



BOARD OF GOVERNORS
OF THE
FEDERAL RESERVE SYSTEM
WASHINGTON, D. C. 20551

STRICTLY CONFIDENTIAL (FR)
CLASS I - FOMC

TO: Federal Open Market Committee

DATE: January 24, 1984

FROM: S. H. Axilrod

A handwritten signature in dark ink, appearing to be "S. H. Axilrod", written over the printed name.

The attached memorandum discussing money growth ranges consistent with price stability and certain transitional issues in attaining them is circulated for general background information.

Attachment

STRICTLY CONFIDENTIAL (FR)
CLASS I - FOMC

TO: Chairman Volcker

DATE: January 23, 1984

FROM: S. H. Axilrod¹

SUBJECT: Money growth and price
stability

This memorandum examines evidence bearing on growth rates in M1 and M2 that would be consistent with secularly stable prices. It also considers certain transitional and related problems, including interest rate behavior as well as budget and international factors, that may influence the path from current money targets to those finally consistent with price stability. Because the relationships involved are highly complex, uncertainties are vast, and the future almost always contains surprises, the conclusions of the paper should be viewed as highly tentative and the options discussed for the transition period should be taken as more in the nature of paradigms to illustrate problems rather than as literal proposals.

In simplest terms, to keep prices stable over time (some price movements related to cyclical and other transitory circumstances would be consistent with secular price stability), no more money should be supplied on average than is needed to accommodate growth in real GNP at its potential rate after allowance for the trend increase in velocity. Thus, the first and second sections of the memorandum (beginning on pp. 2 and 4) examine influences on and the likely long-term trends of real GNP and velocity, respectively. The third section (p. 11) then presents estimates of the ranges of M1 and M2 growth thought at this time to be consistent with stable prices. Of course, there will be a transition period, with its own complications, before the economy reaches a point

1. This memorandum draws on work of and discussions with Messrs. Lindsey, Kohn, Brayton, and Slifman.

where it can grow at its potential without inflation. The fourth section (p. 13) of the memo evaluates money growth during the transition period.

Potential growth in real GNP

The long-run trend rate of expansion of real economic activity (potential GNP growth) can be estimated from trends in labor force and productivity growth. The trend rate of growth of the labor force is determined by the growth of the working-age population and the behavior of labor force participation rates. The Census Bureau now estimates that the growth of the population aged 16 years and over will slow to a 1 percent annual rate during the remainder of the decade from a 1.7 percent pace between 1975 and 1982, as a result of the downtrend in the number of births between 1962 and 1973. Although estimates of labor force participation are subject to considerable uncertainty--and there may be declining participation rates for some groups (such as older men)--on balance the labor force might be expected to grow about 1/2 percentage point faster than population growth, that is, by about 1-1/2 percent annually.

It is likely that the labor force will grow somewhat more rapidly than the working age population because of future increases in participation rates for adult women. Participation rates for this group rose rapidly during the 1970s and contributed importantly to the expansion of the work force. While the increase in participation among adult women is expected to be slower in the 1980s than in the 1970s, the rise is still likely to be on a secular uptrend.

In addition, because of the aging of the baby-boom cohort, the age distribution of population will be shifting over the next two decades towards the 25 to 54 year-old group. These workers historically have a relatively more stable attachment to the labor force; consequently, this change in the

age structure of the labor would likely cause some rise in the overall labor force participation rate even if rates for individual age-sex groups were to remain unchanged.

The trend rate of growth of labor productivity--the other factor affecting the expansion of potential real GNP--averaged around 2-1/2 percent during the 1950s and 1960s and slowed to about 1/2 percent between 1973 and 1980. Over the coming decade, many of the factors that probably contributed to the productivity slowdown after 1973 are expected to improve. The baby-boom cohort has matured and gained job experience and should be a force for faster productivity growth during the next several years; a variety of industries have been deregulated or are less regulated and the effects of these efforts should continue to be felt for some time; ten years after the first oil price shock, there have been substantial adjustments in production techniques that allow labor to use energy and other natural resources more efficiently. Finally, the reattainment of a more stable economic environment could well improve productivity performance by encouraging capital formation and reducing the inefficiencies associated with inflation.

