Monetary Trends

(\sigma_0, \sigma_1, a_0(\bar{a})) \approx 400, \text{ where } \bar{y} \text{ is the log of real GDP}. The 40-year moving average of base velocity growth is calculated similarly. To adjust the monetary base for the effect of retail-deposit swap programs, we add to the monetary base an amount equal to 10 percent of the total amount swept, as estimated by the Federal Reserve Board staff. These estimates are imperfect, at best. Sweep program data are found at research.stlouisfed.org/historical.

Page 11: Implied One-Year Forward Rates are calculated by this Bank from Treasury constant maturity yields. Yields to maturity, R(t), for securities with m ≥ 1 :... 10 years to maturity are obtained by linear interpolation between reported yields. These yields are smoothed by fitting the regression suggested by Nelson and Siegel (1987), with one deterministic forward rate.

Page 12: Repository yields are calculated from yields smoothed using equation (a) in table 13.1 of Shiller (1990),

\[ R(t) = a_0 + a_1 t + \frac{a_2}{2} t^2 \ln(1 + t) \]


References


Note: Available on the Internet at research.stlouisfed.org/pubs/review/

Another Conundrum?

In 2004, former Federal Reserve Chairman Alan Greenspan expressed surprise that long-term nominal interest rates (e.g., 30-year conventional, fixed mortgage rates) failed to increase as the Federal Open Market Committee (FOMC) increased its federal funds interest rate target. Greenspan and others dubbed this a "conundrum." Today, a different type of financial market conundrum may have arisen. Why, with a high and rising overall U.S. and global inflation rate, has the nominal yield on the 10-year U.S. Treasury security remained below 4 percent for most of the past year?

Long-term Treasury yields often are viewed as a key barometer of inflation pressures. This rationale stems from the Fisher equation, which holds that the nominal yield is the sum of the real yield and a premium to compensate bondholders for inflation and the risk of higher inflation. Accordingly, a rise in 10-year Treasury yields, without a concomitant increase in the federal funds rate, often is attributed to the market's expectation of increased long-term inflation.

The U.S. economy has experienced significant price pressures lately—mostly from the effects of large oil, gasoline, and commodity price increases. A sizable decline in the U.S. dollar has also helped to boost prices of nonperishable imported goods. The overall effect has been a 4.1 percent annual increase in CPI for 2017 (its highest rate in 17 years) and a 6.2 percent increase in the year to July 2008.

Producers seem to be increasingly able to pass along higher input price increases to offset their shrinking profit margins. The "core" CPI (less food and energy), after averaging 2.3 percent from 2005 to 2007, has increased at a 3.5 percent annual rate over the three months ending in July 2008, which makes it the relatively low level and volatility of the 10-year U.S. Treasury rate even more puzzling.

The chart plots the nominal yield on the 10-year U.S. Treasury security and the FOMC's federal funds target rate, the year-to-year percent change in the CPI, and the University of Michigan's survey of consumers' expectations for inflation over the next 5 to 10 years. Over the past year, the FOMC has aggressively reduced the federal funds target rate against the backdrop of a rapid acceleration in the overall inflation rate. The result is a real federal funds rate of -3.5 percent and the lowest the 10-year Treasury yield has declined. After the slight increase in consumers' inflation expectations from April to June, 2008, expectations have partially reversed.

Why have financial market participants and consumers been so sanguine in the face of these price pressures? First, financial markets may have a "Phillips curve" view of the world—that is, markets may expect much weaker output growth for the rest of 2008 and into 2009 that will dampen inflation pressures. This effect also will tend to reduce the real yield component, so it could have no net effect on expected inflation. Second, the recent decline in energy and commodity prices suggests that the previous price increases were temporary, which may lead to lower overall inflation and, perhaps, eventually eliminate the second-round effects. Some FOMC members favor this view.

Finally, and perhaps most significantly, financial markets and consumers may believe that the long-term inflation rate is significantly lower than the current inflation rate. The implication is that a failure of the current inflation rate to moderate will be aggressively countered by the FOMC to avoid an increase in long-run inflation expectations. However, should the markets lose confidence in the FOMC, the nominal long-term interest rate would likely rise markedly.

