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# Monetary Policy in an Uncertain World

JAMES TOBIN\*

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Power attracts advice and criticism. These days central banks are the most powerful actors in the economic drama. Polls of American leaders rate Paul Volcker the second most powerful person in the United States. Outside military and diplomatic contexts, Chairman Volcker probably plays a more decisive role than the President himself. So if central bankers are receiving ever larger quantities of conflicting advice from citizens in general and economists in particular, that is testament to their recognized power. And if the counsels of the various critics cancel one another out, as may happen even at this conference and even in this session, then the central bankers can continue in good conscience to do what they would do anyway.

This conference is well-timed, for several reasons. First, the world economy is just beginning to recover from its worst depression since the 1930s; a strong and sustained recovery is still not assured. The monetary authorities of the leading eco-

\* *Sterling Professor of Economics, Yale University, Professor of Economics, University of California, Berkely, and Honorary Adviser of The Institute for Monetary and Economic Studies, Bank of Japan*

conomic powers, the United States, Japan, and the European Community, bear proximate responsibility for the depression, the byproduct of the severe counter-inflationary measures they felt compelled to take at the end of the 1970s. The immediate practical question is what role monetary policies should play in accommodating or promoting recovery.

Second, intellectual developments in macroeconomics converge with real-world events in raising just now some fundamental issues about the conduct of monetary policy. Monetarism, having won the hearts and minds of many economists and central bankers in the 1970s, may now be losing some adherents and influence—partly because of the depression, partly because regulatory, institutional, and technological changes have so clearly altered the meanings and velocities of monetary aggregates. Last summer and fall Chairman Volcker and his colleagues suspended their monetarist targets, to nearly universal relief. But no coherent philosophy of monetary control, no systematic strategy, has yet replaced them. What responsibility central banks should assume for recovery in this decade is a specific instance of a general issue, the weight that real macroeconomic performance should have in monetary policy decisions. A currently influential view is that monetary policies can and should aim solely at nominal, not real, outcomes.

Third, both recent experience and contemporary theory underscore the international dimensions of monetary policies. They will not be overlooked at a meeting here in Tokyo, with participants from several nations. Recent events in the United States played out with remarkable accuracy the textbook scenario for the effects of restrictive monetary policy in a world of floating exchange rates. High interest rates attracted funds to dollar assets and appreciated the home currency; deterioration of the U.S. trade balance was the major component of decline in final demand. Other countries have not welcomed the impacts on their interest rates, exchange rates, and prices. Rhetoric at Versailles and Williamsburg summits recognized the interdependence of our economies and financial markets and the need for coordination of macroeconomic and monetary strategies. But very little concrete progress is evident. In consonance or dissonance the major central banks together determine the international monetary environment and the general levels of interest rates throughout the world. None of the three “locomotives” can claim it is too small to influence the world economy. If in my discussion I fall into the old American habit of talking about one closed economy with one monetary authority, please interpret me as referring to the OECD as a whole and to the several leading central banks as a group.

My keynote remarks are divided into three Parts. Part I takes up the fundamental issue mentioned above, the place of real economic objectives in the making of monetary policy. I argue against the proposition that only nominal variables should concern the central bank. Part II discusses the hierarchy of ultimate objectives, intermediate targets, and instruments in relation to uncertainties monetary policy-

makers face over various horizons. Part III discusses some current issues of policy connected with recovery from the world depression.

## **I. Real and Nominal Variables as Objectives of Monetary Policy**

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

Today many economists and central bankers answer No. Monetary authorities' capacities 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 non-inflationary nominal path and to accept whatever real outcomes occur 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 and 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 will create and maintain anti-inflationary expectations and behaviors.

Monetarists concur with this objective but prefer the discipline of monetary rules to that of gold. They would commit central banks permanently and publicly to specific numerical rates of growth in monetary aggregates or nominal income. 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 economic performance, in particular independent of paths of real outcomes.

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.

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.

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.

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 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 consequence. 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 effects vanish in principle in long-run steady states, but 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 irreversibly interrupt the accumulation of physical and human capital.

