20
Discussion

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Benjamin Friedman's paper summarizes his work on an important topic—the comparison of procedures that extract information about, and compare the thrust of monetary policy over time. This is the "indicator problem" or in Friedman's words, the problem of choosing an "intermediate target." The problem arises when there is incomplete knowledge about the structure of the economy, including the length of leads and lags, the precise size of coefficients and the full specification of the equations used to describe the economy's structure. An indicator provides information about the comparative degree of "ease" or "restraint."

The main argument of the paper is that credit—defined as the total debt obligations of nonfinancial borrowers--contains useful information to supplement monetary aggregates. To paraphrase Friedman, the liabilities side of balance sheets of households and nonfinancial firms contains information that supplements the information in the monetary aggregates — on the asset side of these balance sheets. Most of the paper makes a different point, however. Friedman devotes most of his effort to showing that, on the criteria he uses, his measure of credit dominates the monetary aggregates during the sample period.

My comments have two parts. First, I compare Friedman's approach to some principal alternatives. Then, I offer some specific comments on his procedures and the definition of credit.

Implementing Monetary Control

The problem Benjamin Friedman addresses does not arise if there is a rule requiring constant money growth or tying money growth to some observable measure. With discretionary policy, the central bank may choose to alter policy in response to perceptions or forecasts of future

conditions. When governments choose discretion over rules, two methods of extracting information about the future effects of current policy are in use or have been proposed. To improve outcomes, these approaches must be sufficiently reliable to do better than a monetary rule.

What is "better"? Friedman makes no effort to compare discretionary policies to rules, so I suggest a minimum standard. Discretionary policy should reduce fluctuations in nominal GNP below the variability that can be achieved with a rule requiring constant money growth. To measure variability I start from the definition

(I) $Y = M + V$

where Y, M and V are the first differences of the natural logarithms of nominal output, money and velocity, and velocity is defined as the ratio of nominal output to the particular money stock used as M. Using (1), we can separate the variance of output growth into three components.

(2) var Y = var M + var V + 2 covar (M,V)

where var and covar are respectively variance and covariance.

A rule for constant money growth sets var M and covar (M,V) to zero. Real shocks remain; velocity changes with real shocks, so output fluctuates. Shocks to productivity and labor force affect the supply of output and the demand for money. And real shocks to aggregate demand also affect the demand for money.

Discretionary policy seeks to reduce var Y by making covar (M,V) sufficiently negative to offset the higher value of var M.[1] To reduce var Y by discretionary policy, the central bank must be able to recognize shocks as they occur, classify them as real or nominal, identify them as permanent or transitory and determine whether they originate on the supply or demand side of the economy. The basic case for a rule starts by recognizing that, in practice, this is a difficult task. (See Friedman, 1953).

One alternative to a monetary rule is the use of an econometric equation, or set of equations, to forecast the demand for money, one or more interest rates and other variables. The Federal Reserve uses several different variations, but their aim is to find the (short-term)

1. **I put aside two important issues. One is the control issue—whether var M can be zero. Zero variance is most easily achieved for the monetary base or total reserves. The second is the effect of var M on the demand for M and on var V. These issues are discussed in Brunner & Meltzer (1983).**

interest rate at which the demand for reserves (or the demand for non-borrowed reserves, or the demand for money) equals the stock of the relevant aggregate.

Since 1979, the Federal Reserve's approach places considerable weight on the demand for free reserves — excess reserves minus bank borrowing — or on the demand for borrowed reserves. Information from various sources, including econometric projections, is used to improve their estimates. Despite this effort, estimates of the banks' borrowing are subject to large errors, so the Federal Reserve misses its per-announced short- and longer-term targets for total reserves and money.

The predictions of econometric models are often imprecise in a relatively stable environment. When regulation and inflation force rapid change in arrangements, coefficients of econometric models change; errors of forecast are enlarged. Shifts in policy operations add to the problem.

Benjamin Friedman discusses a second alternative to a rule, the use of an indicator or intermediate target. This approach would have no justification if economists could provide a fully identified model of the economy, with stable parameters and well-specified leads and lags. Much of the policy problem would then disappear also. We would know whatever can be known about the future consequences of policy action and would know how much, when and what to adjust to keep the economy on some optimal path. With less than full information of this kind, there can be a role for intermediate targets if, for reasons that Friedman does not discuss, policy is subject to discretionary changes.*

I have two general comments on the three approaches. The first concerns the criteria to be used in choosing one procedure over another. Friedman does not discuss this issue, but his paper suggests that he would accept reduction in the variance of output growth as one of his criteria. The second distinguishes between systematic and non-systematic, or predictable and unpredictable, variability. Some procedures increase the costs of predicting the growth of money but lower the systematic variance of Y. Regulations may increase or reduce the systematic or predictable var M or var V or both. Regulation Q, for example, increases var Y and makes prediction of monetary aggregates more difficult.

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2. An intermediate target could be the basis of a quantitative rule, but I do not interpret Friedman as favoring a rule.

A recent study suggests that, during the years 1953-80, Federal Reserve policymaking added more variability to nominal output growth than it removed.[3] The study suggests that keeping var M, and therefore covar (M,V), at zero would reduce fluctuations in Y. For the sub-period 1953-69, the difference is not large; the sum var M plus covar (M_1V) is positive but small. For 1969-80, the result is very different. A monetary rule that held money growth constant would have removed as much as half the variance of GNP growth.[4]

The Federal Reserve does not control money growth completely. Only the systematic or predictable growth rate of money can be controlled, so only the variance of the systematic component of money growth can be eliminated. What is, or is not, systematic or predictable depends on the definition of "money" and the rules or procedures under which "money" is produced. The quarterly variance of total reserves or the monetary base can be reduced to zero; the quarterly variance of conventional M^1 or M^2 cannot. Random fluctuations remain.

