

# Did Financial Markets in 1983 Point to Recession?

In the second half of 1983, the financial sector sent conflicting signals of the economy's future course. M-1 growth slowed sharply, suggesting that the economy would also slow substantially, if not fall into recession. But interest rates were only modestly higher than in January 1983, indicating little change in financial market conditions. Because real GNP expanded vigorously over the first two quarters of 1984, considerable interest has developed in why M-1 pointed in the wrong direction and, more generally, in how reliable M-1 is as an indicator of turning points in the business cycle.

In this paper, we review how in the past money and interest rates have both provided fairly clear signs of recession, when their behavior is evaluated properly. We show, according to a criterion developed by William Poole, that the deceleration in M-1 last year—before and after the data revisions—was not as large as those associated with past recessions.<sup>1</sup> By year-end, however, it had become sufficiently large to suggest the high likelihood of an imminent economic downturn. We also show that, in contrast, the rise in interest rates in 1983 was far less steep than usual before past recessions.

Why did the money supply give a false signal? Before each of the past four downturns, the deceleration in M-1 was connected to rising interest rates, according to a well-established money demand equation. For 1983, the slow-

down in M-1 can be explained in two ways, neither of which should have caused concern about the economy. First, slower money growth reflected the response of money demand to the leveling off of interest rates after their rapid decline in the second half of 1982. Alternatively, it reflected a downward shift in money demand.

Last year's experience underscores a point often made: exclusive reliance on M-1 for policy purposes is too narrow a focus. Our results imply that, at the very least, movements in interest rates should be examined to corroborate that slower money supply growth points to an imminent recession. More generally, we believe that it is useful to look at many economic variables, financial and nonfinancial, in the framework of a model when forecasting the economy.

## Monetary slowdowns and recessions

Growth of the narrowly defined money supply, M-1, moderated considerably in the second half of 1983. Over the last two quarters of 1983 M-1 rose at a 7.2 percent annual rate, compared with its 12.4 percent annualized advance over the first two quarters. The slowdown was even more pronounced according to data reported during the course of 1983, which did not incorporate subsequent benchmark revisions and updated seasonal adjustment factors. Prior to these revisions, M-1 growth was measured to be 13.3 percent in the first half of the year and 5.5 percent in the second half, the sharpest deceleration in the post-war period. But even after the revisions, the 5.2 percentage point drop was among the steepest decelerations.

Although last year's slowdown was exceptional, concerns

<sup>1</sup>William Poole, "The Relationship of Monetary Decelerations to Business Cycle Peaks: Another Look at the Evidence," *The Journal of Finance* (June 1975), pages 697-712.

about the economy may not have been warranted. As is well-known, monthly and quarterly changes in M-1 are quite "noisy", and frequently have little to do with the overall economy. For example, 1962 and 1973 saw sharp one-quarter decelerations of about three percentage points. Only the later slowdown was soon followed by recession.

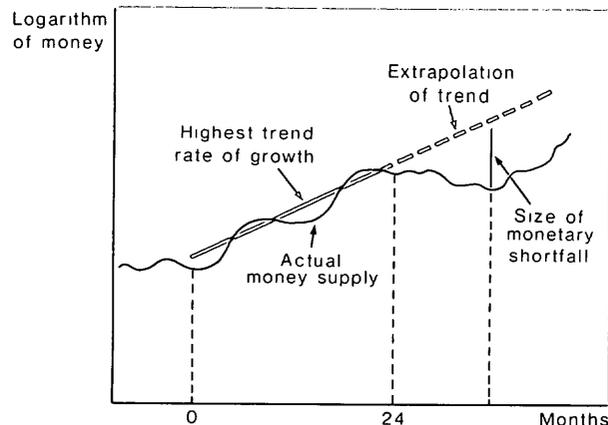
Moreover, evaluating movements in the monetary aggregates without some well-defined criterion or rule is highly discretionary and can be done to "fit" a particular "story". Indeed, choosing two intervals to compute first the acceleration and then the deceleration in M-1 can become quite arbitrary, as the experience of 1979-80 illustrates. The two-quarter growth rate of M-1 spiked in the third quarter of 1979. When the subsequent deceleration (which occurred just prior to the 1980 recession) is measured from that spike, it is comparable to those observed before earlier economic downturns. But when the deceleration is measured from any of the other quarters of 1979, it is only modest. So, we need an objective way to determine the significance of a monetary slowdown.

