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10 The Importance of Stable Money: Theory and Evidence

Michael D. Bordo and Anna J. Schwartz

The importance of monetary stability derives from the significant independent influence of monetary change on the subsequent course of economic activity. If money did not matter at all or were of only secondary importance in affecting the flow of spending, income, and prices, monetary stability would be of little relevance.

Our views reflect theoretical models and the empirical evidence testing them that establish a close relation between economic stability and monetary stability, and between inflation and monetary growth in excess of the rate of real growth. Hence a stable monetary environment is crucial to achieve economic stability encompassing both stable prices and real growth immune to wide swings. The essential element required to generate a stable monetary environment is systematic policy, so as to minimize monetary shocks to the expectations of economic agents. Discretionary policy is unsystematic, hence fails this test. Increasing the variability of money growth in an attempt to fine-tune the economy will make the variance of real output greater than it would otherwise have been. An economy in which countercyclical policy is followed will end up with unstable money and unstable real output.

Postwar developments in monetary theory have shifted the issues that were the original centerpieces of analysis supporting the case for stable money. Correspondingly, the kinds of evidence suggested to test the analysis have changed to reflect the nature of the issues that are highlighted. We examine the developments in chronological order, beginning with Friedman's case for stable money, based on a theoretical argument against the pursuit of countercyclical stabilization policy (section 10.1). Section 10.2 then examines the opposing theory of economic policy associated with Theil and Tinbergen and the Phillips curve analysis. That theory holds that countercyclical policy can be employed to

stabilize the economy and that stable monetary policy is not decisive for that purpose. Successful countercyclical policy would achieve a standard deviation of money growth that would precisely offset the standard deviation of real economic growth that would otherwise occur, and thereby reduce the variance of real output below that of money. The section concludes with a discussion of the natural rate hypothesis that was the culmination of the Phillips curve analysis. The latest development we cover is the rational expectations hypothesis (section 10.3). In each section we examine the implications of the theory for the stable money view and report the available evidence. In section 10.4 we summarize the case for a legislated rule and present some new evidence for a monetary growth rule. Section 10.5 concludes with a brief discussion of the role that a constant monetary growth rule plays in the views of the schools of global monetarism, of Austrian economics, and of the new monetary economics.

10.1 The Case against Discretionary Monetary Policy

The general case against discretionary monetary policy formulated by Friedman (1953) is that, to function well, stabilization policy must offset random disturbances to economic activity; that is, it should remove the variation in income due to those disturbances. To achieve such a goal, two conditions must be satisfied: one involving timing, and the other involving the magnitude of the policy action. The timing of the policy action should conform to that of the disturbance, and the size of the policy action should be congruent with the size of the disturbance. If both conditions are not satisfied, the policy response will be insufficient and may even be destabilizing.

Friedman (1948, 1953) went on to argue that the lags in the effect of discretionary monetary policy are likely to be long and variable, reflecting both an "inside lag"—the time that elapsed before the monetary authority responded to the disturbance—and an "outside lag"—the time that elapsed before changes in monetary growth affect economic activity. As a result, discretionary policy actions might exacerbate rather than mitigate cyclical disturbances. In addition, Friedman contended that there was no basis for believing that policymakers (and the economics profession) possess the detailed knowledge of the economy's complex interactions and of the lag structure requisite for the pursuit of successful countercyclical policies or for fine-tuning. Furthermore, in his view, even well-meaning monetary authorities were likely to respond to political influences. Politically advantageous, short-run actions by the authorities would ignore the long-run destabilizing consequences. The conclusion Friedman drew from this array of circum-

stances and from evidence to be considered in what follows was that monetary policy should be based on a legislated rule instructing the Federal Reserve to increase the quantity of money, or high-powered money, on a year-to-year basis at a steady known rate of growth.

Friedman did not allege that such a prescription would yield nirvana. He allowed for the possible accretion of knowledge of the operation of the economy once the rule was adopted that would permit improving it. Adoption of the rule would not eliminate cyclical change, but the rule would remove disturbances arising from erratic fluctuations in the supply of money. The effect would be to reduce the amplitude of the random shocks to real economic growth inherent in the operation of the economy.

