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MONEY, CREDIT, AND BANKING LECTURE

Monetary Policy: Rules, Targets, and Shocks

JAMES TOBIN

The proper conduct of monetary policy is now once again wide open to discussion. An immediate practical controversy concerns the role of central banks in recovery from the world depression. Underlying that debate are some unresolved fundamental issues regarding the responsibilities, goals, targets, and operating procedures of central banks.

Monetarism won the hearts and minds of many economists and most central bankers in the 1970s. Now it seems to be losing adherents and influence—partly because it is blamed for the severe depression, partly because regulatory, institutional, and technological changes have altered the meanings and velocities of monetary aggregates. Last summer Chairman Volcker and his Federal Reserve colleagues suspended their monetarist targets, to almost universal relief. The severity of the recession, the international debt crisis, and the pace of change in financial structure were all good reasons. It is doubtful, though possible, that money stock targets will regain their previous status. If not, what philosophy of monetary control, what framework for the conduct of policy, will replace them?

A host of monetary architects are ready to fill the vacuum. Some would restore the gold standard or make paper money convertible into other commodities. Some would replace intermediate monetary aggregates with other targets: the monetary base, nominal GNP or final sales, total domestic credit, price indexes or their rates of change, exchange rates. Some advocate irrevocable commitment to announced

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values of chosen targets; others contemplate revision of target values at regular or irregular intervals. Some propose simple rules and targets, not to be changed during their tenure by reference to observed macroeconomic outcomes; others advocate complex feedback formulas describing how monetary instruments will respond to such observations. Some are willing to trust the judgments and priorities of the monetary authorities: let them look at the whole state of the economy and decide what to do without precommitments to any rules or formulas or targets. Hardcore monetarists would, of course, reinstate targets for M1 or other aggregates and tie the central bank more tightly to their realization.

RULES VERSUS DISCRETION

“Rules versus discretion” denotes a long-standing debate on economic policy, especially monetary policy. Should policymakers consistently follow stable announced rules or should they have and use discretion in successive decisions? If they follow announced rules not subject to discretionary change from day to day or year to year, should the rules be fixed or reactive? A fixed, nonreactive rule sets the path of instruments or of intermediate targets under policy control independently of events and observations—policy is deliberately blindfold. A reactive rule alters the values of control variables according to feedback formulas exploiting up-to-date information on the state of the economy.

An example of a fixed rule is the celebrated recommendation of Milton Friedman that a chosen money supply, the control variable, be increased at a constant annual rate, 0 percent or 3 percent or k percent. Once the variable and its growth rate are chosen and announced, the authorities stick to it through thick and thin, depression and prosperity, deflation and inflation. An example of a reactive rule is one of Robert Hall’s (1983) suggestions, that the central bank commit itself to the goal of holding the CPI to a preannounced target, and to adjust its securities portfolio so as to keep the CPI expected a year ahead on the futures market a quarter of the way from the actual current CPI to the target. Discretion, of course, allows policymakers to face each decision anew, unconstrained by rules of either kind.

The formal concepts and distinctions are hard to apply, for several reasons. First, note that fixed rules are rarely advocated for instruments directly under the authorities’ control. Certainly no one in this day and age wants the Fed to peg permanently the federal funds rate or any other nominal interest rate, though a simple instruction to the open market desk is all it takes to do so. And no one, to my knowledge, favors literal freezing of the size of the Federal Reserve securities portfolio or of its rate of growth, another instrument under immediate and full control. That would not even fix the path of the monetary base—Friedman’s (1984) latest preference, by the way, is to hold the base constant as an ultimate goal.

Advocates of fixed rules almost always have in mind intermediate targets, variables that are neither direct control instruments nor ultimate objectives. To control intermediate monetary aggregates, M ’s of any subscript, the Fed like any other gunner uses feedback information, correcting its aim by observing its misses in

previous shots. Application of fixed nonreactive rules to variables under direct control, or very close to it, would be absurd even in the short run, because most of the factors generating noise in the transmission of open market operations have little monetary or economic significance. It would be an even greater absurdity over longer runs when changes in banking structure, financial technology, and regulations alter in unpredictable ways the linkages between control instruments and significant outcomes.