Such an approach was developed by William Poole. He compared the level of M-1 with the extrapolated value of its most recent highest trend, as measured over a predetermined interval. In particular, for each month in the 1914 to 1972 period he calculated the trend in M-1 over the previous twenty-four months. Then, after determining the highest trend between two successive cyclical troughs, he computed the shortfall in M-1 from that trend, extrapolated twelve months beyond the cyclical peak (chart). Using this calculation, Poole found that with few exceptions M-1 fell below trend by at least 3 to 4 percent around a peak in the business cycle. He also judged the finding to be valid for M-2. He concluded that "an NBER [National Bureau of Economic Research] business cycle peak will be identified within plus or minus 5 months of the month of significant deceleration"<sup>2</sup>. As we will discuss later, this means that the condition may not be met until *after* the onset of recession.

We apply Poole's technique to the past four recessions to see whether the pattern he observed has continued. Of course, recent financial innovation and deregulation might have altered the relationship between monetary decelerations and turning points in terms of either size or timing. Still, the results are generally consistent. Specifically, significant monetary slowdowns occurred around the cyclical peaks in 1973 and 1980. This was not quite the case, however, in 1981 (Table 1, right-hand column). But this may be because the 1981-82 recession followed the 1980 recession so closely and depressed the estimated twenty-four month trend. Estimating the trend over a twelve-month

<sup>2</sup>William Poole, page 712. Further work with this approach was done by Bryon Higgins, "Money Growth and Business Cycles", Federal Reserve Bank of Kansas City *Monthly Review* (April 1979).

### Illustration of Poole's Procedure for Identifying Significant Monetary Decelerations



Note: The logarithm of the money supply is plotted on the vertical axis. This means that the distance between the extrapolation of the trend and the actual money supply measures the size of the shortfall as a percentage of the trend level.

Table 1

#### Monetary Decelerations in the Vicinity of Recessions

In percent

Greatest Shortfall in M-1 Relative to its Peak Established Trend*		
Peak in the business cycle†	Trend measured over 12 Months	Trend measured over 24 months
December 1969	7.6 (1/71)	5.4 (12/70)‡
November 1973	9.2 (4/75)	6.2 (4/75)§
January 1980	4.5 (5/80)	4.1 (5/80)//
July 1981	6.8 (7/82)	1.7 (7/82)
1983 Deceleration		
As of 12/83, original data	4.5	1.7
As of 12/83, revised data	3.7	¶
As of 3/84, revised data	5.0	¶

\*Dates in parentheses refer to the month in which the greatest shortfall occurred.

†As classified by the National Bureau of Economic Research.

‡Became significant in December 1969 according to Poole's three percent rule.

§Became significant in July 1974 according to Poole's three percent rule.

//Became significant in April 1980 according to Poole's three percent rule.

¶Cannot be computed, the peak trend rate has not yet been reached.

interval removes the effect of the 1980 recession and reveals a marked deceleration in M-1 during 1981 (Table 1, left-hand column) <sup>3</sup>

How should a shortfall in M-1 relative to a twelve-month trend be evaluated? Surely, the measured peak rate of growth tends to be more rapid as the time span over which it is calculated shrinks. Thus, it is not surprising that, when money growth tapers off, the deceleration looks even more dramatic relative to a shorter trend. But Poole never determined how great the shortfall from a twelve-month trend must be to have the same significance as a three percent shortfall from a twenty-four month trend. But note that in 1967 there was a 2.7 percent decline from the twenty-four month trend and a 4.5 percent decline from the twelve-month trend, that year the economy was either on the brink of recession, or went into a very mild recession. (The NBER did not identify 1967 as a recession.) Using the borderline case of 1967 as a benchmark, we project that a decline from the twelve-month trend on the order of five to six percent would be as significant as a three percent decline from the twenty-four month trend.

Poole's technique helps put the 1983 deceleration into perspective. According to the initially reported data, the highest twenty-four month trend occurred between October 1981 and October 1983 and stood at an annual rate of 9.7

<sup>3</sup>The shortfall from both the twelve and twenty-four month trends would be greater if an adjustment was made to offset the effects of the introduction of NOW accounts nationwide in 1981.