History does not support, in my opinion, the verdict that countercyclical monetary and fiscal policies failed. Today they are blamed for the inflation and stagflation of the 1970s, and for the greater amplitude of business fluctuations in that decade. Against this currently fashionable interpretation of history I would make two points.

First, a somewhat longer historical perspective is desirable. Governments accepted responsibility for macroeconomic stabilization after the Great Depression, and began practicing countercyclical monetary and fiscal policy after the second world war. Compared to previous periods of comparable length, the last thirty-five years and of course especially the period before 1970 look very good, both in their high trends of real growth and in the limited severity of cyclical fluctuations. Maybe there is no causal connection, but neither is there a *prima facie* empirical case for abandoning the policies on account of recent disappointments.

Second, 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 the Federal Reserve was over-accommodative. The two bursts of inflation in the 1970s were associated with extraordinary supply and price shocks, the first in 1973-74 by the Yom Kippur war, the oil embargo, and OPEC's fourfold increase in the dollar price of oil, the second in 1978-80 by 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 policy-makers 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 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. Nor should governments and central banks be paralyzed and our economies kept chronically stagnant for fear of similar recurrences.

I have argued 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. Professor Friedman told us in his 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.

## II. Objectives, Targets, and Operating Rules

Central bankers cannot, I have just argued, 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. Policy makers use at least implicitly their models of the way the world works—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 are having their intended and expected effects. Periodically policy-makers must reconsider whether their policies are achieving to the degree possible the desired mixture of basic economic objectives.

Instrument settings and targets for intermediate variables are not locked in forever. It is important that their subordination to more fundamental objectives be generally understood. To simplify a complex decision process and to aid public understanding, the central bank could use a hierarchical structure. For example, the objective for several years ahead could be described as ranges of outcomes the bank seeks in paths of variables of basic concern: unemployment, real GNP, prices, capital formation. For a year ahead, an intermediate target like nominal GNP growth would indicate how the bank would allow price and productivity shocks to affect output and employ-

ment, while allowing complete freedom to offset velocity-of-money surprises with money supplies. For shorter periods, one month to two quarters ahead, the bank could indicate targets or operating rules relating to intermediate money stocks, bank reserves, and short-term interest rates. For each horizon, the target ranges or rules would remain constant for the period. The policy-makers are thus deciding and announcing how, if at all, instruments will be changed in response to surprises that occur during the interval.

Obviously monetary and fiscal policies should be coordinated, consistent in their assumptions and their aims. It is likewise desirable to coordinate macroeconomic policies, at a minimum to exchange information about them, among the principal economic powers of the non-communist world. I do not try here to say how these difficult tasks are to be achieved.

The policy-makers' model will also tell how stochastic disturbances of various kinds, not directly and immediately observed, produce surprises in observed variables and displace the economy's path from its intended and expected course. Disturbances relevant to monetary policy take several forms: surprises in aggregate real demand—consumption, investment, net exports; portfolio shifts, especially those affecting demands for monetary base or bank reserves and the net demand for foreign currency assets; supply price shocks, for example unexpected movements in nominal wages or labor productivity or import prices.

The structure of the economy combines with the rules that guide the policy instruments themselves to determine how those shocks are translated into observable macroeconomic outcomes, that is into deviations of variables from their intended paths. The observed variables that absorb the shocks include real national product, employment, interest rates, foreign exchange rates, and monetary aggregates. An essential function of the model is to estimate these linkages and how they vary across different operating targets and rules.

Different structures and operating rules distribute the shocks quite differently among the macroeconomic variables. For example, as is well known from William Poole's analysis\*, pegging nominal interest rates converts real demand shocks into unexpected and presumably unwelcome deviations of output and/or price level, but prevents pure portfolio shifts from having such effects. Pegging unborrowed reserves, by comparison, makes real output and prices quite vulnerable to portfolio shifts (velocity shocks) but relatively immune to real demand disturbances, which will be mostly absorbed in interest and exchange rates. On these lines monetarism could be characterized by the conviction that real demand disturbances are much more likely than financial surprises. If so, an ultra-monetarist rule—reducing reserves or money

\* See "Optimal Choice of Monetary Policy Instruments in a Simple Stochastic Macro Model", *Quarterly Journal of Economics*, Vol. 84, No.2, May 1970, pp.197-256

supplies in response to positive interest rate surprises—would logically be preferable to pegging those quantities, unless money demand is wholly insensitive to interest rates.

