

Research Department
Federal Reserve
Bank of
San Francisco

March 23, 1984

Anatomy of the 1981-83 Disinflation

Monetary models that rely on current and past M1 growth overpredicted inflation significantly in 1982 and 1983, while forecasting models based upon the effects of economic slack performed quite well. For 1984, a monetary model forecasts an inflation rate of 9.2 percent in the personal consumption deflator, excluding food and energy, but both a "slack" model and a consensus of professional forecasters predict inflation of 5½ to 6½ percent. Our purpose in this *Letter* is to explore in some detail why the monetarist model "broke down" in 1982.

Economic slack and monetary growth

Economic slack models stress that high monetary growth boosts inflation only if it raises real aggregate demand enough to lower the rate of unemployment and thereby put upward pressure on wages and prices. In the past, monetary models have tended to capture the short-run association between monetary growth and economic slack, but beginning in 1982, the monetary model overpredicted inflation badly. Evidently, the increase in economic slack in late 1981 and 1982 was larger than could have been predicted solely on the basis of the past slowing in monetary growth.

The proximate reason for why monetary models broke down in 1982 was the unusual decline in the income velocity of money or, in other words, its rate of turnover. Between the fourth quarter of 1981 and the first quarter of 1983, the income velocity of M1 declined at a 5.5-percent annual rate in contrast to its long-term positive growth trend of 3 percent. What caused this decline in velocity? One reason was the sharp drop in the inflation rate, and nominal interest rates along with it, that occurred between 1981 and 1982. This changed the relationship between monetary growth and aggregate demand. At lower interest rates, the public will want to hold

more money balances relative to its income because the return on securities becomes less attractive. Therefore, the income velocity of M1 will fall.

However, this well-established positive relationship between interest rates and velocity cannot fully explain the failure of monetarist models to account for the recent drop in inflation. If the drop in inflation and nominal interest rates were the only explanation of the sharp decline in velocity, then the decline in velocity cannot be used to explain the large decline in inflation, or else the reasoning becomes circular.

In fact, monetarist equations already capture the changes in velocity caused by lower or higher inflation, making the estimated response of inflation to changes in past monetary growth greater than one-to-one over any but the longest periods. Therefore, some non-monetary shock must have produced a larger amount of economic slack—and therefore larger declines in inflation, nominal interest rates, and velocity—than could have been predicted on the basis of the past deceleration in monetary growth. The main source of this shock lay in the foreign trade sector.

Net exports and the exchange rate

An extraordinary decline in net exports of \$25.3 billion (in 1972 dollars), plus simultaneous inventory adjustments, accounted for all of the decline in U.S. production during the 1981-82 recession (see chart). Although the recession officially began in July 1981, real final sales (GNP less inventory investment) had already flattened out at the beginning of that year; they declined by \$3.6 billion (in 1972 dollars) over the two-year period. However, real final sales are augmented by export sales and reduced by imports. The underlying strength of the demand of domestic purchasers is thus equal to real final sales less net exports.

Research Department

Federal Reserve Bank of San Francisco

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.

From the beginning of 1981 to the recession trough at the end of 1982, real final sales to domestic purchasers actually increased by \$21.7 billion. Therefore, if real net exports had not declined, real final sales would have grown by \$21.7 billion; and the recession would have been much less severe or perhaps even avoided.

It is widely agreed that a sharp appreciation in the foreign exchange value of the dollar was the fundamental cause of the decline in net exports. Between 1980 and 1982, the real value of the dollar (adjusting for changes in foreign price levels relative to the U.S. price level), rose by more than 30 percent on a trade-weighted basis. The most important reason for this extremely large rise was the increase in U.S. real interest rates (nominal rates adjusted for inflation) relative to real interest rates abroad. Higher real U.S. interest rates made investment in this country attractive to foreigners, who bid up the real value of the dollar in foreign exchange markets. After a period of time, real appreciation of the dollar reduced the quantity of U.S. exports and increased the quantity of imports. Lesser, but possibly significant, additional factors strengthening the dollar have been recent changes in U.S. tax law that give more favorable treatment to capital investment in the United States and increased risk on investments in other parts of the world.