Several types of evidence have been used to evaluate the case for a monetary rule, namely: the statistical record of changes in money growth rates and their relation to changes in economic activity; qualitative historical data; and simulations of the hypothetical path of economic activity under an assumed monetary growth rule, compared with the actual path. We first report the statistical and historical evidence.

One body of evidence, of which Clark Warburton was the author, predated Friedman's theoretical case against discretionary monetary policy. Warburton's writings from the early 1940s, when the Keynesian revolution was in full swing, until the end of his life in 1980, were in the quantity of money tradition and stressed the importance of monetary disequilibrium as the fundamental cause of business fluctuations. At the time that Warburton's views first appeared, attention to the role of money had all but vanished from professional work. His main evidence was based on deviations from trend of quarterly money data for the period 1918–65. He demonstrated that turning points in money preceded those in business, and concluded: "[A]n erratic money supply [was] the chief originating factor in business recessions and not merely an intensifying force in the case of severe depressions" (1966, Intro., p. 9). Warburton also cited, as prime examples of the harmful effects of discretionary policy, the mistakes of the Federal Reserve System that produced the great contraction of 1929–33 and the contraction of 1937–38:

> Since the time of the establishment of the Federal Reserve System, annual deviations in the quantity of money from a reasonable rate of growth have ranged from more than 30 percent excess to nearly 20 percent deficiency. There is no known need for annual variations in the quantity of money, from the estimated reasonable rate of growth, of more than 2 percent, and annual variations in the quantity of money outside this range have been invariably associated with business instability and with inflation or depression. The range of addi-

> tional variation for seasonal purposes is probably not more than three percent. (1966, chap. 17 [1952b], pp. 368–69)

The dismal record of the Federal Reserve led Warburton to strongly favor a legislated monetary rule that would limit the growth rate of money, for a given definition, to three percent per annum.[1]

The evidence provided by Friedman and his associates also utilized statistical and qualitative historical data. Unlike Warburton, who expressed the data as deviations from trend, Friedman and Schwartz used first differences of the logarithms of the money series. They then selected turning points in the series from 1867 to 1960, and compared the peaks and troughs in the percentage rate of change of the money stock with peaks and troughs in general business as dated by the National Bureau of Economic Research reference cycle chronology. On average, of the 18 nonwar cycles since 1870, peaks in the rate of change of the stock of money preceded reference peaks by 16 months, and troughs in the rate of change of the stock of money preceded reference troughs by 12 months. On this basis, they argued strongly that: "Appreciable changes in the rate of growth of the stock of money are a necessary and sufficient condition for appreciable changes in the rate of growth of money income"; and, "this is true both for long secular changes and also for changes roughly the length of business cycles" (1963a, p. 53). Using a different methodology over the same period, William Poole (1975) found that the evidence supported the Friedman and Schwartz conclusion.

To the question whether money changes conformed positively to the business cycle with a lead or inversely with a lag, the answer Friedman and Schwartz gave was that the dispersion (measured by the standard deviation) of the leads and lags, as computed under the two interpretations, is uniformly lower when the money series is treated as conforming positively. Serial correlations, furthermore, of expansions with succeeding contractions and of contractions with succeeding expansions display the same patterns for the money change series and a proxy indicator of physical change in general business. Expansions in both series are not systematically correlated with the succeeding contractions, whereas contractions in both series are highly correlated with the succeeding expansions. This evidence supports the positive interpretation of the relation of money *changes* to the business cycle. Otherwise, if inverted conformity were the case and changes in business produced later changes in the opposite direction in money, then the correlations with the succeeding reference cycle phase for money and the physical change in general business measure should be opposite. But the pattern for business *does* reflect, with a lag, the pattern for money.

Statistical evidence provided by Friedman and Schwartz (1963b, p. 594) matched periods with a low standard deviation of year-to-year percentage changes in monetary growth with comparable periods in velocity, real income, and wholesale prices. They also matched periods with a high standard deviation of year-to-year changes in monetary growth with comparable periods in the other magnitudes. In the nine decades, 1869–1960, four periods of comparative stability in money growth were accompanied by relative stability of the rate of growth of output and the rate of change of prices: 1882–92; 1903–13: 1923–29; 1948–60. All other periods were characterized by unusually unstable money growth rates and unusually unstable rates of growth of output and rates of change of prices.

