Monetary Trends

May 2003

# Replacement Windows: New Credit Programs at the Discount Window

The Federal Reserve lends directly to commercial banks and other depository institutions (hereafter "banks") through its discount window. Such lending helps ensure adequate liquidity in the banking system and serves as a backup source of short-term funding for banks. On January 9, 2003, the Federal Reserve introduced new lending programs designed to better accomplish these functions. The Fed replaced its previous programs, "adjustment" and "extended" credit, with "primary" and "secondary" credit programs. (The "seasonal" credit program remains unchanged.) The new programs differ from their predecessors in several respects, the most significant of which are (i) that the interest rates charged for primary and secondary credit are set above the prevailing rate for federal funds and (ii) that banks ordinarily face few, if any, restrictions on their use of primary credit.[1]

Traditionally, the Fed's discount rate was set below the market rate for federal funds. The volume of outstanding discount loans was ordinarily small, however, because the Federal Reserve prohibited banks from using discount window loans to finance sales of federal funds or for otherwise expanding their assets. Banks also were thought to be reluctant to borrow from the discount window because of a stigma associated with such borrowing. The chart shows the levels of the discount rate and market federal funds rate, as well as discount window borrowing as a percentage of total reserves, for 1987-2002. Except for a brief surge in borrowing after September 11, 2001, discount loans rarely exceeded 1 percent of total banking system reserves in these years, even though the discount rate was almost always less than the funds rate.

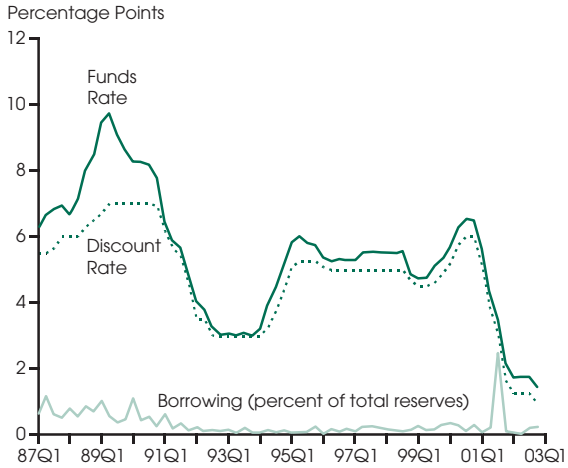
In contrast to adjustment and extended credit, primary credit may be used for any purpose, including financing the sale of federal funds, and banks are no longer required to seek funds from alternative sources before requesting a discount window loan. Primary credit, however, is available only to sound banks—generally those with adequate capital and supervisory ratings for safety and soundness (i.e., CAMELS composite ratings of 1, 2, or 3). Secondary credit is intended for banks that are not eligible for primary credit, and may not be used to fund an expansion of a bank's assets.

The primary credit lending rate is set above the Federal Open Market Committee's target federal funds rate, and the secondary credit rate is set above the primary credit rate. Thus, the discount window should serve only as a backup source of funds for banks, as sound banks ordinarily will choose to obtain short-term funds less expensively from the federal funds market or other market sources. Indeed, the primary credit rate is expected to cap the market funds rate. By introducing a separate lending program for sound banks and imposing few restrictions on the use of primary credit, however, the Fed has likely minimized banks' reluctance to borrow from the discount window. Hence, the new credit programs are expected to ensure that funding is readily available at the primary credit rate in the event of a temporary shortage of liquidity in the banking system.

—David C. Wheelock

[1]For additional details about the programs, see <http://www.frbdiscountwindow.org>.

**Federal Funds Rate, Discount Rate, and Discount Window Borrowing**
Quarterly Averages, 1987-2002




*Views expressed do not necessarily reflect official positions of the Federal Reserve System.*

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## Conventions used in this publication:

1. Unless otherwise indicated, data are monthly.
2. Except where otherwise noted, solid shading indicates recessions, as determined by the National Bureau of Economic Research. The NBER has not yet determined the end of the recession that began in March 2001; however, the hatched shading indicates this recession ended in November 2001, as determined by a statistical model for dating business cycle turning points developed by Marcelle Chauvet ("An Econometric Characterization of Business Cycle Dynamics with Factor Structure and Regime Switching," *International Economic Review*, November 1998, pp. 969-96) and discussed by Marcelle Chauvet and Jeremy Piger ("Identifying Business Cycle Turning Points in Real Time," Federal Reserve Bank of St. Louis *Review*, March/April 2003, pp. 47-62).
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: $[(x_t/x_{t-1})-1]\times 1200$. 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: $[(x_t/x_{t-12})-1]\times 100$.

We welcome your comments addressed to:


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Beginning this issue, MZM and M2 velocities reported on page 12 are plotted on a ratio scale.


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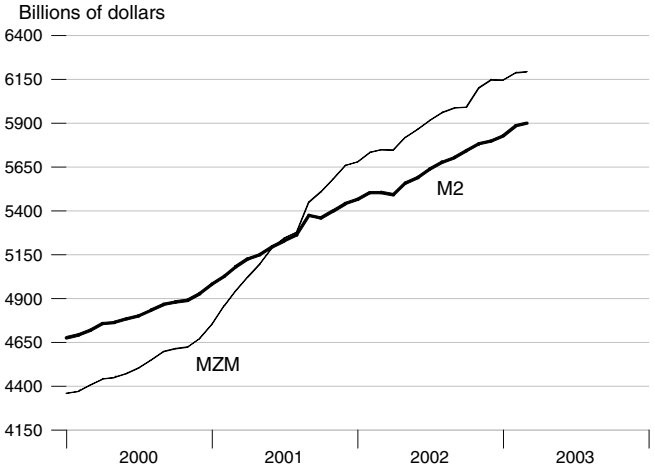
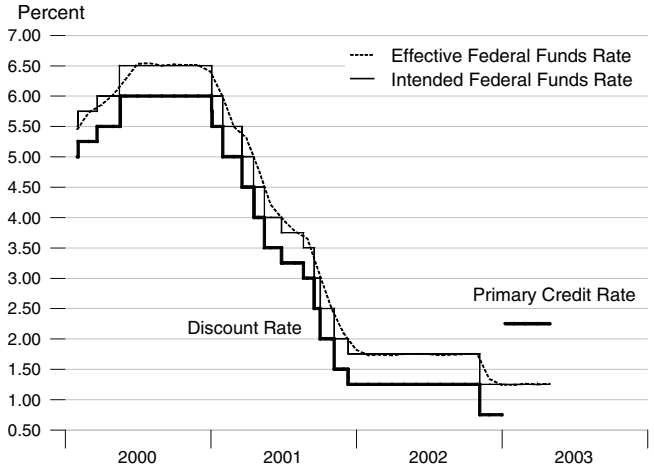
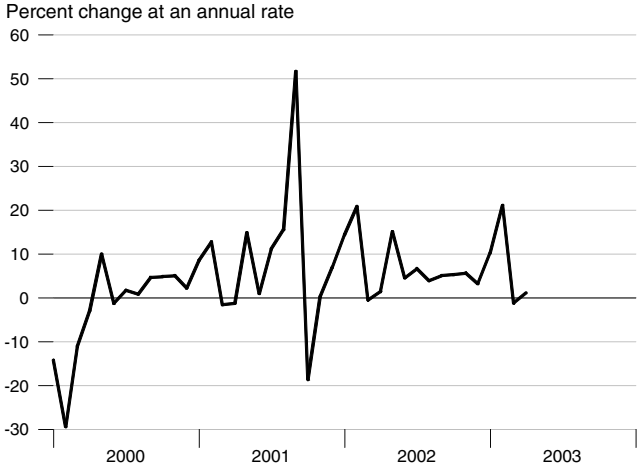
## M2 and MZM



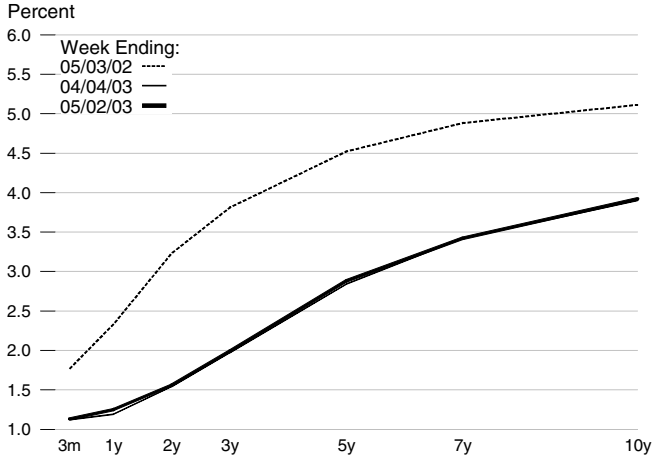

## Reserve Market Rates



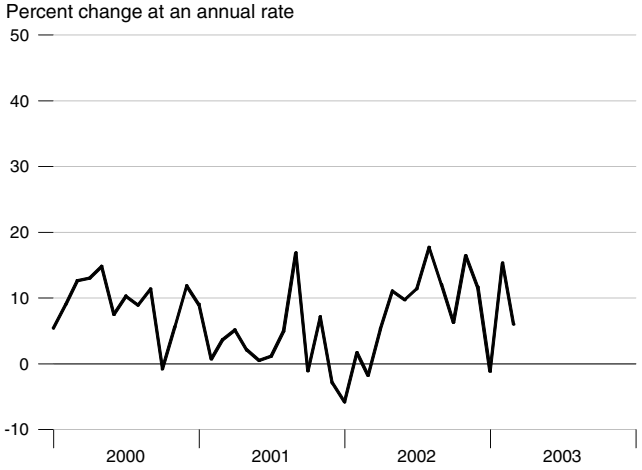

## Adjusted Monetary Base




## Treasury Yield Curve




## Total Bank Credit




## Interest Rates

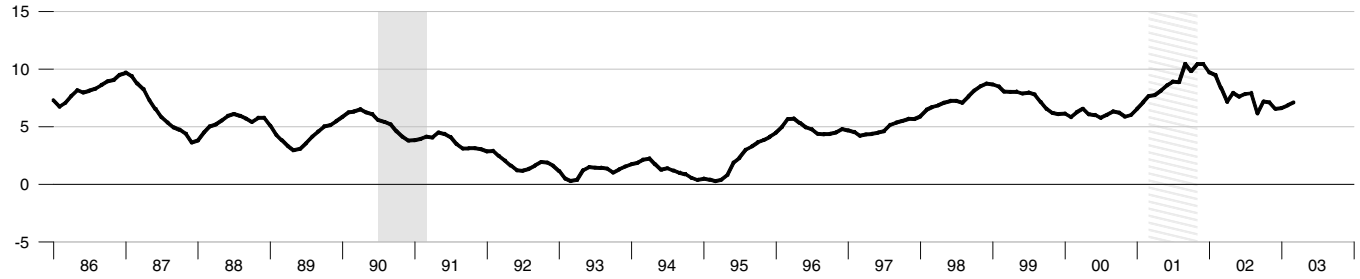
| | Feb 03 | Mar 03 | Apr 03 |
|---|---|---|---|
| Federal Funds Rate | 1.26 | 1.25 | 1.26 |
| Prime Rate | 4.25 | 4.25 | 4.25 |
| Primary Credit Rate | 2.25 | 2.25 | 2.25 |
| Conventional Mortgage Rate | 5.84 | 5.75 | 5.81 |
| **Treasury Yields:** | | | |
| 3-Month Constant Maturity | 1.19 | 1.15 | 1.15 |
| 6-Month Constant Maturity | 1.20 | 1.16 | 1.17 |
| 1-Year Constant Maturity | 1.30 | 1.24 | 1.27 |
| 3-Year Constant Maturity | 2.05 | 1.98 | 2.06 |
| 5-Year Constant Maturity | 2.90 | 2.78 | 2.93 |
| 10-Year Constant Maturity | 3.90 | 3.81 | 3.96 |