Although most of the factors that determine the trend rate of productivity growth point to an improvement from the current pace, there are no strong grounds for anticipating that we will return to the productivity "golden age" of the fifties and early sixties. Our current judgment is that over the rest of the decade the productivity growth trend will move up to the neighborhood of 1-1/2 percent.

With both the growth of the labor force and the trend in productivity expected to be around 1-1/2 percent annually, potential GNP would be expected to grow at about a 3 percent annual rate. There are both

upside and downside risks to this projection. We would view downside risks-- for example, for slower labor force growth--as having a somewhat smaller dimension and lesser likelihood than the up side risks. Thus, while 3 percent per annum is our best point estimate for potential GNP growth over the next decade or so, a reasonable range would be 2-1/2 to 4 percent.

Velocity growth trend

In estimating a velocity growth trend, we have examined a variety of money demand equations developed over the past decade or so. This approach permits abstracting from the effects of interest rates on velocity behavior, thus providing estimates for the effect on velocity of both growth in real income and exogenous technological change.

While output and velocity are separate variables in the equation of exchange ($MV=PY$), the trend rate of velocity is not necessarily independent of potential growth in real output. An example may make the role of real output or income clear. Suppose the elasticity of money demand with respect to real income were $2/3$ and the growth rate in potential real income were 3 percent per year. Money demand would grow by 2 percent per year at stable prices, and velocity growth would be 1 percent for this reason alone. If potential real income growth were 4 percent, velocity growth for this reason alone would be 1.33 percent per year ($2/3$ of the 4 percent growth is financed by money expansion and the remainder by velocity). Thus, estimates of the elasticity of money demand to real income are needed for judging secular velocity trends. Only if the elasticity of money demand with respect to real income were unity--that is the percentage increase in money demand matched potential growth in real output--would it not matter for assessment of velocity trends whether potential real output growth were 3, 4 or some other percent.

Estimates for the post World War II period (using quarterly data) of what has become a conventional specification of money demand in real terms with interest rates and real income as explanatory variables had, until recently, suggested a real income elasticity well below unity, as shown in Table 1. Assuming growth in potential real GNP of 3 percent per year, a secular trend in the income velocity of M1 between 1 and 1-1/2 percent had been implied. However, an estimate of this equation for a more recent sample period (and which allowed for a downward demand shift in the mid-1970's) indicated a real income elasticity much closer to unity, implying a secular trend growth in the velocity of M1 of only 0.2 percent per year (the bottom line of Table 1).

A wide range of estimates of secular V1 growth is implied by various equations with somewhat different specifications presented in Table 2. The Hamburger equation constrains the long-run elasticity to unity (in a sense begging one of the key issues) and has no time trend; hence, the trend in M1 velocity, though not its short-run behavior in response to other factors, is constrained to zero. The remaining models shown have separate equations for currency and transactions deposits, so that the real income elasticities for M1 are weighted averages of the separate elasticities for these components. These elasticities are on the high side (with one exception) relative to all but the most recent equation shown in Table 1.

The models shown on Table 2 developed by the Board staff also include a time trend as an explanatory variable. This trend may be viewed as capturing the exogenous impact of technological advance on velocity behavior. Indeed, in these models, the relatively high secular velocity rise of 1-1/2 to 2 percent per annum (assuming 3 percent real growth) is

Table 1
Quarterly Goldfeld-type M1 Equations

<u>Sample Period</u>	<u>Long-run Real Income Elasticity</u>	<u>V1 trend¹</u>
1950:3 - 1962:2 ²	.56	1.32
1952:2 - 1972:4 ³	.68	.96
1952:2 - 1973:4 ⁴	.55	1.35
1959:3 - 1974:2 ⁵	.54	1.38
1960:1 - 1979:4 ⁶	.92	0.24

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1. Assumes 3 percent growth of potential real GNP.
 2. S. Goldfeld, Commercial Bank Behavior and Economic Activity (1966), Equation 3.3, p. 78.
 3. S. Goldfeld, Brookings Papers on Economic Activity (1973), Equation 4, p. 582.
 4. S. Goldfeld, Brookings Papers on Economic Activity (1976), Equation 1, Table 1, p. 686.
 5. D. Porter and E. Offenbacher, "Update and Extensions on Econometric Properties of Selected monetary Aggregates," April 7, 1982, Appendix Table A3.
 6. R. Hafer and S. Hein, St. Louis Review (February 1982) Equation 3, p. 15. The equation includes a dummy shift variable that starts in 1974:2.

