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** 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** are yields on the most recently issued inflation-indexed securities of 10- and 30-year original maturities. **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 7/25/2013, the current U.K. note has a maturity date of 8/16/2013, and the current U.S. note has a maturity date of 1/15/2015. **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.

*Bank of England*: U.K. note 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 & 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


Anderson, Richard G. and Robert H. Rasche (1996a). "A Revised Measure of the St. Louis Adjusted Monetary Base," Federal Reserve Bank of St. Louis *Review*, March/April, *78*(2), pp. 3-13.*

____ and ____(1996b). "Measuring the Adjusted Monetary Base in an Era of Financial Change," Federal Reserve Bank of St. Louis *Review*, November/December, *78*(6), pp. 3-37.*

____ and ____(2001). "Retail Sweep Programs and Bank Reserves, 1994-1999," Federal Reserve Bank of St. Louis *Review*, January/February, *83*(1), pp. 51-72.*

____ and ____ , with Jeffrey Loesel (2003). "A Reconstruction of the Federal Reserve Bank of St. Louis Adjusted Monetary Base and Reserves," Federal Reserve Bank of St. Louis *Review*, September/October, *85*(5), pp. 39-70.*

____ , Barry E. Jones and Travis D. Nesmith (1997). "Special Report: The Monetary Services Indexes Project of the Federal Reserve Bank of St. Louis," Federal Reserve Bank of St. Louis *Review*, January/February, *79*(1), pp. 31-82.*

McCallum, Bennett T. (1988). "Robustness Properties of a Monetary Policy Rule," *Carnegie-Rochester Conference Series on Public Policy*, vol. 29, pp. 173-204.

____(1993). "Specification and Analysis of a Monetary Policy Rule for Japan," Bank of Japan *Monetary and Economic Studies*, November, pp. 1-45.

Motley, Brian (1988). "Should M2 Be Redefined?" Federal Reserve Bank of San Francisco *Economic Review*, Winter, pp. 33-51.

Nelson, Charles R. and Andrew F. Siegel (1987). "Parsimonious Modeling of Yield Curves," *Journal of Business*, October, pp. 473-89.

Poole, William (1991). Statement before the Subcommittee on Domestic Monetary Policy of the Committee on Banking, Finance and Urban Affairs, U.S. House of Representatives, November 6, 1991. Government Printing Office, Serial No. 102-82.

Sharpe, William F. (1997). *Macro-Investment Analysis*, on-line textbook available at www.stanford.edu/~wfsharpe/mia/mia.htm.

Shiller, Robert (1990). "The Term Structure of Interest Rates," *Handbook of Monetary Economics*, vol. 1, B. Friedman and F. Hahn, eds., pp. 627-722.

Taylor, John B. (1993). "Discretion versus Policy Rules in Practice," *Carnegie-Rochester Conference Series on Public Policy*, vol. 39, pp. 195-214.


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



Monetary Trends

June 2005

# M2 and "Reigniting Inflation"

On April 7, 2005, the *Wall Street Journal* (*WSJ*) published a letter from Milton Friedman in response to a March 21, 2005, editorial that criticized the Federal Reserve's monetary policy as being too easy for too long. Friedman defended the Federal Reserve's actions, chastising the *WSJ* editor for failing to notice that M2 growth had been slowing during the period in which they claimed that the Fed was reigniting inflation. Friedman wrote, "On the contrary, since 2000, the rate of growth in the quantity of money has been trending downward and in the past year has consistently been in the range of 4% to 6%, just about the rate required for a rapidly growing non-inflationary economy."

More than any other single economist, Milton Friedman gets credit for teaching the world that central banks are responsible for inflation through their control over the money supply. This letter is not significant so much because of what it said, but because of who said it. The letter marked 70 years of publications by the prolific Professor Friedman. His first article, "Professor Pigou's Method for Measuring Elasticities of Demand from Budgetary Data," was published in the *Quarterly Journal of Economics* in November 1935.

What about the message? Should slowing M2 growth give us comfort about the future of price stability? As Friedman notes, M2 growth in the range of 4 to 6 percent is consistent with healthy economic growth. Over the past 15 years, M2 has grown at an average annual rate of 4.8 percent while nominal GDP has advanced at a 5.0 percent rate.

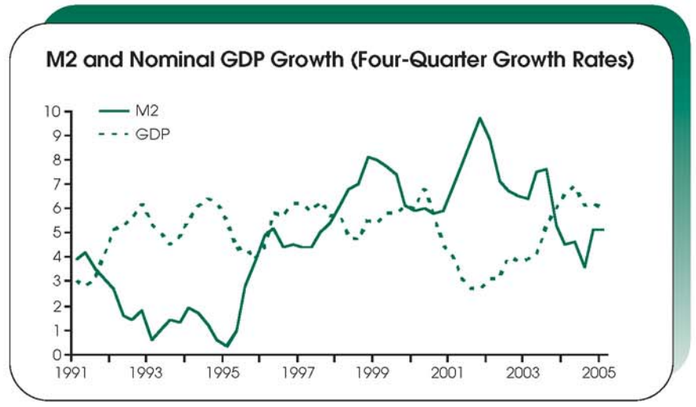
The accompanying chart shows the four-quarter growth rates in M2 and nominal GDP since 1991, including the recent slowdown in M2 growth to the 4 to 6 percent range noted by Friedman. It also shows that the 15-year averages are approximately equal. Low M2 growth between 1991 and 1996 was offset by relatively high growth between 1998 and 2003.

But the chart also shows that M2 and nominal GDP appear to be moving in opposite directions most of the time. The measured correlation between these two series is mildly negative whether we look at the contemporaneous relationship (–0.3), a one-year lead for M2 (–0.11), or a two-year lead (–0.19). Therefore, we have little reason to think that slowing M2 growth today means slowing GDP growth over the next year or two.

The short-run correlation between M2 growth and nominal GDP growth depends importantly on the nature of monetary policy and money demand. If variation in M2 is driven mainly by destabilizing monetary policy (as in the 1970s, or in the case of a hyperinflation), then we expect to see a close correlation between M2 and GDP growth. If we are in an era of relative price stability, then we expect to see the effects of shifts in money demand. We should not be surprised to see M2 and GDP growing in different directions much of the time.

The recent moderation in M2 growth is confirmation that we continue to live in a regime of relative price stability. There is no reason to think that inflation will become a major problem for the U.S. economy unless one believes that there is going to be a major regime change in Federal Reserve policymaking. This caveat helps to explain the high degree of interest in who Chairman Greenspan's successor will be.

—William T. Gavin




*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. 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: $[(x_t/x_{t-1})-1]\times 1200$. 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: $[(x_t/x_{t-12})-1]\times 100$.

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Beginning with this issue, the Monetary Services Index-M2 on pages 4 and 16 includes revisions to user costs. For further information, please refer to the working paper at *research.stlouisfed.org/econ/anderson/usercosts.pdf*.


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# 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 (under $100,000) time deposits issued by financial institutions; and shares in retail 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/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 *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/aggreg/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** shows constant maturity yields calculated by the U.S. Treasury 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/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 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 $((y_t - y_{t-40})/40) \times 400$, where $y_t$ 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/aggreg/swdata.html.

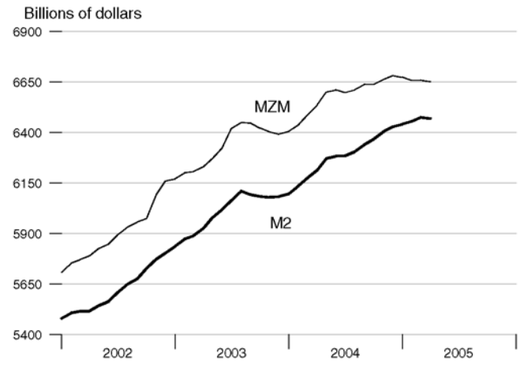
*Page 11*: **Implied One-Year Forward Rates** are calculated by this Bank from Treasury constant maturity yields. Yields to maturity, $R(m)$, for securities with $m = 1,\ldots,$ 10 years to maturity are obtained by linear interpolation between