## MZM and M1

Percent change from year ago

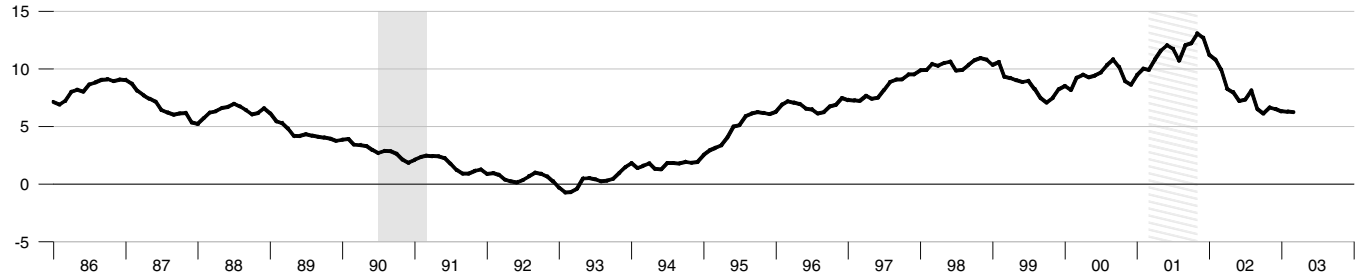
## M2

Percent change from year ago



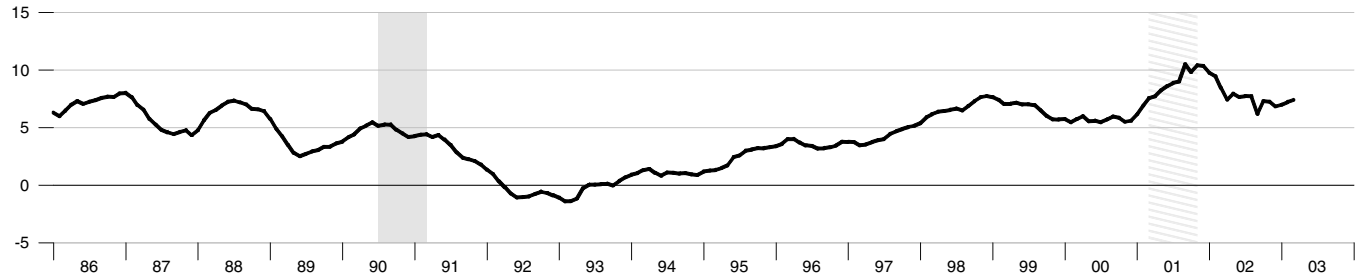

## M3

Percent change from year ago



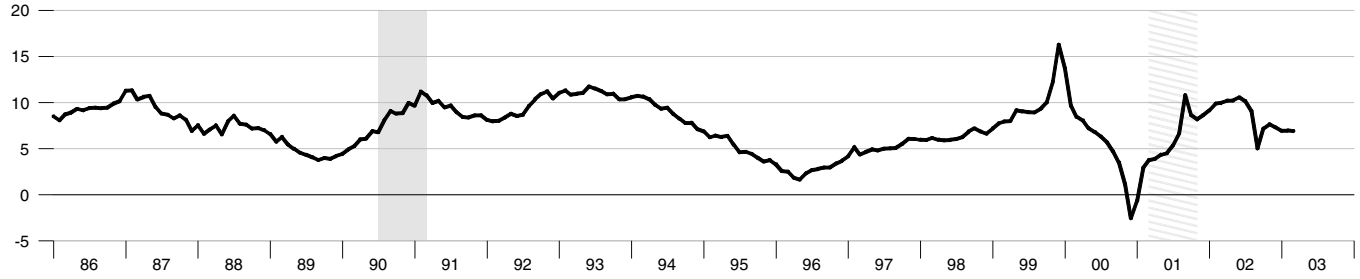

## Monetary Services Index - M2

Percent change from year ago



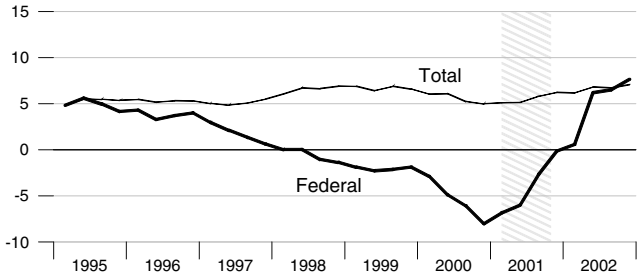
## Adjusted Monetary Base

Percent change from year ago



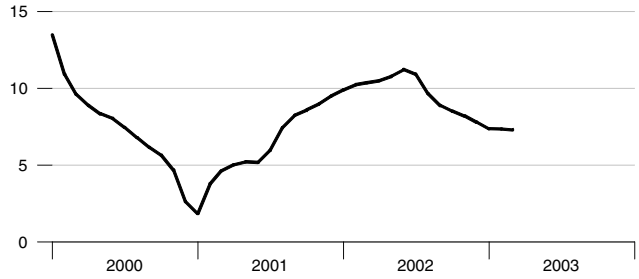

## Domestic Nonfinancial Debt

Percent change from year ago



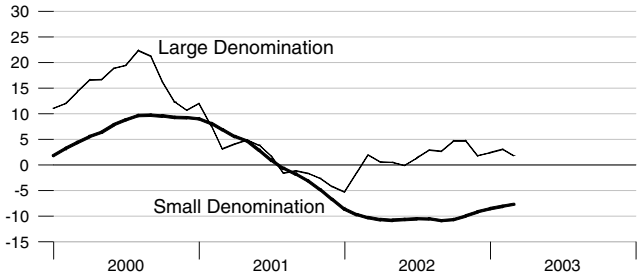

## Currency Held by the Nonbank Public

Percent change from year ago



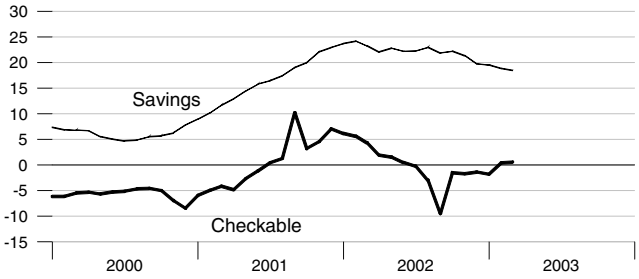

## Time Deposits

Percent change from year ago



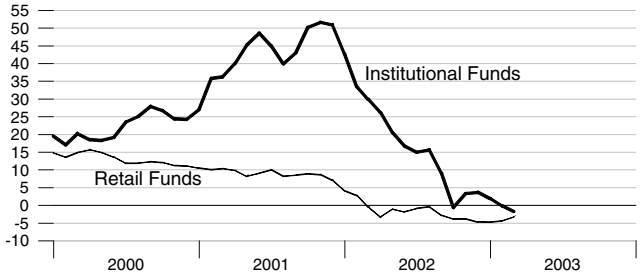

## Checkable and Savings Deposits

Percent change from year ago



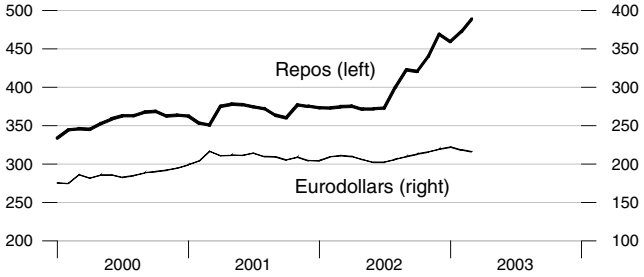

## Money Market Mutual Fund Shares

Percent change from year ago



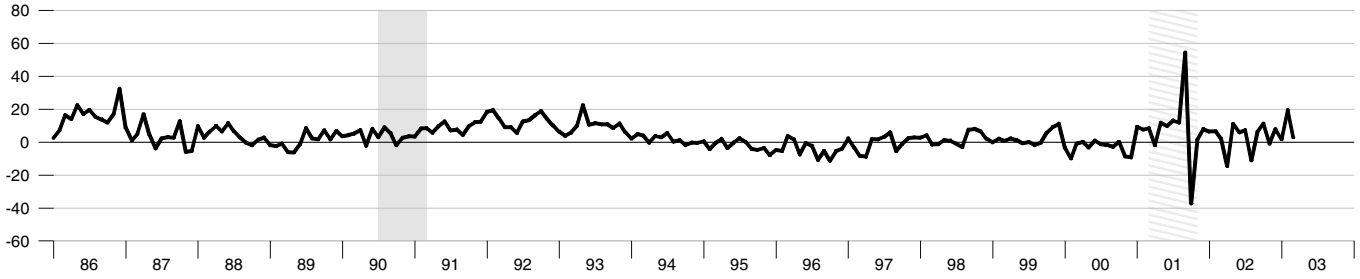

## Repurchase Agements and Eurodollars

Billions of dollars | Billions of dollars



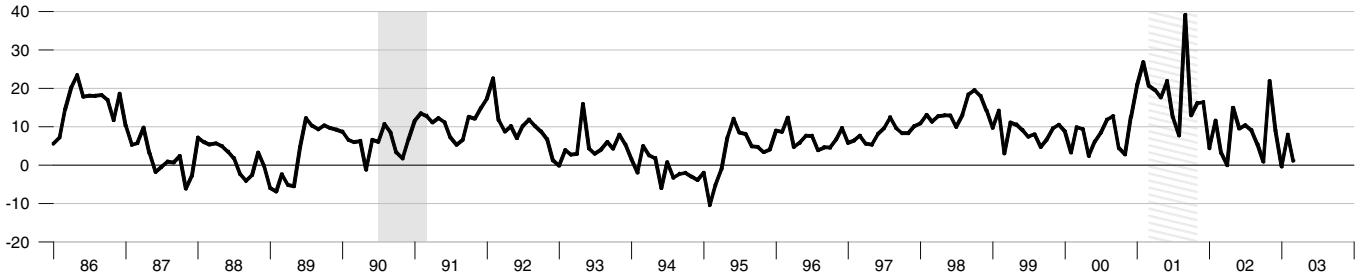