The qualitative historical evidence that Friedman and Schwartz examined also supported the conclusion that erratic money changes, as a result of discretionary actions by the authorities, were accompanied by economic changes in the same direction. Moreover, in a number of episodes when monetary changes had led changes in economic activity, the evidence that the monetary changes were independent of the changes in activity was irrefutable.

We now turn to the simulation studies that compare the hypothetical behavior of the U.S. economy under an assumed constant money growth rate rule with actual economic performance. The evidence is mixed. Friedman (1960) found that a rule would have outperformed discretionary policy in the interwar period, but that the case for the post–World War II period was less clear-cut. For the postwar period, at least until the mid-1960s, most studies (Bronfenbrenner 1961; Modigliani 1964; Argy 1971) concluded that discretionary policy outperformed a 3 or 4 percent monetary growth rule. One inference might be that the Federal Reserve had learned from its "mistakes" in the interwar period. Recently, however, Argy (1979) found that for the period from the late 1960s to the late 1970s, a simulated monetary growth rule for a sample of nine industrial countries would have reduced the variance of real growth considerably below its actual variance.

Finally, Kochin (1980) found that over much of the postwar period U.S. monetary policy was destabilizing. His study, based on an interpretation of the results of several economic models, followed Friedman's (1953) procedure for evaluating stabilization policy.

10.2 Keynesian Riposte and Return Sally

An analytical development that favored intervention along Keynesian lines was the Theil-Tinbergen theory of economic policy. That approach provided policymakers with an array of instruments—monetary, fiscal, incomes policies—to achieve multiple goals by matching instruments

to goals following the principle of comparative advantage. This theory of economic policy combined with the use of optimal control procedures led to a strong case for fine-tuning. It was held that policymakers could devise feedback rules between real economic activity and monetary and fiscal policy that could be applied to offset disturbances to the private sector.

Another development that apparently advanced the case for countercyclical policy was the Phillips curve tradeoff. Phillips (1958), Samuelson and Solow (1960), and Lipsey (1960b) reported evidence of a stable inverse relationship for the U.K., the U.S., and other countries between the rate of change of money wages (alternatively, the rate of change of the price level) and the level of unemployment. The findings led to the view that policymakers could choose, based on a social preference function, between high inflation and low employment, or low inflation and high unemployment, the desired choice to be achieved by discretionary monetary and fiscal policy.

The upshot of these developments was that many economists came to believe that the economy could be stabilized at any desired level of activity. Friedman's objections to fine-tuning seemed to have been circumvented.

Friedman's response came in his 1967 presidential address to the American Economic Association. He argued that the Phillips curve tradeoff was a statistical illusion arising from the failure to account for inflationary expectations. Monetary and fiscal policy could stabilize the economy at some arbitrary level of output or employment, but only temporarily and, even then, only at the expense of accelerating inflation or deflation. Both Friedman (1968) and Phelps (1968) modified the Phillips curve approach by applying the concept of the natural rate employment—that rate consistent with the microeconomic decisions of firms and workers active in the labor force. The natural rate of employment reflects the optimal choice of workers between labor and leisure and the optimal mix of labor and other factors of production for firms in a dynamic economy. According to the "natural rate hypothesis," the natural rate of employment is determined by the intersection of the demand and supply curves for labor, given demographic factors and labor market institutions. Hence deviations of employment from the natural rate are produced only by imperfect information and the costs of acquiring information that affect job search.

One explanation given for such imperfections in information was that employers and workers have different perceptions of changes in real wage rates. It was argued that firms always have perfect information on the prices of their output so that for them actual and expected real wages are always equal. In contrast, workers base their evaluations of prospective real wage rates on their expectations of what the rate of

inflation will be over the duration of their contracts. For example, suppose inflation is rising and workers' expectations do not fully reflect the higher inflation rate. Faced with lower real wage rates, firms will be willing to expand employment, which will put upward pressure on nominal wages. The result will appear as a movement along the (short-run) Phillips curve. However, once workers adjust their expectations to the higher inflation rate, they will demand higher money wages. The resultant rise in real wage rates will cause firms to reduce employment to its previous level. The economy will then return to the natural rate of unemployment consistent with labor market forces, *but at a higher rate of inflation.*

The *measured* unemployment rate is thus assumed to depend on the natural unemployment rate and the difference between the actual and expected inflation rates; that is, on the inflation forecast error, with some rate of adjustment of the unemployment rate to the forecast error. As long as the actual and expected inflation rates differ, measured unemployment can differ from the natural rate. However, in the *long run,* actual and expected inflation rates converge, and hence, measured unemployment reverts to the natural rate, though this adjustment process may be sluggish.

