

---

# FRBSF WEEKLY LETTER

May 9, 1986

## M1 and Monetary Policy

In February, the Federal Reserve submitted its Monetary Policy Report to Congress pursuant to the Full Employment and Balanced Growth Act of 1978 (the so-called Humphrey-Hawkins Act), and Chairman Volcker testified before the House and Senate Banking Committees about the System's 1986 plans for monetary policy. An important element of these reports was information on the 1986 target ranges for the monetary aggregates chosen by the Federal Open Market Committee (FOMC) — the Fed's main monetary policymaking body — at its February meeting.

In his testimony, the Chairman reported the establishment of ranges of 3 to 8 percent for M1 (currency and checkable deposits in the public's hands) and 6 to 9 percent for M2 and M3 (alternate broader monetary aggregates that include savings deposits and other financial assets with varying degrees of liquidity), measured from the fourth quarter of 1985 to the fourth quarter of 1986. The new M1 range is wider than the usual 3 percentage point spread, and the upper and lower bounds are above and below respectively the 4 to 7 percent range tentatively chosen last July for 1986.

The Fed traditionally has tended to focus more on M1 than on the broader monetary aggregates in conducting monetary policy. However, the increased width of the M1 range reflects concerns about that aggregate's reliability as an indicator of monetary policy, and represents a reaction to its unusual behavior in 1985.

M1 grew extremely rapidly last year, while economic activity was sluggish and inflation was subdued. Over the first half of 1985, it grew at about a 10½ percent rate compared with its 4 to 7 percent 1985 target range. The FOMC's response at its July 1986 meeting was to establish a new 3 to 8 percent range beginning from the high base in the second quarter (see Chart 1). But M1 growth accelerated in the second half of last year when M1 grew at nearly a 13 percent annual rate and overshot even the higher 8 percent upper boundary of its second-half range.

The FOMC recently accommodated this rapid growth by effectively incorporating it into the 1986 target. That is, it followed its usual practice of basing the new target on the *actual* level of M1 at the end of the prior year — in this case, the high level of M1 in the fourth quarter of 1985.

Normally, a large M1-overshoot of the target range as occurred in 1985 would risk "overheating" the economy and causing higher inflation in the future. But, as the Fed explained in its February 1986 Monetary Policy Report to Congress, it permitted the overshoot because of a sizable decline in the velocity of M1 — the speed at which M1 is spent and therefore the relationship between M1 and GNP. Even though M1 rose by nearly 12 percent last year, the combined increase in output and prices was only about 5½ percent. This meant that the velocity of M1 fell by about 6½ percent. In contrast, M1 velocity has grown at a positive 3 percent average rate in the postwar period up to 1980.

The FOMC decided that the restrictive action that would have been necessary to hold M1 within its range last year was not justified in light of the drop in velocity, the different signals conveyed by M2 and M3, which remained in their ranges in 1985, the rather sluggish growth in economic activity, and the rather restrained behavior of prices.

### Demand for M1

Analysis of monetary developments using the San Francisco Monthly Money Market Model supports the Fed's approach of effectively de-emphasizing M1 in 1985 and establishing a relatively wide range for that aggregate in 1986. The San Francisco Model describes how the behavior of the public, banks and the Federal Reserve interact to determine the amounts of M1, M2 and M3, the total volume of bank loans, and the levels of short-term interest rates. It was developed and is used regularly by the San Francisco Reserve Bank's staff to analyze and forecast monetary developments.

# FRBSF

Until the second quarter of 1985, this Model had a good track record in forecasting growth in the monetary aggregates up to three months ahead. But over the last nine months of last year, the Model made by far the largest errors of its four-year forecasting history. These errors suggest that M1 *did* behave in an atypical fashion, and support the FOMC's de-emphasis of M1 last year and its establishment of a relatively wide target range for M1 this year.

Chart 2 plots the Model's three-months-ahead forecasts made at the beginning of each quarter from 1982 through 1985, and compares them with the actual data. The average forecast error for M1 growth in the final nine months of 1985 was nearly  $5\frac{1}{2}$  percentage points (annual rate). Prior to last year, the largest average error for any nine successive months was  $2\frac{1}{2}$  percentage points.