Computations suggest that var Y can be reduced to about 1 percent to 2 percent per quarter at annual rates. Further reductions can be obtained, for example, by adopting rules for fiscal policy that reduce the variability of the demand for money and by other policy and institutional changes that reduce uncertainty. The 1 percent to 2 percent range appears to be lower than the errors achieved by Friedman. The comparison suggests that the approach Friedman recommends permits greater variability than a rule requiring constant growth of money or the monetary base and is, therefore, less desirable.

Some Specific Comments

Friedman does not claim that his procedure is optimal. His aim is more limited. This section discusses the paper from a more limited perspective.

The procedure relies on an empirical regularity. In earlier work, Friedman has argued that there is a constant, or nearly constant, relation between the total debt of nonfinancial borrowers and nominal

3. The results are reported in Brunner & Meltzer (1983).

4. The data are quarterly observations. The statements in the text hold the variability of velocity growth constant. A monetary rule would affect the demand for money and therefore change velocity growth and its variability.

GNP. Friedman calls the numerator of the ratio "credit." Something keeps the ratio at or near 1.45 in the U.S.

Chart 1 of the paper shows that since 1946, debt of the federal government has declined relative to debt of households, nonfinancial businesses, and state and local governments. Substitution is about 1 to 1; 1 percent more government debt is accompanied by 1 percent less private debt. This implies full crowding out. Debts of all kinds appear to be substitutes in the aggregate portfolio. Apparently taxes, risks, the regulatory environment and the rate of inflation do not matter for the total. What combination of market decisions, individual and collective choices bring about this result? We can only wonder about the effect on the ratio of the use of par values for debt that has many years to maturity and the exclusion of guarantees and commitments for social security, housing and health. Do these debts not matter? If half the face value of government debt is replaced by commitments of equal value, does the ratio change?

The concept "total nonfinancial liabilities" is unusual. To obtain the total, Friedman combines the liabilities of government, households and nonfinancial corporations, but excludes the liabilties of financial institutions. The latter are counted as assets (including money) of corporations and the public. The government debt held as assets of the Federal Reserve banks is not cancelled, but intercorporate debt is cancelled. My attempt to construct the net assets on the other side of the public's balance sheet left me puzzled by the pattern of consolidation.[5]

Many of these points must be as troubling to Friedman as to me, but if they trouble him he does not say so. Nor does he speculate on the reason for constancy. Does a dollar of credit support 70 cents of GNP? Or, is it the other way around, a dollar of GNP yielding $1.45 of credit? Or, is the relation simultaneous? Does the constancy reflect a constant real rate of interest and a constant ratio of debt to equity in a world of constant risk? Does the growth of social security "debt" just match the perceived growth of equity, so that the ratio of debt to equity remains 1 to 1?

If the credit ratio is truly constant, it contains no information about future GNP. Friedman uses vector autoregressions and other techniques designed to show that credit "causes" GNP. The results in the lower panel of his Table 2, suggest, however, that credit "causes"

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5. The details of the calculation are discussed in Friedman (1980).

prices but is not significantly related to real output when he controls for the effect of money.

The idea that credit "causes" output or prices has a specific meaning. Causality in the Granger-Sims sense means temporal precedence (Zellner, 1979 and Schwert, 1979). Friedman reports that the results of the "causality" tests depend on the sample period. If credit often has a "causal" effect on income and prices, but the significance of the effect differs from sample to sample, how reliable is the information? Friedman does not say, and he gives no basis on which to judge the stability of the estimates from sample to sample.

I accept Friedman's facts about the credit ratio, because he tells me they are facts. Before accepting his conclusion that there is useful information, I want to know more about the interpretation to be placed on the information. The reason is that I can think of two, very different interpretations.

Suppose money increases. If the increase is unanticipated, aggregate demand rises. Firms borrow to restore inventories and to finance production and inventory accumulation; and perhaps households borrow to finance purchases. The increase in borrowing increases Friedman's measure of credit. Production and real income rise. If this is the sequence followed, Granger-Sims tests would show that credit "caused" income. A different definition of causality would describe the unanticipated change in money and aggregate demand as the cause of the increase in credit and output, but the increase in credit would indicate that the economy was expanding.

Suppose that instead of an unanticipated increase in M, there is a large, sustained reduction in the growth of money. Inventories rise, and firms borrow to finance the unintended accumulation. Tax receipts decline, so the budget deficit increases. Credit to firms and government rises, for a time, as output falls. now the increase in the credit ratio has a different interpretation.

If expansions and contractions have about equal effect on credit and are equal in length, output (and prices) would have a weak reaction to credit. The positive relation found by Friedman may reflect (1) the fact that postwar expansions have been longer than postwar contractions and (2) the rise in the anticipated rate of inflation during the sixties and seventies.

My conjectures are consistent with the lead of credit, on average, and with the variability of the relationship between credit and other

variables. Of course, there are other explanations of the interrelation between these variables. Perhaps some are consistent with Friedman's conjectures about the information provided, on average, by postwar movements of credit.

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