—Kevin L. Kliesen

1 Inflation expectations of consumers over the following 12 months rate considerably higher, reaching 5.25 percent in June 2008.
Definitions

M1: The sum of currency held outside the vaults of depository institutions, Federal Reserve Banks, and the U.S. Treasury; travelers checks; and demand and other checkable deposits issued by financial institutions (except demand deposits due to the Treasury and depository institutions); minus cash items in process of collection and Federal Reserve float.

M2 (money, zero maturity): M2 minus small-denomination time deposits, plus institutional money market mutual funds (that is, those included in M3 but excluded from M2). The label M2z was coined by William Poole (1991); the aggregate itself was proposed earlier by Morley (1988).

M3: M2 plus savings deposits (including money market deposit accounts) and small-denomination ($100,000 or more) time deposits issued by depository institutions; and shares in retail money market mutual funds (with initial investments under $50,000), net of retirement accounts.

M3: M2 plus large-denomination ($100,000 or more) time deposits; repurchase agreements issued by depository institutions; Eurodollar deposits, specifically, dollar-denominated deposits due to nonbank U.S. addresses held at foreign offices of U.S. banks worldwide and all banking offices in Canada and the United Kingdom; and institutional money market mutual funds (with initial investments of $50,000 or more).

Bank Credit: All loans, leases, and securities held by commercial banks.

Domestic Nonfinancial Debt: Total credit market liabilities of the U.S. Treasury, federally sponsored agencies, state and local governments, households, and nonprofit institutions.

Adjusted Monetary Base: The sum of currency in circulation outside Federal Reserve Banks and the U.S. Treasury; deposits of depository financial institutions at Federal Reserve Banks; and an adjustment for the effects of changes in monetary reserve requirements on the quantity of base money held by depository institutions. This series is a spliced chain index; see Anderson and Rasche (1996a, 2001, 2003).

Adjusted Reserves: The sum of cash and Federal Reserve Bank deposits held by nonbank institutions and an adjustment for the effects of changes in statutory reserve requirements on the quantity of base money held by depository institutions. This spliced chain index is numerically larger than the Board of Governors' measure, which excludes vault cash held not used to satisfy statutory reserve requirements and Federal Reserve Bank deposits used to satisfy required reserve requirements. See Anderson and Rasche (1996a, 2001, 2003).

Monetary Services Index: An index that measures the flow of monetary services received by households and firms from their holdings of liquid assets; see Anderson, Jones, and Neumark (1997). Indexes are shown for the assets included in M2, with additional data at research.st.louisfed.org/mis/index.html.

Note: M1, M2, M3, Bank Credit, and Domestic Nonfinancial Debt are constructed and published by the Board of Governors of the Federal Reserve System. For details, see Statistical Supplement to the Federal Reserve Bulletin, tables 1.21 and 1.26. M2M, Adjacently Monitored, Adjacent Reserves, and Monetary Services Index are constructed and published by the Research Division of the Federal Reserve Bank of St. Louis.

Notes

Page 3: The data are from the Federal Reserve Bulletin, the Board of Governors of the Federal Reserve System, and the St. Louis Fed. The data are available at https://research.stlouisfed.org/fred2.

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<th>Year</th>
<th>M1</th>
<th>MZM</th>
<th>M2</th>
<th>M3*</th>
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<tbody>
<tr>
<td>2003</td>
<td>6.46</td>
<td>7.41</td>
<td>6.99</td>
<td>6.40</td>
</tr>
<tr>
<td>2004</td>
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<td>2005</td>
<td>2.03</td>
<td>2.23</td>
<td>4.45</td>
<td>5.97</td>
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<td>2006</td>
<td>0.19</td>
<td>4.07</td>
<td>4.79</td>
<td>4.95</td>
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<td>2007</td>
<td>-0.38</td>
<td>9.18</td>
<td>5.91</td>
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**Percent change at an annual rate**

