

---

# FRBSF WEEKLY LETTER

July 8, 1988

## Looking Forward

Most analysts agree that excessive money growth causes inflation and that a primary goal of any central bank should be to promote price stability. Since the 1970s, the Federal Reserve has focused on growth in monetary aggregates to fight inflation. Unfortunately, the recent deregulation of the financial system and innovations in financial practices have made it more difficult to assess the implications of growth in these aggregates for future rates of inflation. As a consequence, both last year and this year the Fed declined to specify a target range for M1, the narrow transaction aggregate it once emphasized in formulating policy. The Fed also widened the target ranges for M2 and M3 in 1988 to reflect the greater uncertainty in interpreting movements in these broader savings-type aggregates.

This *Letter* discusses the problems that deterioration in the reliability of the monetary aggregates poses for the Fed in pursuing its objective of moving the economy toward price stability. As a second-best solution to these problems, a conditional forecast from an econometric model of the U.S. economy could serve as an indicator of the impact of policy actions. Such economic forecasts could be used in much the same way that monetary aggregates and other intermediate targets have been used in the past in designing policies.

### Intermediate targets

Monetary-policy actions—open market-operations and discount rate changes—do not have an immediate impact on the economy, but instead, influence it with a lag. Thus, if policymakers intend to follow a discretionary policy, as opposed to a fixed growth-rate rule, they need a tool, or “intermediate target,” that gives them feedback on the future effects of today’s actions. To be helpful in this way, the intermediate target should meet three conditions. First, it should have a reliable (predictable) relationship to the ultimate goals of policy, such as future economic activity and the price level. It also should have a leading relationship with these variables—that is, changes in the intermediate target should precede changes in the price level, for example.

Finally, the intermediate target should be subject to control by the Federal Reserve both in the short run and the long run.

Real interest rates, for example, do not satisfy the last of these criteria since the levels of real rates vary along with changes in fundamental saving and investment characteristics of the economy and are only temporarily affected by monetary policy. If the Fed were to try to hold a given interest rate below (or above) its long-run equilibrium value, the economy would become dynamically unstable, swinging into accelerating inflation (or deflation). In contrast, the Fed can determine the level of the money supply in the long run, and this will have long-run implications for the price level and nominal GNP.

To measure the money supply, the Fed has employed three monetary aggregates—M1, M2, and M3. M1, in particular, satisfied the criteria for an intermediate target reasonably well until recently. Its relationship with prices was relatively stable most of the time, and it was subject to a reasonable degree of control. Moreover, its movements led movements in important macroeconomic variables. The lag from changes in M1 growth to changes in the growth of real GNP was around six months, while the lag to inflation was about 1½ to 2 years.

These lags from M1 growth to inflation meant that a policy oriented around M1 automatically looked forward. Changes in *current* values of M1 provided a forecast of *future* developments in the economy. With respect to inflation, a change in the rate of M1 growth of one percent, for example, generally led to an equal change in the rate of inflation 1½ to 2 years later. Thus a policy that focused on *current* deviations between M1 and its targeted values, in effect, also was focusing on deviations between *future* inflation and an objective for future inflation.

Unfortunately, in recent years the relationship between M1 and future economic developments has deteriorated. The velocity of M1—the rate at

# FRBSF

which it is spent and re-spent each year in generating GNP (measured at current prices)—grew at a relatively steady 3 percent rate in the 1960s and 1970s. But beginning in 1982, M1's velocity became much less predictable, and has ended up declining on balance since then. It appears that the deregulation of deposit interest rates and the introduction of new deposit instruments, among other things, have changed the nature of M1, and made it a less reliable intermediate target.

Today, the broader aggregates—M2 and M3—appear to be more reliable than M1, but still less reliable than M1 once was. Recently, a number of alternative indicators have been discussed, including, for example, commodity prices, the monetary base (which includes reserves held at the Federal Reserve banks and currency in circulation), and M1A (which includes currency and non-interest-bearing transaction deposits). But while these indicators provide useful information for monetary policy, it has not been demonstrated that any of them has sufficient reliability to be the sole, or even primary, focus of Fed policy.

## Current data

In the absence of a highly reliable intermediate target, it would be dangerous for policy to be judged mainly on the basis of the current condition of the economy. Primary reliance on current data would be risky and could allow policy inadvertently to wander off course. Assume, for example, that over the course of a year incoming data on the economy suggested increasing strength, and that the Fed in response gradually tightened reserve availability, thereby raising interest rates. Although the tightening of policy in this situation might be appropriate, current economic developments would not provide a gauge for the correct *degree* of tightening needed over the year. By the time the year was over, policy might have been tightened too much or too little. Since the feedback from real GNP and inflation is slow to emerge, large mistakes can be made before they are discovered.

A current-data approach also can lead to policy mistakes because the timing of the effects of policy actions is likely to be inappropriate. For example, if policy were eased in response to a weak current quarter, the effects might not be felt until the economy already had begun to

strengthen. These timing problems are acute in the case of inflation. For example, by the time the actual data on inflation begin to show an increase, the underlying inflationary pressures already have been present for a year or more. Thus, it would be too late to turn the inflationary trend around without severe tightening and the attendant high costs of lost output and employment.