Table 2

Various Quarterly and Monthly Equations for M1

<u>Equation Description and Sample Period</u>	Long Run Elasticity for scale variable:			Velocity trend for:		
	<u>Real GNP</u>	<u>Personal Consumption Expenditure</u>	<u>Time trend (annual rate)</u>	<u>Currency¹</u>	<u>Transactions Deposits¹</u>	<u>M1^{1,2}</u>
<u>Quarterly</u>						
1. Hamburger, 11/23/83 paper 1955:2 - 1972:4	1.0		---	---	---	0.0
2. Data Resources						
Currency 1965:1 - 1982:4		.77	---	.69		
Transactions Deposits 1967:1 - 1982:4	.46		---		1.62	1.35
		<u>Per Capita Real GNP</u>				
3. Board model--nonlinear specs.						
Currency 1960:1 - 1981:4		.95	-.80	.95		
Transactions Deposits ³ 1961:1 - 1981:4	.82		-2.02		2.38	1.97
<u>Monthly</u>		<u>Real Personal Income</u>				
4. Board model						
Currency 1971:2 - 1982:12	.62		---	1.14		
Transactions Deposits 1971:1 - 1982:12	1.0		-1.88		1.88	1.67
5. San Francisco Model						
Currency 1976:8 - 1983:10	.77		---	.69		
Transactions Deposits 1976:8 - 1983:10	.70		---		.90	.84

1. Assumes 3 percent growth for potential real GNP, real personal consumption expenditure, and real personal income and 2 percent growth for per capita real GNP.
 2. Uses current shares of M1: 29 percent for currency plus travelers' checks and 71 percent for transactions deposits.
 3. For demand deposits; 1977:1 to 1981:4 for OCD.

mainly influenced by the time trend; the real income elasticities themselves would suggest only a very small trend rise in velocity.

Over-all, the econometric evidence provides a 0 to 2 percent range for the annual trend in V_1 , taking account of real income elasticities (assuming for the moment 3 percent real GNP growth) and technological change. To the extent that the upper end of this range assumes a strong influence from technological innovation (as is the case in the Board models), there are reasons to believe that the future velocity trend will be lower.

Part of the increase in velocity captured by time trend in fact may have been induced by the emergence of a sizable opportunity cost of holding money during the 1970s, particularly as the public viewed these costs as persisting over time. It seems likely that as price stability is attained and opportunity costs for money holdings look as if they will be low over a sustained period, the pace of innovation will slow. This tendency, of course, would be reinforced if interest comes to be paid on demand deposits and on required reserve balances.

Future velocity growth also may be held down if the income elasticity were to prove even higher than estimates for recent decades. This could result from the behavior of household depositors, who switched considerable savings-type balances from outside M_1 into NOW accounts in the early 1980s. The relative importance of these balances in M_1 is expected to continue growing, and their long-run income elasticity may well be closer to the figure of unity that is generally thought to be the case for nontransactions deposits as a whole.

While there are reasons to believe a 2 percent trend rate for V_1 is high, it is also unlikely that there will be no trend at all. Virtually all unconstrained models do find a real income elasticity less

than unity. Moreover, while exogenous velocity growth may naturally slow in the aftermath of the recent wave of innovations and of deregulation in transactions deposits, the development and spread of new cash management techniques are unlikely to come to a halt. And it is always possible that a new wave of financial innovation might evolve out of, say, improved communications technology, such as use of home computers to manage cash.

On balance, the secular velocity trend, given stable prices, seems most likely to be around 1 percent. Complete deregulation of and payment of market interest rates on all transaction deposits may make a slower trend rate more plausible. A higher trend rate would seem to depend mostly on continuation of innovation at the pace of the past decade.