| | | M1 | MZM | M2 | M3 |
|---|---|---|---|---|---|
| **Percent change at an annual rate** | | | | | |
| | 2000 | 0.18 | 8.12 | 6.09 | 9.43 |
| | 2001 | 3.03 | 15.80 | 8.70 | 11.40 |
| | 2002 | 4.85 | 12.85 | 7.57 | 8.03 |
| | 2003 | 6.42 | 7.40 | 6.94 | 6.40 |
| | 2004 | 5.52 | 3.91 | 4.54 | 5.23 |
| 2003 | 1 | 7.95 | 7.76 | 6.84 | 6.59 |
| | 2 | 9.87 | 5.30 | 7.36 | 5.10 |
| | 3 | 7.60 | 10.41 | 7.66 | 7.72 |
| | 4 | 2.39 | -2.03 | -0.42 | -0.25 |
| 2004 | 1 | 5.97 | 2.37 | 3.49 | 5.48 |
| | 2 | 5.97 | 8.60 | 7.82 | 9.40 |
| | 3 | 3.60 | 2.07 | 3.53 | 4.27 |
| | 4 | 5.51 | 2.69 | 5.67 | 3.71 |
| 2005 | 1 | 0.46 | 0.15 | 3.58 | 4.18 |
| 2003 | Apr | 6.44 | 4.41 | 7.19 | 4.23 |
| | May | 19.99 | 8.15 | 10.96 | 7.90 |
| | Jun | 9.71 | 9.91 | 8.25 | 7.39 |
| | Jul | 3.64 | 18.21 | 8.84 | 12.68 |
| | Aug | 8.78 | 5.57 | 9.10 | 4.40 |
| | Sep | 0.33 | -0.69 | -3.58 | -0.39 |
| | Oct | 0.84 | -4.47 | -1.54 | -0.47 |
| | Nov | 1.38 | -3.57 | -0.90 | -2.37 |
| | Dec | 6.78 | -1.89 | 0.73 | 0.26 |
| 2004 | Jan | -2.02 | 2.50 | 2.58 | 7.85 |
| | Feb | 16.59 | 6.03 | 7.74 | 8.61 |
| | Mar | 11.47 | 9.07 | 7.56 | 10.18 |
| | Apr | 0.31 | 8.95 | 7.37 | 8.75 |
| | May | 3.51 | 11.92 | 11.33 | 11.74 |
| | Jun | 6.29 | 2.02 | 2.34 | 5.26 |
| | Jul | -6.62 | -2.39 | 0.36 | 0.52 |
| | Aug | 16.10 | 2.48 | 4.00 | 4.19 |
| | Sep | 4.04 | 4.94 | 6.66 | 6.23 |
| | Oct | 0.04 | -0.15 | 5.03 | 1.08 |
| | Nov | 13.29 | 4.40 | 6.95 | 3.76 |
| | Dec | -1.31 | 3.47 | 4.47 | 5.92 |
| 2005 | Jan | -8.41 | -1.47 | 2.52 | 5.10 |
| | Feb | 6.45 | -2.84 | 2.58 | 2.44 |
| | Mar | 6.05 | 0.12 | 3.56 | 1.73 |
| | Apr | -15.15 | -1.26 | -0.95 | 5.21 |

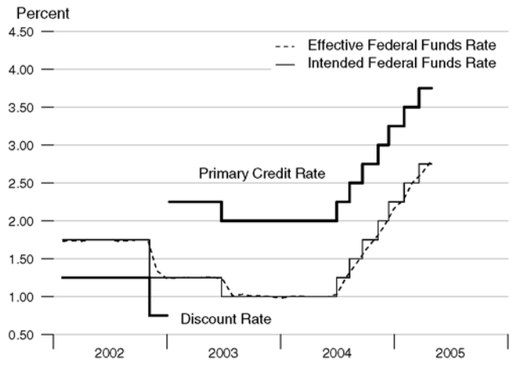




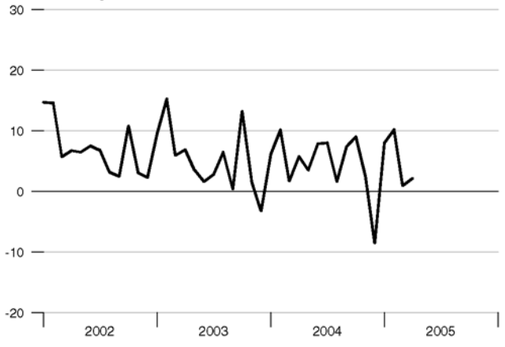
## M2 and MZM



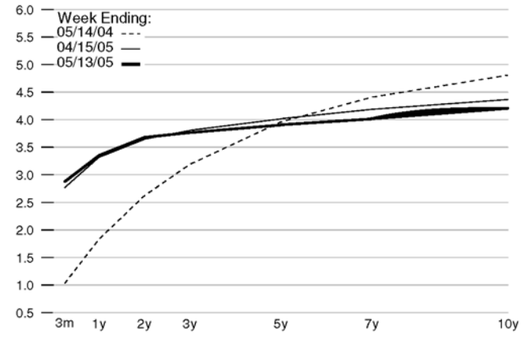

## Reserve Market Rates



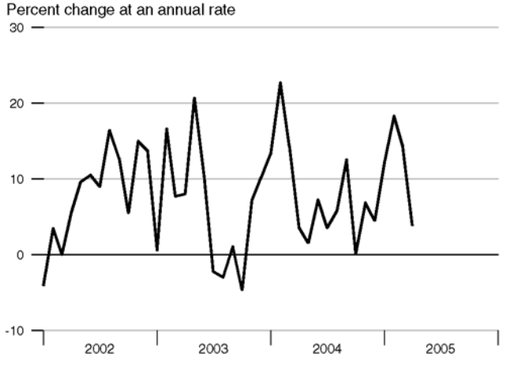

## Adjusted Monetary Base




## Treasury Yield Curve




## Total Bank Credit

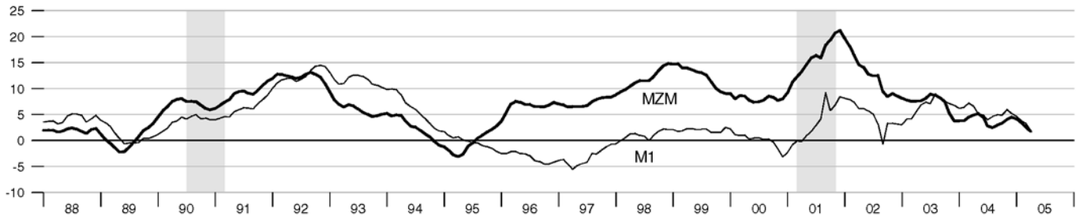



## Interest Rates

| | Feb 05 | Mar 05 | Apr 05 |
|---|---|---|---|
| Federal Funds Rate | 2.50 | 2.63 | 2.79 |
| Prime Rate | 5.49 | 5.58 | 5.75 |
| Primary Credit Rate | 3.49 | 3.58 | 3.75 |
| Conventional Mortgage Rate | 5.63 | 5.93 | 5.86 |
| **Treasury Yields:** | | | |
| 3-Month Constant Maturity | 2.58 | 2.80 | 2.84 |
| 6-Month Constant Maturity | 2.85 | 3.09 | 3.14 |
| 1-Year Constant Maturity | 3.03 | 3.30 | 3.32 |
| 3-Year Constant Maturity | 3.54 | 3.91 | 3.79 |
| 5-Year Constant Maturity | 3.77 | 4.17 | 4.00 |
| 10-Year Constant Maturity | 4.17 | 4.50 | 4.34 |