Table 2

**The Extent of the Monetary Deceleration at the Time of the Onset of the Recession**

In percent

**Shortfall in M-1 Relative to Its Peak Established Trend**

Peak in the business cycle*	Trend measured over 12 months	Trend measured over 24 months
December 1969	4.6	3.5
November 1973	2.9	1.4
January 1980	1.1	0.9
July 1981	2.0	0.0
<b>1967 Deceleration</b>		
As of 1/67	4.5	2.7
<b>1983 Deceleration</b>		
As of 12/83, original data	4.5	1.7
As of 12/83 revised data	3.7	†
As of 3/84, revised data	5.0	†

\*As classified by the National Bureau of Economic Research

†Cannot be computed, the peak trend rate is rising as of March

percent, substantially faster than the 5.5 percent rate in the second half of last year. By the end of 1983, M-1 was 1.7 percent below the extrapolated level of the trend, just over halfway to meeting Poole's criterion for significant deceleration. By this test, forecasts of a 1984 recession based on the M-1 deceleration were premature. <sup>4</sup> And after the data revisions, the peak trend growth was rising into early 1984, and therefore, no shortfall could even be measured.

But looking at the 1983 deceleration relative to the twelve-month trend may be more meaningful, for a similar reason as in 1981. Specifically, measuring the trend over a shorter interval reduces the influence of a nearby recession, in this instance, the 1981-82 recession. Before the data revisions, the highest twelve-month trend was 12.8 percent, spanning July 1982 to July 1983. The shortfall from this trend registered 4.5 percent in December. The data revisions lessened the decline to 3.7 percent in December, but by March 1984, it registered 5.0 percent. In terms of the twelve-month trend, then, the M-1 shortfall seemed to approach, but not reach, a significant decline of five to six percent.

**M-1 as a leading indicator**

Poole's approach confirms that monetary decelerations and recessions in the past were closely linked. His results, however, do not substantiate the leading indicator properties of M-1. <sup>5</sup> In fact, his findings dispute claims that M-1 is a useful forecasting tool. As Poole shows for the 1914-72 period, decelerations in M-1 typically become significant somewhere inside of six months before or after the cyclical peak. In fact, for the nine cyclical peaks he covered, the decelerations become significant before the turning point four times, and after the turning point five times. For none of the three recessions since Poole's study did the decelerations become significant until after the economy had already turned downward.

To further investigate M-1's leading indicator properties, we measure the size of the shortfalls at the time of each of the past four cyclical peaks. In 1973 and 1980, the decline from the twenty-four month trend was around 1 percent to 1½ percent in the month when the economy turned downward, and in 1981, no decline occurred (Table 2). Even though the slowdowns were much greater relative to the twelve-month trend, they do not approach the magnitude of the 1967 slowdown, which was associated with a near recession. In sum, relying on M-1 (relative to its highest prior twelve-month or twenty-four month trend) as a leading indicator may be quite risky.

<sup>4</sup>The introduction of the Money Market Deposit account in December 1982 distorted the growth of M-2 and M-3 in early 1983. Hence, the broader aggregates could not be used to confirm or dispute the information contained in M-1.

<sup>5</sup>The growth rate of M-1 is classified a leading indicator by the Department of Commerce, but it is not a component of the composite index of leading indicators.

Nevertheless, the pattern in M-1 growth prior to the onset of the past four recessions offers a way to evaluate the most recent experience. The deceleration in 1983 (according to the initially reported data) was larger than most that occurred before past recessions. Even using the revised data, the shortfall relative to the twelve-month trend (as of December 1983 or March 1984) looks large.

Because the deceleration in M-1 did not meet Poole's criterion, deciding whether it implied a recession had to be based on judgement (or some test other than Poole's). It was possible that a subsequent boost in M-1 could very well offset the shortfall and prevent this criterion from ever becoming satisfied. When forecasting the economy, however, the risk of giving a false alarm must be weighed against the risk of waiting too late to sound a warning. In this light, if M-1 was the *only* indicator, the slowdown in M-1 growth certainly looked ominous and probably justified forecasting an economic downturn during the first half of 1984.<sup>6</sup> In retrospect, even if the revised M-1 data had been known last year, the deceleration relative to the twelve-month trend was so sharp that it might have raised concern. In any case, especially because the deceleration's size was not decisive, corroborating evidence from other sources should have been sought. As we will show, other developments in financial markets did not support forecasting an impending recession.