Of course the central bank need not peg anything for very long; our Federal Open Market Committee convenes monthly and knows how to telephone between meetings. As soon as the nature of a shock can be identified, the central bank will know how to alter any peg, whether for interest rates or for monetary quantities, to get back on track. Meanwhile the evidence may be ambiguous; nominal interest rates, net borrowed reserves, monetary aggregates may rise or fall either because of real demand shocks or because of purely financial shifts. During that ambiguous meanwhile the appropriate operating rule depends on the probabilities of the different kinds of shocks. A formula relating reserve supplies to nominal interest rates, taking account of those probabilities, is generally better than pegging either of the two variables. The relationship might be positive, “leaning against the wind”, or negative, “pushing the wind back”, as in the ultra-monetarist case mentioned above. The interim rule should be the more accommodative the greater the probability that observed interest rate deviations reflect portfolio shifts rather than real demand shocks. But no such formula should be followed once the nature of the disturbance can be diagnosed.

Targeting of monetary aggregates amounts to a rule calling for restricting reserves when  $M_1$ , let us say, exceeds the intended path and expanding them when  $M_1$  falls short. Like interest rate deviations,  $M_1$  deviations sometimes reflect undesired strength or weakness in nominal income, and sometimes reflect innocuous shifts in money demand or in intermediation. In the first case they should be opposed, in the second case accommodated. It is hard to make a case for  $M_1$  constancy as the optimal interim rule. It is even harder to see why  $M_1$  targets should be maintained in the face of subsequent evidence on the nature of the disturbances. Interest rates carry much the same information sooner and more accurately. Indeed considerable evidence on the sources of disturbance becomes available as soon as or even sooner than reliable  $M_1$  statistics. Monthly series of personal income, retail sales, industrial production, unemployment, and price indexes anticipate quarterly reports of real and nominal GNP. The central bank is in a position to know quite promptly a great deal about purely financial sources of  $M_1$  surprises. Decisions on how much to accommodate should rely on these kinds of information. What usefulness monetary aggregates have comes from their informational content, not from their semantic monetary character. Central banks should ask their research staffs to devote more effort to obtaining and utilizing alternative and supplementary information.

Those of you who follow the American financial press are familiar, only too familiar, with the obligatory weekend news story about the latest, two-week old,  $M$  figures. The reporter feels a professional obligation to explain to the innocent reader



who wanders to that page of his newspaper why these numbers are so important. Nowadays the standard formula—maybe it's the Fed's own publicists who supply it—is that  $M_1$  “measures money readily available for spending.” We economists know that is nonsense.  $M_1$  does not begin to measure the funds that could conceivably be mobilized and readily spent for goods and services. An increase in  $M_1$  may indicate or presage an increase in spending, or the contrary.

A target for nominal GNP or MV (money stock times its income-velocity) makes much more sense over periods of several quarters, long enough for the central bank to detect and offset velocity surprises. This is what the Federal Reserve has been groping toward these last few years, explaining its departures from monetary aggregate targets as corrections for identifiable changes in the “meaning” of the measures, i.e. their relation to nominal income. A nominal GNP target implies for the duration of its tenure a one-for-one tradeoff between price and quantity. An upward supply price shock will 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 simpler to understand. In any case it can be re-set annually, taking into account price and wage developments, unemployment and excess capacity, estimates of sustainable real growth rates, and other circumstances.

Adherence in recent years to money growth targets, reinforced by the Fed's feeling that its credibility was at stake, has prevented the Federal Reserve from accommodating promptly and fully some changes in money demand which, on the poolean principles sketched above, should have been accommodated as soon as the sources of the shocks were clear. I refer to increases in liquidity preference for precautionary motives bred by the depression, to shifts of lending transactions from open markets into financial intermediaries and thus into monetary aggregate statistics, and to deregulations that made deposits more attractive interest-bearing assets than before.