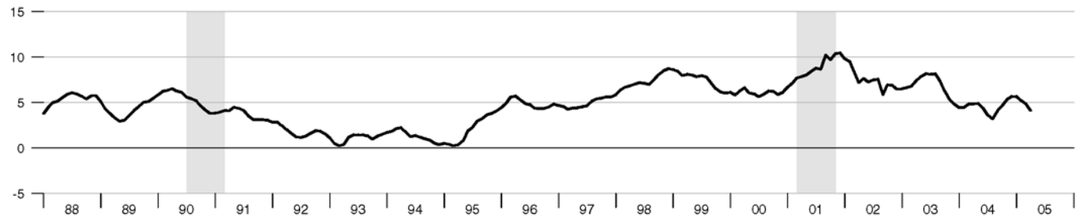
## MZM and M1

Percent change from year ago




## M2

Percent change from year ago

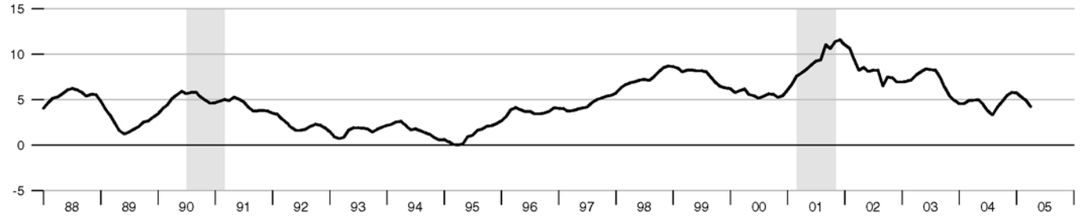



## M3

Percent change from year ago

## Monetary Services Index - M2

Percent change from year ago








| | | Federal Funds | Primary Credit Rate | Prime Rate | 3-mo CDs | Treasury Yields 3-mo | Treasury Yields 3-yr | Treasury Yields 10-yr | Corporate Aaa Bonds | S & L Aaa Bonds | Conventional Mortgage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2000 | | 6.24 | | 9.23 | 6.46 | 6.00 | 6.22 | 6.03 | 7.62 | 5.58 | 8.06 |
| 2001 | | 3.89 | | 6.92 | 3.69 | 3.47 | 4.08 | 5.02 | 7.08 | 5.01 | 6.97 |
| 2002 | | 1.67 | | 4.68 | 1.73 | 1.63 | 3.10 | 4.61 | 6.49 | 4.87 | 6.54 |
| 2003 | | 1.13 | 2.11 | 4.12 | 1.15 | 1.03 | 2.11 | 4.02 | 5.67 | 4.52 | 5.82 |
| 2004 | | 1.35 | 2.34 | 4.34 | 1.56 | 1.40 | 2.78 | 4.27 | 5.63 | 4.50 | 5.84 |
| 2003 | 1 | 1.25 | 2.25 | 4.25 | 1.26 | 1.18 | 2.07 | 3.92 | 6.00 | 4.60 | 5.83 |
| | 2 | 1.25 | 2.23 | 4.24 | 1.17 | 1.06 | 1.77 | 3.62 | 5.31 | 4.28 | 5.51 |
| | 3 | 1.02 | 2.00 | 4.00 | 1.07 | 0.95 | 2.20 | 4.23 | 5.70 | 4.68 | 6.01 |
| | 4 | 1.00 | 2.00 | 4.00 | 1.10 | 0.93 | 2.38 | 4.29 | 5.66 | 4.52 | 5.92 |
| 2004 | 1 | 1.00 | 2.00 | 4.00 | 1.05 | 0.93 | 2.17 | 4.02 | 5.45 | 4.26 | 5.61 |
| | 2 | 1.01 | 2.00 | 4.00 | 1.25 | 1.10 | 2.98 | 4.60 | 5.93 | 4.82 | 6.13 |
| | 3 | 1.43 | 2.42 | 4.42 | 1.70 | 1.51 | 2.92 | 4.30 | 5.64 | 4.54 | 5.89 |
| | 4 | 1.95 | 2.94 | 4.94 | 2.25 | 2.04 | 3.05 | 4.17 | 5.48 | 4.39 | 5.73 |
| 2005 | 1 | 2.47 | 3.44 | 5.44 | 2.78 | 2.58 | 3.61 | 4.30 | 5.32 | 4.23 | 5.76 |
| 2003 | Apr | 1.26 | 2.25 | 4.25 | 1.24 | 1.15 | 2.06 | 3.96 | 5.74 | 4.60 | 5.81 |
| | May | 1.26 | 2.25 | 4.25 | 1.22 | 1.09 | 1.75 | 3.57 | 5.22 | 4.16 | 5.48 |
| | Jun | 1.22 | 2.20 | 4.22 | 1.04 | 0.94 | 1.51 | 3.33 | 4.97 | 4.07 | 5.23 |
| | Jul | 1.01 | 2.00 | 4.00 | 1.05 | 0.92 | 1.93 | 3.98 | 5.49 | 4.59 | 5.63 |
| | Aug | 1.03 | 2.00 | 4.00 | 1.08 | 0.97 | 2.44 | 4.45 | 5.88 | 4.82 | 6.26 |
| | Sep | 1.01 | 2.00 | 4.00 | 1.08 | 0.96 | 2.23 | 4.27 | 5.72 | 4.63 | 6.15 |
| | Oct | 1.01 | 2.00 | 4.00 | 1.10 | 0.94 | 2.26 | 4.29 | 5.70 | 4.64 | 5.95 |
| | Nov | 1.00 | 2.00 | 4.00 | 1.11 | 0.95 | 2.45 | 4.30 | 5.65 | 4.50 | 5.93 |
| | Dec | 0.98 | 2.00 | 4.00 | 1.10 | 0.91 | 2.44 | 4.27 | 5.62 | 4.41 | 5.88 |
| 2004 | Jan | 1.00 | 2.00 | 4.00 | 1.06 | 0.90 | 2.27 | 4.15 | 5.54 | 4.42 | 5.74 |
| | Feb | 1.01 | 2.00 | 4.00 | 1.05 | 0.94 | 2.25 | 4.08 | 5.50 | 4.26 | 5.64 |
| | Mar | 1.00 | 2.00 | 4.00 | 1.05 | 0.95 | 2.00 | 3.83 | 5.33 | 4.11 | 5.45 |
| | Apr | 1.00 | 2.00 | 4.00 | 1.08 | 0.96 | 2.57 | 4.35 | 5.73 | 4.69 | 5.83 |
| | May | 1.00 | 2.00 | 4.00 | 1.20 | 1.04 | 3.10 | 4.72 | 6.04 | 4.93 | 6.27 |
| | Jun | 1.03 | 2.01 | 4.01 | 1.46 | 1.29 | 3.26 | 4.73 | 6.01 | 4.85 | 6.29 |
| | Jul | 1.26 | 2.25 | 4.25 | 1.57 | 1.36 | 3.05 | 4.50 | 5.82 | 4.71 | 6.06 |
| | Aug | 1.43 | 2.43 | 4.43 | 1.68 | 1.50 | 2.88 | 4.28 | 5.65 | 4.52 | 5.87 |
| | Sep | 1.61 | 2.58 | 4.58 | 1.86 | 1.68 | 2.83 | 4.13 | 5.46 | 4.40 | 5.75 |
| | Oct | 1.76 | 2.75 | 4.75 | 2.04 | 1.79 | 2.85 | 4.10 | 5.47 | 4.38 | 5.72 |
| | Nov | 1.93 | 2.93 | 4.93 | 2.26 | 2.11 | 3.09 | 4.19 | 5.52 | 4.45 | 5.73 |
| | Dec | 2.16 | 3.15 | 5.15 | 2.45 | 2.22 | 3.21 | 4.23 | 5.47 | 4.35 | 5.75 |
| 2005 | Jan | 2.28 | 3.25 | 5.25 | 2.61 | 2.37 | 3.39 | 4.22 | 5.36 | 4.24 | 5.71 |
| | Feb | 2.50 | 3.49 | 5.49 | 2.77 | 2.58 | 3.54 | 4.17 | 5.20 | 4.16 | 5.63 |
| | Mar | 2.63 | 3.58 | 5.58 | 2.97 | 2.80 | 3.91 | 4.50 | 5.40 | 4.29 | 5.93 |
| | Apr | 2.79 | 3.75 | 5.75 | 3.09 | 2.84 | 3.79 | 4.34 | 5.33 | 4.18 | 5.86 |

