base quarter has the advantage of relying on data that include recent benchmark and seasonal revisions. Given the misalignment of current growth targets and money growth over the past two years the 1977IV base also has the advantage of not building the relatively low 1978I money growth into the base.

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by one quarter. If it were decided to change the target growth rate, then the band would be redefined by applying the new target growth rate to the levels of the old band in the most recent quarter.

An illustration of how this system would have worked since 1975 is as follows. For the period 1975I to 1976I the M_2 target was announced to be 8.5 - 10.5 percent growth. The mean of this growth range is 9.50 percent and in the illustration it is assumed that this mean is the target growth rate. The M_2 base in the illustration is the actual level of M_2 in 1975I, \$619.3 billion. This base, plus or minus $1\frac{1}{2}$ percent, yields starting points for the bands of \$610.0 billion and \$628.6 billion. The band is defined by projecting these two limits forward at the 9.50 percent target growth rate.

Each time the announced targets are unchanged the band is projected forward by one quarter; when the target is changed the band is bent. For example, for the 1976III - 1976III target period, the M_2 target growth range was lowered to 7.5 - 10.5 percent. The midpoint of this range is 9.0 percent. This reduction in the target growth range is taken to bend the previously defined band in the base quarter of 1975III; the new band is defined by extending the band limits at the 9.0 percent growth rate from the 1975III levels of the previously defined band.

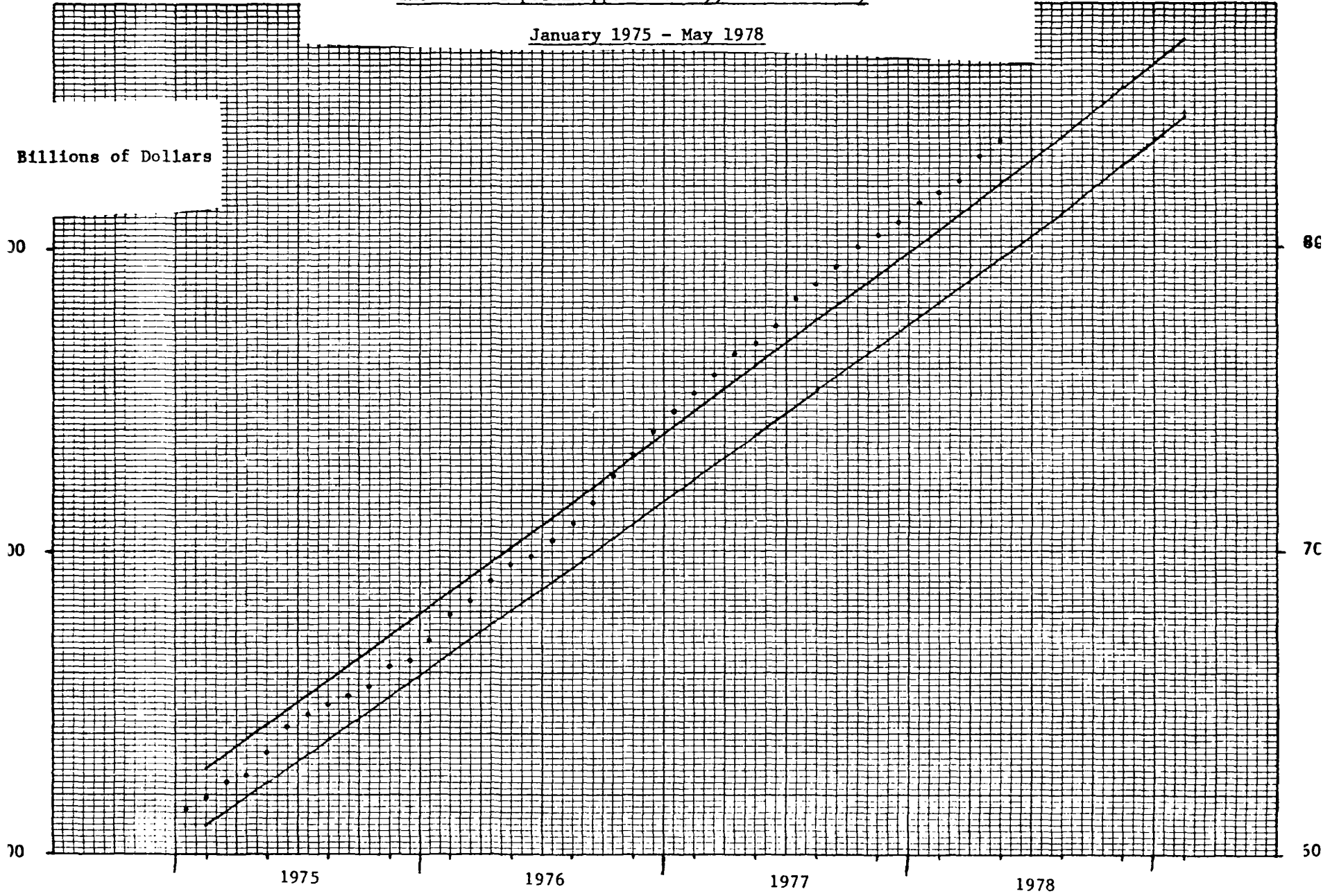
As can be seen in this illustration, the distinguishing feature of the proposal is that the target ranges are set in conjunction with the previously defined target levels instead of with respect to the actual money growth stock quarter by quarter. Figure 2 shows the band defined by growth rates equal to the midpoint of the M_2 target ranges specified quarter by quarter since 1975.