## M1

Percent change at an annual rate



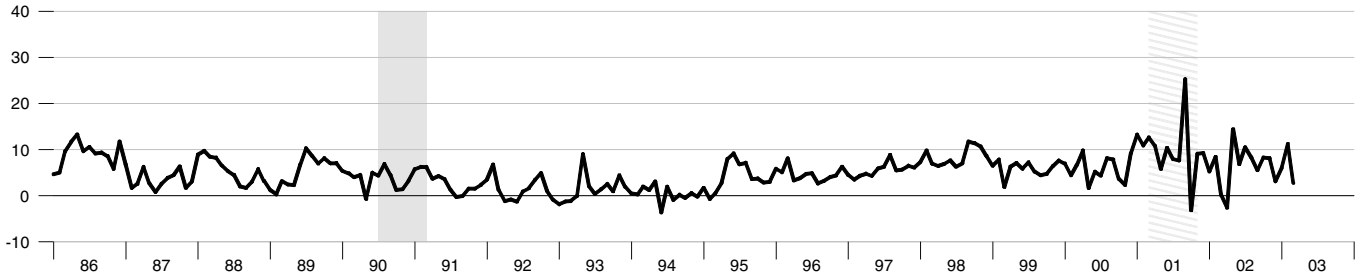

## MZM

Percent change at an annual rate



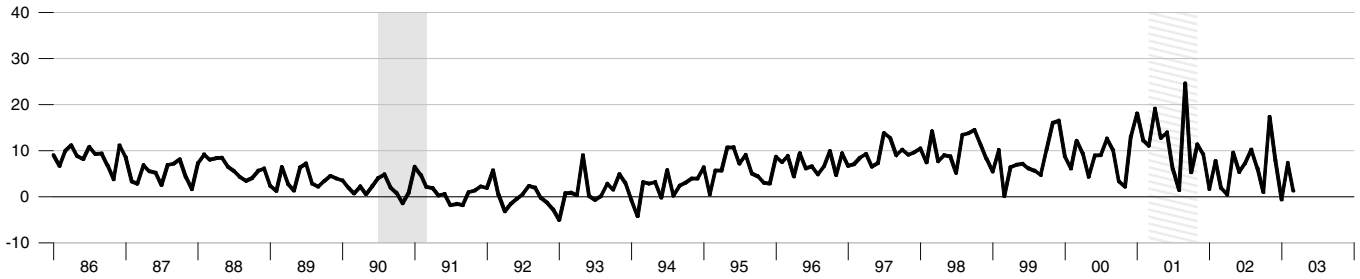

## M2

Percent change at an annual rate



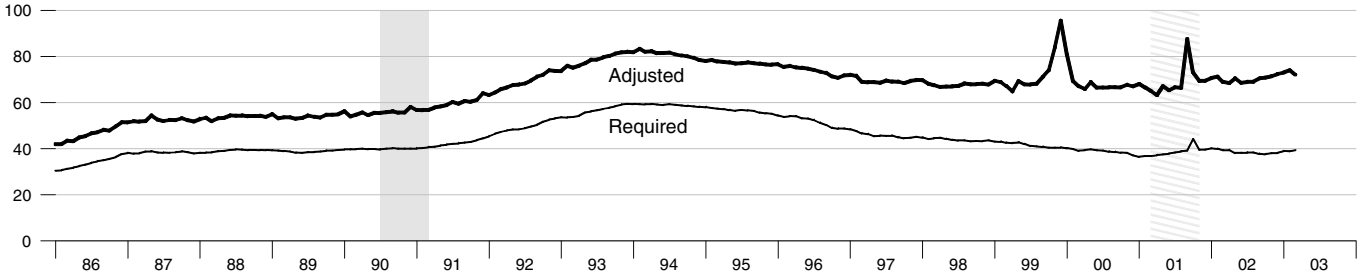

## M3

Percent change at an annual rate



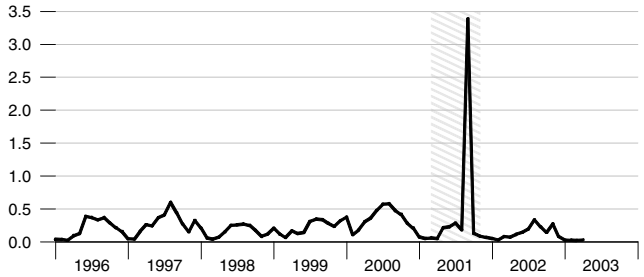
## Adjusted and Required Reserves

Billions of dollars



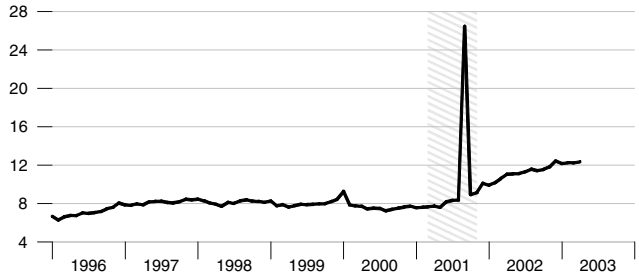

## Total Borrowings, nsa

Billions of dollars




## Excess Reserves plus RCB Contracts

Billions of dollars

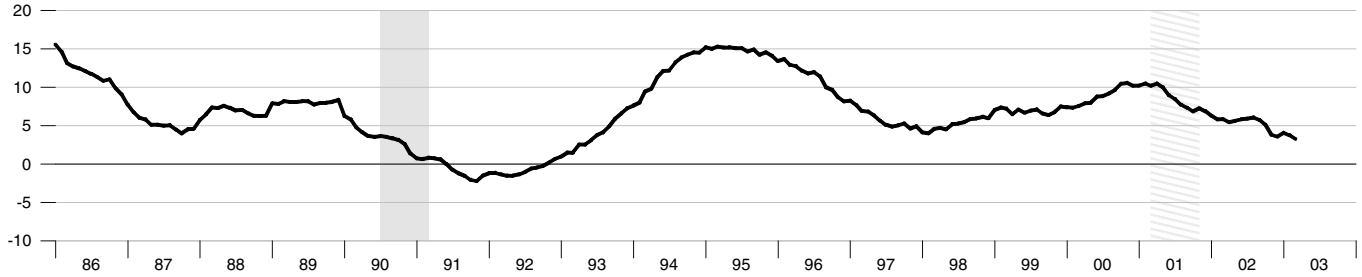



## Nonfinancial Commercial Paper

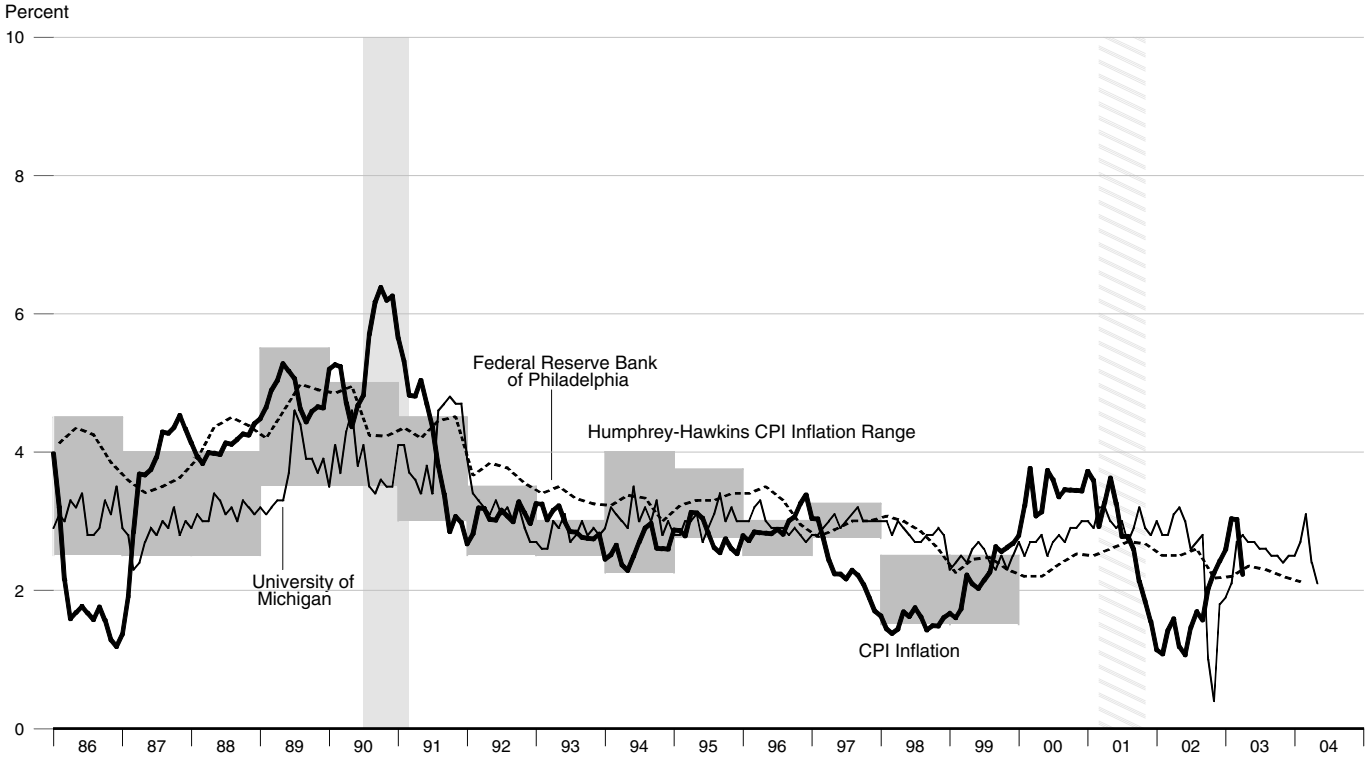
Percent change from year ago

## Consumer Credit

Percent change from year ago

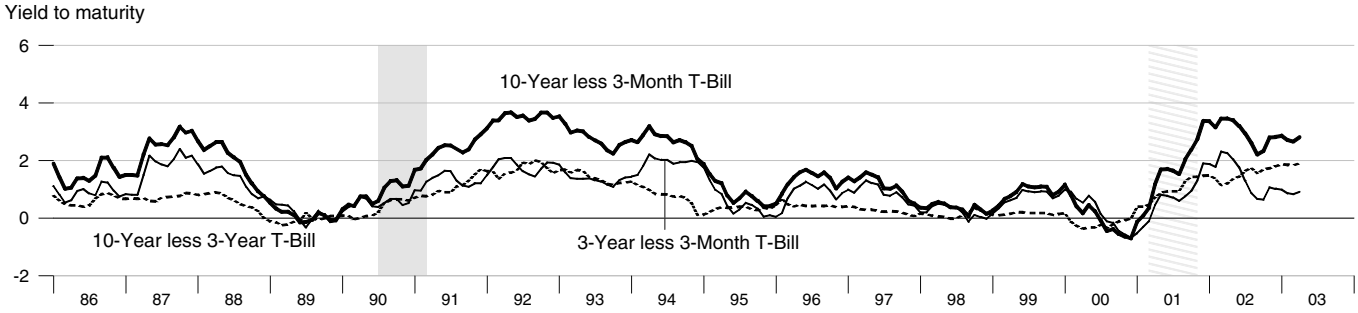


## Inflation and Inflation Expectations

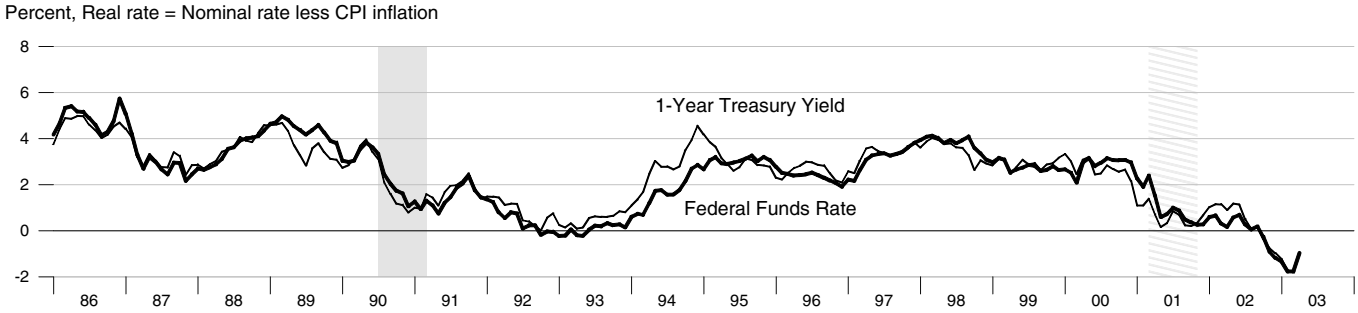



The shaded region shows the Humphrey-Hawkins CPI inflation range. Beginning in January 2000, the Humphrey-Hawkins inflation range was reported using the PCE price index and therefore is not shown on this graph. See notes on page 19.