#### Interest rates and the onset of recessions

Besides the volume of money, an important piece of financial data is the level of interest rates. In judging whether developments in financial markets indicate a near-term recession, it seems eminently reasonable to pay attention to interest rates as well as the money supply, particularly when their signals differ, as in 1983.<sup>7</sup> In essence, a price variable as well as a quantity variable should be considered.

To evaluate last year's rise in rates, we begin by calculating the percent (or relative) change in the nominal commercial paper rate over the last four quarters of each expansion in the postwar period. The rise in the paper rate before past recessions has not been of uniform magnitude, tending to be greater since the late 1960s (Table 3, column 1). Specifically, the commercial paper rate rose two to four times more steeply in the later period. Over the last three quarters of 1983, it climbed about 10 percent. While this is close to some of the increases in the 1950s, that decade may not provide a good standard for evaluating the recent rise.

Financial deregulation and innovation, as well as wider

<sup>6</sup>To determine whether this was so within a framework based on statistical theory, the technique developed by Neftçi could be applied. See Salih N. Neftçi, "Optimal Prediction of Cyclical Downturns", *Journal of Economic Dynamics and Control* (1982), pages 225-41.

<sup>7</sup>The Federal funds rate is classified as a leading indicator of business cycle peaks, the Treasury bill rate a coincident indicator of peaks. The commercial paper rate is not classified.

Table 3

#### Behavior of Interest Rates over Four Quarters Before Recession

Start of recession	Percent change in nominal commercial paper rate	Percentage point change in real commercial paper rate*	Percent change in real cost of capital
1949-I	38.1	†	11.3
1953-III	12.9	0.6	2.4
1957-IV	17.9	1.0	3.5
1960-III	13.1	0.8	3.8
1970-I	44.6	2.2	11.7
1974-I	68.5	0.8	16.6
1980-II	43.5	3.3	13.8
1981-IV	72.0	7.5	14.6
1983 (I-IV)	10.0	0.5	-4.7

\*Figures are the average of four estimates of the change in the 120-day real commercial paper rate. Each estimate of the real rate subtracts a different proxy for inflation expectations from the nominal commercial paper rate. These proxies are the change in the fixed weight GNP deflator in the contemporaneous quarter (before 1960 the implicit GNP deflator was used), the change in the fixed weight GNP deflator over the previous four quarters, University of Michigan survey data on price expectations over the subsequent twelve months, and the Livingston survey data on price expectations over the subsequent three months.

†Not available

swings in inflation, would certainly seem to be important considerations in analyzing interest rate behavior.<sup>8</sup> The raising and eventual elimination of the ceiling on CD rates, the growth of the Eurodollar market, and the greater diversity of bank liabilities, all reduced the role of credit rationing at times when financial conditions tightened. Consequently, sharper movements in interest rates were needed to restrain the demand for goods and services. But it is also possible that aggregate demand reacted more quickly and strongly to a given percent rise in interest rates when rates reached high levels.<sup>9</sup> Nevertheless, most analyses suggest that the interest elasticity of demand has not yet increased to a significant extent. For our purposes, the upshot is that the behavior of short-term rates since the late 1960s is probably more relevant than that of earlier periods in evaluating the recent rise in interest rates. Using this comparison, then,

<sup>8</sup>See Richard G. Davis, "Credit Market Restraints and the Functioning of Monetary Policy," *Federal Reserve Bank of New York Research Paper Number 8015* (September 1980). Donald D. Hester, "Innovations and Monetary Control," *Brookings Papers on Economic Activity I* (1981). Albert M. Wojnilower, "The Central Role of Credit Crunches in Recent Financial History," *Brookings Papers on Economic Activity II* (1980).

