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 7/15/2014. **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.

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

Monetary Trends

February 2005

THE FEDERAL RESERVE BANK of ST. LOUIS

Hard "Core" Inflation

One of the more popularly cited indicators of economic welfare is the so-called core inflation rate. It is often considered a better measure of trend movements in aggregate prices than the overall inflation rate because it tries to eliminate high-frequency fluctuations. Low-frequency price changes are those that largely stem from sustained monetary policy actions and, hence, are more relevant to policymakers trying to gauge trend inflation. While news reports might lead one to believe that there exists a precise measure of the core inflation rate, there is, in fact, no universally accepted definition. In particular, two measures, shown in the accompanying figure with consumer price index (CPI) inflation, are widely used: inflation excluding food and energy (XFE) and weighted median inflation (WMI).[1]

The most frequently reported measure of core inflation is CPI inflation XFE. The overall CPI is a measure of the total price that consumers pay for a given market basket of goods and services compared with the base year, and the inflation rate is the percentage change in the CPI from a year earlier.[2] CPI inflation XFE is calculated as the rate of change in the CPI after food and energy are eliminated from the market basket. Food and energy prices are excluded because they can be highly volatile and difficult to predict.

Popular in academic research, the WMI rate is a second common measure of core inflation. In determining the CPI, each component has an associated weight—the respective proportion of all expenditures that consumers spend on that particular item. The WMI rate is determined by computing the simple monthly rate of change in prices for each component, then ordering the items by their inflation rates, and pairing each with its appropriate weight. WMI is the inflation rate associated with an accumulated weight of 50 percent: In other words, for any month, half of the components have inflation rates higher than the weighted median, while the other half have lower inflation rates. This is an appealing measure of core inflation because it eliminates components with relatively large (and relatively small) changes in prices, which generally do not persist, while the weighted median more closely reflects the persistent trend in price movements.[3]

Smith (2004) analyzes various measures of core inflation—including the two described here—in an attempt to determine the optimal choice.[4] She defines core inflation as the best predictor of future inflation, and her tests provide evidence that, of the two, WMI does indeed do a superior job at predicting future inflation, which other economists have also shown. Inflation XFE excludes the same components in every period, even if their individual price fluctuations are not unusual relative to those of other components, whereas the WMI eliminates different components each month, depending on their price fluctuations at that time. Consequently, the latter appears to be a better method to capture the underlying price trend among all expenditures. Therefore, the core inflation rate that we typically read about in the newspaper might not be the one that best forecasts future inflation.

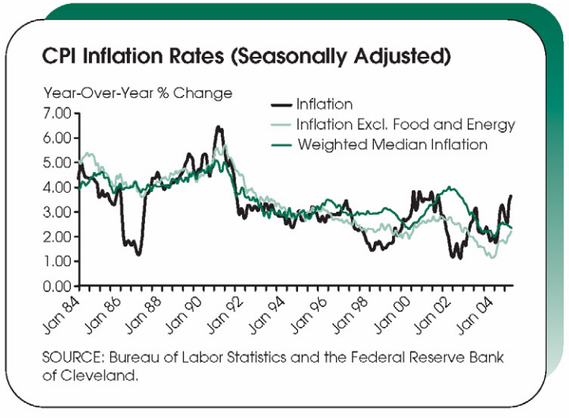
—Kristie M. Engemann and Michael T. Owyang

[1] Alternative measures of core inflation exist—e.g., the trimmed mean. The personal consumption expenditures price index is sometimes used instead of the CPI and is preferred by policymakers.

[2] The Bureau of Labor Statistics lists the following major groups in the CPI market basket: food and beverages; housing; apparel; transportation; medical care; recreation; education and communication; and other goods and services.

[3] Clark, Todd E. "Comparing Measures of Core Inflation." Federal Reserve Bank of Kansas City *Economic Review*, Second Quarter 2001, *86*(2), pp. 5-31.

[4] Smith, Julie K. "Weighted Median Inflation: Is This Core Inflation?" *Journal of Money, Credit, and Banking*, April 2004, *36*(2), pp. 253-63.