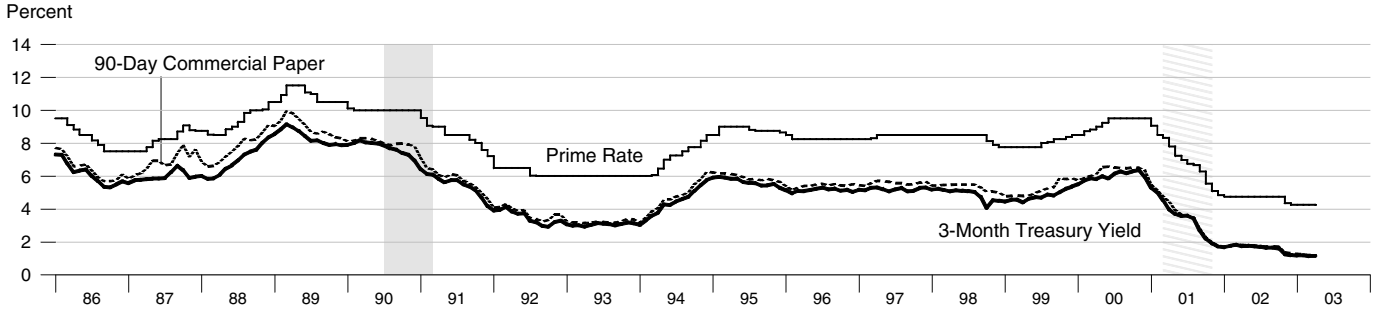
## Treasury Security Yield Spreads



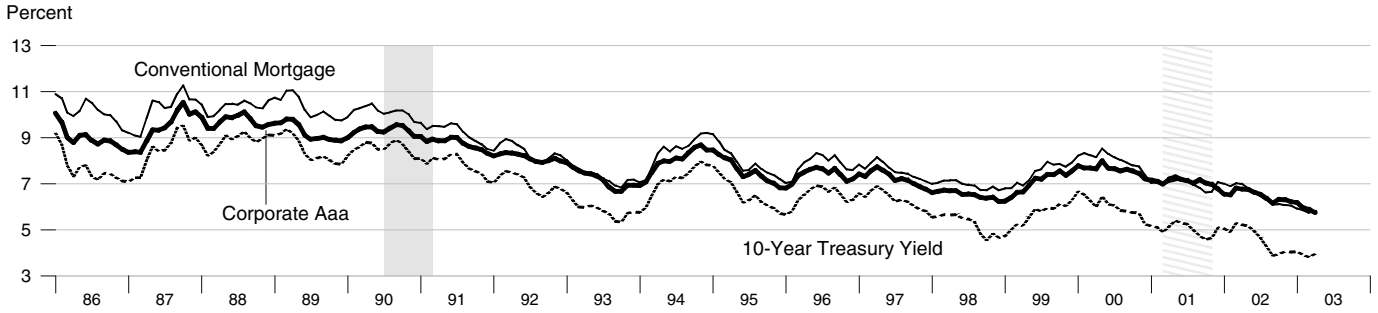

## Real Interest Rates



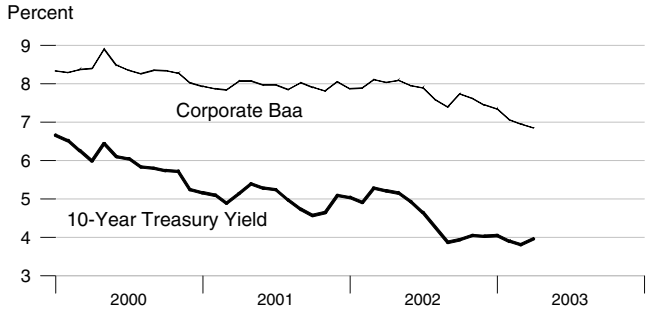
## Short-Term Interest Rates



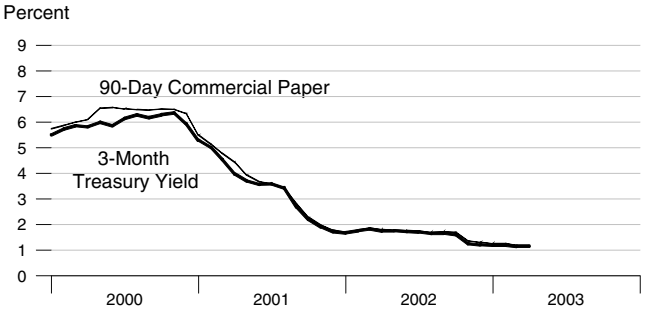

## Long-Term Interest Rates



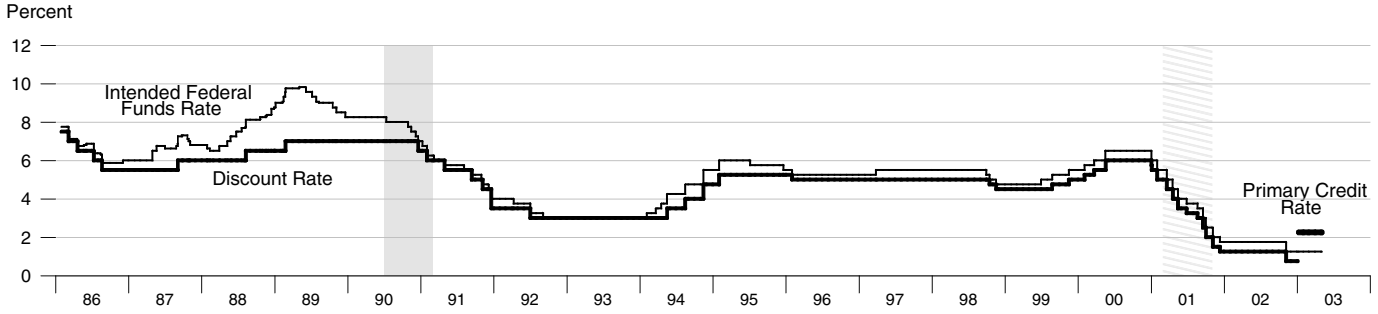

## Long-Term Interest Rates



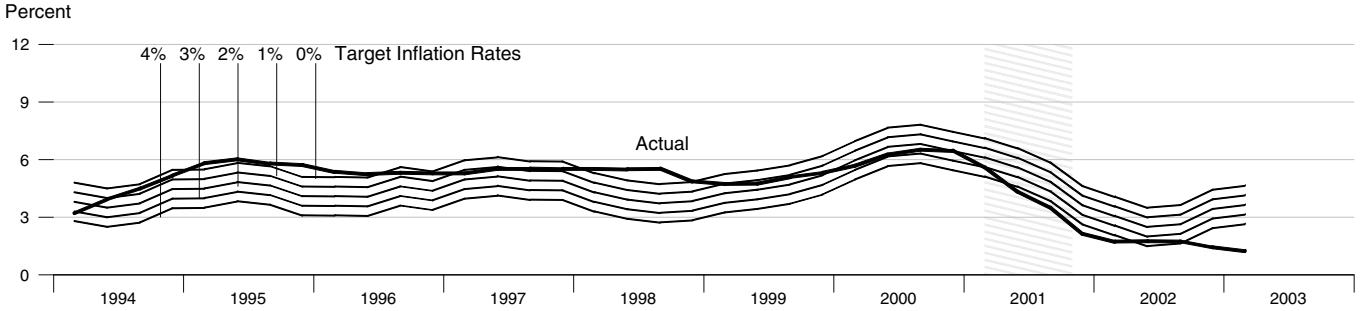

## Short-Term Interest Rates




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



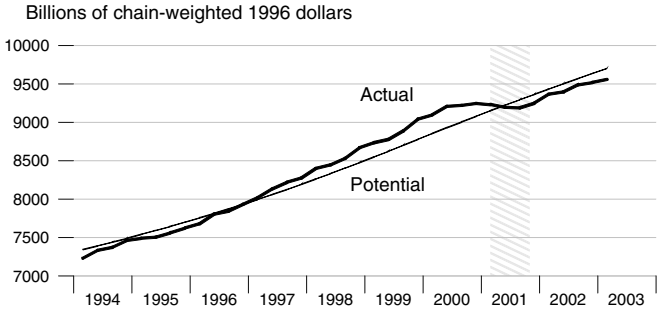
## Federal Funds Rate and Inflation Targets



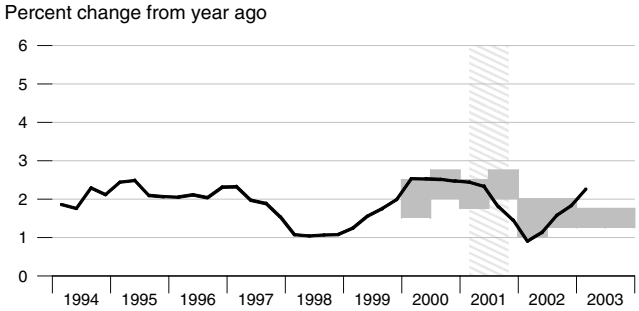

Calculated federal funds rate is based on Taylor's rule. See notes on page 19.

# Components of Taylor's Rule

## Actual and Potential Real GDP

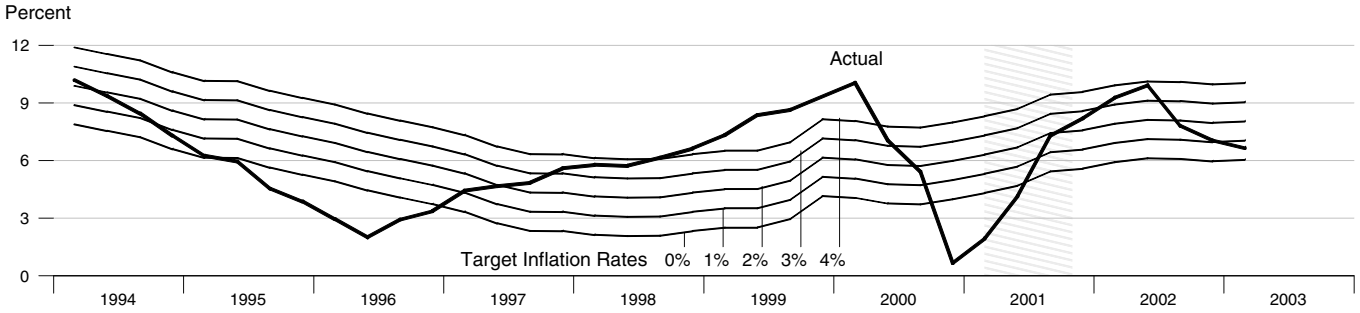



## PCE Inflation and Projections




The shaded region shows the range of projections published in the Monetary Policy Report to Congress.

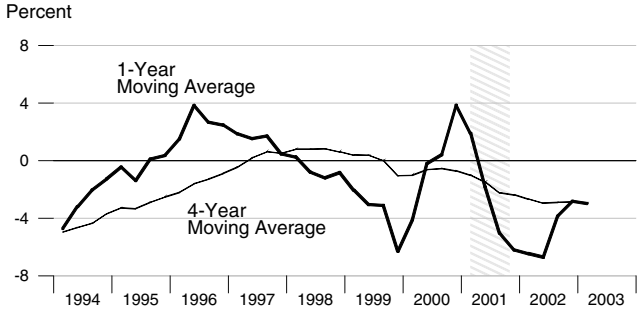
## Monetary Base Growth* and Inflation Targets



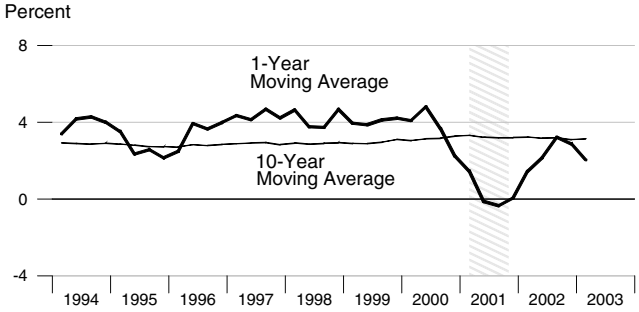

*Modified for the effects of sweeps programs on reserve demand.
Calculated base growth is based on McCallum's rule. Actual base growth is percent change from year ago. See notes on page 19.