At the same time structural changes are making the system less automatically accommodative than it used to be. Deregulation allowing payment of market interest rates on deposits makes velocities less sensitive to interest rate levels than they were previously. In consequence, given the same monetarist policy rules, the economy is less vulnerable to real demand and price shocks and more vulnerable to purely financial shocks. A related result is greater volatility of interest rates and exchange rates. It is also likely that the probability of financial shocks to the demand for moneys and reserves has been increased. These consequences were probably unintended; the reforms were made largely for standard microeconomic reasons. But the macroeconomic effects should be explicitly considered in a review of the hierarchy of goals, targets, and rules. Because of the structural changes any operating rule that was optimal before is no longer optimal and should be replaced by a more accom-

modative rule.

### III. Monetary Policies and Recovery from the World Slump

Not everybody thinks recovery is a good idea right now. Some believe it is premature because victory over inflation is not yet complete. They would continue the relentless process of disinflation, at the cost of high unemployment and prolonged stagnation, until core inflation rates are dependably reduced to zero. That could take several more years. This is a coherent and candid position, whatever one may think of the cost-benefit calculations implicit in it.

It is not, I think, the prevailing sentiment, anyway outside the United Kingdom. Most governments and central bankers, most business managers and financiers, and certainly most of the general public would welcome recovery. The question is what, if anything, macroeconomic policy, in particular monetary policy, should do to bring recovery about. Many who would welcome a spontaneous-combustion recovery—energized for example by a miraculous burst of business investment—are afraid of a recovery driven or even accommodated by monetary expansion. In their view a recovery powered by a spurt of velocity would be fine, while one generated by commensurate increase of money stocks would be dangerous.

The argument that recovery driven by monetary stimulus is more inflationary than recovery otherwise fueled but of the same shape and strength is not one that I understand. Standard macroeconomic theory says that, as a strong first approximation, price and output paths depend on the interaction of aggregate spending flows, nominal GNP or MV, with the economy's capacity to produce goods and services. The division of demand impulses between prices and output, between wages and employment, depends on the ongoing inertial patterns of wage and price inflation, on the degree and composition of under-utilized productive resources, and on the wage- and price-setting institutions of the society. The relevant demand variable is MV, regardless of its factorization between M and V. Prices do not depend directly on policy instruments, monetary and fiscal. Macro policy influences are indirect, channeled through the determinants enumerated, principally through aggregate demand. I am aware of some qualification of this standard doctrine, but they are of second order.

What opponents of monetary stimulus generally have in mind, to the extent that they are not really objecting to recovery per se, is an expectational response to monetary expansion. Perception of expansionary policy will, they allege, lead the public to expect inflation. Expecting it, businesses and workers will raise prices and wages at once, and no improvement in output and employment will occur. The expectations will be self-fulfilling. No such inflationary expectations would block a

recovery which started and rolled on its own steam, without monetary accommodation. In the case of a spontaneous-combustion recovery unemployment and excess capacity would discipline wages and prices. In the case of money-fueled recovery they would not. The scenario does not make sense. It certainly violates the canons of rational expectations, particularly if the standard model outlined above is correct. If the story had been true for monetary disinflation, similar self-fulfilling expectations would have unwound the inflation of 1970-80 quickly and costlessly.

A less extreme story focusses on the effects of inflationary expectations, generated by perceptions of expansionary monetary policy, on interest rates rather than on actual prices and wages. The "financial markets" will expect inflation in future if not now. The resulting high long-term interest rates will hinder recovery.

One source of such psychology is the monetarist habit of defining monetary policy by growth rates of aggregates. This leads to indiscriminating extrapolation of currently announced targets for one quarter or one year or of deviations from targets. In the United States Chairman Volcker needs to convince his nervous financial constituency, now relieved by his reappointment, that the economy needs and can safely absorb a change in the *level* of money stock, and that this by no means signified permanently higher rates of growth. The level change is needed for three reasons. First, recovery itself requires larger money stocks, to make up for the restrictions of the past three years and to bring real interest rates down to levels consistent with recovery and sustained prosperity. Second, disinflation itself has made monetary assets more attractive. Third, as already noted, payment of market-determined interest rates on deposits has increased the demand for moneys. Events since the Fed adopted its more pragmatic stance in 1982 give cause for optimism. Money growth accelerated, but contrary to repeated monetarist warnings interest rates, long as well as short, moved down, not up.

