The Freddie Mac Primary Mortgage Market Survey indicates that the interest rate on commitments for 30-year fixed-rate mortgages declined from a peak of 8.52 percent in May 2000 to 5.23 percent in June 2003 (Figure 1). A sharp decline in interest rates typically leads to increased demand for mortgage originations: First, potential homeowners seek to take advantage of the low rate to purchase a home. Second, existing mortgage holders are keen to refinance their mortgages at the lower interest rate. Mortgage lenders were able to meet this increased demand because of a low cost of funds during this time period, thereby resulting in a steady increase in total mortgage originations. According to the Mortgage Bankers Association, the dollar value of total mortgage originations for 1- to 4-family homes steadily increased from $238 billion in 2000:Q1 to roughly $1,200 billion in 2003:Q3 (Figure 1).

If this growth in originations reflects the decline in the interest rate, then mortgage originations might be expected to decline when the contract rate increases. Indeed, mortgage originations did decline when contract rates rose after 2003. However, as Figure 1 shows, the level of originations continued to remain higher on average than pre-2003 levels. Why? Two reasons: First, interest rates in the post-2003 period remain below the high levels attained in the pre-2003 era. Second, there was a change in the composition of originations, with substantial growth in the nonprime segment affecting the overall market.

Figure 2 shows the breakdown of mortgage originations by market segment. Prime mortgages include loans securitized by an “agency”—namely, Freddie Mac, Fannie Mae, and Ginnie Mae. Jumbo loans are prime mortgages but are for amounts exceeding agency-conforming limits. Nonprime mortgages include both subprime and Alt-A markets. Subprime mortgages generally include loans to borrowers with incomplete or impaired credit histories, while Alt-A mortgages include loans to borrowers who usually have high credit scores but are unable or unwilling to document a stable income history or are buying second homes or properties for investment purposes.1 Figure 2 shows that an increase in agency mortgages is the major factor behind the growth in total mortgage originations between 2000 and 2003. However, prime originations declined sharply after 2003. The growth of originations after 2003 was sustained by the subprime and Alt-A segments of the mortgage market.

—Rajdeep Sengupta and Yu Man Tam


Views expressed do not necessarily reflect official positions of the Federal Reserve System.
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3 Monetary and Financial Indicators at a Glance
4 Monetary Aggregates and Their Components
6 Monetary Aggregates: Monthly Growth
7 Reserves Markets and Short-Term Credit Flows
8 Measures of Expected Inflation
9 Interest Rates
10 Policy-Based Inflation Indicators
11 Implied Forward Rates, Futures Contracts, and Inflation-Indexed Securities
12 Velocity, Gross Domestic Product, and M2
14 Bank Credit
15 Stock Market Index and Foreign Inflation and Interest Rates
16 Reference Tables
18 Definitions, Notes, and Sources

Conventions used in this publication:

1. Unless otherwise indicated, data are monthly.
2. Shaded areas indicate recessions, as determined by the National Bureau of Economic Research.
3. Percent change at an annual rate is the simple, not compounded, monthly percent change multiplied by 12. For example, using consecutive months, the percent change at an annual rate in x between month \( t-1 \) and the current month \( t \) is: \( \left( \frac{x_t}{x_{t-1}} - 1 \right) \times 1200 \). Note that this differs from National Economic Trends. In that publication, monthly percent changes are compounded and expressed as annual growth rates.
4. The percent change from year ago refers to the percent change from the same period in the previous year. For example, the percent change from year ago in x between month \( t-12 \) and the current month \( t \) is: \( \left( \frac{x_t}{x_{t-12}} - 1 \right) \times 100 \).

We welcome your comments addressed to:

Editor, Monetary Trends
Research Division
Federal Reserve Bank of St. Louis
P.O. Box 442
St. Louis, MO 63166-0442

or to:

stlsFRED@stls.frb.org

On March 23, 2006, the Board of Governors of the Federal Reserve System ceased the publication of the M3 monetary aggregate. It also ceased publishing the following components: large-denomination time deposits, RPs, and eurodollars.
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 MSI series until we revise the code to accommodate the discontinuation of M3.
Percent change at an annual rate

**M1**

- Actual values for September and October 2001 are 55.87 and -38.35 percent rate, respectively.