The forecasting errors in 1985 came mainly from the equation in the Model describing the public's demand to hold M1 balances. The money demand equation in the Model, in conventional fashion, relates the amounts of M1 balances the public is willing to hold to the level of interest rates, the public's transactions needs as measured by people's incomes, and the level of prices. In addition, the San Francisco Model allows for temporary changes in money holdings as the process by which banks create and retire loans causes new checking account deposits to be created and extinguished.

An apparent increase in the public's desire to hold M1 balances unrelated to the factors described above caused the Model's money demand equation to underpredict M1 growth by 3 percent from the fourth quarter of 1984 to the fourth quarter of 1985 (on a quarterly average basis). Nearly all of this error was concentrated in the final three quarters of the year. Chart 1 plots the results of using the money demand equation to predict the total stock of M1 outstanding.

A formal statistical test indicates a significant upward shift in the M1 demand equation in 1985. In other words, the rapid growth in M1 in 1985 resulted in the public holding substantially more M1 balances than average historical relationships would have predicted.

It should be noted that, even without a shift in the demand for M1, that aggregate would most likely have exceeded its original 4 to 7 percent target range unless the Fed had taken restrictive action to the contrary. The Model's estimates suggest that even without the shift in money demand, M1 would have grown at a robust 9 percent rate as interest rates declined sharply between the third quarter of 1984 and the third quarter of 1985. The rate drop thus contributed about  $2\frac{3}{4}$  percentage points to M1 growth last year.

## Velocity of M1

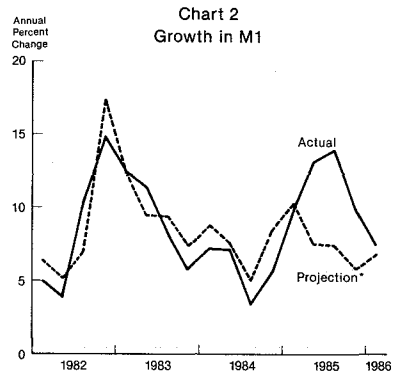
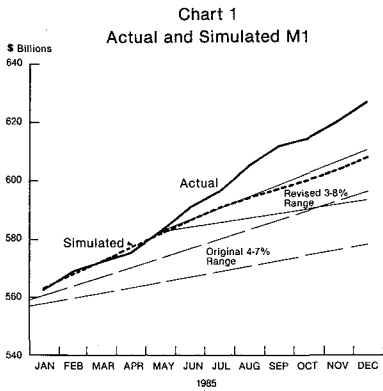
An upward shift in M1 demand implies that M1's rapid growth in 1985 should have had a less potent effect on growth in GNP and prices than would have been expected on the basis of historical relationships. The money demand shift can be interpreted as a greater willingness on the part of the public to hold M1 balances, all else being equal. Thus, accommodating this willingness to *hold* more M1 balances would not stimulate the economy very much because the increased liquidity available in the economy would *not* be spent on goods and services.

A so-called "reduced form" model that relates growth in nominal (current dollar) GNP to current and past rates of growth in M1 (as well as a variable measuring fiscal policy) supports this conclusion. On the basis of historical relationships, this model predicts that nominal GNP should have grown over  $4\frac{1}{2}$  percent more than it actually did last year.

The money market model suggests that the money demand shift accounted for 3 percentage points of the  $6\frac{1}{2}$  percent decline in the velocity of M1 in 1985. Thus, we can attribute almost one-half of the decline in M1 velocity last year to the M1-demand shift. The main explanation for the remaining change in velocity is the decline in interest rates in late 1984 and early 1985 mentioned earlier.

## Explanations

Several interesting hypotheses have been advanced to explain the unusual behavior of M1 in 1985. Unfortunately, either not enough data are available for an adequate test or the data that are available do not confirm the hypotheses.



\* Projections are three-months-ahead *ex ante* forecasts made in the first month of each quarter using the San Francisco Money Market Model.

One plausible hypothesis is based on the observation that 1985 is the first year in which short-term interest rates fell to relatively low levels at the same time that many of the deposits in M1 yielded interest. As a result, consumers had to sacrifice only a relatively small amount of interest to hold funds in the checkable deposits in M1. They may therefore have shifted a sizeable amount of savings-type funds into M1.

