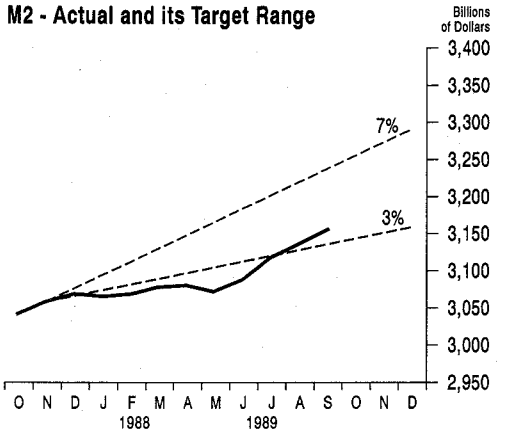
FRBSF Weekly Letter

November 10, 1989

Interpreting Recent Growth in M2

When economic activity slowed over the early part of this year, many worried that the U.S. economy was about to enter a recession. One of the factors contributing to this concern was the sluggish growth of the monetary aggregates, especially M2. From the fourth quarter of 1988 to June 1989, M2 grew at less than a two percent annual rate. Consequently, as Chart 1 shows, the level of M2 over the first half of this year was significantly below the levels established by the three to seven percent target growth range. However, M2 has grown at an annual average rate of nearly nine percent over the three months ending in September.

Chart 1:
M2 - Actual and its Target Range



This *Letter* examines the recent behavior of M2 to determine why the aggregate grew at such a slow rate over the first half of the year. Moreover, given the prevailing uncertainty about M2 in the wake of recent changes in the financial environment, this article discusses whether short-term movements in M2 generally can tell us anything about the direction of economic activity over and above what we can more easily infer from movements in other key macroeconomic variables.

Why the slowdown?

Many argued earlier this year that M2's departure from its target range was a signal that the Federal Reserve needed to ease monetary policy to avoid a recession. However, financial innovation and deregulation have made it difficult to interpret short-term movements in M2. For instance, M2 now is more sensitive to interest rate movements (in the short run), so that a given change in open market interest rates can lead to a surprisingly large change in M2. Thus, before attaching policy significance to M2's departure from its target range earlier this year, we need to understand the cause of the slowdown.

To determine why M2 was below target, it is important first to determine whether the behavior of M2 in 1989 has been consistent with the aggregate's historical relationship to key macroeconomic variables such as income, prices, and interest rates. Behavior consistent with this relationship means simply that movements in M2 will provide no information about the direction of the economy apart from that which also is contained in past and current values of the other key macroeconomic variables.

Below-target growth in M2, by itself, cannot tell us whether a slowdown in economic activity is imminent. Additional information is needed. In this case, forecasts from econometric models of the economy will provide more accurate and reliable information than will movements in M2 alone, because these models incorporate more data and underlying economic relationships. Thus, when M2's behavior is "normal," movements in M2, by themselves, are not sufficient to predict future activity.

By contrast, growth of M2 that is out of line with this aggregate's historical relationship with income, prices, and interest rates suggests that movements in M2 may be providing signals about future movements in income and prices that are not yet directly discernible from these variables. Whether this is the case, however, depends on the origins of M2's unusual behavior.

"Shocks" to the money supply (such as a tightening of monetary policy) can cause M2 to behave in an unusual manner if, as some economists claim, individuals do not immediately adjust their real (that is, price-level adjusted)

money balances in response to such a shock. In that case, a change in the money supply initially would have no effect on other macroeconomic variables. Gradually, however, individuals would adjust their moneyholdings to the levels they desire, and this adjustment process would have an effect on income, prices, and interest rates. In this case, a slowdown in money growth would signal a slowdown in economic activity which policy makers should offset to prevent a contraction in the economy's output.

The other possibility is that the observed slowdown in M2 was the result of a decline in the public's willingness to hold money balances. In this case, slower M2 growth reflects the public's preferences, and no adjustments in income, prices, and interest rates will take place. As a result, policy makers would be correct in choosing not to respond to below-target growth in M2.

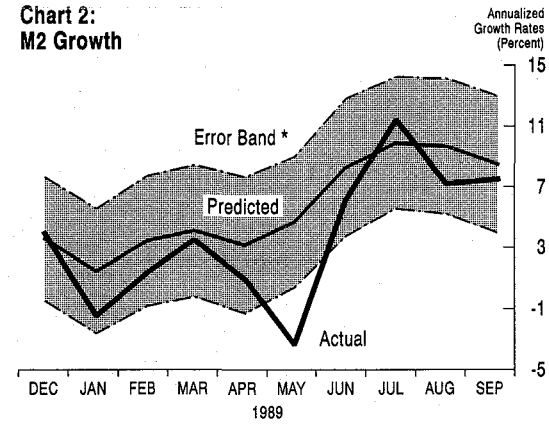
Unusual growth?

One way to determine which of these factors was responsible for slow M2 growth over the first half of this year is to compare actual M2 with predicted values obtained from an estimated money demand equation. Any supply and/or demand shocks should show up as a departure of actual M2 growth from the predicted values.