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

| | | Money Stock | | | | Bank | Adjusted | | |
|---|---|---|---|---|---|---|---|---|---|
| | | M1 | MZM | M2 | M3 | Credit | Monetary Base | Reserves | MSI M2 |
| | 2000 | 1103.482 | 4508.932 | 4801.002 | 6861.391 | 5025.383 | 607.106 | 84.511 | 248.688 |
| | 2001 | 1136.938 | 5221.307 | 5218.620 | 7643.640 | 5345.093 | 641.167 | 85.923 | 271.335 |
| | 2002 | 1192.032 | 5892.156 | 5613.534 | 8257.680 | 5596.994 | 697.072 | 87.914 | 294.062 |
| | 2003 | 1268.505 | 6328.391 | 6003.106 | 8786.362 | 6120.005 | 740.762 | 92.915 | 315.116 |
| | 2004 | 1338.512 | 6575.974 | 6275.504 | 9245.467 | 6591.330 | 776.518 | 95.578 | 329.786 |
| 2003 | 1 | 1231.793 | 6193.410 | 5866.583 | 8621.050 | 5955.561 | 726.828 | 90.855 | 307.874 |
| | 2 | 1262.199 | 6275.435 | 5974.514 | 8731.063 | 6135.741 | 738.281 | 91.807 | 313.550 |
| | 3 | 1286.174 | 6438.678 | 6088.880 | 8899.502 | 6186.066 | 744.144 | 94.732 | 319.626 |
| | 4 | 1293.854 | 6406.044 | 6082.447 | 8893.835 | 6202.650 | 753.796 | 94.266 | 319.415 |
| 2004 | 1 | 1313.176 | 6443.963 | 6135.538 | 9015.656 | 6424.644 | 761.243 | 94.542 | 322.305 |
| | 2 | 1332.790 | 6582.490 | 6255.537 | 9227.488 | 6554.198 | 770.962 | 96.125 | 328.638 |
| | 3 | 1344.775 | 6616.481 | 6310.761 | 9326.095 | 6647.223 | 782.591 | 96.310 | 331.675 |
| | 4 | 1363.307 | 6660.963 | 6400.181 | 9412.628 | 6739.253 | 791.277 | 95.333 | 336.526 |
| 2005 | 1 | 1364.881 | 6663.413 | 6457.460 | 9510.991 | 6934.667 | 798.060 | 96.180 | 339.542 |
| 2003 | Apr | 1244.962 | 6229.976 | 5924.733 | 8675.075 | 6048.562 | 736.490 | 92.281 | 310.967 |
| | May | 1265.697 | 6272.272 | 5978.844 | 8732.167 | 6152.618 | 738.676 | 91.440 | 313.744 |
| | Jun | 1275.938 | 6324.056 | 6019.965 | 8785.946 | 6206.044 | 739.676 | 91.700 | 315.938 |
| | Jul | 1279.812 | 6420.039 | 6064.290 | 8878.770 | 6194.443 | 741.389 | 93.633 | 318.327 |
| | Aug | 1289.179 | 6449.851 | 6110.288 | 8911.334 | 6179.164 | 745.394 | 95.535 | 320.717 |
| | Sep | 1289.532 | 6446.143 | 6092.063 | 8908.401 | 6184.591 | 745.648 | 95.029 | 319.835 |
| | Oct | 1290.433 | 6422.121 | 6084.259 | 8904.944 | 6160.831 | 753.833 | 95.387 | 319.453 |
| | Nov | 1291.913 | 6403.039 | 6079.700 | 8887.332 | 6197.349 | 754.786 | 94.912 | 319.278 |
| | Dec | 1299.217 | 6392.972 | 6083.381 | 8889.229 | 6249.769 | 752.769 | 92.500 | 319.515 |
| 2004 | Jan | 1297.033 | 6406.283 | 6096.437 | 8947.387 | 6319.317 | 756.606 | 92.731 | 320.341 |
| | Feb | 1314.962 | 6438.460 | 6135.755 | 9011.571 | 6438.833 | 763.012 | 95.437 | 322.307 |
| | Mar | 1327.532 | 6487.145 | 6174.423 | 9088.011 | 6515.783 | 764.112 | 95.458 | 324.267 |
| | Apr | 1327.878 | 6535.526 | 6212.369 | 9154.269 | 6535.329 | 767.768 | 96.609 | 326.334 |
| | May | 1331.757 | 6600.424 | 6270.999 | 9243.835 | 6543.938 | 770.029 | 95.311 | 329.465 |
| | Jun | 1338.736 | 6611.520 | 6283.242 | 9284.359 | 6583.327 | 775.088 | 96.455 | 330.116 |
| | Jul | 1331.351 | 6598.333 | 6285.147 | 9288.370 | 6602.868 | 780.276 | 95.214 | 330.422 |
| | Aug | 1349.213 | 6611.946 | 6306.075 | 9320.768 | 6634.707 | 781.339 | 95.540 | 331.374 |
| | Sep | 1353.760 | 6639.165 | 6341.060 | 9369.147 | 6704.093 | 786.158 | 98.176 | 333.229 |
| | Oct | 1353.808 | 6638.326 | 6367.643 | 9377.559 | 6705.210 | 792.055 | 97.051 | 334.778 |
| | Nov | 1368.804 | 6662.660 | 6404.527 | 9406.947 | 6743.539 | 793.690 | 96.344 | 336.761 |
| | Dec | 1367.308 | 6681.903 | 6428.372 | 9453.377 | 6769.010 | 788.085 | 92.605 | 338.039 |
| 2005 | Jan | 1357.721 | 6673.726 | 6441.861 | 9493.547 | 6837.446 | 793.357 | 94.613 | 338.823 |
| | Feb | 1365.018 | 6657.934 | 6455.690 | 9512.873 | 6941.728 | 800.094 | 97.335 | 339.428 |
| | Mar | 1371.904 | 6658.580 | 6474.829 | 9526.552 | 7024.826 | 800.730 | 96.592 | 340.376 |
| | Apr | 1354.583 | 6651.561 | 6469.717 | 9567.925 | 7047.763 | 802.155 | 96.924 | 340.202 |

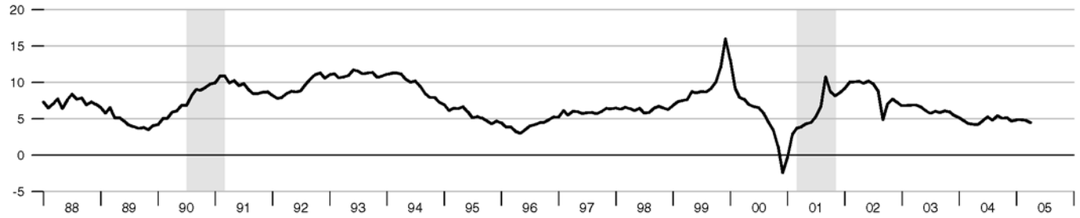
*All values are given in billions of dollars.