**MZM**

- Actual value for September 2001 is 39.41 percent rate.

**M2**

- Actual value for September 2001 is 24.90 percent rate.

**M3**

- See table of contents for changes to the series.

*Research Division*

*Federal Reserve Bank of St. Louis*
Adjusted and Required Reserves

Billions of dollars

Total Borrowings, nsa

Billions of dollars

Excess Reserves plus RCB Contracts

Billions of dollars

Nonfinancial Commercial Paper

Percent change from year ago

Consumer Credit

Percent change from year ago

As of April 10, 2006, the Federal Reserve Board made major changes to its commercial paper calculations. For more information, please refer to http://www.federalreserve.gov/releases/cp/about.htm.

*Actual value for September 2001 is $26.43 billion.

* Total borrowings include loans to depository institutions for primary, secondary, seasonal credit, primary dealer credit facility, and other credit extensions, but exclude term auction credit.
Inflation and 1-Year-Ahead Inflation Expectations

Percent

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. See notes on page 19.

Treasury Security Yield Spreads

Yield to maturity

The graph shows the yield to maturity for various Treasury securities:
- 10-Year less 3-Month T-Bill
- 10-Year less 3-Year Note
- 3-Year less 3-Month T-Bill

Real Interest Rates

Percent, Real rate = Nominal rate less year-over-year CPI inflation

The graph shows the real interest rates:
- 1-Year Treasury Yield
- Federal Funds Rate
Monetary Trends

Short-Term Interest Rates

Long-Term Interest Rates

Long-Term Interest Rates

Short-Term Interest Rates

FOMC Intended Federal Funds Rate, Discount Rate, and Primary Credit Rate

Data available as of June 2008.
Federal Funds Rate and Inflation Targets

Calculated federal funds rate is based on Taylor's rule. See notes on page 19.

Components of Taylor's Rule

Components of McCallum's Rule

Monetary Base Growth* and Inflation Targets

*Modified for the effects of sweeps programs on reserve demand.

Calculated base growth is based on McCallum's rule. Actual base growth is percent change from year ago. See notes on page 19.
Monetary Trends

Updated through 07/15/08

11

Research Division
Federal Reserve Bank of St. Louis

Implied One-Year Forward Rates

Week Ending:

06/13/08

07/11/08

2y 3y 5y 7y 10y

Percent

2.5

3.0

3.5

4.0

4.5

5.0

5.5

6.0

6.5

Rates on 3-Month Eurodollar Futures

Percent, daily data

05/12 05/19 05/26 06/02 06/09 06/16 06/23 06/30 07/07 07/14

Rates on Selected Federal Funds Futures Contracts

Percent, daily data

05/12 05/19 05/26 06/02 06/09 06/16 06/23 06/30 07/07 07/14

Rates on Federal Funds Futures on Selected Dates

Percent

06/13/2008 07/14/2008

Inflation-Indexed Treasury Securities

Weekly data

Note: Yields are inflation-indexed constant maturity U.S. Treasury securities

2006 2007 2008 2009

Maturity

Percent

0

1

2

3

Inflation-Indexed Treasury Yield Spreads

Weekly data

Note: Yield spread is between nominal and inflation-indexed constant maturity U.S. Treasury securities.

2006 2007 2008 2009

Horizon

Percent

0.5

1.0

1.5

2.0

3.0

3.5

4.0

Inflation-Indexed 10-Year Government Notes

Percent, weekly data

France

2004 2005 2006 2007 2008

U.K.

U.S.

Note: Yields are inflation-indexed constant maturity U.S. Treasury securities

2006 2007 2008

Horizon

Percent

0.5

1.0

1.5

2.0

3.0

3.5

4.0

Inflation-Indexed 10-Year Government Yield Spreads

Percent, weekly data

France

2004 2005 2006 2007 2008

U.K.