Thus the question is not whether reactive procedures will be used by the central bank. They inevitably will be. It is whether they are used for intermediate targets of little or no intrinsic importance, or for macroeconomic outcomes of ultimate significance, GNP, prices, unemployment.

Second, I think, effectively binding rules are bound to be simple, like fixed growth rates for intermediate monetary aggregates. Simplicity gives them their political appeal and power. The lasting strength of the budget balance norm is an example; it is impaired if confined to “full employment” conditions or waived for recessions. Likewise the once powerful imperative of gold convertibility at historic parity depended on *not* specifying in advance any circumstances in which the commitment might conceivably be repudiated.

It is not really feasible to spell out in advance what a central bank or government will and will not do in a long list of contingencies. One reason is political: no government or agency can bind its successors. Another is operational: formulas telling how the central bank will respond to statistics of unemployment, prices, and exchange rates, to budget and tax legislation, to OPEC extortions and Iranian revolutions, to Brazilian defaults and Soviet harvests, are on the same imaginary plane as private Arrow-Debreu contracts. If state-of-nature contracts were feasible and prevalent, we would not need money or monetary policy anyway.

In practice, then, any rule will be a simple fixed path of intermediate target variables, limiting responses to new information—prescribed or discretionary—to adjustment of instruments to achieve the path. Truly responsive policies will be discretionary, free to react to events, observations, and projections without formal constraints.

A currently popular theoretical notion is the concept of a policy régime, defined by the rules guiding the actions, reactive or nonreactive, of policymakers. Its significance arises from the belief that private agents adjust their behaviors to their understanding of the régime. For the reasons just given, I find the concept fuzzy in application: régimes and changes of régime are difficult to define and to discern.

The main contemporary issue is between some simple monetarist rule and discretionary countercyclical policy. From 1950 to 1973, in most dimensions a period of remarkably stable and successful macroeconomic performance, the Federal Reserve was vague, responsive, and active. Most of the time its stance was “leaning against the wind.” In the 1970s the Fed gradually became more monetarist and less responsive to the cyclical state of the economy. The climax of this development was the announcement in October 1979 of a program of relentless monetary disinflation, along with new operating procedures setting unborrowed reserves instead of over-

night interest rates for periods between FOMC meetings. But the Fed, as its 1982 actions indicate, has never committed itself irrevocably to monetary aggregate targets independent of actual economic outcomes. Such a commitment would indeed be a régime change of great importance.

Simple fixed rules are often supported on the grounds that they minimize risk. Economists and central bankers, it is argued, know little about the effects of monetary measures, their size, their timing, even their direction. Action is at least as likely to do harm as to do good. “fine-tuning” is more likely to destabilize than to stabilize. Countercyclical responses frequently have perverse consequences because of the “long and variable lags” between diagnosis and action and result. Activism confuses private agents and distorts the market signals on which they rely. The safest course is to do nothing.

However, as I have argued above, “doing nothing” is not well defined. Mariners would not define a fixed rudder angle rather than a fixed compass heading as conservatively “doing nothing.” Monetary rules themselves require the authorities to adjust instruments to achieve intermediate targets. How fast they should try to return to track when events beyond their control, like winds, waves, and currents, throw them off is a consequential problem. Achieving intermediate targets, to whatever degree of precision, does not in any case achieve desired paths of macroeconomic variables that really matter. Your conclusion as to what is a minimum-risk strategy, or an optimal strategy, will depend on your model of the financial and economic system and on your objectives and priorities. It is unlikely to coincide with holding constant any of the instruments or variables directly under central bank control or any intermediate target paths. I shall return to these questions later in the lecture.

REAL AND NOMINAL OBJECTIVES

Should monetary authorities consider the real economic performance of their economies in setting policies? Should their objectives include real outcomes of national and international performance—production, employment, capital formation, trade—as well as nominal variables—prices, nominal incomes, exchange rates?