<sup>9</sup>See M. Akbar Akhtar, *Financial Innovations and Their Implications for Monetary Policy: An International Perspective*, Bank for International Settlements Economic Papers Number 9 (December 1983).

the ten percent advance of the nominal commercial paper rate in 1983 was clearly quite small, and indeed, almost trivial

### Real interest rates

From our estimates, real short-term rates also did not rise enough last year to suggest an imminent recession. Real rates, of course, are unobservable, their proper measurement has long been debated without ever being settled. For this reason, we present an average of several different estimated changes in the real commercial paper rate for each pre-recession period. But because these estimates are occasionally negative, or positive and close to zero, we cannot always calculate in a meaningful way the percent change. Consequently, we examine their *percentage point* (or absolute) changes over the four quarters before each recession.

In comparison to these changes, the rise in the real paper rate in 1983 was relatively small (Table 3, column 2). We estimate that this rate climbed by less than one percentage point last year, from between 3½ and 4½ percent in the first quarter of 1983 to between 4 and 5 percent in the fourth quarter of 1983. Among the recent experiences, only the modest advance in 1973 approached this increase. That period, however, involved a jump in oil prices and restrictive fiscal policy, it may not be an appropriate episode to compare with 1983. The increases in the real paper rate before the other recessions since the late 1960s were between four and fifteen times greater than the rise in 1983. Overall, it would seem reasonable to conclude that, from an historical perspective, the behavior of short-term interest rates—nominal and real—in 1983 did not point to a near-term recession.

The same was true of real long-term rates. Long-term rates can be measured by the real cost of capital, a weighted average of the corporate bond rate adjusted for inflation expectations and the dividend-price ratio.<sup>10</sup> The real cost of capital fell during most of 1983, by the fourth quarter it stood about five percent below its level of three quarters earlier (Table 3, column 3). But it had climbed sharply before each recession since 1969. Thus, real long-term rates confirmed the information in short-term rates: financial markets were not appreciably tighter in the second half of last year.

Still another sign of stable financial conditions came from domestic nonfinancial sector debt, the credit aggregate first monitored by the Federal Reserve in 1983. Its growth was virtually the same in the two halves of the year, 10.6 percent versus 10.5 percent, at annual rates.

<sup>10</sup>See Patrick J. Corcoran and Leonard G. Sahling, "The Cost of Capital: How High Is It?", this *Quarterly Review* (Summer 1982), page 23. Patrick J. Corcoran, "The Cost of Capital: An Update" this *Quarterly Review* (Autumn 1983), page 23.

### Money demand: the connection between money, interest rates and the economy

There is good reason to doubt the import of a slowdown in M-1 growth when nominal interest rates are fairly constant. M-1 and interest rates, in principle, are not independent. Specifically, the demand for money represents a direct connection between short-term interest rates and the money supply. When interest rates rise, the quantity of money demanded tends to fall, everything else held constant, because alternatives to holding money become more attractive. The coincidence of rising interest rates and slower M-1 growth around the onset of past recessions most likely reflected in part this connection. Individually, they indicated the same fundamental change toward tighter financial markets.

We demonstrate the link between decelerations in M-1 and rises in interest rates by simulating the demand for money—represented by a well-established, widely-used equation of the transactions demand for money—over the intervals before the past four recessions.<sup>11</sup> This is done with and without the actual increase in interest rates, all other determinants of money demand follow their historical paths. The difference between the two sets of simulations brings out the role interest rates played in the observed slowdowns of M-1 growth.

The simulations indicate that, before the 1970 and 1974 recessions, the rise in short-term rates contributed substantially to the decelerations in M-1 growth (Table 4). For example, just before the 1974 recession the rate of increase

<sup>11</sup>This equation was analyzed extensively by Stephen M. Goldfeld, "The Demand for Money Revisited", in *Brookings Papers on Economic Activity III* (1973), pages 576-638.

Table 4

#### The Effect of Rising Interest Rates on the Growth of M-1 before the 1970 and 1974 Recessions

In percent

Period	Actual	Simulated with actual interest rates	Growth Rates of M-1	
			Simulated with constant interest rates	Actual over previous four quarters
1969-I to 1970-I	3.0	3.6	6.4	8.3
1973-I to 1974-I	5.4	6.3	8.2	8.5
1979-II to 1980-II	4.3	7.4	8.5	7.7
1980-IV to 1981-IV	5.1	9.3	10.7	7.4

Source: Federal Reserve Bank of New York staff estimates.

in M-1 would have been 1.9 percentage points faster had interest rates not risen in 1973. Thus, the deceleration in M-1 growth from 8.5 percent (over the four quarters ending 1973-I) to 5.4 percent (over the four quarters ending 1974-I) can be explained mostly as a consequence of the run-up in rates. Either the money supply or interest rates then would have provided a correct reading on changing developments in the financial markets in 1973.