U.S.
Velocity
Nominal GDP/MZM, Nominal GDP/M2 (Ratio Scale)

Interest Rates
Percent

MZM Velocity and Interest Rate Spread
Ratio Scale

M2 Velocity and Interest Rate Spread
Ratio Scale

Interest Rate Spread = 3-Month T-Bill less MZM Own Rate

Interest Rate Spread = 3-Month T-Bill less M2 Own Rate
Monetary Trends

Gross Domestic Product
Percent change from year ago

Real Gross Domestic Product
Percent change from year ago

Gross Domestic Product Price Index
Percent change from year ago

M2
Percent change from year ago

Dashed lines indicate 10-year moving averages.
Monetary Trends

updated through 07/08/08

Standard & Poor's 500

Recent Inflation and Long-Term Interest Rates

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<tr>
<th>Country</th>
<th>Composite Index (left)</th>
<th>Price/Earnings Ratio (right)</th>
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<td>2007</td>
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<td>2.34</td>
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<td>0.53</td>
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<td>United Kingdom</td>
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<table>
<thead>
<tr>
<th>Country</th>
<th>Percent change from year ago</th>
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<td>United States</td>
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<td>Canada</td>
<td>2.19  2.13  2.41  1.78</td>
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<td>France</td>
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<td>Germany</td>
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<td>Italy</td>
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<td>Japan</td>
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<table>
<thead>
<tr>
<th>Country</th>
<th>Long-Term Government Bond Rates Percent change from year ago</th>
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<td>France</td>
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<td>Germany</td>
<td>3.80  4.04</td>
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<td>Italy</td>
<td>4.38  4.53</td>
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<td>United Kingdom</td>
<td>4.44  4.64  4.87  5.21</td>
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</table>

Inflation and Long-Term Interest Rate Differentials

- Inflation differential = Foreign inflation less U.S. inflation
- Long-term rate differential = Foreign rate less U.S. rate

Research Division
Federal Reserve Bank of St. Louis 15
<table>
<thead>
<tr>
<th>Year</th>
<th>M1</th>
<th>MZM</th>
<th>M2</th>
<th>M3*</th>
<th>M1</th>
<th>MZM</th>
<th>M2</th>
<th>M3*</th>
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<td>6120.355</td>
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<td>315.192</td>
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<th>Oct</th>
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Note: All values are given in billions of dollars. *See table of contents for changes to the series.
**We will not update the MS1 series until we revise the code to accommodate the discontinuation of M3.
### Monetary Trends

<table>
<thead>
<tr>
<th>Year</th>
<th>Federal Funds Rate</th>
<th>Primary Credit Rate</th>
<th>Prime Rate</th>
<th>3-mo CD Rate</th>
<th>3-mo Treasury Yield</th>
<th>3-yr Treasury Yield</th>
<th>10-yr Treasury Yield</th>
<th>Corporate Aaa Bonds Rate</th>
<th>Municipal Aaa Bonds Rate</th>
<th>Conventional Mortgage Rate</th>
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<td>2003</td>
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#### Note:
All values are given as a percent at an annual rate.
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<tr>
<td>Apr</td>
<td>-3.43</td>
<td>8.82</td>
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<td>16.47</td>
<td>3.92</td>
<td>-0.17</td>
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*See table of contents for changes to the series.
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.

MZM (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 MZM was coined by William Poole (1991); the aggregate itself was proposed earlier by Motley (1988).

M2: M1 plus savings deposits (including money market deposit accounts) and small-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 (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 (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 nonfinancial firms. End-of-period basis.

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 statutory reserve requirements on the quantity of base money held by depositories. This series is a spliced chain index; see Anderson and Rasche (1996a,b, 2001, 2003).

Adjusted Reserves: The sum of vault cash and Federal Reserve Bank deposits held by depository institutions and an adjustment for the effects of changes in statutory reserve requirements on the quantity of base money held by depositories. This spliced chain index is numerically larger than the Board of Governors’ measure, which excludes vault cash not used to satisfy statutory reserve requirements and Federal Reserve Bank deposits used to satisfy required clearing balance contracts; 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 Nesmith (1997). Indexes are shown for the assets included in M2, with additional data at research.stlouisfed.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. MZM, Adjusted Monetary Base, Adjusted Reserves, and Monetary Services Index are constructed and published by the Research Division of the Federal Reserve Bank of St. Louis.