Today many economists and central bankers answer no. Monetary authorities’ capabilities and responsibilities, they argue, cover only nominal variables. After all, they have only nominal instruments. Dedication of those instruments to real objectives has, they allege, not improved but if anything actually worsened real performance, while destabilizing prices and causing inflation. Chastened by the stagflation of the last fifteen years, central banks should be content to provide a stable, credible, predictable noninflationary nominal path and to accept whatever real outcomes come along that way. Devotees of the new classical macroeconomics assure us that those outcomes will be optimal. Knowing that the central bank will neither confuse them nor rescue them from the consequences of imprudent wage

and price increases, private agents in free markets will achieve the natural equilibrium values of real variables, quantities, and relative prices.

The issue is an old one, and the answer has oscillated over the history of central banking. The primacy of nominal objectives was well established before the Great Depression. Central banks and governments were expected to place defense of a fixed parity of their currency with gold or foreign currencies ahead of domestic economic performance. Today some economists, statesmen, and commentators—frustrated by exchange rate instabilities these past ten years—advocate restoration of an international gold standard. They believe that the discipline of gold convertibility, available to individuals as well as to foreign governments, would create and maintain anti-inflationary expectations and behaviors.

Monetarists concur with the objective but prefer the discipline of nominal monetary rules to that of gold. Some would impose such rules by legislative or constitutional mandate. The purpose and effect are the same as intended by advocates of the gold standard. Monetary operations will be, and will be seen to be, independent of actual real economic performance.

I believe that purely nominalist monetary strategies are neither feasible nor desirable, for several reasons.

The first reason is political. The responsibility of the central government for real macroeconomic performance is strongly entrenched in the politics of democratic societies. This has been true at least since the Great Depression of the 1930s and especially after World War II. In the United States, for example, the Employment Act of 1946 and the Full Employment and Balanced Growth Act of 1978 (“Humphrey-Hawkins”) commit the federal government, including the Federal Reserve System, to the pursuit of real economic goals. More important realistically, unemployment, real growth, and related variables are significant factors in public opinion and in electoral campaigns.

A purely nominal stance of monetary policy, willfully blindfold to real developments, is not likely to be credible. Sooner or later the central bank of a democracy will rescue the economy from the worst unintended real byproducts of a fixed nominalist line, just as Paul Volcker did last summer. Expectation that this will happen is bound to undermine policies whose effectiveness depends on public belief that it never will.

Central banks cannot stand aloof from objectives highly valued by the societies they serve. Central bankers and their constituencies frequently dismiss the priorities of elected officials, for example, reduction of unemployment, as “political” hence unworthy of respect. The legitimacy of such a value judgment is as doubtful as its welfare economics.

The second point is economic. The dichotomy between real and nominal policy operations, by which monetary instruments are classified as purely nominal, is not valid theoretically or empirically.

Nominal price and wage paths are sluggish, some more sluggish than others. Prices and wages which are administered or negotiated change less rapidly and

readily than the prices of financial assets and of commodities traded in auction markets. Because of such inertia, fluctuations in aggregate nominal spending resulting from monetary operations have important real consequences over fairly long short runs. The 1980–83 recession and depression confirm this obvious fact once again. Nor is it confined to downturns. Cyclical recoveries, stimulated or at least accommodated by monetary expansions, generate real as well as nominal gains. It is disingenuous, to say the least, for central bankers to pretend that their actions have no effects on real interest rates, unemployment rates, and other variables of concern to the populace.

The claim that monetary policies, since they necessarily rely on nominal instruments, can have only nominal effects trades on an analogy between altering monetary stocks and changing the unit of account. Switching the unit of account from dollars to half dollars would, everyone agrees, have no real consequences. Why shouldn't doubling the stock of "dollars" by other means be likewise neutral? The analogy is false. Actual central bank operations do not, while units changes do, change the public's stocks of all nominal assets in the same proportion. Actual operations effect exchanges of some assets for others, usually obligations to pay currency on demand for obligations to pay currency in future. Since future currency is not a perfect substitute for present currency, these exchanges are not neutral. They generally affect real interest rates, real exchange rates, saving, investment, and other real variables. Price changes affect private wealth and its distribution. Changes in inflation rates and in the distribution of price expectations necessarily alter real rates of return on currency and other assets with fixed nominal interest, and therefore influence the whole structure of asset prices and returns.