# Components of McCallum's Rule

## Monetary Base Velocity Growth

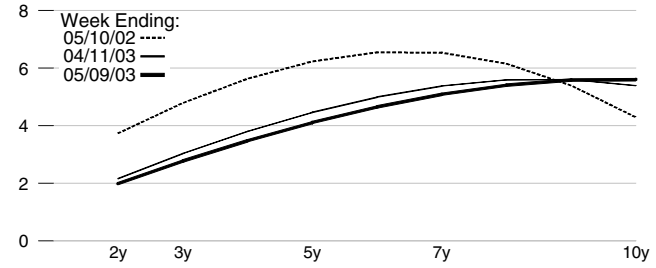



## Real Output Growth



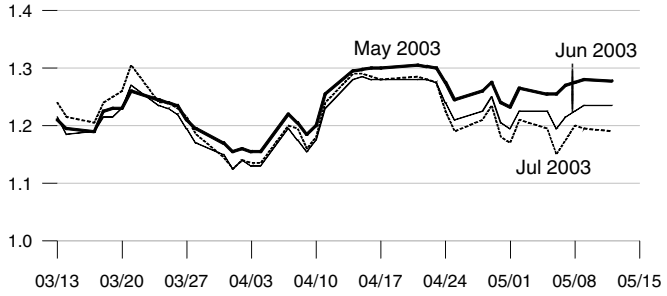
## Implied One-Year Forward Rates

Percent



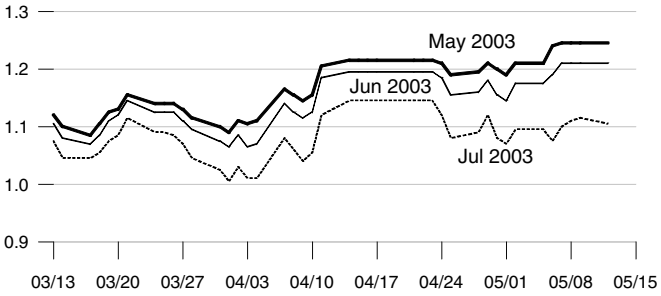

## Rates on 3-Month Eurodollar Futures

Percent, daily data



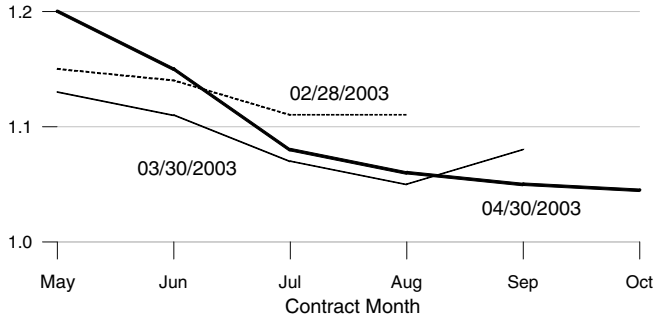

## Rates on Selected Federal Funds Futures Contracts

Percent, daily data



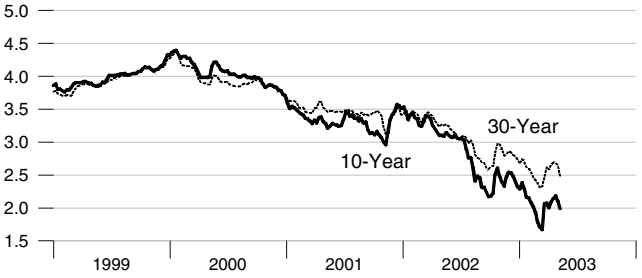

## Rates on Federal Funds Futures on Selected Dates

Percent



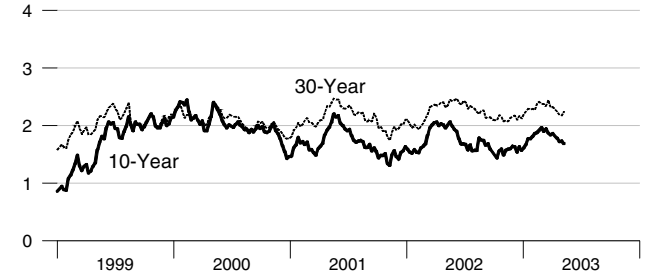

## Inflation-Indexed Treasury Bonds

Percent, weekly data



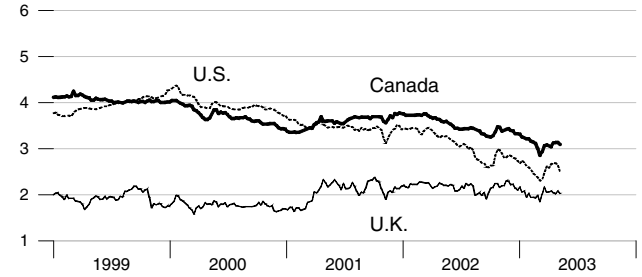

## Inflation-Indexed Treasury Yield Spreads

Percent, weekly data



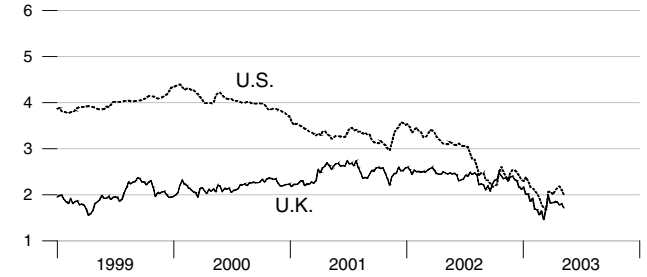

## Inflation-Indexed 30-Year Government Bonds

Percent, weekly data



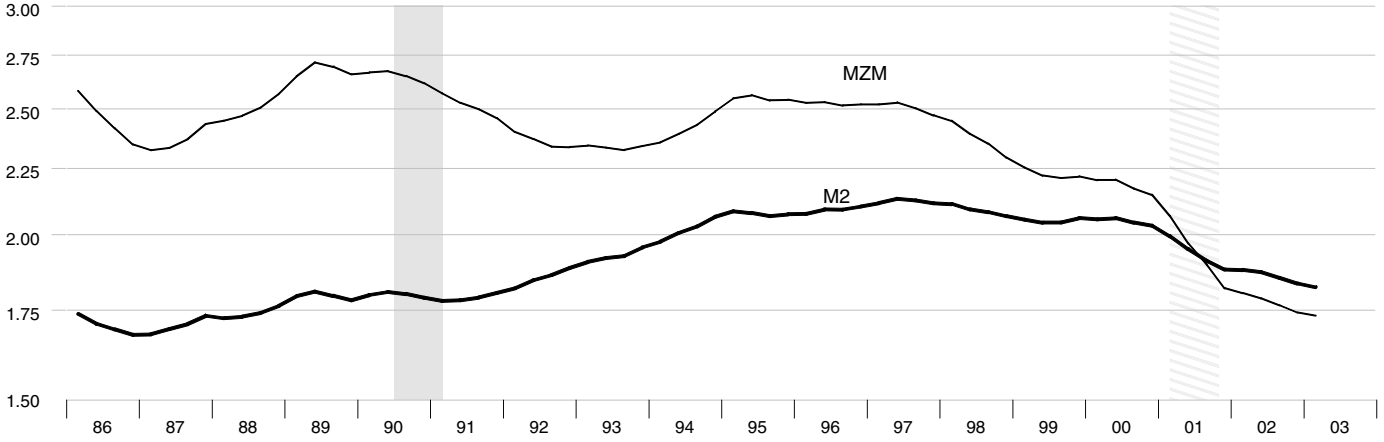

## Inflation-Indexed 10-Year Government Bonds

Percent, weekly data



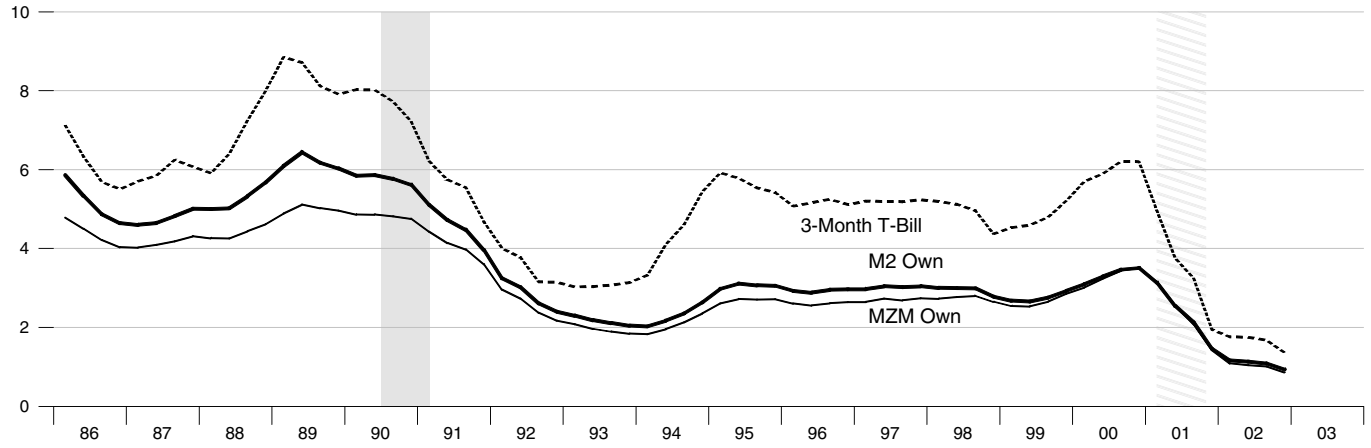
## Velocity

Nominal GDP/MZM, Nominal GDP/M2 (Ratio Scale)