Lenders' expectations and fears do not set rates unilaterally; there are two sides to all markets, even bond markets. If long-term rates were to rise on expectations of inflation held by borrowers and lenders alike, real rates would not have risen and the high nominal rates would not be a deterrent to current investment and recovery. More likely borrowers and lenders differ in their expectations and calculations of risk. Long rates high enough to compensate lenders for their fears of inflation would be high real rates for borrowers, certainly high relative to their current appraisals of earnings prospects. The effects of these asymmetries on term structure are ambiguous. The predictable result is that both sides shift to short maturities, or to long-term contracts carrying variable short-term rates. In short markets central bank supplies of base money, expanded by hypothesis, are decisive for interest rates. Neither banks nor other lenders will sit on idle cash.

Central banks should not be paralyzed in fright of bond market psychology. Let them educate the public by words, deeds, and experience. World recovery, with real

growth of production exceeding long-run sustainable rates for several years, is essential to bring unemployment down, to raise the utilization of industrial capacity, to generate the saving and capital formation needed for long-run progress, and not least to provide the third world with the markets and export earnings which alone can resolve their critical financial difficulties. High real interest rates, especially in the United States, are a major obstacle to world recovery. It is true that prospective structural budget deficits are part of the problem, though cyclical deficits now and in the fiscal years immediately ahead are not. But whatever contributions future fiscal corrections can make, interest rates cannot be lowered without substantial help from monetary policy. To bring them down will require a period of above-normal monetary growth in the United States and in the other locomotive economies. If monetary policy is to be made on the assumption that it cannot expand real economic activity even after monetary restriction has depressed it for several years, we are doomed to a downward ratchet or to a mix of fiscal and monetary policies unfavorable to capital formation.

Everyone agrees that in this recovery it is important to avert inflation accelerations such as occurred at the ends of the two previous recoveries in the 1970s. I have argued above that it is unduly conservative to frame policy on the assumption that the extraordinary supply price shocks of those periods are bound to recur. There remains the serious question how much unemployment and general economic slack to maintain as insurance against another acceleration. In concluding this talk, I wish to address this issue briefly as a problem of policy-making under uncertainty.

According to a widely accepted model of inflation there exists at any time a minimum unemployment rate consistent with non-acceleration of inflation, 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% to 5%. For policy-makers 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 necessary to eliminate the 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 and accelerating inflation not exceed some epsilon, perhaps even zero. Thus if there were any non-negligible probability that policies designed to bring expected unemployment down to, say, 9% 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 conservative policy-makers would try to keep unemployment higher than 9%. This solution is the spirit of macroeconomic strategies prevailing today, and it is a recipe and rationale for stagnation.

An optimal 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 times the probability that such correction will be necessary, i.e. 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 Nairu threshold was crossed, then the median estimate of the 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.

Permanently high unemployment and excess capacity is costly insurance, and quite possibly self-defeating in the long run, as the same problems of reconciling price stability and prosperity recur at lower levels of output and employment. Incomes policies, for all their allocational inefficiencies, may be a much less costly mode of insurance. But to discuss that non-monetary alternative would take me beyond my subject and my time.

I have argued that the recoveries of the 1970s are not relevant models for the 1980s, insofar as they suggest that double-digit inflations are the inexorable outcome. Uncritically accepted, that reading of history could lock our economies in stagnation for another decade. A better analogy is to the recovery of 1961-65. In 1961 as in 1983 fears of inflation persuaded many influential people in and out of government that the United States must settle permanently for higher unemployment and slower growth. At that time too a pair of recessions back to back had at considerable social cost diminished inflation and inflationary psychology. Building on that foundation, expansionary fiscal and monetary policies—assisted by an informal incomes policy in the shape of wage—price guideposts—successfully generated recovery. The unemployment target of the day, 4%, was achieved with negligible increase in inflation. There were even supply-side policies, notably the investment tax credit, designed to foster investment and long-run growth. Events belied and dissipated the initial pessimism, and the stock market soared.