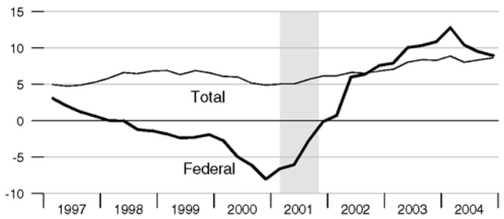
### Adjusted Monetary Base

Percent change from year ago



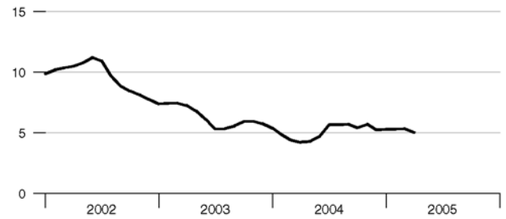

### Domestic Nonfinancial Debt

Percent change from year ago



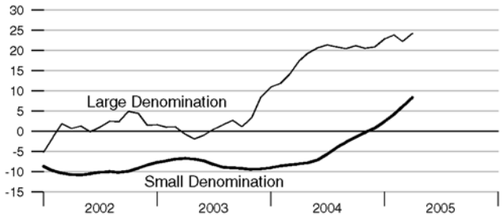

### Currency Held by the Nonbank Public

Percent change from year ago



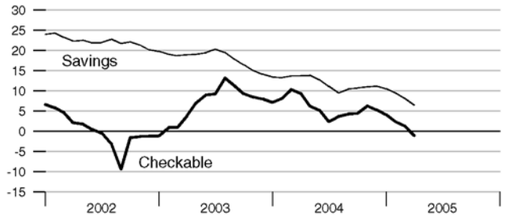

### Time Deposits

Percent change from year ago



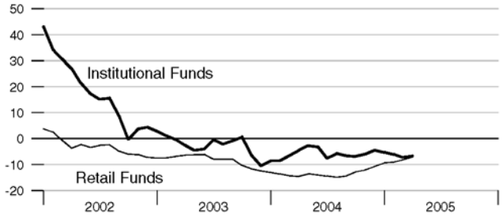

### Checkable and Savings Deposits

Percent change from year ago



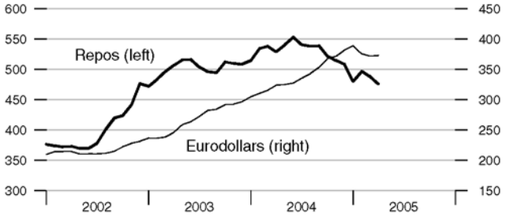

### Money Market Mutual Fund Shares

Percent change from year ago



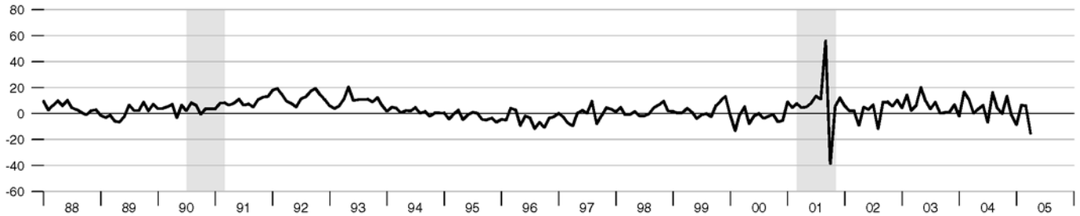

### Repurchase Agreements and Eurodollars

Billions of dollars — Billions of dollars



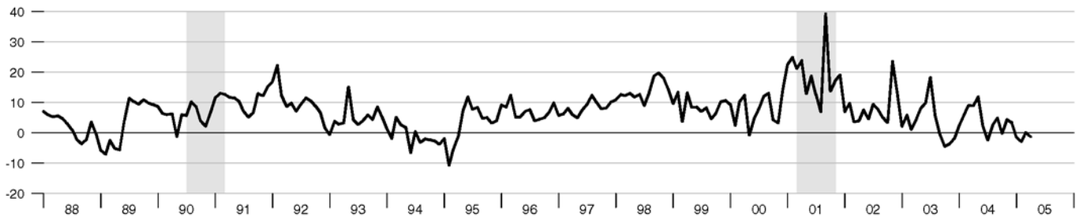
## M1

Percent change at an annual rate



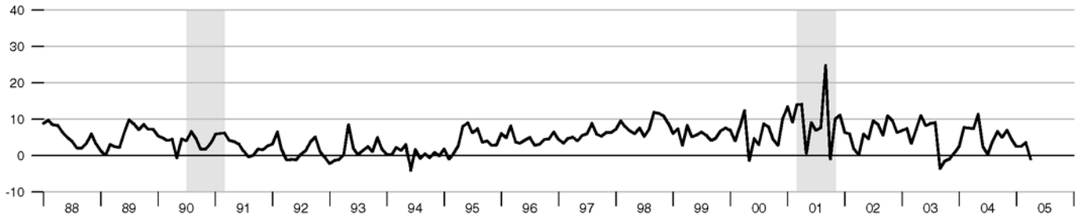

## MZM

Percent change at an annual rate



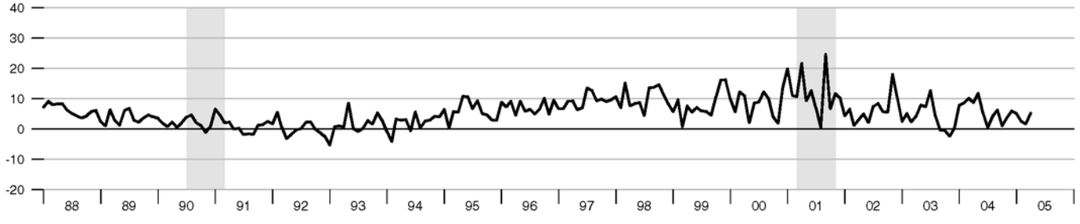

## M2

Percent change at an annual rate




## M3

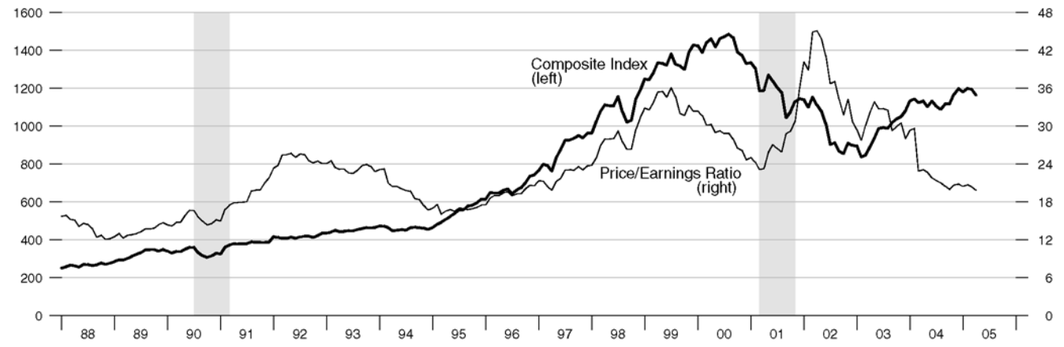
Percent change at an annual rate







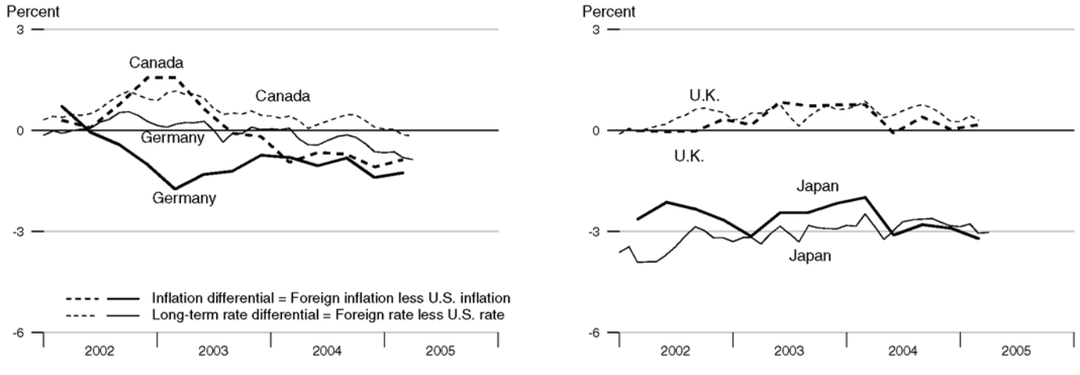

## Standard & Poor's 500




## Recent Inflation and Long-Term Interest Rates

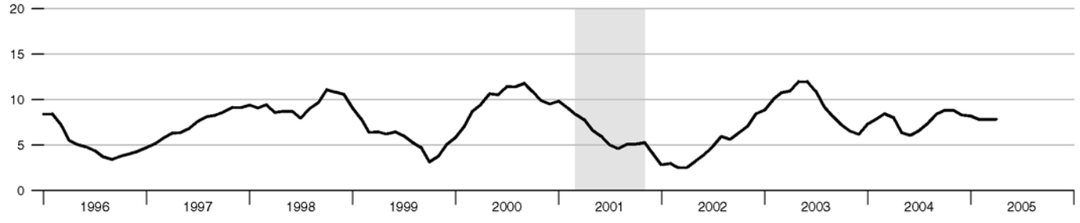
| | Consumer Price Inflation Rates (Percent change from year ago) | | | | Long-Term Government Bond Rates (Percent) | | | |
|---|---|---|---|---|---|---|---|---|
| | 2004Q2 | 2004Q3 | 2004Q4 | 2005Q1 | Jan05 | Feb05 | Mar05 | Apr05 |
| United States | 2.84 | 2.69 | 3.37 | 3.00 | 4.22 | 4.17 | 4.50 | 4.34 |
| Canada | 2.18 | 1.99 | 2.29 | 2.13 | 4.26 | 4.20 | 4.37 | 4.18 |
| France | 2.38 | 2.28 | 2.08 | 1.70 | 3.58 | 3.60 | 3.75 | . |
| Germany | 1.79 | 1.88 | 1.98 | 1.74 | 3.56 | 3.54 | 3.70 | 3.48 |
| Italy | 2.33 | 2.23 | 1.98 | 1.92 | 3.71 | 3.68 | 3.84 | 3.65 |
| Japan | -0.27 | -0.10 | 0.48 | -0.20 | 1.36 | 1.40 | 1.45 | 1.32 |
| United Kingdom | 2.75 | 3.09 | 3.41 | 3.17 | 4.48 | 4.61 | 4.80 | . |