The theory of search is an alternative way of explaining unemployment. This theory posits that the natural rate of unemployment is determined by long-run demographic forces, but that deviations from the natural rate are caused by short-run factors affecting the costs and duration of search.

The policy implication that emerged from the natural rate hypothesis was that stabilization policies aimed at reducing unemployment below the natural rate would have only temporary success. Any attempt to achieve permanent results would produce accelerating, and ultimately runaway, inflation. In addition, policies designed to peg the unemployment rate at the natural rate could lead easily to an explosive inflation or deflation if the forces determining the natural rate were to change. Such forces include changes in the labor force skill mix and demographic determinants of the labor force. Thus, the natural rate hypothesis strengthens the case for monetary stability, since monetary instability would produce deviations between the expected and actual inflation rates, causing fluctuations in unemployment and output.

10.3 The Rational Expectations Hypothesis and the Case for Stable Money

Recent advances in the treatment of expectations supplement the case for monetary stability implied by the natural rate hypothesis. According to the rational expectations hypothesis, economic agents

act rationally with respect to the gathering and processing of information, just as they do with respect to any other activity (Muth 1961). This proposition implies that agents will not make persistent forecast errors. If their forecasts turn out to be wrong, agents will learn the reason for their errors and revise their methods of forecasting accordingly. Such an approach seems more reasonable than alternative approaches commonly used to model expectations, such as static expectations that simply extrapolate existing conditions, or adaptive expectations that have the property of yielding continuous forecast errors. Additionally, in contrast to the adaptive expectations approach that uses only past values of the variable about which expectations are to be formed, the rational expectations hypothesis also uses other relevant information.

The rational expectations model assumes that private agents form expectations about the rate of inflation based on their understanding of the economic model that generates the inflation rate, as well as on the policy rule followed by the monetary authorities.

In a model based on rationally formed expectations, Sargent and Wallace (1975) demonstrated that systematic monetary policy would be completely ineffective in influencing real variables. They argued that if the monetary authorities devised a monetary feedback rule, using optimal feedback techniques, according to which the authorities systematically altered the money supply to offset disturbances in real economic activity, then private decision-makers would learn the rule and incorporate it into their rational expectations. The thrust of this model—where deviations of output from its full employment (or natural) level can only be produced by an inflation forecast error—is that if expectations are formed rationally, the forecast error cannot be manipulated by systematic (and, therefore, anticipated) monetary or fiscal policy. Indeed, the only way output or unemployment can be altered from its natural rate is by an *unexpected* shock. However, unexpected shocks—monetary or other—have the negative attribute of increasing the level of uncertainty in the economy.

If a negatively sloping Phillips curve were observed, it might result from constant price expectations in a period with *ex post* fluctuations in actual inflation due to unanticipated random shocks that are negatively correlated with *ex post* fluctuations in measured unemployment (Begg 1982, p. 141). Lucas (1973) offered a variant explanation, in a world of rational expectations, for a negatively sloped short-run Phillips curve or, alternatively, a positively sloped short-run supply curve for output, which is determined by lagged output and the discrepancy between actual and expected inflation. Lucas assumed that the economy is characterized by uncertainty, and that competitive firms cannot readily discern whether a change in the price of their output reflects a

change in the price level or a change in relative prices. He then demonstrated that other things equal, the greater the variance of the aggregate price level, owing to greater monetary variability, the more likely it is that firms will mistake a price level change for a change in relative prices. Expansion of output in response to an increase in the level of prices, holding relative prices constant, will ultimately lead to accumulation of inventory, cutbacks in output, layoffs, and more inelastic supply curves and also a more inelastic aggregate supply and Phillips curve. In addition, greater price level variability will be associated with greater resource misallocation because price level variability impairs the ability to perceive the information that prices convey in a market economy.