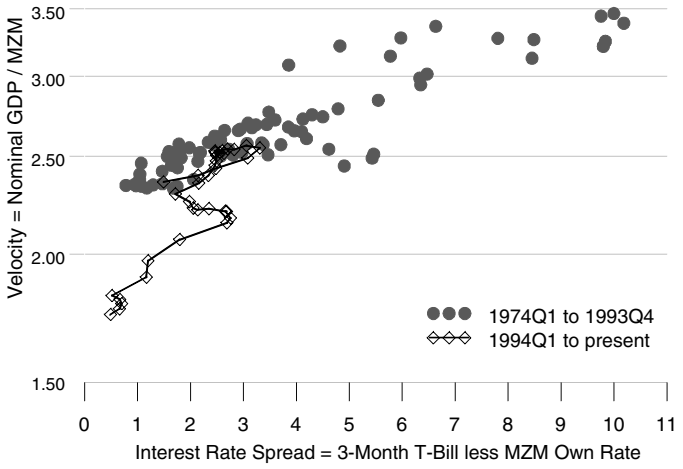

## Interest Rates

Percent



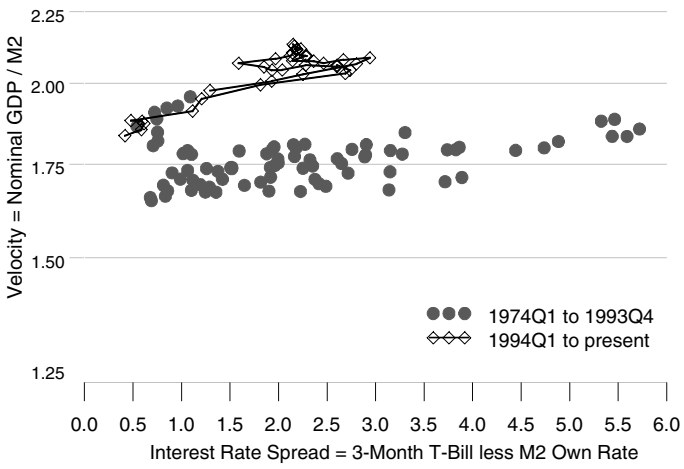

## MZM Velocity and Interest Rate Spread

Ratio Scale



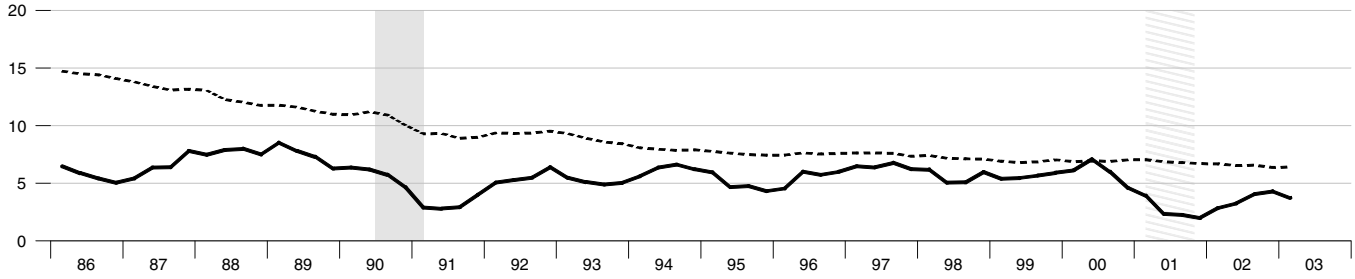

## M2 Velocity and Interest Rate Spread

Ratio Scale



## Gross Domestic Product

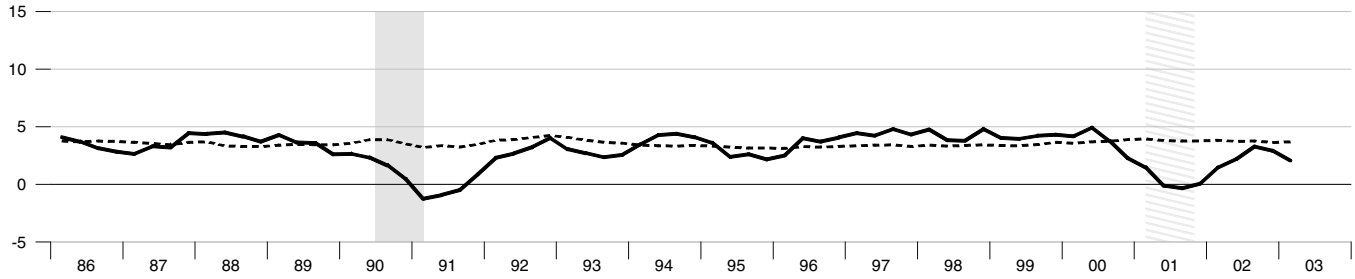
Percent change from year ago




Dashed lines indicate 10-year moving averages.

## Real Gross Domestic Product

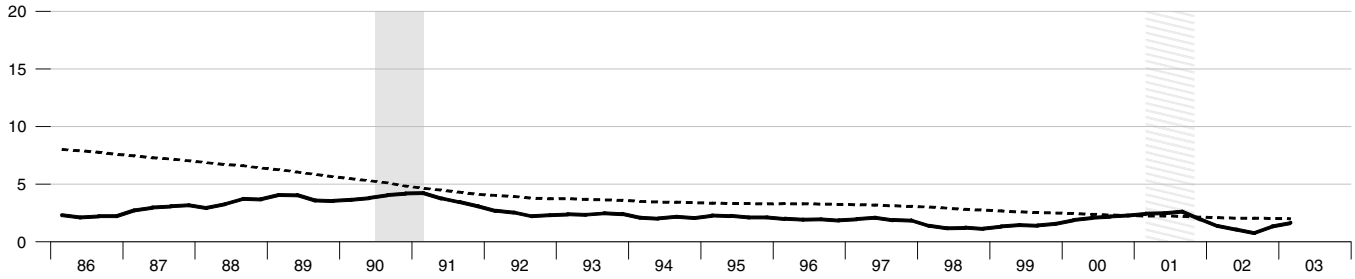
Percent change from year ago




Dashed lines indicate 10-year moving averages.

## Gross Domestic Product Price Index

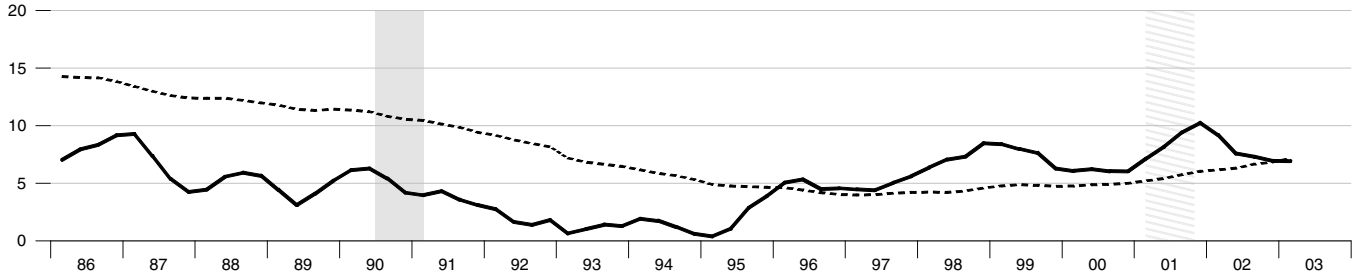
Percent change from year ago




Dashed lines indicate 10-year moving averages.

## M2

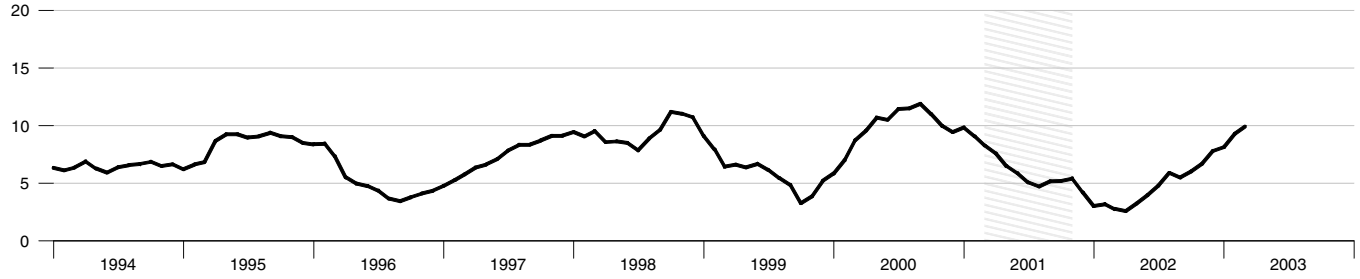
Percent change from year ago




Dashed lines indicate 10-year moving averages.