## Inflation and Long-Term Interest Rate Differentials



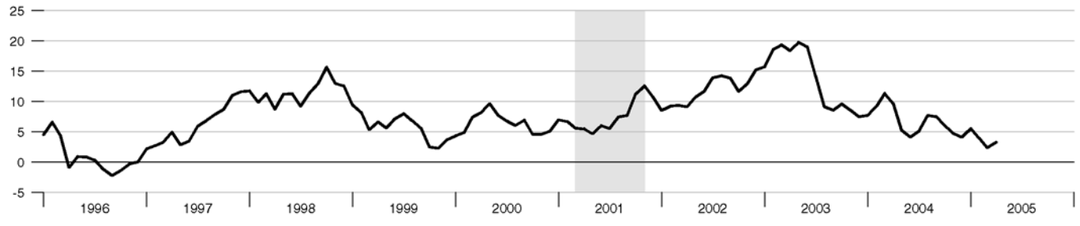
## Bank Credit

Percent change from year ago




## Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago

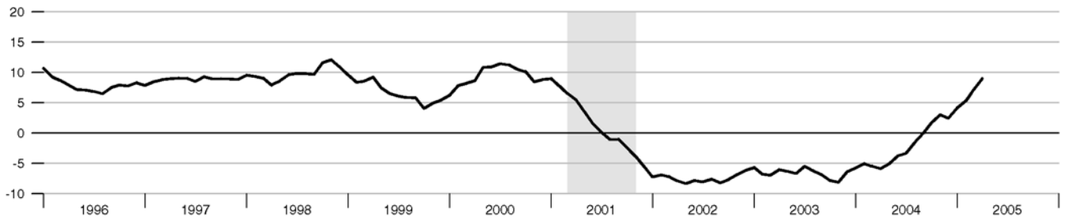



## Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago

## Commercial and Industrial Loans at Commercial Banks

Percent change from year ago

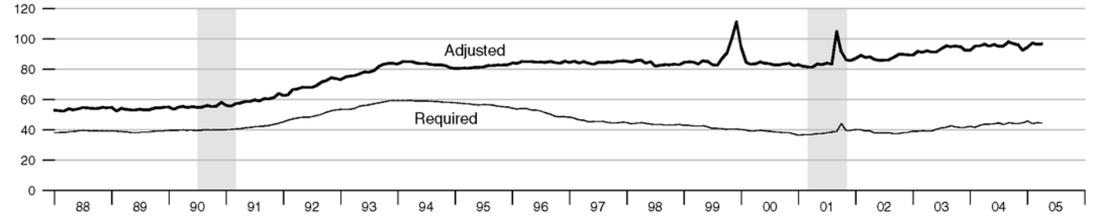






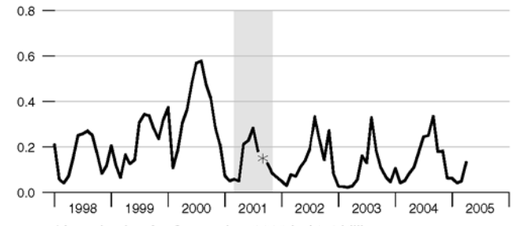

## Adjusted and Required Reserves

Billions of dollars




## Total Borrowings, nsa

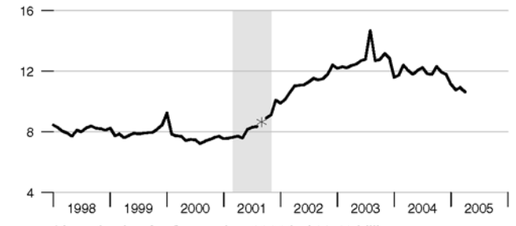
Billions of dollars




*Actual value for September 2001 is $3.4 billion.

## Excess Reserves plus RCB Contracts

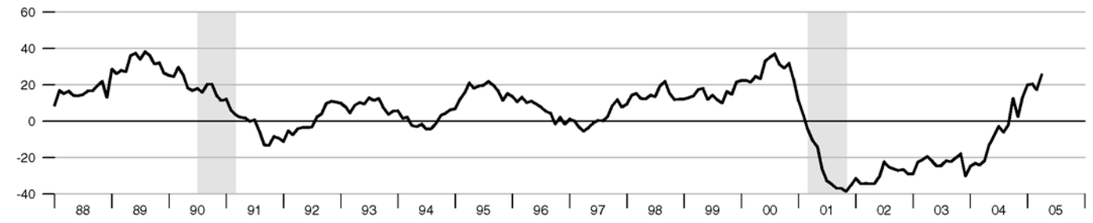
Billions of dollars




*Actual value for September 2001 is $26.43 billion.

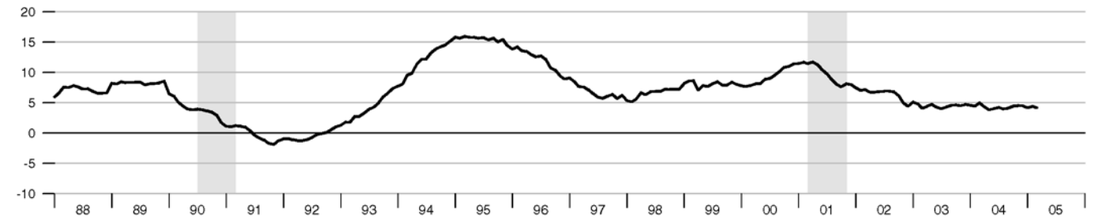
## Nonfinancial Commercial Paper

Percent change from year ago

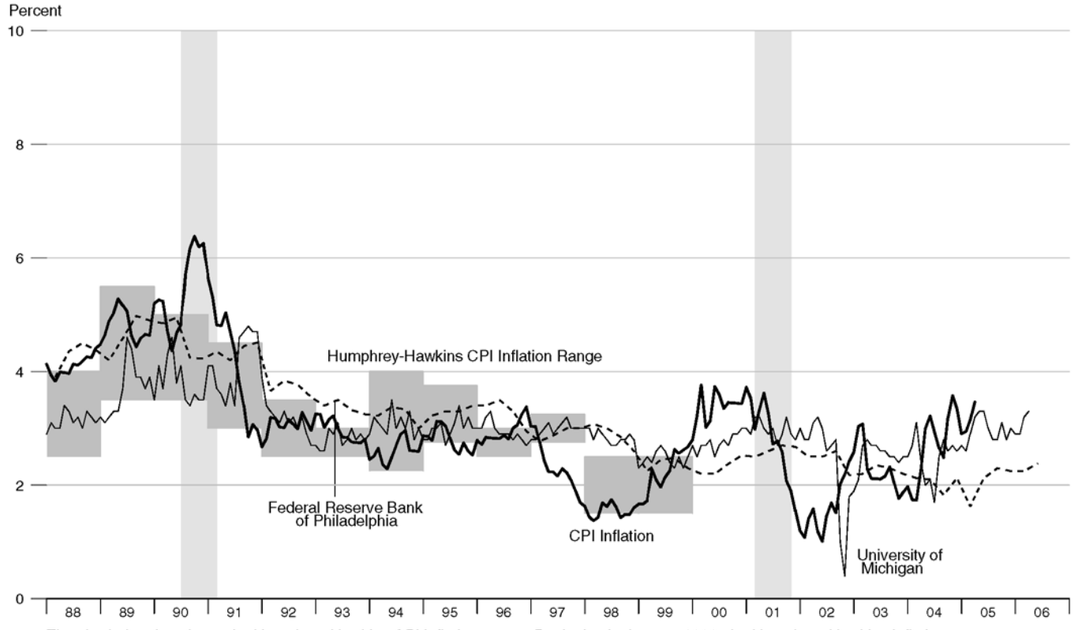



## Consumer Credit

Percent change from year ago



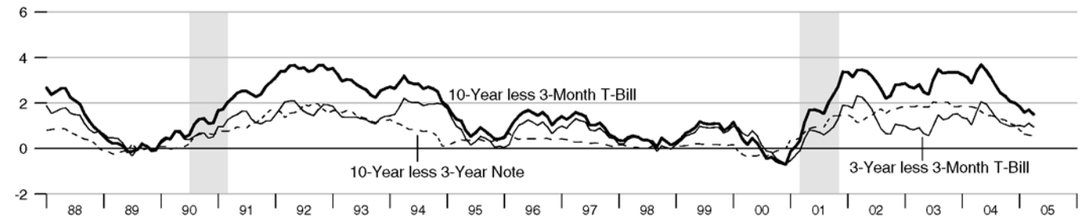
## Inflation and Inflation Expectations




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.

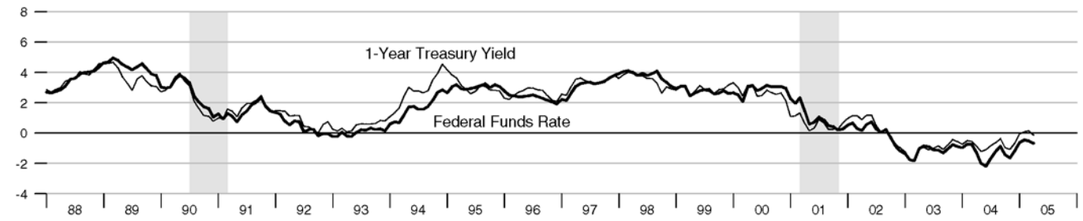
## Treasury Security Yield Spreads

Yield to maturity




## Real Interest Rates

Percent, Real rate = Nominal rate less CPI inflation

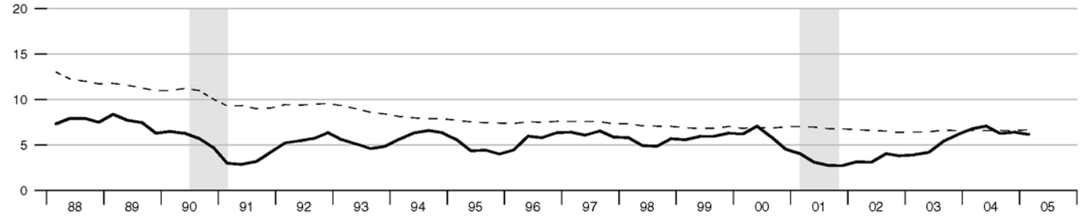







## Gross Domestic Product

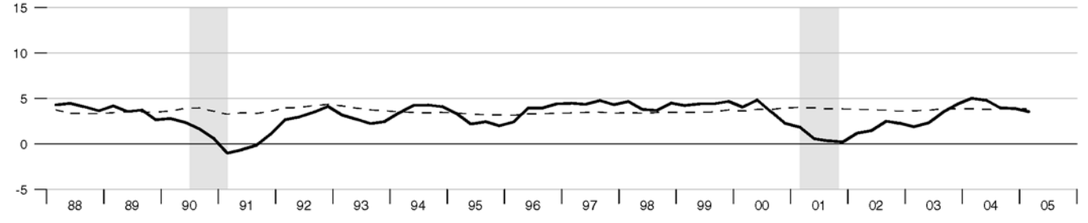
Percent change from year ago




Dashed lines indicate 10-year moving averages.