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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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, π_{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

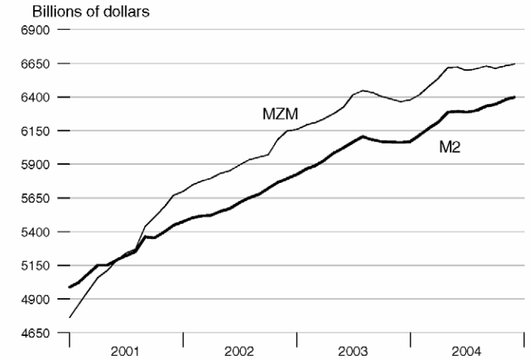
$$\Delta MB_t^* = \pi^* + (\text{10-year moving average growth of real GDP}) - (\text{4-year moving average of base velocity growth})$$

to five alternative target inflation rates, $\pi^* = 0, 1, 2, 3, 4$ percent, where ΔMB_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.

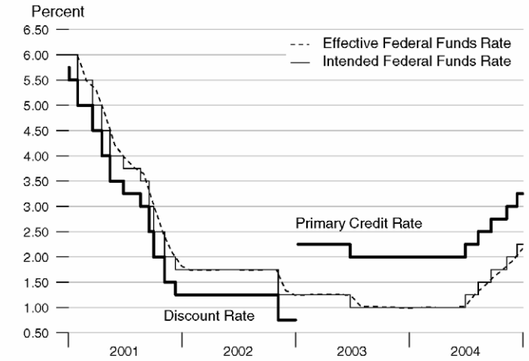
Page 11: **Implied One-Year Forward Rates** are calculated by this Bank from Treasury constant maturity yields. Yields to maturity, $R(m)$, for securities with $m = 1,\ldots, 10$ years to maturity are obtained by linear interpolation between

		M1	MZM	M2	M3
Percent change at an annual rate					
2000		0.18	8.12	6.09	9.43
2001		3.03	15.79	8.70	11.39
2002		4.85	12.84	7.57	8.03
2003		6.04	7.31	6.84	6.32
2004		5.40	3.85	4.47	5.20
2002	1	5.94	11.13	7.35	6.55
	2	-0.95	6.06	3.63	3.96
	3	1.74	6.78	7.12	5.58
	4	6.26	9.44	8.01	8.97
2003	1	8.01	7.90	6.94	6.71
	2	8.53	6.14	8.22	5.73
	3	6.52	9.64	6.93	7.02
	4	2.57	-3.00	-1.29	-1.13
2004	1	6.12	2.61	3.55	5.93
	2	6.26	10.36	9.54	10.78
	3	3.38	1.17	2.65	3.50
	4	5.56	1.03	4.31	2.37
2002	Dec	12.64	12.50	5.69	10.45
2003	Jan	3.17	2.20	6.42	1.95
	Feb	14.43	6.54	8.62	5.25
	Mar	5.36	3.36	4.88	4.37
	Apr	5.34	6.08	8.71	5.19
	May	11.14	7.00	10.38	7.47
	Jun	12.76	9.46	8.22	6.86
	Jul	2.27	17.05	7.95	10.71
	Aug	7.60	5.92	7.99	5.47
	Sep	-0.12	-2.63	-4.48	-1.36
	Oct	2.54	-5.65	-2.91	-3.12
	Nov	-0.63	-3.68	-0.62	-1.81
	Dec	9.38	-3.40	-0.63	0.03
2004	Jan	-5.37	2.54	1.53	7.91
	Feb	17.60	7.57	9.93	9.51
	Mar	17.66	11.22	9.34	12.08
	Apr	-2.43	11.42	9.32	10.50
	May	-0.71	13.77	13.63	13.46
	Jun	12.31	0.74	1.41	4.13
	Jul	-9.73	-4.22	-1.12	-1.90
	Aug	16.18	2.30	2.32	4.92
	Sep	3.61	3.51	6.21	5.72
	Oct	-1.18	-2.93	2.67	-2.23
	Nov	14.63	3.26	6.34	3.09
	Dec	0.85	2.22	3.23	5.52