Following the introduction of interest-bearing NOW accounts in 1981 and Super-NOW accounts in 1983, the percentage of M1 balances that pay some interest has risen to around 30 percent. Yields on this component of M1 became more competitive with open market interest rates last year as market rates fell. This explanation is consistent with the very rapid growth in NOW accounts last year, but is difficult to confirm conclusively because of our limited experience with periods of small spreads between yields on NOWs (and Super-NOWs) and other liquid investments.

A second hypothesis is that GNP, which measures domestic production, may not have been the best measure of transactions needs for M1 in 1985 because of the rapid increases in U.S. imports. Although imports generate financial transactions, which in turn require M1 balances, imports are not captured in GNP. With imports reaching historic proportions, the wedge between the volume of transactions and GNP was large last year. Therefore, the traditional practice of using GNP to represent aggregate transactions needs may have been one reason money demand equations typically under-predicted M1 growth in 1985. However, correcting for this possible source of bias by adding

imports to the measure of transactions does not overturn the conclusion that money demand did shift upward in 1985. We must conclude that the causes of the problems with M1 in 1985 are not very well understood.

#### Policy implications

Unfortunately, the persisting uncertainty as to the cause of M1's behavior in 1985 leaves that aggregate's current and future usefulness as an intermediate target of monetary policy up in the air. By itself, one episode of large forecasting errors certainly does not warrant throwing away an aggregate that, for decades, has been widely viewed as the most reliable one available to the Fed. Moreover, M1 seems to have come back on track in the first quarter of this year — the Model predicted M1 growth at a 6¾ percent annual rate from December 1985 to March 1986 versus actual growth at a 7½ percent rate.

Nevertheless, because the sources of M1's problems last year are not, in our view, very well explained, it is difficult to have much confidence that M1 will behave more normally from now on. The FOMC's approach of establishing a wide range for M1 in 1986 is therefore appropriate. Perhaps by the end of this year, it will be possible to make a better assessment of how big a role M1 can play in future U.S. monetary policy.

**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 (Gregory Tong) 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.

Alaska Arizona California Hawaii Idaho  
Nevada Oregon Utah Washington

Research Department  
Federal Reserve  
Bank of  
San Francisco

**BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT**

(Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding	Change from	Change from	4/17/85
	4/16/86	4/9/86	Dollar	Percent <sup>7</sup>
Loans, Leases and Investments <sup>1 2</sup>	203,749	2,230	13,817	7.2
Loans and Leases <sup>1 6</sup>	185,461	2,482	13,285	7.7
Commercial and Industrial	53,457	867	839	1.5
Real estate	66,623	52	3,830	6.0
Loans to Individuals	39,068	222	5,450	16.2
Leases	5,645	- 10	297	5.5
U.S. Treasury and Agency Securities <sup>2</sup>	10,404	- 258	- 383	- 3.5
Other Securities <sup>2</sup>	7,885	7	915	13.1
Total Deposits	206,040	2,372	8,073	4.0
Demand Deposits	52,745	2,894	5,337	11.2
Demand Deposits Adjusted <sup>3</sup>	34,419	- 271	4,084	13.4
Other Transaction Balances <sup>4</sup>	16,966	474	2,419	16.6
Total Non-Transaction Balances <sup>6</sup>	136,329	- 995	318	0.2
Money Market Deposit Accounts—Total	46,282	- 194	2,691	6.1
Time Deposits in Amounts of \$100,000 or more	36,357	- 712	- 2,276	- 5.8
Other Liabilities for Borrowed Money <sup>5</sup>	26,359	712	6,362	31.8
<b>Two Week Averages of Daily Figures</b>	Period ended 4/7/86	Period ended 3/24/86		
<b>Reserve Position, All Reporting Banks</b>				
Excess Reserves (+)/Deficiency (-)	- 3	135		
Borrowings	17	10		
Net free reserves (+)/Net borrowed(-)	- 20	125		

<sup>1</sup> Includes loss reserves, unearned income, excludes interbank loans

<sup>2</sup> Excludes trading account securities

<sup>3</sup> Excludes U.S. government and depository institution deposits and cash items

<sup>4</sup> ATS, NOW, Super NOW and savings accounts with telephone transfers

<sup>5</sup> Includes borrowing via FRB, TT&L notes, Fed Funds, RPs and other sources

<sup>6</sup> Includes items not shown separately

<sup>7</sup> Annualized percent change