Notes

Page 3: Readers are cautioned that, since early 1994, the level and growth of M1 have been depressed by retail sweep programs that reclassify transactions deposits (demand deposits and other checkable deposits) as savings deposits overnight, thereby reducing banks’ required reserves; see Anderson and Rasche (2001) and research.stlouisfed.org/aggrep/swdata.html. Primary Credit Rate, Discount Rate, and Intended Federal Funds Rate shown in the chart Reserve Market Rates are plotted as of the date of the change, while the Effective Federal Funds Rate is plotted as of the end of the month. Interest rates in the table are monthly averages from the Board of Governors H.15 Statistical Release. The Treasury Yield Curve and Real Treasury Yield Curve show constant maturity yields calculated by the U.S. Treasury for securities 5, 7, 10, and 20 years to maturity. Inflation-Indexed Treasury Yield Spreads are a measure of inflation compensation at those horizons, and it is simply the nominal constant maturity yield less the real constant maturity yield. Daily data and descriptions are available at research.stlouisfed.org/fred2/. See also Statistical Supplement to the Federal Reserve Bulletin, table 1.35. The 30-year constant maturity series was discontinued by the Treasury as of February 18, 2002.

Page 5: Checkable Deposits is the sum of demand and other checkable deposits. Savings Deposits is the sum of money market deposit accounts and passbook and statement savings. Time Deposits have a minimum initial maturity of 7 days. Large Time Deposits are deposits of $100,000 or more. Retail and Institutional Money Market Mutual Funds are as included in M2 and the non-M2 component of M3, respectively.

Page 7: Excess Reserves plus RCB (Required Clearing Balance) Contracts equals the amount of deposits at Federal Reserve Banks held by depository institutions but not applied to satisfy statutory reserve requirements. This measure excludes the vault cash held by depository institutions that is not applied to satisfy statutory reserve requirements. Consumer Credit includes most short- and intermediate-term credit extended to individuals. See Statistical Supplement to the Federal Reserve Bulletin, table 1.55.

Page 8: Inflation Expectations measures include the quarterly Federal Reserve Bank of Philadelphia Survey of Professional Forecasters, the monthly University of Michigan Survey Research Center’s Surveys of Consumers, and the annual Federal Open Market Committee (FOMC) range as reported to the Congress in the February testimony that accompanies the Monetary Policy Report to the Congress. Beginning February 2000, the FOMC began using the personal consumption expenditures (PCE) price index to report its inflation range; the FOMC then switched to the PCE chain-type price index excluding food and energy prices (“core”) beginning July 2004. Accordingly, neither are shown on this graph. CPI Inflation is the percentage change from a year ago in the consumer price index for all urban consumers. Real Interest Rates are ex post measures, equal to nominal rates minus year-over-year CPI inflation.

Page 9: FOMC Intended Federal Funds Rate is the level (or midpoint of the range, if applicable) of the federal funds rate that the staff of the FOMC expected to be consistent with the desired degree of pressure on bank reserve positions. In recent years, the FOMC has set an explicit target for the federal funds rate.

Page 10: Federal Funds Rate and Inflation Targets shows the observed federal funds rate, quarterly, and the level of the funds rate implied by applying Taylor’s (1993) equation to five alternative target inflation rates, $\pi = 0, 1, 2, 3, 4$ percent, where $f_{t-1}$ is the implied federal funds rate, $\pi_{t-1}$ is the previous period’s inflation rate (PCE) measured on a year-over-year basis, $\gamma$ is the log of the previous period’s level of real gross domestic product (GDP), and $\gamma_{t-1}$ is the log of an estimate of the previous period’s level of potential output. Potential Real GDP is as estimated by the Congressional Budget Office.