Brunner, Cukierman, and Meltzer (1980) perceive the problem of extracting the signal from prices somewhat differently from Lucas. For them, the distinction that needs to be made is not the sorting out of aggregate from relative price changes. It is rather the distinction between transitory and permanent price changes. Firms will wait to learn whether a change is permanent before reacting to it and, with great price variability, that process is made more difficult and prolonged than would otherwise be the case.

In any event, price variability reflecting discretionary money variability clearly has negative effects on the economy and reinforces the case for monetary stability. Moreover, the entire enterprise of selecting discretionary policies by simulation of econometric models has been challenged by Lucas (1976). His critique was based on the kinds of equations that are used in econometric models. These are reduced forms of effects on the economy of existing policy arrangements that incorporate the private sector's expectations of policy effects on economic variables. Were the authorities to change the policy rule, the public would adjust its expectations accordingly. Consequently, attempts to forecast the effects of alternative policies without accounting for changes in private agents' expectations are bound to lead to inappropriate policies.

Discretionary policy (defined as policy reacting to the current situation) based on optimal control techniques has been shown by Kydland and Prescott (1977) to be suboptimal and possibly destabilizing in a world of rational expectations. The policy chosen at each point in time may be the best, given the current situation. In the authors' terminology, the policy may be consistent, but it will be suboptimal because the policymaker has failed to take into account the optimizing rules of economic agents. The decisions of agents will change as they come to recognize the change in policy. The example Kydland and Prescott cite is that agents may expect tax rates to be lowered in recessions and increased in booms and make decisions in light of those expectations.

Over successive periods, it is not optimal to continue with the initial policy because control theory is not the appropriate tool for dynamic economic planning. Current decisions of economic agents are affected by what they expect future policy to be. A government that attempted to reduce unemployment by increasing the money supply without attention to the rational inflation expectations of private agents would end up with a suboptimal mix of the natural rate of unemployment and positive inflation, despite the fact that it sought to maximize its "social welfare function" by combining the desirability of full employment and zero inflation. The authors conclude (1977, p. 487):

> The implication of this analysis is that, until we have . . . [a tested theory of economic fluctuations], active stabilization may very well be dangerous and it is best that it not be attempted. Reliance on policies such as a constant growth in the money supply and constant tax rates constitute a safe course of action. When we do have the prerequisite understanding of the business cycle, the implication of our analysis is that policymakers should follow rules rather than have discretion. The reason that they should not have discretion is not that they are stupid or evil but, rather, that discretion implies selecting the decision which is best, given the current situation. Such behavior either results in consistent but suboptimal planning or in economic instability.

Oversimplication by certain proponents of the rational expectations hypothesis should be noted. A number of factors could lead to nonneutral effects of anticipated monetary growth even in the presence of rational expectations. First, anticipated monetary growth can have effects on the natural rate of unemployment (output) through a real balance effect on the aggregate expenditure function, or by changing the steady state capital-labor ratio and thus affecting the real rate of interest (Buiter 1980).

Second, if the assumption that both government and the private sector have equal access to information is violated when there is a rule for systematic monetary policy, then it is possible for the government to change its policy after the private sector has formed its expectations and thereby affect the inflation forecast error. As a result, output and unemployment can deviate from the natural rate. Such an outcome is also possible in cases where wages are determined by multi-period overlapping contracts (Fischer 1977). In that situation, even if private agents form their expectations rationally, the government can systematically affect output and employment between contract negotiating dates. Third, if the assumption of market clearing is abandoned, yet the assumption of rational expectations is maintained, then it is possible for output to be affected by stabilization policy. Explanations for price stickiness range from the Keynesian disequilibrium approach (Buiter

1980) to price setting behavior in a world of high coordination costs (Cagan 1980).