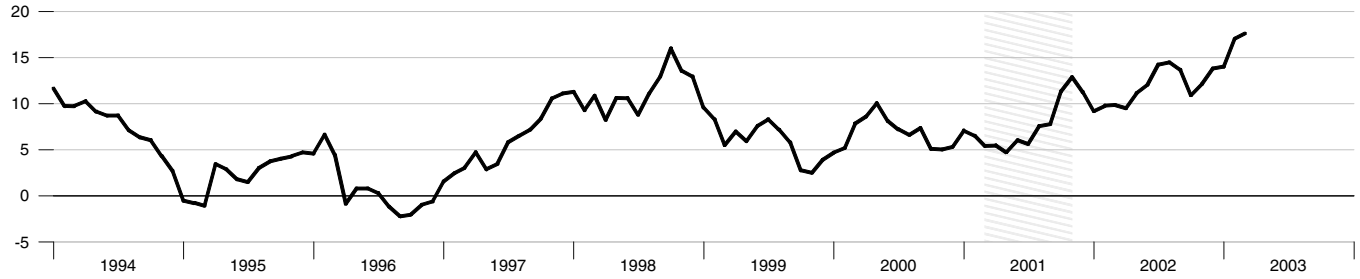
## Bank Credit

Percent change from year ago



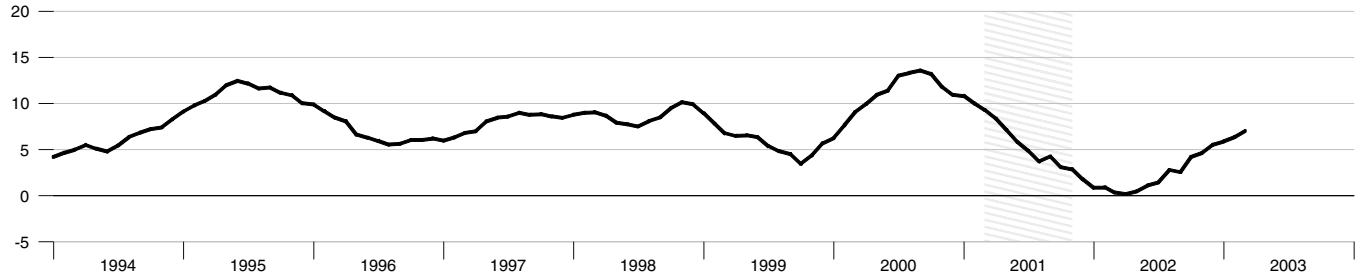

## Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago



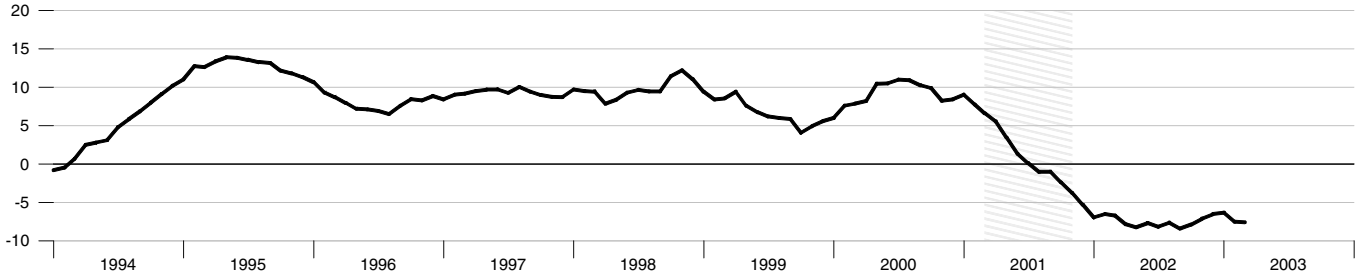

## Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago

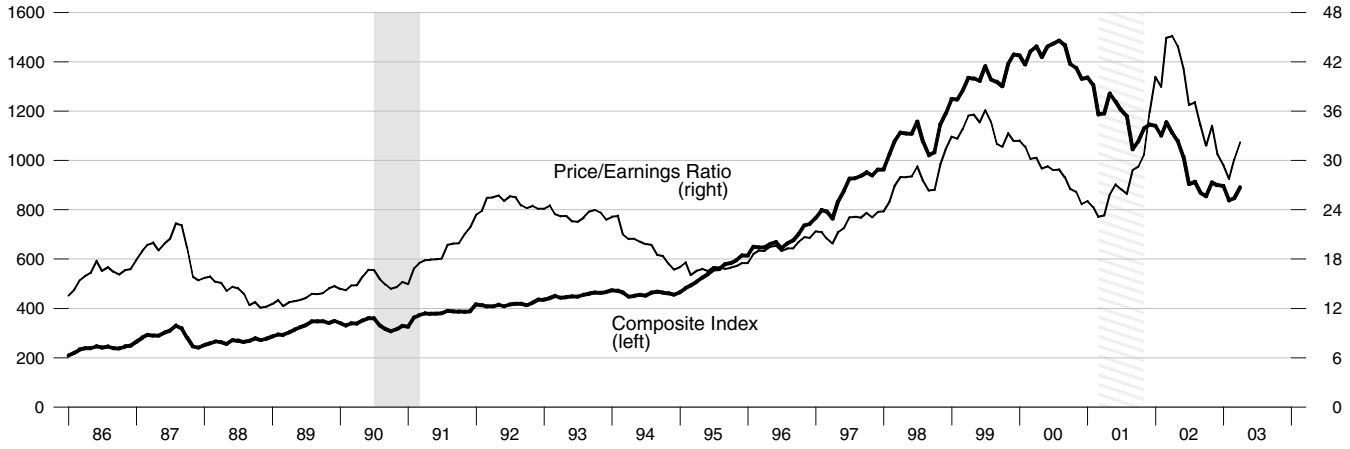



## Commercial and Industrial Loans at Commercial Banks

Percent change from year ago



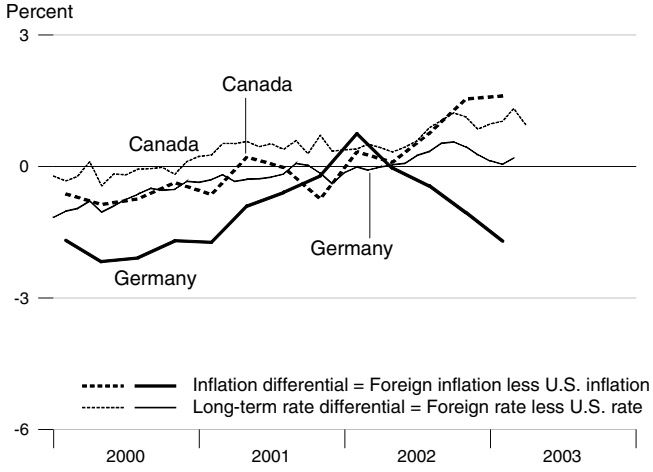
## Standard & Poor's 500

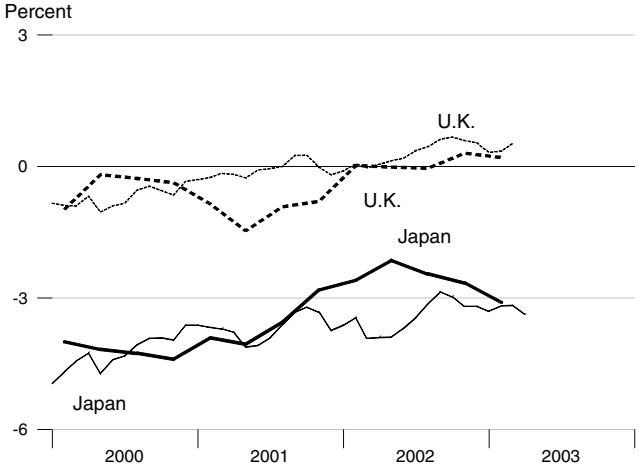



## Recent Inflation and Long-Term Interest Rates

| | Consumer Price Inflation Rates | | | | Long-Term Government Bond Rates | | | |
|---|---|---|---|---|---|---|---|---|
| | Percent change from year ago | | | | Percent | | | |
| | 2002Q2 | 2002Q3 | 2002Q4 | 2003Q1 | Jan03 | Feb03 | Mar03 | Apr03 |
| United States | 1.24 | 1.58 | 2.25 | 2.87 | 4.05 | 3.90 | 3.81 | 3.96 |
| Canada | 1.33 | 2.33 | 3.79 | 4.47 | 5.02 | 4.93 | 5.13 | 4.90 |
| France | 1.63 | 1.75 | 2.14 | 2.38 | 4.41 | 4.33 | 4.55 | . |
| Germany | 1.20 | 1.14 | 1.20 | 1.17 | 4.18 | 3.95 | 4.00 | . |
| Italy | 2.27 | 2.41 | 2.77 | 2.72 | 4.38 | 4.16 | 4.18 | 4.31 |
| Japan | -0.90 | -0.87 | -0.40 | -0.23 | 0.75 | 0.72 | 0.64 | 0.59 |
| United Kingdom | 1.23 | 1.53 | 2.56 | 3.07 | 4.37 | 4.25 | 4.33 | . |

## Inflation and Long-Term Interest Rate Differentials



| | | Money Stock | | | | Bank | Adjusted | | |
|---|---|---|---|---|---|---|---|---|---|
| | | M1 | MZM | M2 | M3 | Credit | Monetary Base | Reserves | MSI M2 |
| 1998 | | 1080.016 | 3707.676 | 4206.459 | 5747.977 | 4329.574 | 508.942 | 67.808 | 241.499 |
| 1999 | | 1101.888 | 4167.305 | 4523.633 | 6248.602 | 4587.385 | 557.865 | 72.360 | 257.790 |
| 2000 | | 1104.045 | 4504.688 | 4798.744 | 6835.799 | 5037.361 | 590.821 | 68.319 | 272.405 |
| 2001 | | 1137.041 | 5214.991 | 5218.119 | 7614.441 | 5357.837 | 623.788 | 68.983 | 296.067 |
| 2002 | | 1191.271 | 5890.649 | 5620.537 | 8224.221 | 5606.426 | 678.865 | 70.129 | 319.092 |
| 2001 | 1 | 1100.484 | 4851.627 | 5028.958 | 7270.803 | 5278.948 | 604.848 | 66.577 | 285.133 |
| | 2 | 1116.478 | 5103.197 | 5156.375 | 7538.275 | 5326.133 | 610.939 | 65.235 | 292.627 |
| | 3 | 1163.269 | 5323.070 | 5287.777 | 7718.573 | 5377.345 | 633.771 | 73.522 | 300.320 |
| | 4 | 1167.931 | 5582.071 | 5399.365 | 7930.112 | 5448.923 | 645.595 | 70.596 | 306.187 |
| 2002 | 1 | 1184.655 | 5719.453 | 5490.160 | 8044.869 | 5436.937 | 663.335 | 70.297 | 311.380 |
| | 2 | 1182.774 | 5810.252 | 5545.959 | 8127.813 | 5499.993 | 674.121 | 69.186 | 315.070 |
| | 3 | 1192.042 | 5953.936 | 5672.614 | 8283.597 | 5667.444 | 684.786 | 69.477 | 321.947 |
| | 4 | 1205.615 | 6078.953 | 5773.416 | 8440.606 | 5821.331 | 693.218 | 71.557 | 327.970 |
| 2003 | 1 | 1226.215 | 6172.395 | 5866.491 | 8550.715 | 5932.103 | 709.368 | 73.034 | 333.783 |
| 2001 | Mar | 1107.965 | 4942.648 | 5079.257 | 7339.726 | 5290.617 | 606.425 | 65.080 | 288.020 |
| | Apr | 1106.282 | 5023.156 | 5125.029 | 7456.386 | 5316.290 | 605.800 | 63.239 | 290.700 |
| | May | 1117.017 | 5096.859 | 5149.815 | 7535.539 | 5329.758 | 613.259 | 67.119 | 292.380 |
| | Jun | 1126.135 | 5189.575 | 5194.282 | 7622.899 | 5332.352 | 613.759 | 65.346 | 294.800 |
| | Jul | 1138.346 | 5243.358 | 5228.639 | 7660.362 | 5339.378 | 619.440 | 66.654 | 296.830 |
| | Aug | 1149.702 | 5277.079 | 5262.000 | 7669.345 | 5360.037 | 627.455 | 66.379 | 299.080 |
| | Sep | 1201.758 | 5448.773 | 5372.691 | 7826.012 | 5432.619 | 654.419 | 87.534 | 305.050 |
| | Oct | 1164.475 | 5507.546 | 5358.520 | 7860.421 | 5428.243 | 644.250 | 72.956 | 304.050 |
| | Nov | 1165.870 | 5581.293 | 5398.998 | 7934.569 | 5464.045 | 644.417 | 69.378 | 306.220 |
| | Dec | 1173.448 | 5657.374 | 5440.578 | 7995.347 | 5454.480 | 648.117 | 69.455 | 308.290 |
| 2002 | Jan | 1179.706 | 5678.119 | 5464.352 | 8006.534 | 5431.902 | 655.869 | 70.666 | 309.800 |
| | Feb | 1186.123 | 5732.647 | 5502.677 | 8057.823 | 5441.955 | 667.217 | 71.245 | 312.010 |
| | Mar | 1188.136 | 5747.592 | 5503.450 | 8070.251 | 5436.955 | 666.918 | 68.980 | 312.330 |
| | Apr | 1173.682 | 5747.376 | 5491.487 | 8073.065 | 5453.948 | 667.691 | 68.480 | 312.260 |
| | May | 1184.393 | 5818.670 | 5557.324 | 8137.026 | 5502.122 | 676.061 | 70.546 | 315.590 |
| | Jun | 1190.248 | 5864.711 | 5589.065 | 8173.347 | 5543.909 | 678.610 | 68.531 | 317.360 |
| | Jul | 1197.364 | 5915.231 | 5637.899 | 8222.881 | 5594.610 | 682.348 | 68.943 | 319.780 |
| | Aug | 1186.289 | 5959.936 | 5676.871 | 8292.697 | 5676.160 | 684.570 | 69.021 | 322.140 |
| | Sep | 1192.472 | 5986.641 | 5703.072 | 8335.213 | 5731.563 | 687.439 | 70.468 | 323.920 |
| | Oct | 1203.600 | 5991.142 | 5742.402 | 8342.249 | 5754.768 | 690.454 | 70.817 | 326.180 |
| | Nov | 1202.743 | 6100.145 | 5781.354 | 8462.255 | 5829.918 | 693.675 | 71.461 | 328.380 |
| | Dec | 1210.501 | 6145.573 | 5796.492 | 8517.314 | 5879.306 | 695.526 | 72.392 | 329.350 |
| 2003 | Jan | 1212.226 | 6143.704 | 5825.727 | 8513.154 | 5873.106 | 701.446 | 73.007 | 331.400 |
| | Feb | 1231.710 | 6183.909 | 5880.101 | 8564.841 | 5947.678 | 713.705 | 73.925 | 334.540 |
| | Mar | 1234.708 | 6189.573 | 5893.644 | 8574.149 | 5975.524 | 712.952 | 72.170 | 335.410 |

*All values are given in billions of dollars.