Trend velocity of M2. The amount of empirical work explaining M2 behavior is small relative to research that has been devoted to M1, and the material summarized below focuses on research undertaken within the Federal Reserve. Two approaches have been taken to explaining the demand for M2. One uses an equation for nontransactions M2 in conjunction with equations used to describe M1. The Board's monthly and quarterly models and the San Francisco monthly model fall into this category. The other approach (represented by work done by Porter and Offenbacher) estimates an aggregate M2 equation.

As shown in Table 3, the estimates of secular M2 velocity from these approaches--which use differing explanatory variables--cluster around zero. They range from -.2 percent in one of the Porter-Offenbacher equations to .4 percent in both the Board and San Francisco monthly models. The small positive numbers shown in Table 4 that are implicit in the Board's quarterly and monthly models would be reduced to -.1 and .25 percent, respectively, if the one percent trend in V1 suggested in the preceding subsection were

Table 3

Secular Velocity Trends for M2 and Components

	Velocity Trend for: Nontransactions Component of		
	<u>M1</u> ¹	<u>M2</u>	<u>M2</u> ²
1. Board Quarterly Model	2.0	-.4	.1
2. Board Monthly Model	1.7	0.0	.4
3. San Francisco Monthly Model	.8	.2	.4
4. Porter-Offenbacher Quarterly Equation ³ with real GNP	--	--	-0.2
5. Porter-Offenbacher Quarterly Equation ³ with real GNP and ratchet variable	--	--	0.2

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1. The listed values are taken from table 3. The quarterly model value is taken from the nonlinear specification.
 2. For the disaggregated models of M2, the M2 velocity is calculated by weighting the M1 and nontransactions M2 velocities with their current shares in M2 (.24 and .76, respectively).
 3. Ed Offenbacher and Dick Porter, "Update and Extension on Econometric Properties of Selected Monetary Aggregates," memorandum, April 7, 1982.

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substituted for the model estimates. With the income elasticity of M2 close to unity, and with no obvious time trend effect on the velocity of M2, the rate of growth of M2 would be about equal to the rate of growth of potential real GNP.

Conclusions for long-run growth in M1 and M2

The trend growth in real income appears to be the main influence on M1 growth in a period of price stability and virtually the only influence on M2 growth, given our estimate that the secular growth in V1 may range around 1 percent¹ and that V2 has essentially no time trend. If growth in potential GNP is taken to be in the 2-1/2 to 4 percent range earlier noted, M2 growth in a period of price stability would be in the same order of magnitude. M1 growth would most likely be a little lower since its velocity can be expected to rise somewhat.

Allowing for velocity and GNP uncertainties, a reasonable set of rounded ranges (with widths of no more than 3 percentage points) for monetary growth consistent with price stability could be 2 to 5 percent for M2 and 1 to 4 percent for M1.

Both ranges are well below current Committee targets, implying considerable scope for further reductions. For reference, target ranges for 1983 and earlier years are shown in relation to actual outcomes for aggregates, velocity, and GNP in Table 4. As may be seen, the price stability ranges are much lower than any of the ranges since ranges were adopted in the mid-1970's and are also lower than any outcomes since the beginning of the 1970's. While it may be hoped that conditions are now

1. The trend in real output itself will have only a minor effect on V1; if real income elasticity is no lower than .75, V1 will be raised (or lowered) by about 1/4 percentage point for every one percentage point differential in the real output trend.

Table 4

Adopted and Actual Long-run Growth Rate Ranges in Monetary Aggregates
Percent Change: Q4 to Q4