One such equation is the M2 demand equation contained in the San Francisco Money Market Model. The specification used in this model assumes that there is a long-run, equilibrium relationship between the level of M2 and the levels of income, interest rates, and prices, but that short-run disturbances can affect the growth rate of the aggregate, temporarily driving M2 away from its equilibrium value. These deviations, or "errors," between actual and equilibrium values of M2 are eliminated over time in this "error-correction" specification.

This equation was used to predict the rate of money growth over the period from the fourth quarter of 1988 to September 1989, given the actual values of income, prices,and interest rates observed during this period. Chart 2 compares these predicted growth rates with the actual values. If the range of disturbances to M2 over the forecast horizon had been the same as it was in the past, actual M2 growth should lie within the error band depicted in the chart. The error band encompasses a range of plus or minus two standard errors around this forecast, implying that unless the nature of the disturbances has changed, there is only a 5% chance that M2 growth would move outside this range.

Chart 2:
M2 Growth



* Band represents two standard errors.

Chart 2 shows that although M2 growth was less than predicted over the first four months of this year, the deviation was within the error band. In contrast, May's negative growth rate can be considered unusual. Over the last four months, M2 growth has moved back into the two-standard-error range, with the July growth rate in the upper half of the range.

Tax payments and unusual growth

The decline in M2 during May represents statistically unusual behavior, but it also appears to have been the result of a temporary disturbance to the public's demand for M2. One plausible explanation for this behavior is that individuals were faced with unexpectedly large tax obligations this year, and were forced temporarily to draw down money balances held in M2 to meet these obligations. Reports from the U.S. Treasury are consistent with this interpretation. For example, revenues during April were substantially higher than projected, even though projections for 1989 were above last year's levels. Individuals paid $68.5 billion in April 1989, compared with $53.3 billion in April 1988.

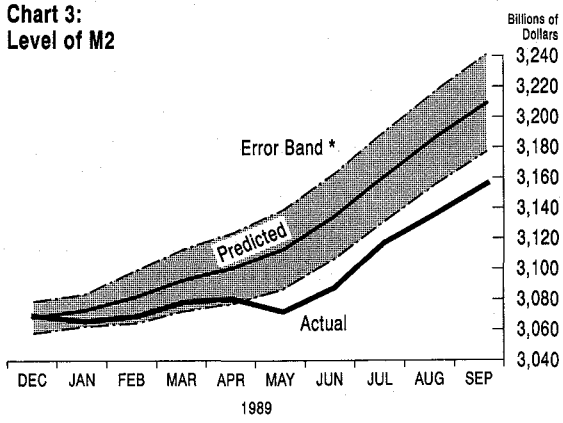
This explanation suggests that the M2 slowdown during April and May was temporary in nature. It is also consistent with the subsequent rapid growth in M2, since it is reasonable to expect individuals to replenish depleted balances.

One-time disturbance

Has the growth since May been sufficient to offset the effects of the unusually low growth in that month? The answer is provided in Chart 3, which plots the actual and predicted *levels* of M2 and the corresponding standard error band. The chart shows that the level of M2 fell below the two-standard-error band in May, and that it has remained below the band through September.

At first glance, this observation seems to suggest that M2 has continued to behave erratically. However, the estimated equation in the Money Market model suggests that less than 10% of any gap between actual and predicted M2 typically is eliminated each month. So it will be a while before the effects of the large negative shock in May disappear.

Chart 3:
Level of M2



*Band represents two standard errors.

Since M2's behavior in May appears to be the result of special factors during the month, a second simulation of the model was run that included M2 growth through May. This simulation suggests that actual M2 growth over the June to September period was close to what we would expect, given that there had been an unusually large shock to M2 in May. Although we clearly do not have enough data to make a firm judgment, this outcome is at least consistent with the interpretation that the behavior of M2 since the fourth quarter of 1988 is not fundamentally out of line with what past experience would suggest.

M2 and monetary policy

Since there appears to be little evidence of unusual behavior prior to May, should we interpret the slow growth in M2 over the early part of this year as a signal of a coming slowdown in economic activity? As discussed above, in the absence of any money-demand or -supply shocks, any standard model of the economy can be used to predict economic activity more reliably than can M2 alone. Forecasts obtained from different macro models used by this Bank did not suggest that a recession was imminent.

What then should one make of the below-target level of M2 over the first half of this year? While it is possible that M2's behavior may have been signalling that economic conditions over this period were different from what was expected when the ranges were first formulated, it is also useful to keep in mind that in the early part of the year M2's target range is relatively narrow, narrower even than the two-standard-error band shown in Chart 3. Thus, M2 may have fallen outside the target range early in the year largely as a result of random, but not unusual, movements at a time when the target range was relatively narrow.

Finally, what does this episode tell us about the significance of short-run movements in M2 generally? Because it has occurred in an environment in which recent financial innovations and deregulation already have made it difficult to interpret movements in all of the monetary aggregates, it suggests that we need to be extremely cautious in attaching policy significance to such short-run movements. This is not to say that all movements in M2 are unrelated to economic activity. On the contrary, there appears to be a stable long-run relationship between M2 and income, prices, and interest rates. Analysts are less likely to be misled when they focus on this longer-term relationship.

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