Unfortunately, similar demonstrations for the 1980 and 1981-82 recessions are not so clear-cut; the demand-for-money equation tracks the actual money stock poorly over the 1980-82 period. The effects of financial innovation, deregulation of bank deposits, the credit control program, and volatility throughout the economy combine to undermine the equation's performance. But none of these developments severs the interest rate/money demand connection, if interest rates had not risen prior to these later recessions, money growth would have been faster. Allowing for the overprediction of money growth in 1980-82, we can compare the simulated growth rates of M-1 with actual and constant interest rates. Around the onset of the 1980 recession, a third of the monetary deceleration can be attributed to rising interest rates; before the 1981 recession, over a half.

Let us now turn our attention to 1983. First, let us assume that the response of money demand to changes in interest rates (and its other determinants) has a mean lag of three to six months, the typical estimate obtained in econometric studies covering the past ten years or so.<sup>12</sup> In other words, one half of the adjustment in the quantity of money demanded by firms and households as a result of a change in interest rates takes place in three to six months.

Combining this estimate with the observed pattern in short-term rates since mid-1982 produces an explanation for M-1 growth in 1983. Short-term rates fell sharply during the third and fourth quarters of 1982, into January of 1983. Taking the time lag into account, more rapid money growth could be expected to begin in the fourth quarter of 1982 and continue into the second quarter of 1983. Then money growth should have slackened as the effect of falling interest rates wore off. The modest rise in rates over the remainder of 1983 would also have tended to depress M-1 growth.

<sup>12</sup>See Flint Brayton, Terry Farr, and Richard Porter, "Alternative Money Demand Specifications and Recent Growth in M-1"; Washington, D.C. Board of Governors of the Federal Reserve System, Division of Research and Statistics, Econometric and Computer Applications Section (May 1983); John P. Judd and Rose McElhattan, "The Behavior of Money and The Economy in 1982-83"; Federal Reserve Bank of San Francisco *Economic Review* (Summer 1983).

If interest rates in 1982-83 cannot satisfactorily explain the behavior of the money supply, the alternative is, naturally, that the large swing in M-1 growth was due to shifts in the demand for money. In particular, extraordinary factors (for example, precautionary demands for liquidity on the part of households) may have shifted money demand upward in the first half of last year and downward in the second half. But such a *downward* shift—a fall in the demand for liquidity—would not seem likely to harm economic activity. Under either explanation, then, behavior of M-1 last year did not represent a fundamental market development with adverse implications for the economy.

### Conclusion

The failure of M-1 to correctly signal the economy's direction in the first half of 1984 can be related to unresolved issues in monetary policy. Of course, the extent to which monetary authorities should focus on the money supply in formulating policy has been debated for many years. The most avid proponents of the money supply argue that it should be the sole input to policy deliberations. Other analysts argue that taking account of additional economic indicators, besides the money supply, would generally lead to better policy decisions. Some Federal Open Market Committee members have acknowledged in their public remarks the usefulness of targeting monetary aggregates, but at the same time stressed that they need a broader and more flexible approach to policy making.

Our analysis lends support to the view that monetary policy should be formulated in a broad framework. The episode we examined demonstrates that focusing exclusively on just one variable, M-1 in this instance, can be misleading. Moreover, it is probably not the only such occasion in the recent past. We believe, for example, that the growth of M-1 in 1975-77 seriously understated the expansionary forces building in the economy, which contributed to the acceleration of inflation in 1978 and 1979.

But note that there are also occasions when forecasts based on a wide range of variables will not be better than a projection based exclusively on M-1. There are several reasons why an economic forecast can be far from the mark, only some of which could have been foreseen. Also note that the behavior of the monetary aggregates may provide information on the economy's course and should not be ignored. Nevertheless, we believe that, in general, weighing the import of various economic indicators will substantially reduce the risk of errors such as forecasting recession in early 1984.

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