M₂

Figure 2

The Band Proposal Applied to M₂, and Actual M₂

January 1975 - May 1978



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The proposal has been outlined in terms of a band for M_2 rather than in terms of bands for both M_1 and M_2 . If target growth rates are to be changed by only small amounts each quarter, then it is likely that the differential levels of M_1 and M_2 would wander far enough off their targeted levels that it would be impossible simultaneously to achieve levels of M_1 and M_2 within their respective bands after a relatively few quarters. Because the differential growth rate cannot be controlled, some base drift in either M_1 or M_2 is inevitable.

Experience since 1975 seems to support this view. Figure 3, which was constructed in the same manner as Figure 2, shows the band proposal applied to M_1 . A comparison of these figures suggests that if M_2 had been held within its band in late 1976, then M_1 would have been forced below its band.

If the band proposal is to be adopted, it will probably be necessary for the FOMC to reach a decision on the primacy of M_1 or M_2 . My suggestion is to go with M_2 -- M_2 velocity now seems somewhat more stable than M_1 velocity and continuing regulatory changes seem to raise more problems for M_1 than for M_2 . Nevertheless, it seems desirable to specify M_1 and M_3 target growth ranges as memorandum items along with the M_2 target band. The behavior of M_1 and M_3 relative to their target ranges could then be used as guides as to whether M_2 should tend toward the upper or lower side of its band.

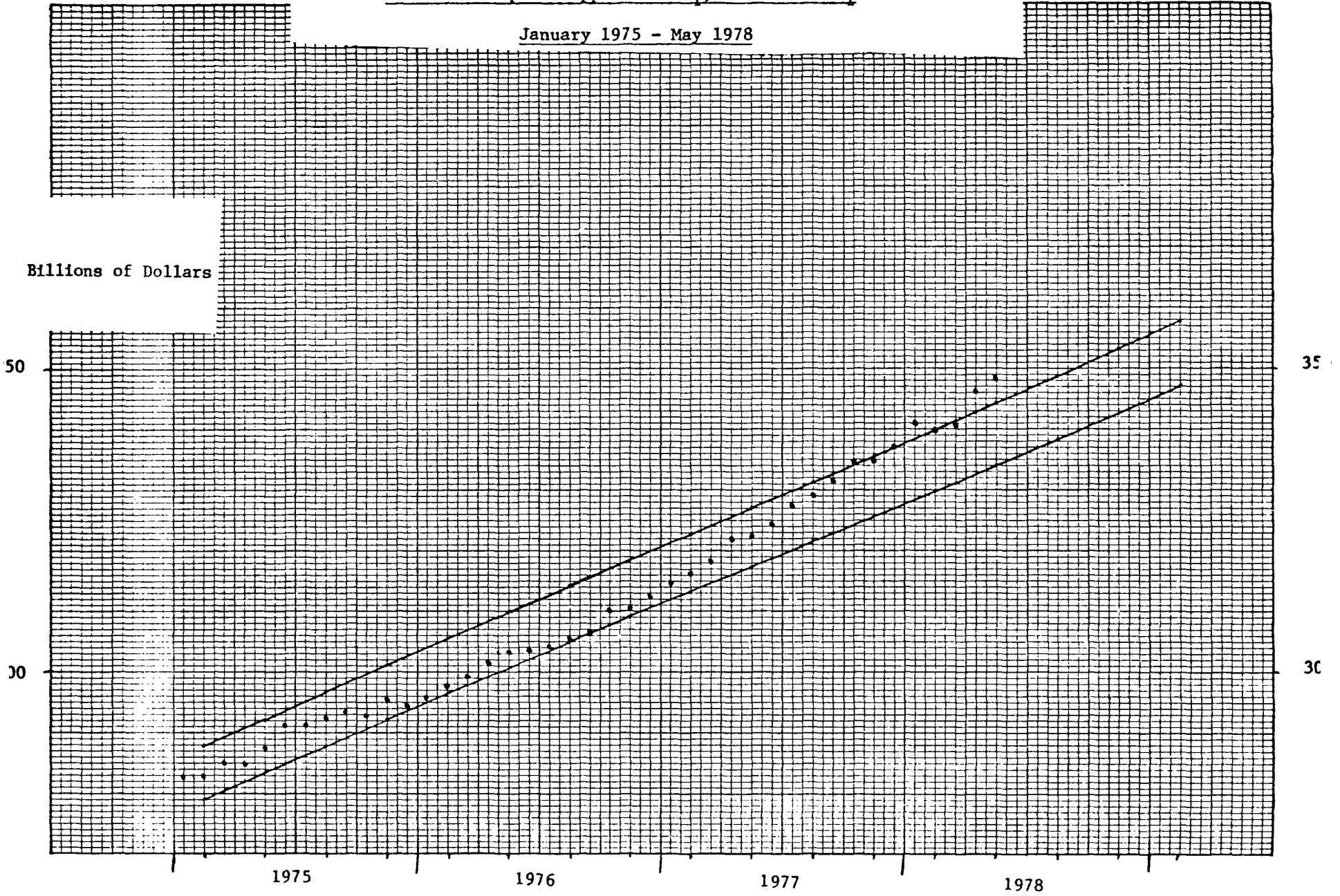
Analysis of the Band Proposal. The band proposal has the advantage of avoiding the base drift problem. Base drift generates a problem whenever short-run money control errors, or deliberate money stock fluctuations as an element in short-run policy, produce changes in the base from which the one-year money targets are calculated. By linking new policy targets to