Money not the only cause

Monetarist models failed to capture the effect of a much stronger dollar in generating economic slack by reducing net exports that, in turn, contributed to the large decline in inflation. M1 growth slowed from 8.1 percent in 1978 to 7.4 and 7.2 percent in 1979 and 1980, respectively, and to 5.1 percent in 1981. Such a slowing should tend to raise real short-term interest rates, and hence the real exchange rate, temporarily by first reducing the growth of real money balances. As the price level adjusts in the long-run, however, the real stock of money, real interest rates, and the real exchange rate should return to normal.

We have estimated an econometric equation embodying the monetary model of inflation over the period from 1964 through 1980. This equation does not capture even the temporary nexus between monetary growth and the real exchange rate because, in the first place, until 1973, exchange rates were fixed under the Bretton Woods system and bore no relationship to year-to-year movements in money. Moreover, in the period between 1973 and 1980, when exchange rates between major currencies were allowed to float, a statistical test reveals that changes in the real exchange rate were not significantly related to current and past monetary growth—the influence of other factors dominated. And although a negative relationship does exist between the level of the real exchange rate and monetary growth, it fails to hold into the forecast period beyond 1980. Consequently, our monetarist equation for forecasting inflation could not have predicted the effect of the sharp rise in the real exchange rate that actually occurred.

While the slowing in nominal monetary growth that occurred prior to 1982 contributed to a temporary increase in real interest rates (real M1 declined by over 4 percent a year between 1979 and 1981) that made the dollar so strong, it is only one of the contributing factors. The reduction in the growth of nominal M1 accounted for less than half of the reduction in real M1 growth during this period. The dominant influence on real M1 was an acceleration of inflation, strongly fueled by shocks from food and energy prices.

More importantly, the strength of the effect of higher real short-term interest rates on the real exchange rate depends upon how long high real rates are expected to last, or, equivalently, whether they are transmitted to real long-term interest rates. If a real interest rate differential on a 1-year bond of 3 percentage points in favor of the United States is expected to last for a year, it could boost the real exchange rate above its long-

run value by only 3 percent. That is, the expected return of the exchange rate to its long-run value would just offset the extra yield on the bond. But if this differential were anticipated to last for 10 years, the real exchange rate should rise by 30 percent.

Two readily identifiable factors contributed to market expectations that high real short-term interest rates would last for some time. First, because the Administration supported the Federal Reserve's efforts to reduce the rate of monetary growth, international investors renewed their confidence in the ability of the United States to pursue a course of stable monetary policy. Such a policy reduces the likelihood that real interest rates could be temporarily depressed by excessive monetary stimulation in the future. Second, after passage of the Economic Recovery Tax Act in the Summer of 1981, it soon became clear that the structural, or cyclically adjusted, federal budget deficit would grow very substantially in the future. The demand of the federal government for credit would therefore be expected to keep future real short-term interest rates high.