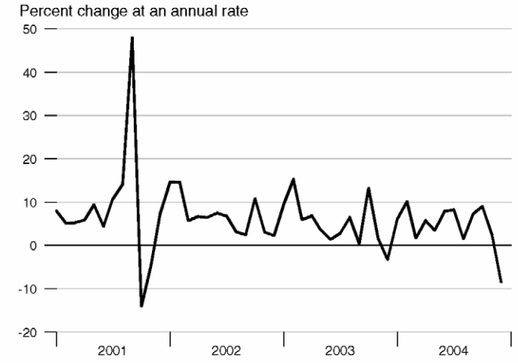
M2 and MZM



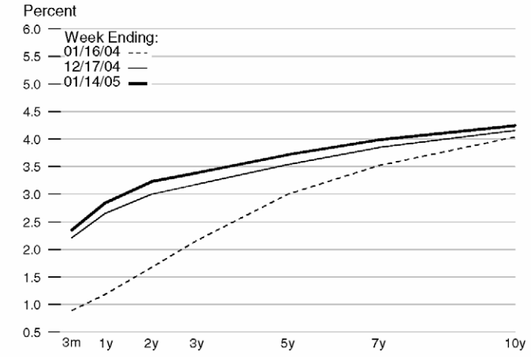
Reserve Market Rates



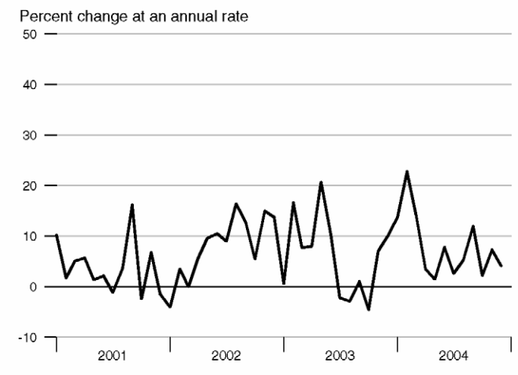
Adjusted Monetary Base



Treasury Yield Curve



Total Bank Credit

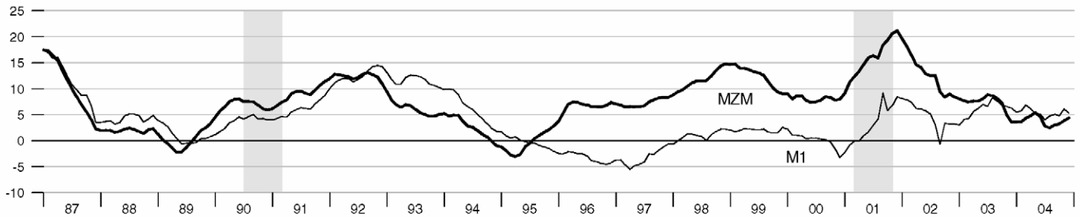


Interest Rates

	Oct 04	Nov 04	Dec 04
Federal Funds Rate	1.76	1.93	2.16
Prime Rate	4.75	4.93	5.14
Primary Credit Rate	2.75	2.93	3.15
Conventional Mortgage Rate	5.72	5.73	5.75
Treasury Yields:			
3-Month Constant Maturity	1.79	2.11	2.22
6-Month Constant Maturity	2.05	2.32	2.50
1-Year Constant Maturity	2.23	2.50	2.67
3-Year Constant Maturity	2.85	3.09	3.21
5-Year Constant Maturity	3.35	3.53	3.60
10-Year Constant Maturity	4.10	4.19	4.23