## Real Gross Domestic Product

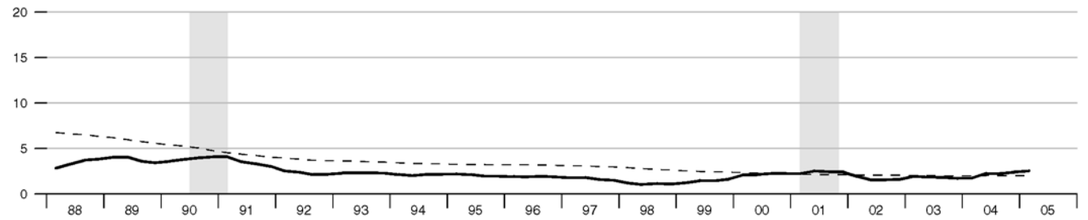
Percent change from year ago




Dashed lines indicate 10-year moving averages.

## Gross Domestic Product Price Index

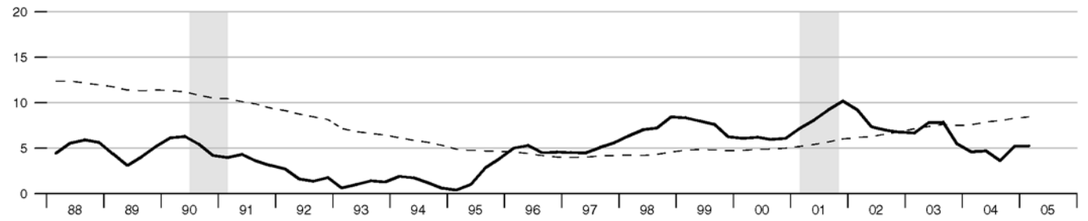
Percent change from year ago




Dashed lines indicate 10-year moving averages.

## M2

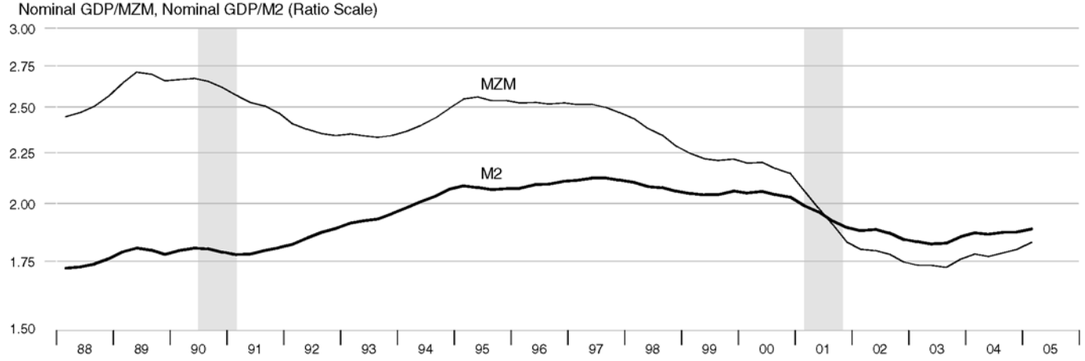
Percent change from year ago




Dashed lines indicate 10-year moving averages.