Some of these nonneutral effects vanish, in principle, in long-run steady states. Others do not. Time will eliminate the inertia of price and wage adjustments. But there are no long-run steady states whose properties are independent of the paths by which they are reached. For example, depressions and high real interest rates may interrupt irreversibly the accumulation of physical and human capital.

I am arguing that monetary authorities should not, indeed cannot, escape responsibility for real macroeconomic outcomes. To avoid misunderstanding I stress that I certainly am not advocating that they disregard nominal outcomes, price levels, and inflation rates. Somewhere in the framework of monetary policy objectives and targets there must be nominal anchors that prevent unlimited accommodation and give due weight to the costs of inflation and society's distaste for it. Milton Friedman told us in his famous Presidential Address some fifteen years ago that monetary policy could not *peg* real variables like unemployment and real interest rates and should not try. If "peg" meant to seek a particular unchanging numerical value forever, I think no one wanted or wants to peg. Permanent pegging of unemployment is one thing. Taking account of the state of the labor market is quite another. Trying to move unemployment down in some circumstances, up in others, is not pegging.

We should be careful not to draw the wrong lessons from the 1970s. After 1965

there were three bursts of inflation, each followed by recessions deliberately provoked by anti-inflationary monetary policies. The first acceleration of inflation, associated with the Vietnam war, was a classic demand-pull episode. President Johnson, contrary to the advice of his own economists, loaded his increased war spending on to an already fully employed economy without raising taxes, and in retrospect the Federal Reserve was overaccommodative. The two bursts of inflation in the 1970s were associated with extraordinary supply and price shocks: the first in 1973–74 from food shortages, oil embargo, and OPEC's fourfold increase in the dollar price of oil; the second in 1978–80 from the Iranian revolution, restriction of Middle East oil supplies, and a further tripling of the OPEC price. These events happened to occur in the late stages of cyclical recoveries, to which conscious stimulative and accommodative policies in the United States and other countries had contributed.

The lessons pundits and policymakers commonly draw from these experiences are that recoveries are dangerous, especially if they are promoted by policy. Accordingly central banks are most reluctant now to adopt expansionary policies even when their economies are as severely depressed as they are today. But these are the wrong lessons if the frightening bursts of inflation were due not to recoveries per se or to policies that fostered them, but to the extraordinary exogenous shocks. Vietnam, OPEC, and the Ayatollah Khomeini were not the endogenous consequences of normal policy-assisted business cycle recoveries. Fear of recurrences should not paralyze our governments and central banks and consign our economies to chronic stagnation.

The serious question of macroeconomic policy today is how much unemployment and general economic slack to maintain as insurance against another acceleration of inflation. According to a widely accepted model, there exists at any time a minimum unemployment rate consistent with nonacceleration, sometimes called the natural rate of unemployment or more neutrally the non-accelerating-inflation-rate-of-unemployment (NAIRU). Here the unemployment rate is serving as a barometer of general slack, of the overall pressure of aggregate demand on productive capacity. Unfortunately no one knows what the NAIRU is. Current estimates for the United States vary from 8 percent to 5 percent. For policymakers this doubt is compounded by uncertainty about the translation of their instruments via aggregate demand into unemployment. The decision problem is to balance, given these uncertainties, the costs of unemployment and lost production against the risks and costs of accelerating inflation. Those costs and risks can be made commensurate by estimating the extra unemployment-years necessary to eliminate a bulge of accelerating inflation should it occur.

A conservative solution is to minimize expected unemployment subject to the constraint that the probability of trespassing the NAIRU threshold not exceed some epsilon, perhaps even zero. Thus if there were any nonnegligible probability that policies designed to bring expected unemployment down to, say, 9 percent would generate acceleration—either because the NAIRU may be at least that high or because the policies might actually bring a lower unemployment rate—then conser-

vative policymakers would seek to keep unemployment higher than 9 percent. This solution is the spirit of macroeconomic strategies prevailing today, and it is a recipe and rationale for stagnation.