Year Ending	M1			M2			M3			Credit ¹		Nominal GNP	Real GNP	GNP Deflator
	Target Range	Outcome	Velocity	Target Range	Outcome	Velocity	Target Range	Outcome	Velocity	Target Range	Outcome			
1970	--	4.9	.0	--	5.9	-.9	--	9.2	-3.9	--	--	4.9	-.1	5.0
1971	--	6.7	2.7	--	13.5	-3.5	--	14.8	-4.5	--	--	9.6	4.7	4.7
1972	--	8.5	2.8	--	12.9	-1.2	--	14.0	-2.1	--	--	11.5	7.0	4.3
1973	--	5.8	5.5	--	7.2	4.1	--	11.6	.0	--	13.2	11.6	4.2	7.1
1974	--	4.8	2.2	--	5.9	1.1	--	8.6	-1.5	--	10.2	7.1	-2.8	10.2
1975	--	5.0	4.8	--	12.1	-1.8	--	9.3	.7	--	4.3	10.0	2.2	7.7
1976	4.7-7.5	6.1	3.0	7.5-10.5	13.3	-3.5	9.0-12.0	11.1	-1.6	6.0- 9.0	7.8	9.3	4.4	4.7
1977	4.5-6.5	8.2	3.7	7.0-10.0	11.2	.9	8.5-11.5	12.3	-.1	7.0-10.0	10.8	12.2	5.7	6.1
1978	4.0-6.5	8.2	6.0	6.5- 9.0	8.0	6.2	7.5-10.0	11.1	3.2	7.0-10.0	13.5	14.7	5.8	8.5
1979	3.0-6.0	7.4	2.1	5.0- 8.0	8.1	1.5	6.0- 9.0	9.6	.1	7.5-10.5	12.6	9.7	1.4	8.2
1980	4.0-6.5	7.2	2.0	6.0- 9.0	9.0	.3	6.5- 9.5	9.7	-.4	6.0- 9.0	9.1	9.3	-.8	10.2
1981	6.0-8.5 (3.5-6.0) ²	5.1 (2.4) ²	5.4 (8.2) ²	6.0- 9.0	9.4	1.3	6.5- 9.5	11.7	-.8	6.0- 9.0	7.9	10.8	2.0	8.7
1982	2.5-5.5	8.5	-5.5	6.0- 9.0	9.3	-6.1	6.5- 9.5	10.1	-6.9	6.0- 9.0	7.9	2.6	-1.7	4.4
1983 ³	5.0-9.0	5.5 (9.6)	4.2 (.7)	7.0-10.0	7.3 (11.8)		6.5- 9.5	9.1	1.1	8.5-11.5	10.5	10.4	6.1	4.1

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1. Bank credit for 1973 through 1982, and total domestic nonfinancial debt for 1983 shown on December to December basis.
2. Data in parentheses are adjusted to remove the effects of shifts into other checkable deposits from outside M1.
3. Target ranges and outcomes use Q2 as a base for M1 and February/March as a base for M2. Velocities and outcomes shown in parentheses are on Q4 to Q4 basis. Figures do not reflect revisions to benchmark and from new seasonals.

more favorable to reducing ranges and actual growth in line with attainment of price stability, there are a number of transitional questions, to be discussed in the next section.

Money growth in the transitional period

Policy toward money growth in a transitional period to price stability would need to take account of the impact of the monetary decisions themselves on inflationary expectations, the speed with which the transition can be completed without undue restraint on economic growth, demands for money in response to declines in market interest rates as price stability is approached, and exogenous developments that might influence demands for money and for goods and services, including changes in the present budgetary and balance of payments situations. It is very difficult, clearly, to estimate the likely timing and magnitude of such developments in advance. Thus, the policy approaches evaluated should be considered as illustrative of major issues that may arise and not necessarily as literal policy prescriptions.

Budgetary and balance of payments considerations. Changes in the stance of fiscal policy and also balance of payments adjustments could affect choices of money growth paths during a transition period, though not the basic thrust toward slower money growth consistent with price stability. For example, if the present structural budget deficit is at some point reduced, it would, according to standard structural models of the economy, require a one-time reduction in real and nominal interest rates to keep real income from varying substantially from what it otherwise would be. A reduction of interest rates could also involve an increase in money demand at around the time the deficit is reduced, with the magnitude dependent on the interest-elasticity of M1 demand under the institutional conditions of the period. Whether, or to what extent, monetary

policy would want to encourage a temporarily more rapid growth in money than was otherwise targeted would depend on part on the response of the economy to easing credit market conditions in the circumstances.