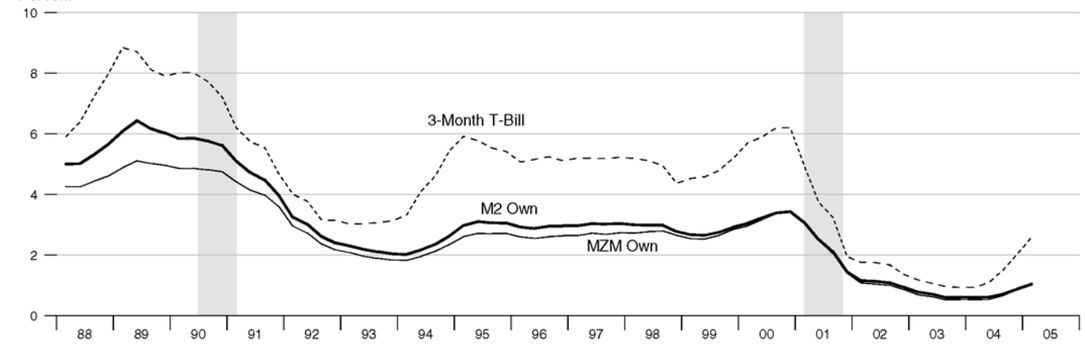
## Velocity

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



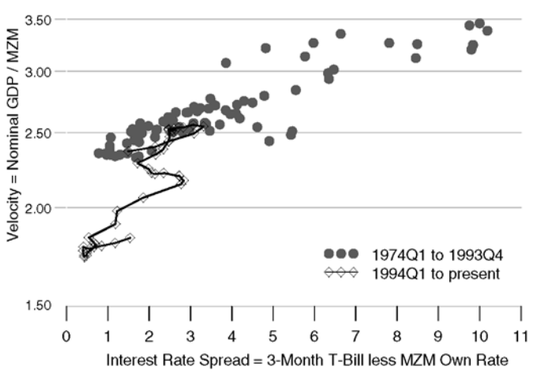

## Interest Rates

Percent



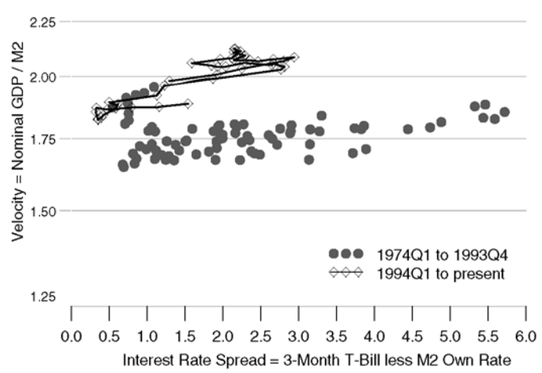

## MZM Velocity and Interest Rate Spread

Ratio Scale




## M2 Velocity and Interest Rate Spread

Ratio Scale

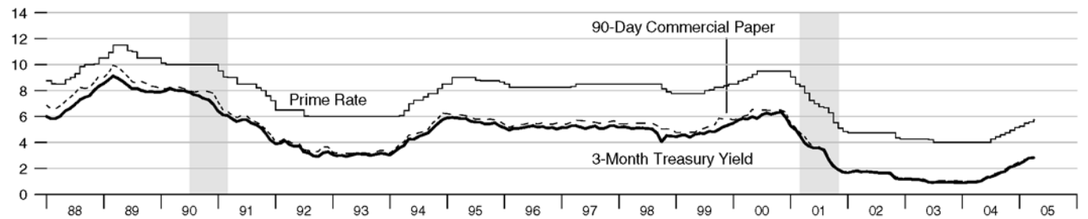






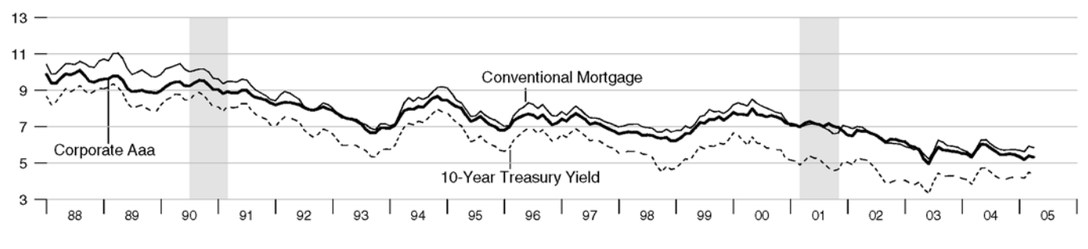

## Short-Term Interest Rates

Percent




## Long-Term Interest Rates

Percent

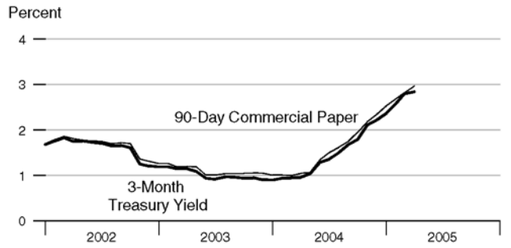



## Long-Term Interest Rates

Percent

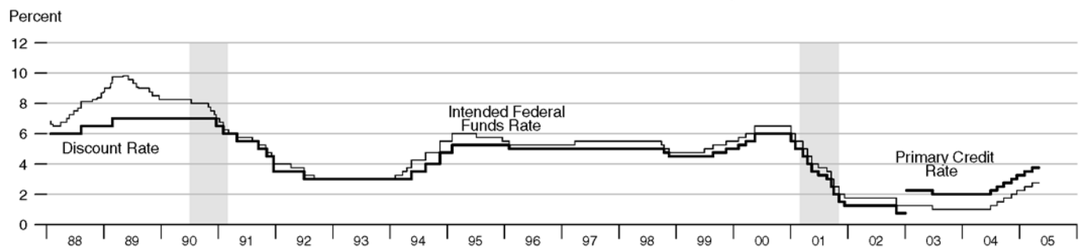
## Short-Term Interest Rates

Percent

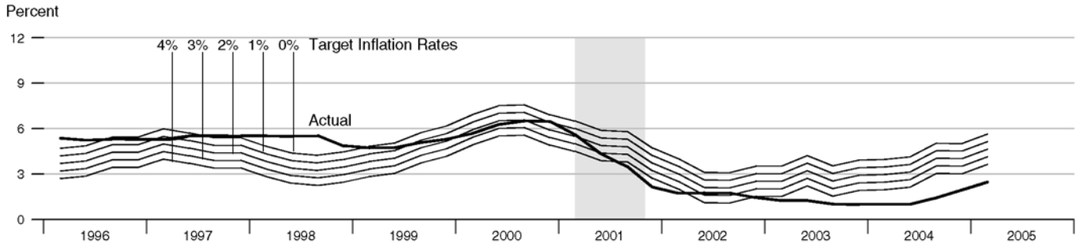



## FOMC Intended Federal Funds Rate, Discount Rate, and Primary Credit Rate

Percent



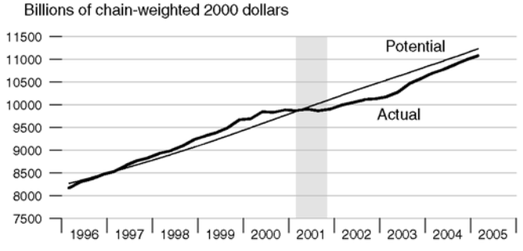
## Federal Funds Rate and Inflation Targets



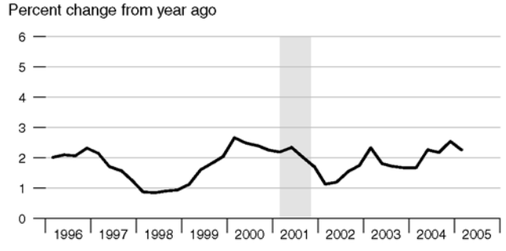

Calculated federal funds rate is based on Taylor's rule. See notes on page 19.

## Components of Taylor's Rule

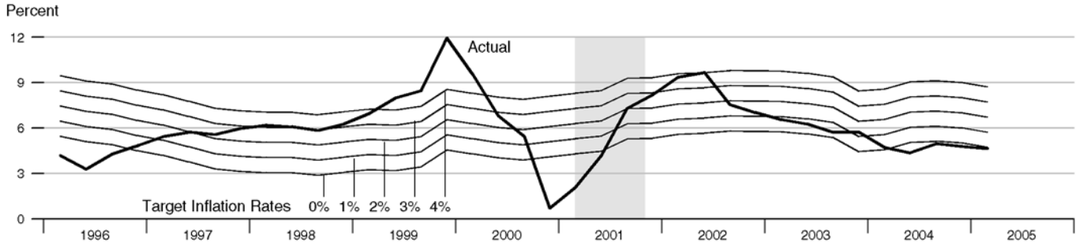
### Actual and Potential Real GDP




### PCE Inflation



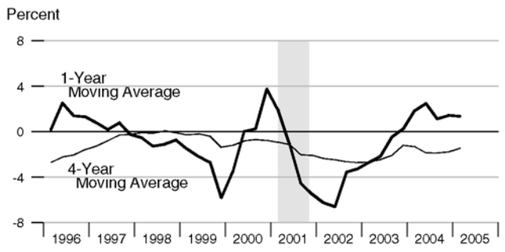

## Monetary Base Growth* and Inflation Targets



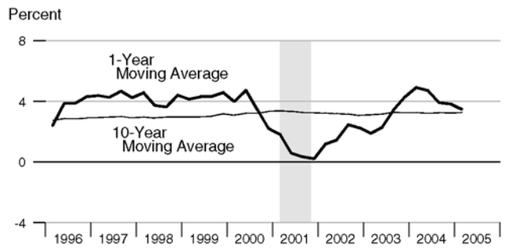

*Modified for the effects of sweeps programs on reserve demand.
Calculated base growth is based on McCallum's rule. Actual base growth is percent change from year ago. See notes on page 19.

## Components of McCallum's Rule

### Monetary Base Velocity Growth



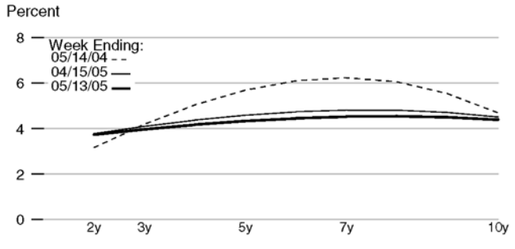

### Real Output Growth



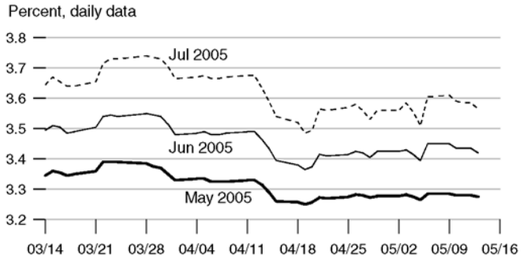




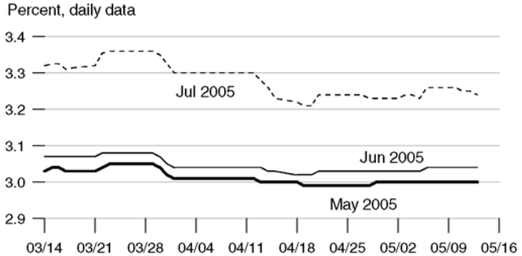

## Implied One-Year Forward Rates



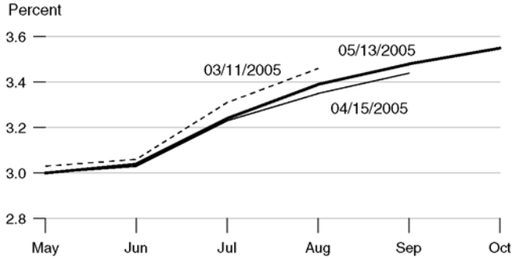

## Rates on 3-Month Eurodollar Futures



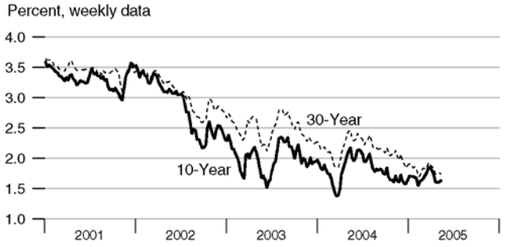

## Rates on Selected Federal Funds Futures Contracts




## Rates on Federal Funds Futures on Selected Dates

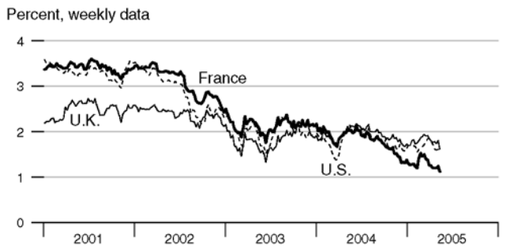


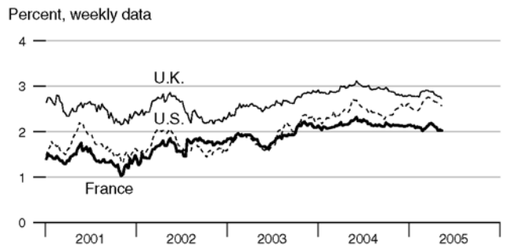

## Inflation-Indexed Treasury Securities




## Inflation-Indexed Treasury Yield Spreads

## Inflation-Indexed 10-Year Government Notes




## Inflation-Indexed 10-Year Government Yield Spreads