An optimal cost-benefit solution would not apply so absolute a constraint. A marginal dose of stimulus is justified if and only if the expected gain from reduction in unemployment exceeds the expected loss due to inflation acceleration. The latter is the cost of the unemployment correction necessary to eliminate the acceleration multiplied by the probability that the NAIRU threshold will have been crossed. If, for example, the correction costs two unemployment points for every point by which the threshold was crossed, then the median estimate of NAIRU is the proper target of policy. A higher relative correction cost implies a higher unemployment target, a lower appraisal of the cost a more ambitious unemployment goal.

MONETARY RULES AND THE CONVERSION OF SHOCKS INTO MACROECONOMIC OUTCOMES

An important consideration in comparing competing frameworks for the conduct of monetary policy is how they combine with the structure of the economy to determine how unpredictable shocks are absorbed. Shocks generate deviations from the macroeconomic paths expected when the instruments are set or the intermediate target values are chosen. They arise from unanticipated external events, aberrations in behaviors of private agents, and imperfections in forecasting models. If policies are governed by irrevocably fixed rules, shocks and the deviations they generate lead to no new decisions. If targets can be revised periodically, policymakers can base their next move on the observations, influenced by the shocks, obtained in the interim. Between periodic revisions they may follow operating rules relating their instruments to observed variables.

Shocks are of several kinds. The most important are the following: *Real demand* shocks affect aggregate demand for goods and services. They may arise in consumer spending, investment, net exports, and government fiscal operations. *Financial shocks* affect demand for monetary assets relative to their portfolio substitutes. These two types may be correlated, for example, if increased demand for money or some other asset is also a symptom of greater saving. *Price* shocks affect current and expected prices of goods and services. They may arise in world commodity markets, in exchange rates, or in domestic wage and price settings by trade unions and businesses, for example, "cost-pushes."

The conversion of shocks into unexpected macroeconomic outcomes depends jointly on the structure of the financial and economic system and on the conduct of macroeconomic policies. Different monetary frameworks, in particular, distribute the various shocks differently as between macroeconomic variables, real GNP, real interest rates, exchange rates, and prices.

This mode of analysis has been well known at least since William Poole's celebrated article in 1970. Poole used standard *IS-LM* analysis and greatly simplified the problem. But the qualitative conclusions would survive in a more elabo-

rate model. Reminding you of his analysis is a good way to emphasize some general principles.

Poole assumed that the central bank could fix either a monetary quantity M or an interest rate r , or alternatively adopt a supply function relating M to market-determined r . His M could be interpreted to be something closer to central bank instruments—the base or unborrowed reserves—than to an endogenous intermediate aggregate. His r is a short-term interest rate, nominal, but also real as he abstracted from price and inflation effects or assumed inertia in those variables over the short period to which the analysis applies. The central bank's objective is a target value of GNP, but no information about this variable will be available during the period after the policy is decided. Interest rates, however, will be observed, making it possible to base the M -setting on them.

Poole showed that pegging the interest rate protected the economy from GNP deviations due to purely financial shocks but transmitted real demand shocks fully into GNP. A monetarist policy would convert both types of shocks partly into output and partly into interest rates. GNP would be less vulnerable to real demand shocks and more vulnerable to financial shocks than under the interest rate peg. A supply function relating M to r would in general dominate either of the two single-variable policies. The interest rate contains information, but the information is ambiguous because an upward deviation could be due to a positive shock either to real demand or to money demand. The supply formula that minimizes variance of GNP would be the more elastic the greater the relative probability of financial shocks, the smaller the interest- and income-elasticities of money demand, and the flatter the IS locus. Conceivably the optimal supply formula would be supermonetarist, namely one that changed M systematically in the opposite direction from observed interest rates. This might be required to convert a nonvertical natural LM curve into a vertical one, which would protect the economy completely from IS shocks, as would be appropriate if financial shocks were sure never to happen. In general, there is no justification at all for assuming that the optimal LM shape is the one that corresponds to a fixed M . The optimal rule could be either less or more accommodative than that. "Leaning against the wind" was usually somewhat more accommodative.