If money growth was increased in the course of a shift in fiscal policy toward a less stimulative posture, this need not necessarily raise the long-term level of prices. A fiscal policy which entailed no or low structural deficits over time would involve a lower real rate of interest than a high deficit policy--because smaller deficits allow more room for capital investment, thus making it less scarce. Such a lower real rate of interest would imply a permanent increase in the level of money demand and decrease in the level of velocity as the long-run opportunity cost of holding money is lowered. Thus money that might be added to encourage economic activity as the budget is shifted to a less stimulative posture would not necessarily have to be later withdrawn, at least in its entirety, to hold a given price level.

Whether lower deficits will also raise the secular rate of real growth, thereby affecting the required long-run growth of money, is a more difficult question. Lower deficits probably will raise real growth for a time as the shift in the fiscal stance leads to accelerated growth in the capital stock. But after the capital stock is built up to levels consistent with lower real interest rates--which could take a substantial amount of time--the growth in capital, and real growth in the economy, would tend to revert to something like its earlier pace. However that may be, the effects on real growth over the long-run are in practice not likely to be large enough to alter our estimate that the economy's potential real growth lies in a 2-1/2 to 4 percent range, though the effects may work to increase the odds on growth being in the upper half of the range, at least for a time.

Issues raised by the present state of the balance of payments appear to be essentially transitional. It seems unlikely that a current account deficit of about \$100 billion can persist over time. Correction of that deficit will almost inevitably involve a significant depreciation of the dollar on exchange markets, with an attendant once and for all impact on the level of prices--say about 1-1/2 percent for every 10 percent drop in the dollar. Such upward price pressures associated with a depreciation pose a dilemma for policy. They could be accommodated through somewhat faster money growth temporarily, but this would slow, and make more uncertain, progress toward price stability and may have adverse effects on inflationary expectations. On the other hand, monetary growth could be left on an unchanged course, which would result probably in temporarily higher unemployment rates than otherwise. The preferred approach for policy clearly would depend on the prevailing economic conditions--such as whether the unemployment rate was on the decline in any event (so that keeping money growth unchanged would not lead to much if any rise of unemployment), or on the sensitivity of market expectations in the circumstances of the time to increases in money growth.

Because possible adjustments to monetary targets arising from changes in budgetary or foreign exchange conditions would depend on surrounding circumstances, they have not been explicitly taken into account in the ensuing analysis of alternative approaches to lowering money growth to ranges that are consistent with price stability. Moreover, any such adjustments, should they seem desirable, may well be modest enough to be subsumed within the target ranges that would otherwise be adopted.

Policy options in the transitional period. There are a number of courses, involving more or less complex strategies, that might be charted

for reducing money growth targets from current ranges to those consistent with price stability. The two options discussed in this section, though, involve relatively steady reductions in targeted growth rates, with the principal difference being in the length of period over which the reductions are sought. Such strategies tend to avoid uncertainties about the ultimate course of monetary policy that might be connected with more variable money growth paths and thus may also have the advantage of accelerating the adjustment process by more quickly encouraging dissipation of inflationary expectations.

The pace of reduction in money growth targets need not be determined precisely in advance but can be gauged, each year, in part by the degree to which wage increases in excess of productivity growth are abating, in part by the pressure to be exerted in an effort to encourage such adjustments, and in part in light of special circumstances of the period (institutional change, exogenous shocks, the state of the business cycle). The pace of reduction would also be limited by the constraint that monetary policy should not aim to be so restrictive in the transitional period that there is risk of a significant rise in unemployment from current levels.

The shortest transitional period that would seem consistent with avoiding such a rise in unemployment, given historical wage and price rigidities, appears to be about five years, but clearly that period could be shorter or longer depending on changing attitudes or exogenous shocks. An about five-year transition would entail a reduction in M1 growth targets of about 1 percentage point per year from the current 5 to 9 percent to 1 to 4 percent. A similar pace of reduction would be involved for M2.

Attainment of price stability in this period could entail, say, a 50 percent drop in private nominal short-term rates from 9-1/2 percent currently to around 5 percent. That drop that would itself involve an increase in demand for M1 over the period by an amount given by the interest elasticity of M1. There is to be sure considerable uncertainty about that elasticity in light of, among other things, the changing composition of M1, particularly the greater role played by transactions accounts which also serve as repositories of savings. Moreover, the elasticity may well change over time because of a growing tendency for transactions deposits to bear market interest rates.