M_1

Figure 3

The Band Proposal Applied to M_1 , and Actual M_1

January 1975 - May 1978



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previously defined policy targets there is no tendency for money control errors to be automatically built into the target level in the future. The band proposal provides a clear perspective on money growth over an horizon of several years by drawing attention to any tendency for deviations from target money growth to cumulate.

Another advantage of the proposal is that it provides a clear relationship between the quarterly announcement and previous quarterly announcements. A change in the target growth rate redefines the target band over the next four quarters and displaces the remaining three quarters of the four-quarter band defined in the previous quarter.

Data revision would not change the policy target under the band proposal. Thus, when benchmark revisions, or changed seasonal factors, become available the target range in terms of money stock levels is not affected. Under the present system data revisions sometimes produce substantial changes in the target levels leaving the current value of the money stock farther from target than thought just before the data revisions. However, the band proposal has the disadvantage that major data revisions that ought to lead to changes in policy targets will not do so in the automatic fashion that occurs under the present system. Major data revisions will require formal restatement of the target band.

Another reason to move to the band proposal is that it emphasizes the importance of money stock levels along a growth path and deemphasizes growth rate calculations based on weekly money numbers. It is suggested that the weekly release on the monetary aggregates report the 13-week moving average of the monetary aggregates. This calculation would encourage the market and the financial press to compare quarterly averages of

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the money numbers with the stated target band rather than to make growth rate calculations over short spans of time.

The band width of 3 percentage points is somewhat larger than the width of the money growth targets announced in the past; nevertheless, this band width provides somewhat less policy freedom within announced targets than does the current procedure because the current procedure makes use of the base-drift phenomenon. However, the reduction in policy freedom is probably not as great as might appear at first glance and it is probable that an M_2 target band will provide more policy freedom than is actually needed or desired. When interest rates rise sharply, there is a tendency toward disintermediation and so time deposit growth slows providing room within the M_2 band for open market operations to cushion interest rate increases. Conversely, when interest rates fall time deposit growth tends to rise and so there is room to follow less expansionary open market operations in order to cushion interest rate declines. Finally, with M_1 listed as a memorandum item there is the possibility of running somewhat outside the announced bands if M_1 behavior seems to justify such a policy.

Concluding Comments

In considering alternative specifications for money growth targets a central issue is the purpose the targets are to serve. The current formulation provides the FOMC with a very substantial amount of freedom to determine, or react to, money growth as it sees fit. This freedom is generated by the ambiguities inherent in multiple targets and base drift.

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While the present monetary targets do not themselves seem to constrain the FOMC very much, my judgment is that the FOMC is probably constrained to a greater extent than it realizes by political pressures. With the benefit of hindsight, I believe that it is clear today that the economy would now be in a better position for a continuation of an orderly cyclical expansion if money growth had trended down rather than up in 1977. But it would have been politically difficult to have started pushing interest rates up in late 1976, or to have pushed rates up faster in early 1977, to restrain money growth. Similarly, today there is tremendous concern over inflation and declining concern over unemployment. Judging from past business cycle experience, the time will surely arrive within a few quarters when it will be desirable for the Fed to push interest rates down in order to sustain money growth; such a move will not be easy if today's political environment prevails at that time.

My feeling is that the band proposal may provide a way for the Federal Reserve to inject a longer view into the political process. A test question for the FOMC to consider is whether it would have wanted to use Figure 2 last year to make the argument that M_2 was running above its target band and that interest rates simply had to be raised to bring money growth under control. Similarly, at or shortly after the peak of the next business cycle, when unemployment is low and inflation still accelerating, would the FOMC want to appeal to a similar figure to justify pushing interest rates down in order to keep the money stock from falling below its band?

Put bluntly, if the FOMC does not want to use the announced money targets to attempt to reduce the political pressures that help to generate

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procyclical money growth behavior, then the ambiguity of the current formulation of money growth targets is surely to be preferred to the band proposal. The band proposal, by eliminating the political safety valve of base drift, will eventually lead to a situation in which the money stock is grossly and visibly out of line with the band unless the Fed is prepared to take the political heat of raising interest rates sharply at a time such as early 1977 and lowering them in a political environment similar to the one that exists today.