One characteristic monetarist proposition asserts the stability of money demand, the unimportance of financial shocks relative to real demand shocks. This calls for a vertical LM locus—if nature does not provide one, policy should. But the volatility of demand for any of the statistical measures of money, increasing in recent years, is evidence against this proposition and the prescription it implies.

Monetarist policy has made the LM curve more vertical in recent years. Structural changes are working in the same direction. Deregulation is allowing deposits to bear market-determined interest rates, which will move up or down with the rates depository institutions can earn on their assets. Thus the demand for deposits, however sensitive to the differential between open market rates and deposit rates, will be much less sensitive to the general level of rates. In short, this reform itself is making the economy's natural LM curve much steeper. If the pre-reform M - r rule was

optimal by Poole criteria, it is no longer optimal. The rule should be changed in the accommodative direction—the more so if, as seems likely, the reform also increases the volatility of money demand. This seems likely because, once the two rates are so close, depositors will be less precise and prompt in moving funds between moneys and near-moneys. Professor Hadjimichalakis of the University of Washington here in Seattle has in a recent book (1982) explored thoroughly the implications for monetary policy of recent structural changes of this kind.

The Poole analysis can be extended to take explicit account of supply price shocks. The risk that price increases will be associated with upward deviations of GNP from the target path is, of course, a reason for gearing policy to a more modest real GNP objective. I discussed this problem earlier in the lecture. The possibility of a price shock uncorrelated with GNP is a different matter. Such a shock lowers real output and raises the price level. Steepening the *LM* curve accentuates the output fall and mitigates the price increase. For those concerned with price stability or with the danger that a one-shot price increase sets off a wage/price spiral in its wake, this is a reason for preferring a more monetarist structure. The OPEC crises of the 1970s delivered a positive supply price shock together with a negative real demand shock. If the *LM* curve, inclusive of the money supply rule, is close to vertical, there will be in such cases a much larger output loss but a smaller general price increase than if monetary policy is more accommodative. But in such cases the nature of the stagflationary shock is pretty obvious quite promptly, and it is unnecessary to respond as if interest rates are the only information.

The price shock just discussed is an increase in price level, present and future, leaving expected inflation unchanged. An increase in the expected inflation rate is a shock of a different kind. It is equivalent to a reduction in demand for money at a given real interest rate. The nominal interest rate rises relative to the real rate, and the real rate falls. Thus inflationary expectations are expansionary, like a negative shock to demand for money. If this seems strange in these times, it is because experience itself has led people to expect that monetary policy itself will become more restrictive on news of higher inflation.

The only reason in the Poole analysis for a rule relating a monetary quantity only to the nominal interest rate, if to that, is that other information regarding shocks is not available. In fact there is plenty of other information, even within the horizon before policy variables are reset.

Changes in endogenous money quantities themselves, relative to unborrowed reserves, are indicative of changes in money demand. By themselves, they are as ambiguous as interest rates in telling whether the source is transactions demand connected with increases in GNP or prices, or greater liquidity preference. A number of “reforms” have been proposed to limit variability in the money multipliers connecting the monetary base or unborrowed reserves to intermediate aggregates. These include indexation of the discount rate to market interest rates and payment of a similarly indexed rate on reserves. They are objectionable on the ground that they, like the deregulation of deposit interest, enhance the volatility of interest rates and the vulnerability of business activity to purely financial shocks. In

addition, they suppress the information contained in deviations of endogenous monetary quantities from expectations.

Other information available monthly or more frequently covers personal income, credit volume, prices, retail sales, production, employment, inventories, and orders. These data should enable the Fed's experts to diagnose the shocks occurring and to advise whether they are types that should be accommodated or not. What usefulness monetary aggregates have comes from their informational content, not from their semantic monetary character. The informational content is limited. Central banks should ask their staffs to devote more effort to obtaining and utilizing alternative and supplementary information.