Assuming for purposes of analysis an interest elasticity on the order of 10 to 15 percent for M1 demand, the projected drop of interest rates would raise M1 demand by on the order of 5 to 8 percent. M2 demand would probably be affected by much less since its interest elasticity appears to have declined to relatively low levels with deregulation.

If the drop of interest rates were spread smoothly over the transitional period, the associated increase in M1 demand and drop in velocity would average around 1 to 1-1/2 percentage points per year. That would be consistent with one percentage point per year reductions from the current M1 range, given a deceleration in prices and a relatively modest growth in real GNP, but with actual growth in M1 near the upper limits of those ranges.

However, while sufficient M1 and M2 would have been provided to accommodate the decline in market interest rates as inflation disappears in this approach, sufficient money may well not have been provided to raise economic activity to levels consistent with full employment. Thus, at the end of such a transition period, a resurgence of money growth would

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be needed for a time to stimulate the economy to full employment. (If that were not done, and M1 and M2 growth were maintained in their 1 to 4 percent and 2 to 5 percent ranges, prices would begin declining.)

To move the economy up to full employment would require a further drop of interest rates, both nominal and real, to 3 or 4 percent for example. To achieve this would require a temporary re-acceleration of money growth so that the economy could grow faster than its potential for a while and to accommodate also the increase in money demand associated with the further 20 to 40 percent drop in interest rates.

There is obviously the possibility that the gains in curbing inflation expectations would be undone by such a re-expansion in money growth, even though it was intended to be temporary. But the potential for losing the gains would probably be much less if and as the needed re-expansion occurred after a sustained period of diminishing wage and price increases.

The risk of an unduly complicated "re-entry" problem might be reduced by an alternative policy approach in which money growth is reduced to a noninflationary pace over an even lengthier period. This might involve, for example, 1/2 percentage point per annum reductions in money targets, rather than one percentage point. Because the real economy would then presumably be growing over the transitional period at a slightly faster rate than in the first alternative, wage and price pressures would diminish more slowly and interest rates would decline less rapidly each year. With a little luck, enough time would have elapsed in that process so that the whole of the needed one-time increase in the level of M1 that is implicit in the drop of interest rates associated with attainment of stable prices and in the expansion of the level of economic activity to its potential would have been gradually dropped into the economy. In that ideal world, policy would

not be faced with the need to accelerate M1 at the end of a transitional period.

The choice of a policy that involves a longer or a shorter transitional period depends in part on assessment of the degree of wage and price flexibility in the economy and in part on which policy approach may itself have the best possibility of reducing inflationary expectations and thereby increasing the odds on ultimate success. While a shorter period has something of a re-entry problem and may restrain real growth more, it would seem to provide greater assurance--by keeping restraint on the economy and more clearly signifying the intentions of monetary policy--that price stability will in practice be reached. In the degree that the shorter-period approach is effective in reducing inflationary expectations quickly, that would in practice provide more scope for real growth sooner.

A longer transitional period theoretically allows for more real economic growth over the nearer-term, but at the risk that a very extended phase-down to price stability will not carry enough conviction to the market to keep price and wage increases and inflationary expectations from accelerating as the unemployment rate declined more quickly early in the period. Thus, the phase-down to price stability might involve a much bumpier path for prices and employment than had been anticipated, with attendant pressures on policy decisions.

The choice of a shorter or longer transitional period is not, however, entirely within the Committee's hands. Even if the Committee chose a longer period, the effective period could still be quite short if wage and price increases proved to be surprisingly flexible in a downward direction. The drop in interest rates to long-run equilibrium levels would then come more rapidly. The increase in money needed to satisfy the additional money

demand generated from the lower interest rates would more quickly emerge (somewhat like in 1982-83). If the increase in money demand were not accommodated the economy would at least temporarily be much weaker than desired. Thus, when setting a course to price stability, the Committee would need to keep in mind the possibility that M1 growth may have to surge in a particular short period, depending in part on its own choice and in part on the speed of the public's response. This possibility should probably be kept in the public's consciousness also so as to avoid potential misunderstandings should the attainment of price stability occasion or require a period of rapid monetary growth.