## "Targeting" a conditional forecast

Given the problems with the current-data approach, it is clear that an alternative approach to policy needs to be forward-looking to take account of the lags in the effects of monetary policy on the economy. In addition, a wide variety of information on current and expected future economic developments should be taken into account to compensate for the deterioration in the information content of the monetary aggregates.

In lieu of a reliable monetary aggregate target, these criteria may be best met by explicitly orienting policy around information obtained from conditional forecasts of inflation and other goal variables. Using an econometric forecasting model of the economy, growth paths can be estimated for the monetary-policy instruments—open-market operations and the discount rate—to achieve the inflation objective.

Given the lags in policy, this objective would need to be defined over a period covering one to two years into the future. If the ultimate goal were price stability, one most likely would want to aim at gradual year-by-year reductions in inflation to mitigate adverse effects on employment and output.

Of course, a forward-looking econometric model can be used to estimate paths for the policy instruments that are consistent with achieving any other policy objective, such as nominal income, as well.

Once an inflation objective is chosen, an econometric model could be used to make a number of forecasts using different assumptions about the paths for the policy instruments. The path that generated the forecast consistent with the inflation objective would be the appropriate path for policy. The chosen estimates then would define policy actions until the next policy meeting. The conditional forecasts would need to be updated

---

as new information emerged, and thus the policy setting would change over time.

Several types of models potentially could be used. Models that process a wide variety of information seem the most useful today. Neo-Keynesian-style structural models and vector autoregressions fall into this category, since both types of models are capable of processing a wide variety of information and attempt to represent or mimic the dynamic structure of the economy. No matter what type of model is used, though, policy makers still could adjust model forecasts according to their own best judgments, just as they could when policy was oriented around an intermediate target.

This conditional forecasting approach, in fact, is conceptually similar to using an intermediate monetary target. The intermediate target in this instance is the conditional forecast of inflation, which in turn, is a function of all of the data that are processed by the model. In effect, the method involves targeting a forecast of future inflation, and requires the policy instrument to be adjusted to keep the forecast of inflation equal to the objective for inflation. If the forecast were reasonably accurate, the change in inflation forecasted today would lead actual changes in inflation in the future, in the same way that changes in the growth of M1 used to lead changes in inflation.

#### **Accuracy of forecasts**

It is well known that economic forecasting is not an exact science—inevitably, errors are made. Why, then, should the design of monetary policy be entrusted to one- to two-year-ahead forecasts? First, it is by no means obvious that forecasts into the future are less accurate than current-quarter estimates. Current-quarter data contain a lot of “noise”—movements not related to changes in economic fundamentals—that cancels out over time. Thus the fundamentals tend to show through more clearly over longer forecast horizons.

A recent article in *Challenge Magazine* examined the accuracy of forecasts obtained from a

regular survey of forecasters conducted by *Blue Chip Economic Indicators* from 1977 to 1986. The one-year-ahead consensus forecasts of real GNP growth were significantly more accurate than the forecasts of current-quarter growth. For current-quarter growth, the average (absolute) error for GNP was a huge 2.6 percentage points (at an annual rate), whereas the forecasts made in October for real GNP growth in the following year had an error of only 1.0 percent. For inflation, the error one-year ahead was 1.2 percent. Unfortunately, the current-quarter errors for inflation were not presented. However, forecasting experience at this Bank suggests that the inflation forecast errors over these two horizons are about equal.

Second, and more importantly, short of basing policy on a fixed rule, there is no choice but to forecast, either implicitly or explicitly, because of the lags in monetary policy. Since actions today have little or no effect on results today, there is no way to judge the thrust of today's policy by looking at current economic performance. Reliance on current numbers implicitly makes the questionable assumption that today's performance is a good forecast of tomorrow's performance. Thus the issue of forecast accuracy must be considered in relative, not absolute terms. No matter how large a model's forecast errors, if they are smaller than the errors that would be made using current data only, or intermediate monetary targets, then the model should be used.

This discussion is not intended to downplay the size of forecast errors that inevitably will be made using econometric models. However, the long lags from monetary-policy actions to inflation make forecasting an essential part of effective inflation control. Given that simple forecasting models (such as those based on intermediate targets like the money supply) have deteriorated in recent years, the best alternative appears to be econometric models that process a wide range of information and attempt to predict the future effects of policy changes on the economy.

**John P. Judd**

---

Opinions expressed in this newsletter do not necessarily reflect the views of the management of the Federal Reserve Bank of San Francisco, or of the Board of Governors of the Federal Reserve System.

Editorial comments may be addressed to the editor (Barbara Bennett) or to the author. . . . Free copies of Federal Reserve publications can be obtained from the Public Information Department, Federal Reserve Bank of San Francisco, P.O. Box 7702, San Francisco 94120. Phone (415) 974-2246.

Research Department  
Federal Reserve  
Bank of  
San Francisco

Alaska Arizona California Hawaii Idaho  
Nevada Oregon Utah Washington