Fourth, evidence of persistence—that unemployment does not rapidly disappear and bring the economy to full employment—or alternatively, the existence of serial correlation of output and employment over the business cycle, has been advanced as contradicting the rational expectations approach. On the other hand, McCallum (1980) explains persistence within the rational expectations context as reflecting real costs of adjusting the fixed capital stock and other factors of production. For Lucas (1975), persistence occurs because of information lags that prevent "even relevant past variables from becoming perfectly known" (p. 1114), and an accelerationist effect of physical capital. Finally, the rational expectations approach fails to explain how private agents learn from their forecast errors in forming rational expectations (De Canio 1979).

We now turn to the evidence for the rational expectations hypothesis. The evidence most generally cited is that by Barro (1977a, 1977b, 1981) and Barro and Rush (1980). Barro and Rush regressed the unemployment rate over the 1949–77 period on lagged values of a measure of unexpected monetary growth and of expected monetary growth. Expected monetary growth was estimated from a regression of current monetary growth on past monetary growth, the deviation of government spending from its trend, and past unemployment. Such a regression was designed to capture the monetary rule that economic agents perceived. The predicted values of the regression were employed to represent expected monetary growth, and the residuals, to represent unexpected monetary growth.

Barro and Rush found most of the variation in unemployment was explained by unexpected monetary growth, and that expected monetary growth was not statistically significant. They concluded that expected monetary growth is neutral and that only unsystematic elements of monetary policy affect the unemployment rate—a finding that is supportive of the rational expectations hypothesis.

The evidence that Barro has presented—that only unexpected monetary growth explains variations in unemployment—has been challenged. Cagan (1980) argued, following a more traditional approach, that most variations in output and employment can be explained by deviations in money growth from a long-run trend, without invoking rational expectations. Sargent (1976) demonstrated that it is difficult to distinguish Barro's results from those produced by a more traditional approach because of the observational equivalence of natural and unnatural rate theories. For Sargent, the only way to test a refutable hypothesis is to be able to isolate periods involving a change in clear-cut policy rules. Gordon (1976a, 1976b, 1979) argues that, unless it can

be shown that the full effect of a change in nominal income is absorbed by price change, the case for the neutrality hypothesis is not confirmed. In his view, to the extent that some of the effect of expected monetary growth is absorbed by output change, scope remains for stabilization policy. Mishkin (1982) also finds that anticipated movements in monetary growth have effects on output and unemployment that are larger than those of unanticipated movements, but his evidence confirms that expectations are rational.

The rational expectations approach appears to be firmly established, despite unresolved questions including those mentioned above. A clear implication of the literature is that active monetary intervention is likely to lead to large price level changes with little favorable effect on output or employment. Unpredictable policies are likely to increase the degree of uncertainty in the economy and enlarge the fluctuations around the natural rate. The aim of policy should therefore be to establish predictable monetary rules, preferably rules that are easily understood, with full consideration of all the relevant costs and benefits.

10.4 The Case for a Legislated Rule

Modigliani's presidential address to the American Economic Association (1977) disputed monetarist views that (a) the economy is sufficiently shockproof that stabilization policies are not needed; (b) postwar fluctuations resulted from unstable monetary growth; (c) stabilization policies decreased rather than increased stability. He finds that "Up to 1974, these [stabilization] policies have helped to keep the economy reasonably stable by historical standards, even though one can certainly point to some occasional failures" (1977, p. 17). He attributes the serious deterioration in economic stability since 1973 to "the novel nature of the shocks that hit us, namely, supply shocks. Even the best possible aggregate demand management cannot offset such shocks without a lot of unemployment together with a lot of inflation. But, in addition, demand management was far from the best." The failure, he contends, was the result of ineffective use of stabilization policy "including too slavish adherence to the monetarists' constant money growth prescription."

Modigliani's defense of stabilization policies amounts to acknowledging specific failures while asserting overall success, except when exogenous supply shocks occur which "we had little experience or even an adequate conceptual framework to deal with" (1977, p. 17).