MONETARY OBJECTIVES, TARGETS, AND OPERATING RULES: A MULTISTAGE FRAMEWORK

Central bankers cannot hope for easy lives administering mechanical rules independent of actual and prospective economic conditions. In the end there is no substitute for stochastic dynamic models of the economy linking policy instruments to contemporaneous and future outcomes. Policymakers use at least implicitly their models of the way the world works; it is better to make them explicit. They can and should regularly consider and evaluate various feasible deviations from a "current policies" reference path. New information about exogenous variables, stochastic disturbances, and structural equations is always flowing in. New observations tell whether current instrument settings, targets, and operating rules are having their expected and intended effects.

Instrument settings, targets, and operating rules are not locked in forever. It is important that their subordination to fundamental objectives be generally understood. Periodically policymakers must reconsider whether their policies are achieving to the degree possible the desired mixture of basic economic objectives.

To simplify a complex decision process and to aid public understanding, the central bank could use a hierarchical, multistage structure. The objective for several years ahead could be described in ranges of outcomes sought in paths of variables of basic concern: unemployment, real GNP, prices, capital formation. Ideally these would be consistent with the multiyear budget and economic program of the Congress and the Administration, and the Federal Reserve would have considerable input to these joint projections.

For two years ahead, the intermediate target should be nominal GNP growth, or as Robert Gordon (1983) has suggested, nominal final sales. This would indicate how the policymakers would allow price and productivity shocks to affect output and employment, while allowing complete freedom to offset velocity-of-money surprises with money supplies. Indeed the Fed might advertise this target as a velocity-adjusted monetary aggregate, a concept toward which it has been groping in these last turbulent years, explaining departures from monetary aggregate targets as corrections for identifiable changes in the "meaning" of the measures, that is, their relation to nominal income. For periods of a year or more, a nominal GNP or

final sales target makes much more sense than any monetary aggregate, or the monetary base.

A nominal GNP or final sales target implies for the duration of its tenure a one-for-one trade-off between price and quantity. An upward supply price shock would mean commensurately smaller real GNP growth. These terms of trade may not accord with national priorities. Separate ranges for price and quantity would allow an extra degree of freedom. But a nominal GNP target range is easier to explain and understand. In any case it can be reset annually, taking into account price and wage developments, unemployment and excess capacity, estimates of sustainable real growth rates, and other circumstances.

For shorter periods, one or two quarters ahead, the central bank could indicate targets or operating rules relating to intermediate money stocks, bank reserves, and short-term interest rates. These would be consistent with the intermediate range nominal income targets, which in turn would be intended to implement the longer range program. For each short-term horizon the target ranges or rules would remain constant. The policymakers are thus deciding and announcing how, if at all, instruments will be changed in response to surprises that occur during the interval.

I have argued: that monetary policy cannot be governed by irrevocably fixed rules blind to actual economic developments; that policies responsive to events cannot be prescribed fully in advance but ultimately depend upon discretion; that monetary authorities cannot escape responsibilities for real economic outcomes of significance to the society, as exemplified by recovery from the world depression; that choices of targets and operating rules should be guided by the ways they interact with economic and financial structure to convert shocks of various kinds into macroeconomic outcomes and by the probabilities of the several kinds of shocks; that for periods long enough for velocity shocks to be identified and offset, a nominal GNP or final sales target is much preferable to any intermediate monetary aggregate. I have sketched a multistage framework for the conduct of monetary policy that embodies these ideas. I know that central bankers will object because explicit policymaking on these lines makes their responsibilities for important economic outcomes transparent. They prefer to hide behind less meaningful descriptions of what they are doing. But there is no reason for the rest of us to respect that preference.

A final remark. I have discussed the architecture of national monetary policy as if it were isolated from fiscal policy and from the macroeconomic policies of other nations. Those are serious omissions, which I do not have time or space or wit to remedy. Monetary strategies, targets, and projections should be consistent with those on which the federal budget is based. The two types of macroeconomic policy should not be made by separate governments which scarcely communicate with each other. The pessimal mix of the two policies from which we now suffer is in part the result of such compartmentalization. Likewise, the state of the world economy is testimony to the disarray among the policies of the major economic powers, those represented at the latest do-nothing summit festival in Williamsburg. Somehow surely they could manage greater coordination in macroeconomic policy.

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