| | | Federal Funds | Discount Rate | Primary Credit Rate | Prime Rate | 3-mo CDs | Treasury Yields 3-mo | 3-yr | 10-yr | Corporate Aaa Bonds | S & L Aaa Bonds | Conventional Mortgage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1998 | 5.35 | 4.92 | | 8.35 | 5.47 | 4.91 | 5.14 | 5.26 | 6.53 | 4.93 | 6.94 |
| | 1999 | 4.97 | 4.62 | | 7.99 | 5.33 | 4.78 | 5.49 | 5.64 | 7.04 | 5.28 | 7.43 |
| | 2000 | 6.24 | 5.73 | | 9.23 | 6.46 | 6.00 | 6.22 | 6.03 | 7.62 | 5.58 | 8.06 |
| | 2001 | 3.89 | 3.41 | | 6.92 | 3.69 | 3.47 | 4.08 | 5.02 | 7.08 | 4.99 | 6.97 |
| | 2002 | 1.67 | 1.17 | | 4.68 | 1.73 | 1.63 | 3.10 | 4.61 | 6.49 | 4.87 | 6.54 |
| 2001 | 1 | 5.59 | 5.11 | | 8.62 | 5.26 | 4.95 | 4.64 | 5.05 | 7.08 | 5.03 | 7.01 |
| | 2 | 4.33 | 3.83 | | 7.34 | 4.10 | 3.75 | 4.43 | 5.27 | 7.22 | 5.11 | 7.13 |
| | 3 | 3.50 | 3.06 | | 6.57 | 3.34 | 3.24 | 3.93 | 4.98 | 7.11 | 4.87 | 6.97 |
| | 4 | 2.13 | 1.64 | | 5.16 | 2.06 | 1.94 | 3.33 | 4.77 | 6.92 | 4.97 | 6.78 |
| 2002 | 1 | 1.73 | 1.25 | | 4.75 | 1.82 | 1.76 | 3.75 | 5.08 | 6.62 | 5.02 | 6.97 |
| | 2 | 1.75 | 1.25 | | 4.75 | 1.83 | 1.75 | 3.77 | 5.10 | 6.71 | 5.01 | 6.81 |
| | 3 | 1.74 | 1.25 | | 4.75 | 1.76 | 1.67 | 2.62 | 4.26 | 6.35 | 4.72 | 6.29 |
| | 4 | 1.44 | 0.94 | | 4.45 | 1.49 | 1.36 | 2.27 | 4.01 | 6.28 | 4.71 | 6.08 |
| 2003 | 1 | 1.25 | | 2.25 | 4.25 | 1.26 | 1.18 | 2.07 | 3.92 | 6.00 | 4.60 | 5.83 |
| 2001 | Apr | 4.80 | 4.28 | | 7.80 | 4.53 | 3.97 | 4.42 | 5.14 | 7.20 | 5.14 | 7.08 |
| | May | 4.21 | 3.73 | | 7.24 | 4.02 | 3.70 | 4.51 | 5.39 | 7.29 | 5.15 | 7.15 |
| | Jun | 3.97 | 3.47 | | 6.98 | 3.74 | 3.57 | 4.35 | 5.28 | 7.18 | 5.03 | 7.16 |
| | Jul | 3.77 | 3.25 | | 6.75 | 3.66 | 3.59 | 4.31 | 5.24 | 7.13 | 4.79 | 7.13 |
| | Aug | 3.65 | 3.16 | | 6.67 | 3.48 | 3.44 | 4.04 | 4.97 | 7.02 | 4.89 | 6.95 |
| | Sep | 3.07 | 2.77 | | 6.28 | 2.87 | 2.69 | 3.45 | 4.73 | 7.17 | 4.93 | 6.82 |
| | Oct | 2.49 | 2.02 | | 5.53 | 2.31 | 2.20 | 3.14 | 4.57 | 7.03 | 4.89 | 6.62 |
| | Nov | 2.09 | 1.58 | | 5.10 | 2.03 | 1.91 | 3.22 | 4.65 | 6.97 | 4.85 | 6.66 |
| | Dec | 1.82 | 1.33 | | 4.84 | 1.83 | 1.72 | 3.62 | 5.09 | 6.77 | 5.18 | 7.07 |
| 2002 | Jan | 1.73 | 1.25 | | 4.75 | 1.74 | 1.68 | 3.56 | 5.04 | 6.55 | 5.05 | 7.00 |
| | Feb | 1.74 | 1.25 | | 4.75 | 1.82 | 1.76 | 3.55 | 4.91 | 6.51 | 4.93 | 6.89 |
| | Mar | 1.73 | 1.25 | | 4.75 | 1.91 | 1.83 | 4.14 | 5.28 | 6.81 | 5.09 | 7.01 |
| | Apr | 1.75 | 1.25 | | 4.75 | 1.87 | 1.75 | 4.01 | 5.21 | 6.76 | 5.09 | 6.99 |
| | May | 1.75 | 1.25 | | 4.75 | 1.82 | 1.76 | 3.80 | 5.16 | 6.75 | 5.03 | 6.81 |
| | Jun | 1.75 | 1.25 | | 4.75 | 1.81 | 1.73 | 3.49 | 4.93 | 6.63 | 4.92 | 6.65 |
| | Jul | 1.73 | 1.25 | | 4.75 | 1.79 | 1.71 | 3.01 | 4.65 | 6.53 | 4.81 | 6.49 |
| | Aug | 1.74 | 1.25 | | 4.75 | 1.73 | 1.65 | 2.52 | 4.26 | 6.37 | 4.78 | 6.29 |
| | Sep | 1.75 | 1.25 | | 4.75 | 1.76 | 1.66 | 2.32 | 3.87 | 6.15 | 4.58 | 6.09 |
| | Oct | 1.75 | 1.25 | | 4.75 | 1.73 | 1.61 | 2.25 | 3.94 | 6.32 | 4.66 | 6.11 |
| | Nov | 1.34 | 0.83 | | 4.35 | 1.39 | 1.25 | 2.32 | 4.05 | 6.31 | 4.77 | 6.07 |
| | Dec | 1.24 | 0.75 | | 4.25 | 1.34 | 1.21 | 2.23 | 4.03 | 6.21 | 4.70 | 6.05 |
| 2003 | Jan | 1.24 | | | 4.25 | 1.29 | 1.19 | 2.18 | 4.05 | 6.17 | 4.72 | 5.92 |
| | Feb | 1.26 | | 2.25 | 4.25 | 1.27 | 1.19 | 2.05 | 3.90 | 5.95 | 4.57 | 5.84 |
| | Mar | 1.25 | | 2.25 | 4.25 | 1.23 | 1.15 | 1.98 | 3.81 | 5.89 | 4.51 | 5.75 |
| | Apr | 1.26 | | 2.25 | 4.25 | 1.24 | 1.15 | 2.06 | 3.96 | 5.74 | 4.60 | 5.81 |

*All values are given as a percent at an annual rate.

| | | M1 | MZM | M2 | M3 |
|---|---|---|---|---|---|
| **Percent change at an annual rate** | | | | | |
| | 1998 | 1.00 | 11.67 | 7.30 | 10.36 |
| | 1999 | 2.03 | 12.40 | 7.54 | 8.71 |
| | 2000 | 0.20 | 8.10 | 6.08 | 9.40 |
| | 2001 | 2.99 | 15.77 | 8.74 | 11.39 |
| | 2002 | 4.77 | 12.96 | 7.71 | 8.01 |
| 2001 | 1 | 2.66 | 18.59 | 10.64 | 13.23 |
| | 2 | 5.81 | 20.74 | 10.13 | 14.71 |
| | 3 | 16.76 | 17.23 | 10.19 | 9.57 |
| | 4 | 1.60 | 19.46 | 8.44 | 10.96 |
| 2002 | 1 | 5.73 | 9.84 | 6.73 | 5.79 |
| | 2 | -0.64 | 6.35 | 4.07 | 4.12 |
| | 3 | 3.13 | 9.89 | 9.13 | 7.67 |
| | 4 | 4.55 | 8.40 | 7.11 | 7.58 |
| 2003 | 1 | 6.83 | 6.15 | 6.45 | 5.22 |
| 2001 | Mar | 8.48 | 20.64 | 12.61 | 11.04 |
| | Apr | -1.82 | 19.55 | 10.81 | 19.07 |
| | May | 11.64 | 17.61 | 5.80 | 12.74 |
| | Jun | 9.80 | 21.83 | 10.36 | 13.91 |
| | Jul | 13.01 | 12.44 | 7.94 | 5.90 |
| | Aug | 11.97 | 7.72 | 7.66 | 1.41 |
| | Sep | 54.33 | 39.04 | 25.24 | 24.51 |
| | Oct | -37.23 | 12.94 | -3.17 | 5.28 |
| | Nov | 1.44 | 16.07 | 9.06 | 11.32 |
| | Dec | 7.80 | 16.36 | 9.24 | 9.19 |
| 2002 | Jan | 6.40 | 4.40 | 5.24 | 1.68 |
| | Feb | 6.53 | 11.52 | 8.42 | 7.69 |
| | Mar | 2.04 | 3.13 | 0.17 | 1.85 |
| | Apr | -14.60 | -0.05 | -2.61 | 0.42 |
| | May | 10.95 | 14.89 | 14.39 | 9.51 |
| | Jun | 5.93 | 9.50 | 6.85 | 5.36 |
| | Jul | 7.17 | 10.34 | 10.48 | 7.27 |
| | Aug | -11.10 | 9.07 | 8.30 | 10.19 |
| | Sep | 6.25 | 5.38 | 5.54 | 6.15 |
| | Oct | 11.20 | 0.90 | 8.28 | 1.01 |
| | Nov | -0.85 | 21.83 | 8.14 | 17.26 |
| | Dec | 7.74 | 8.94 | 3.14 | 7.81 |
| 2003 | Jan | 1.71 | -0.36 | 6.05 | -0.59 |
| | Feb | 19.29 | 7.85 | 11.20 | 7.29 |
| | Mar | 2.92 | 1.10 | 2.76 | 1.30 |

# 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**: M2 minus small-denomination time deposits, plus institutional money market mutual funds. The label MZM was coined by William Poole (1991) for this aggregate, proposed earlier by Motley (1988).

**M2**: M1 plus savings deposits (including money market deposit accounts) and small-denomination (less than $100,000) time deposits issued by financial institutions; and shares in retail money market mutual funds (funds with initial investments of less than $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).

**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 series, a 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) and research.stlouisfed.org/aggreg/newbase.html.

**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; additional data are available at research.stlouisfed.org/msi/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 *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*: **MZM**, or "Money, Zero Maturity," includes the zero maturity, or immediately available, components of M3. MZM equals M2 minus small-denomination time deposits, plus institutional money market mutual funds (that is, the money market mutual funds included in M3 but excluded from M2). 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/aggreg/swdata.html. For analytical purposes, MZM largely replaces M1. The **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** shows constant maturity yields calculated by the U.S. Treasury Department for securities with 3 months and 1, 2, 3, 5, 7, and 10 years to maturity. Daily data and descriptions are available at research.stlouisfed.org/fred/data/wkly.html. See also *Federal Reserve Bulletin*, table 1.35. The 30-year constant maturity series was discontinued by the Treasury Department 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 *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 Humphrey-Hawkins Act testimony each year. Beginning February 2000, the FOMC began using the personal consumption expenditures (PCE) price index to report its inflation range and therefore is not 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 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

$$f_t^* = 2.5 + \pi_{t-1} + (\pi_{t-1} - \pi^*)/2 + 100 \times (y_{t-1} - y_{t-1}^P)/2$$

to five alternative target inflation rates, $\pi^* = 0, 1, 2, 3, 4$ percent, where $f_t^*$ is the implied federal funds rate, $\pi_{t-1}$ is the previous period's inflation rate (PCE) measured on a year-over-year basis, $y_{t-1}$ is the log of the previous period's level of real gross domestic product (GDP), and $y_{t-1}^P$ 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

$$\Delta MB_t^* = \pi^* + (\text{10-year moving average growth of real GDP}) - (\text{4-year moving average of base velocity growth})$$

to five alternative target inflation rates, $\pi^* = 0, 1, 2, 3, 4$ percent, where $\Delta MB_t^*$ 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 $((y_t - y_{t-40})/40) \times 4 \times 100$, where $y_t$ is the log of real GDP. The four-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 available at research.stlouisfed.org/aggreg/swdata.html.

*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),

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

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 $D(m) = (1 - e^{-R(m) \times m})/R(m)$. 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** each 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 Bonds** are yields on the most recently issued inflation-indexed securities of 10- and 30-year original maturities. **Inflation-Indexed Treasury Yield Spreads** equal, for 10- and 30-year maturities, the difference between the yields on the most recently issued inflation-indexed securities and the unadjusted bond yields of similar maturity. **Inflation-Indexed 30-Year Government Bonds** shows the yield of an inflation-indexed bond that is scheduled to mature in approximately (but not greater than) 30 years. The current bond for Canada has a maturity date of 12/01/2031, the current U.K. bond has a maturity date of 7/22/2030, and the current U.S. bond has a maturity date of 4/15/2032. **Inflation-Indexed 10-Year Government Bonds** shows the yield of an inflation-indexed bond that is scheduled to mature in approximately (but not greater than) 10 years. The current U.K. bond has a maturity date of 8/23/2011 and the current U.S. bond has a maturity date of 7/15/2012.

*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 1996 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 1996 dollars.

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

*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

*Bank of Canada*
Canadian inflation-linked bond yields.

*Bank of England*
U.K. inflation-linked bond yields.

*Board of Governors of the Federal Reserve System*
Monetary aggregates and components: H.6 release. Bank credit and components: H.8 release. Consumer credit: G.19 release. Required reserves, excess reserves, clearing balance contracts, and discount window borrowing: H.4.1 and H.3 releases. Interest rates: H.15 release. Nonfinancial commercial paper: Board of Governors website. Nonfinancial debt: Z.1 release. M2 own rate.

*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 & Poors Inc.*
Stock price-earnings ratio, stock price composite index.

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

*U.S. Department of the Treasury*
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***Note***: Articles from this Bank's *Review* are available on the Internet at research.stlouisfed.org/publications/review/.