Table 10.1 shows the standard deviations of quarter-to-quarter deviations of a two-quarter moving average from a 20-quarter growth rate of M1. The standard deviations are a proxy for unexpected monetary change (shocks) that, according to both older and newer approaches,

Table 10.1 **Comparative Variability of Monetary Growth and Rates of Change of Real GNP, Postwar Subperiods Quarterly, 1952I–1982III**

Period	Standard Deviation of Quarter-to-Quarter Percentage Changes in:	
	Deviations from a 20-Quarter Moving Average of M1 of a 2-Quarter Moving Average (1)	Annualized Real Output Growth (2)
1952I–1960IV	1.93	4.76
1961I–1971II	1.80	3.17
1961I–1973III	1.75	3.20
1971III–1982III	2.11	4.79
1973IV–1982III	2.18	4.89

Note: We are indebted to the division of research of the St. Louis Federal Reserve Bank for the data underlying col. 1.

should be associated with consequent effects on real output and, once fully anticipated, on prices. The table, therefore, also shows the standard deviations of quarter-to-quarter annualized real output growth rates for three postwar subperiods: 1952I to 1960IV; 1961I to 1971II (alternatively, 1973III); 1971III (1973IV) to 1982III.

The variability of the (unexpected) money series declined moderately during the 1960s and until the quarter preceding the Nixon price controls or, alternatively, the quarter preceding the 1973 oil price shock. Over the same subperiods, real output variability also declined, but substantially more than the decline in money variability. In the final subperiods, both money variability and real output variability rose to levels exceeding the ones prevailing in the initial subperiod.[2]

Modigliani's attribution of the serious deterioration of economic stability since 1973 to "too slavish adherence to the monetarists' constant money growth rule" is not apparent in table 10.1. The inability of stabilization policy to cope with unexpected developments *supports* monetarist views. If policymakers are thought to have an informational advantage over private agents and so able to reduce fluctuations of output around its natural rate, they must be able to make correct inferences about the precise character of current shocks. That does not seem to be the case.

Theory and evidence strongly suggest that a systematic monetary rule is superior to discretion. A fixed rule with no feedback from the current situation to policy instruments, a rule that is simple and preannounced, is the most favorable condition for stabilizing the economy. Any feedback rules that involve government manipulation of the private

sector's forecast errors is doomed to failure. There is no information available to authorities that is not also available to the private sector.

A fixed, simple, preannounced rule can take a number of forms. For some who are opposed to discretionary policy, the preferred systematic rule is the gold standard rule, for others, an interest rate or price rule. We do not examine the reason such rules have won support from their adherents. The rule we favor is a constant monetary growth rule. It satisfies the requirement for a systematic preannounced policy or regime that economic agents can incorporate in their expectations. It is a rule which can easily be implemented. The case for it, as stated initially by Friedman, is that economists lack adequate knowledge to conduct discretionary policy successfully. A monetary growth rule would obviate monetary policy mistakes. When physicians take the Hippocratic oath, they pledge not to do harm to their patients. Economists should take a similar oath with respect to the instruments that they may be in a position to administer.

The development of the rational expectations approach suggests that public response to stable monetary growth would contribute to the stabilization of the economy. Constant monetary growth will not make the business cycle obsolete. But avoidance of the mistakes of discretionary monetary policy will reduce the amplitude of fluctuations inevitable in a dynamic economy.

10.5 Divergent Views on a Constant Monetary Growth Rule

Economists who accept the primacy of monetary change in producing changes in economic activity do not all agree that the policy solution is to adopt a rule for constant monetary growth. We may distinguish the views of adherents of global monetarism, Austrian economics, and the new monetary economics.

Global monetarism emphasizes that the world economy is highly integrated with respect both to commodity and capital markets, international price and interest rate arbitrage serving to coordinate national economies. The appropriate unit of analysis, therefore, is not the individual national economy but rather the world. The elements of the doctrine were constructed for a world of fixed exchange rates where the domestic rate of inflation is determined exogenously by the world rate of inflation, and the domestic money stock is determined by the rate of growth of domestic nominal income, set by the world inflation rate. For such an approach, prescribing a rule for domestic monetary growth is pointless. Under a flexible rate regime, however, domestic monetary authorities can control their money supplies *if they choose*. Regardless of the exchange rate regime, global monetarism has not supported a monetary rule for a single nation.