Monetary Base Growth and Inflation Targets shows the quarterly growth of the adjusted monetary base (modified to include an estimate of the effect of sweep programs) implied by applying McCallum’s (1988, 1993) equation to five alternative target inflation rates, $\pi = 0, 1, 2, 3, 4$ percent, where $\Omega MB_t^*$ is the implied growth rate of the adjusted monetary base. The 10-year moving average growth of real GDP for a quarter $t$ is calculated as the average quarterly growth during the previous 40 quarters, at an annual rate, by the formula $(\gamma_t - \gamma_{t-40})/40$, where $\gamma_t$ is the log of real GDP. The 4-year moving average of base velocity growth is calculated similarly. To adjust the monetary base for the effect of retail-deposit sweep 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 imprecise, at best. Sweep program data are found at research.stlouisfed.org/aggrep/swdata.html.
Monetary Trends

Page 11: Implied One-Year Forward Rates are calculated by this Bank from Treasury constant maturity yields. Yields to maturity, \( R(m) \), for securities with \( m = 1, \ldots, 10 \) 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),

\[
R(m) = a_0 + (a_1 + a_2)(1 - e^{-m/(50)})/(m/50) - a_2 - e^{-m/(50)},
\]

and forward rates are calculated from these smoothed yields using equation (a) in table 13.1 of Shiller (1990),

\[
f(m) = [(D(m)R(m) - D(m-1)) / [D(m) - D(m-1)]],
\]

where duration is approximated as \( D(m) = (1 - e^{-m/(50)})/mR(m) \). These rates are linear approximations to the true instantaneous forward rates; see Shiller (1990). For a discussion of the use of forward rates as indicators of inflation expectations, see Sharpe (1997). Rates on 3-Month Eurodollar Futures and Rates on Selected Federal Funds Futures Contracts trace through time the yield on three specific contracts. Rates on Federal Funds Futures on Selected Dates displays a single day’s snapshot of yields for contracts expiring in the months shown on the horizontal axis. Inflation-Indexed Treasury Securities and Yield Spreads are those plotted on page 3. Inflation-Indexed 10-Year Government Notes shows the yield of an inflation-indexed note that is scheduled to mature in approximately (but not greater than) 10 years. The current French note has a maturity date of 7/25/2015, the current U.K. note has a maturity date of 8/16/2013, and the current U.S. note has a maturity date of 1/15/2018. Inflation-Indexed Treasury Yield Spreads and Inflation-Indexed 10-Year Government Yield Spreads equal the difference between the yields on the most recently issued inflation-indexed securities and the unadjusted security yields of similar maturity.

Page 12: Velocity (for MZM and M2) equals the ratio of GDP, measured in current dollars, to the level of the monetary aggregate. MZM and M2 Own Rates are weighted averages of the rates received by households and firms on the assets included in the aggregates. Prior to 1982, the 3-month T-bill rates are secondary market yields. From 1982 forward, rates are 3-month constant maturity yields.

Page 13: Real Gross Domestic Product is GDP as measured in chained 2000 dollars. The Gross Domestic Product Price Index is the implicit price deflator for GDP, which is defined by the Bureau of Economic Analysis. U.S. Department of Commerce, as the ratio of GDP measured in current dollars to GDP measured in chained 2000 dollars.

Page 14: Investment Securities are all securities held by commercial banks in both investment and trading accounts.

Page 15: Inflation Rate Differentials are the differences between the foreign consumer price inflation rates and year-over-year changes in the U.S. all-items Consumer Price Index.

Page 17: Treasury Yields are Treasury constant maturities as reported in the Board of Governors of the Federal Reserve System’s H.15 release.

Sources

**Agence France Trésor**: French note yields.

**Bank of Canada**: Canadian note yields.


**Bureau of Economic Analysis**: GDP.

**Bureau of Labor Statistics**: CPI.

**Chicago Board of Trade**: Federal funds futures contract.

**Chicago Mercantile Exchange**: Eurodollar futures.

**Congressional Budget Office**: Potential real GDP.

**Federal Reserve Bank of Philadelphia**: Survey of Professional Forecasters inflation expectations.

**Federal Reserve Bank of St. Louis**: Adjusted monetary base and adjusted reserves, monetary services index, MZM own rate, one-year forward rates.

**Organization for Economic Cooperation and Development**: International interest and inflation rates.

**Standard & Poor’s**: Stock price-earnings ratio, stock price composite index.

**University of Michigan Survey Research Center**: Median expected price change.

**U.S. Department of the Treasury**: U.S. security yields.

References


*Available on the Internet at research.stlouisfed.org/publications/review/.