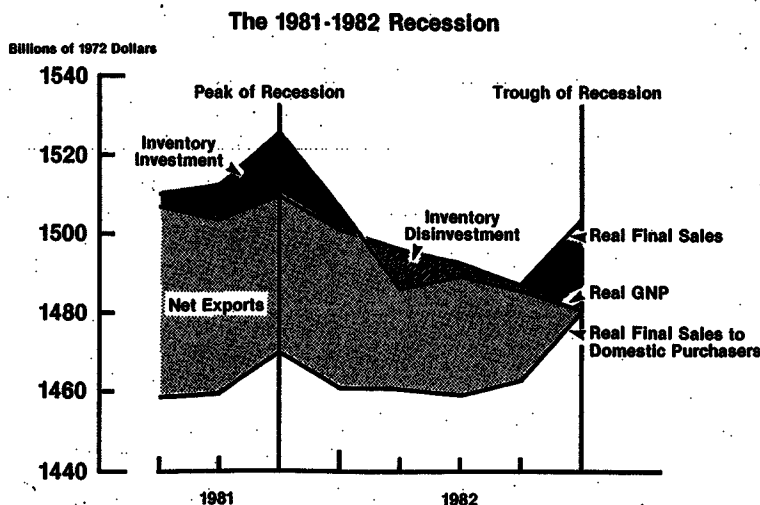
Conclusion

The solution to the puzzle of why monetarist equations for forecasting inflation have broken down recently lies in the foreign

trade sector. During the 1981-82 recession, the drop in real final demand was led by a drop in real net exports. Slower monetary growth contributed in expected degree to weakness in such sectors as consumer durables, housing, and business fixed investment. But the evidence indicates that an appreciation in the real foreign exchange value of the dollar, which was the key factor in the sharp drop of net exports, could not have been accurately predicted from the previous slowing in monetary growth. The most important influence on the real exchange rate was the expectation of continued high real interest rates created by renewed international confidence in U.S. monetary stability and by the anticipation of large federal budget deficits.

The decline in net exports contributed greatly to the increase in economic slack that was mainly responsible for the subsequent drop in inflation. The reduction in real aggregate demand caused by the drop in net exports helped to produce a decline in the income velocity of M1, at first directly, and later indirectly as less inflation led to lower nominal interest rates. Because of this quite independent effect of net exports upon aggregate demand and economic slack, the decline in inflation was considerably greater than predicted by monetarist forecasting equations.

Adrian W. Throop



FIRST CLASS

Alaska • Nevada • Oregon • Utah • Washington
Idaho • Arizona • California • Hawaii

San Francisco Bank of Federal Reserve Research Department

PRESORTED
FIRST CLASS MAIL
U.S. POSTAGE PAID
PERMIT NO. 752
San Francisco, Calif.

BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT

(Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding 3/7/84	Change from 2/29/84	Change from year ago	
			Dollar	Percent
Loans, Leases and Investments ^{1 2}	176,691	-1,010	666	1.7
Loans and Leases ^{1 6}	156,418	- 993	1,063	3.1
Commercial and Industrial	46,636	373	673	6.7
Real estate	59,276	46	377	2.9
Loans to Individuals	26,947	- 2	296	5.1
Leases	5,011	5	50	- 4.6
U.S. Treasury and Agency Securities ²	12,184	- 3	322	- 11.8
Other Securities ²	8,088	- 13	75	- 4.2
Total Deposits	185,698	- 295	5,298	- 12.7
Demand Deposits	43,364	- 872	5,872	- 54.4
Demand Deposits Adjusted ³	29,102	403	2,229	- 32.5
Other Transaction Balances ⁴	12,467	462	307	- 11.0
Total Non-Transaction Balances ⁶	129,867	114	882	3.1
Money Market Deposit Accounts—Total	40,524	151	927	10.7
Time Deposits in Amounts of \$100,000 or more	37,971	- 113	193	- 2.3
Other Liabilities for Borrowed Money ⁵	19,327	- 894	3,679	- 73.0
Weekly Averages of Daily Figures	Week ended 3/7/84	Week ended 2/29/84	Comparable year-ago period	
Reserve Position, All Reporting Banks				
Excess Reserves (+)/Deficiency (-)	NA	NA	NA	
Borrowings	NA	NA	NA	
Net free reserves (+)/Net borrowed (-)	NA	NA	NA	

¹ Includes loss reserves, unearned income, excludes interbank loans

² Excludes trading account securities

³ Excludes U.S. government and depository institution deposits and cash items

⁴ ATS, NOW, Super NOW and savings accounts with telephone transfers

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

⁶ Includes items not shown separately

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 Section, Federal Reserve Bank of San Francisco, P.O. Box 7702, San Francisco 94120. Phone (415) 974-2246.