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<tr>
<th>Year</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
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<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
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</thead>
<tbody>
<tr>
<td>2006</td>
<td>1.98</td>
<td>4.69</td>
<td>5.44</td>
<td>2.06</td>
<td>3.22</td>
<td>3.69</td>
<td>4.10</td>
<td>7.70</td>
<td>6.58</td>
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<td>10.80</td>
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**Adjusted Monetary Base**

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<tr>
<th>Month</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
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<th>Sep</th>
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</thead>
<tbody>
<tr>
<td>2006</td>
<td>3.73</td>
<td>3.61</td>
<td>3.61</td>
<td>4.08</td>
<td>5.33</td>
<td>5.43</td>
<td>4.62</td>
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<td>2007</td>
<td>3.56</td>
<td>3.45</td>
<td>3.45</td>
<td>2.74</td>
<td>3.97</td>
<td>5.03</td>
<td>4.26</td>
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**Reserve Market Rates**

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<th>Month</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
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<tbody>
<tr>
<td>2008</td>
<td>13.44</td>
<td>8.00</td>
<td>17.00</td>
<td>12.40</td>
<td>2.39</td>
<td>1.31</td>
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*See table of contents for changes to the series.
Monetary Trends

MZM and M1
Percent change from year ago

M2
Percent change from year ago

M3*
Percent change from year ago

Monetary Services Index - M2**
Percent change from year ago

*See table of contents for changes to the series.

**We will not update the M3I series until we revise the code to accomodate the discontinuation of M3.

Research Division
Federal Reserve Bank of St. Louis
### Money Stock

<table>
<thead>
<tr>
<th>Year</th>
<th>M1</th>
<th>M2M</th>
<th>M2</th>
<th>M3*</th>
<th>Bank Credit</th>
<th>Adjusted Monetary Base</th>
<th>Reserves</th>
<th>MSI M2**</th>
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<td>2003</td>
<td>1273.484</td>
<td>6327.288</td>
<td>5984.489</td>
<td>8747.561</td>
<td>6118.379</td>
<td>740 938</td>
<td>93.325</td>
<td>315.192</td>
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<td>2004</td>
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<td>6779.720</td>
<td>6266.961</td>
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<td>2005</td>
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<td>7325.614</td>
<td>6645.752</td>
<td>10006.477</td>
<td>7245.165</td>
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<td>6859.317</td>
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<td>7857.063</td>
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<td>2007</td>
<td>1365.124</td>
<td>7641.525</td>
<td>7254.434</td>
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<td>8743.016</td>
<td>850 673</td>
<td>94.328</td>
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#### Adjusted Monetary Base

**Percent change from year ago**

#### Domestic Nonfinancial Debt

**Percent change from year ago**

#### Currency Held by the Nonbank Public

**Percent change from year ago**

#### Time Deposits*

**Percent change from year ago**

#### Checkable and Savings Deposits

**Percent change from year ago**

#### Money Market Mutual Fund Shares

**Percent change from year ago**

### Note

All values are given in billions of dollars. *See table of contents for changes to the series.

**We will not update the M3 series until we revise the code to accommodate the discontinuation of M3.**
M1
Percent change at an annual rate

MZM
Percent change at an annual rate

M2
Percent change at an annual rate

M3*
Percent change at an annual rate

Recent Inflation and Long-Term Interest Rates

Inflation and Long-Term Interest Rate Differentials
CPI Inflation and 1-Year-Ahead CPI Inflation Expectations

The shaded region shows the Humphrey-Hawkins CPI inflation range. Beginning in January 2000, the Humphrey-Hawkins inflation range was reported using the PCE price index and therefore is not shown on this graph.

10-Year Ahead PCE Inflation Expectations and Realized Inflation

Dashed lines indicate 10-year moving averages.

Gross Domestic Product

Dashed lines indicate 10-year moving averages.

Real Gross Domestic Product

Gross Domestic Product Price Index

Dashed lines indicate 10-year moving averages.

Treasury Security Yield Spreads

Real Interest Rates

Dashed lines indicate 10-year moving averages.

M2

Dashed lines indicate 10-year moving averages.