Austrian economics acknowledges the role of monetary policy in producing inflation, and shares the monetarist view that the result of monetary attempts to reduce unemployment below its natural level is accelerating inflation. The chief emphasis, however, is less on these propositions than on the distortions in the production process resulting from monetary expansion. Moreover, in Austrian economics, flexible exchange rates are not the path to domestic monetary control. Hayek, for example, favors fixed exchange rates as a constraint on the government's overexpansion of the domestic money supply. The preferred solution, however, is the abolition of central banks, and the establishment of a commodity money. Hayek recently has advocated the denationalization of money and giving private producers freedom to offer alternative kinds of money. The market would then choose the money that would prove to be stable. Hence no legislated rule would be required.

The new monetary economics enters under the free-market banner. In the system that we are familiar with, money is the product of pervasive government regulation. Had free-market policies prevailed for transactions services, economists of that persuasion argue, a more efficient banking system would have been created, and velocity would have been much different. The new monetary economics therefore opposes a constant monetary growth rule on the ground that macroeconomic performance, under free-market provision of money, could be much better than a rule would have produced. Different schemes have been elaborated by members of this school to replace an inefficiently regulated money stock, but as Hall (1982, p. 1555) writes: "None of them would rely on the concept of a money stock or its stability relative to total income. Whether their macroeconomic performance would equal that of a simple money growth rule is still a matter of controversy."

Proposals to change utterly root and branch the existing monetary system strike us as ignoring the enormous attachment of the private sector to arrangements that have become customary. Imposing a system that appeals to visionaries as far more satisfactory than the one markets have adjusted to, given the existing network of regulations, is not the historical way in which alterations in the monetary system have occurred. A complete breakdown in existing arrangements as a result, say, of the catastrophe of hyperinflation would be a prerequisite to adoption de novo of one of the schemes the new monetary economics espouses.

The new monetary economics, by proclaiming that results superior to those of a monetary growth rule are within reach, shares some of the confidence of interventionists. Advocates of a monetary growth rule are skeptical not only about demand management or fine-tuning

by interventionists, but also about the prospects that new schemes for settling transactions can be as easily implemented as they can be devised.

Some observers predict that the deregulation process now under way will obscure the quality of moneyness of assets and hence render control by the central bank problematical. We regard this apocalyptic view as unduly alarmist. Not so long ago, it was commonly argued that payment of interest on demand deposits would mean the end of their use as transactions balances. That has not happened and we do not foresee radical changes on the horizon in the operation of the payments system. The alternatives are not the creation de novo of a set of monetary arrangements or the preservation unchanged of the existing set.

For all the talk of the adoption of monetarism by central banks, their performance gives little indication that they in fact have been influenced by the central message of the doctrine—monetary instability is a potent source of unstable economic performance. Note, for example, the wide swings that have been observed even in a smoothed two-quarter moving average of the U.S. money growth rate since 1980—1.9 percent in the second quarter, 5.8 percent in the third quarter, followed by 13.2 percent in the fourth quarter; in the four quarters of 1981, 8.1, 7.1, 4.9, 3.0 percent; and in the first three quarters of 1982, 8.3, 7.1, and 3.4 percent, with the fourth quarter figure a likely high multiple of the third quarter figure. Is this monetarism?

A legislated rule has *never* been tried. It is a modest step towards restraining monetary authorities, but both theory and evidence suggest that it could be a giant step toward achieving economic stability.

Notes

1. Warburton (1964, p. 1328). In earlier studies, in the 1940s and 1950s, Warburton advocated a 5 percent annual growth rate in the money stock, inclusive of an adjustment for a projected steady secular decline in velocity of 1.5 percent per year. The shift to a lower proposed growth rate for money incorporated the assumption that the reversal in the trend of velocity in the 1950s—from negative to positive—would continue.

2. Milton Friedman has called our attention to the similarity between the results of a table he constructed for the period 1962I through 1982IV (divided at 1971I and 1973III), and of our table. He calculated a geometric mean of 12-term moving standard deviation of growth rates of M1, M2, and real output. The increase in the variability of M1 from 1962–71 to 1971–82 of 0.26 in his table matches our finding of an increase of 0.31; the increase in the variability of real output he found of 1.61 is almost identical with the increase of 1.62 in our table. For M2, in his table, the increase in variability from the first to the second period is much sharper than for M1—1.21 compared to 0.26