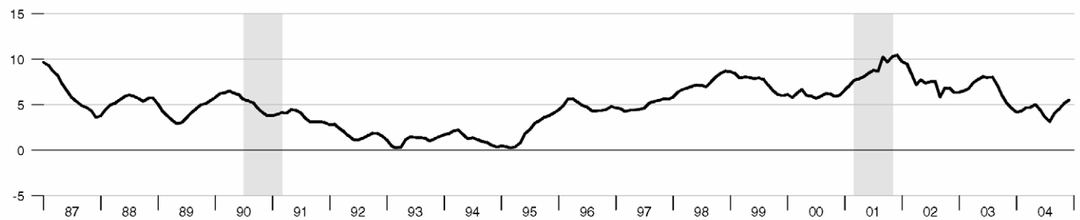
MZM and M1

Percent change from year ago



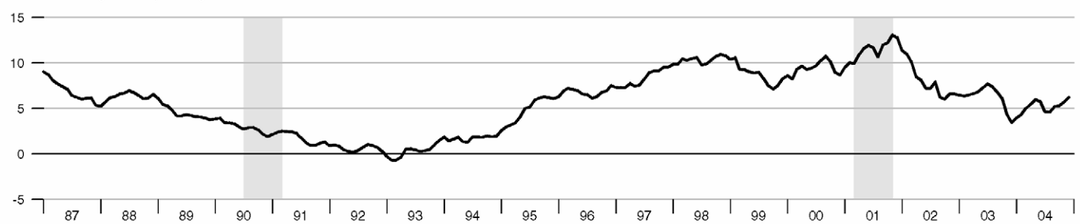
M2

Percent change from year ago



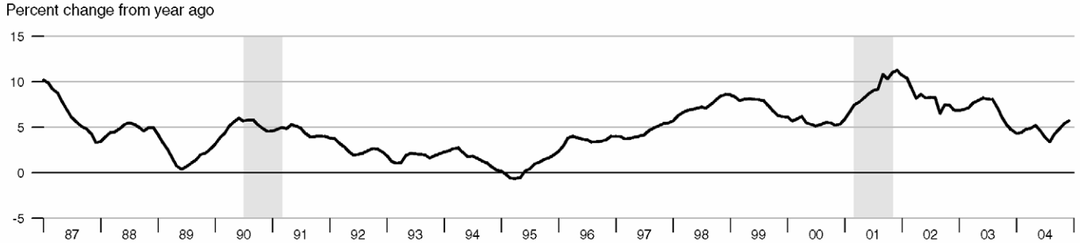
M3

Percent change from year ago



Monetary Services Index - M2

Percent change from year ago



		Federal Funds	Discount Rate	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	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	5.01	6.97
2002		1.67	1.17		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
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
	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
2002	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
	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	5.14	2.45	2.22	3.21	4.23	5.47	4.35	5.75

*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	1103.415	4508.945	4801.426	6861.426	5025.617	607.106	84.511	242.164
	2001	1136.880	5221.045	5219.302	7643.244	5345.611	641.167	85.923	263.713
	2002	1192.000	5891.329	5614.522	8256.727	5597.372	697.072	87.914	285.710
	2003	1263.999	6322.136	5998.403	8778.216	6120.337	740.674	92.828	305.763
	2004	1332.228	6565.837	6266.733	9234.566	6592.466	776.404	95.450	320.020
2002	1	1186.891	5741.671	5499.367	8093.191	5420.284	680.264	88.149	279.198
	2	1184.074	5828.695	5549.339	8173.235	5496.364	692.937	86.970	282.317
	3	1189.215	5927.549	5648.161	8287.348	5655.519	702.753	86.805	287.719
	4	1207.819	6067.400	5761.220	8473.135	5817.319	712.332	89.733	293.608
2003	1	1231.999	6187.285	5861.115	8615.195	5955.828	726.828	90.855	298.738
	2	1258.257	6282.247	5981.585	8738.704	6135.942	738.230	91.756	304.834
	3	1278.762	6433.654	6085.272	8892.087	6186.516	743.993	94.581	310.150
	4	1286.977	6385.356	6065.640	8866.879	6203.061	753.644	94.120	309.331
2004	1	1306.655	6427.078	6119.532	8998.351	6426.394	761.085	94.365	312.263
	2	1327.088	6593.582	6265.436	9240.887	6556.095	770.823	96.014	319.838
	3	1338.291	6612.866	6307.001	9321.859	6643.133	782.544	96.269	322.174
	4	1356.878	6629.823	6374.963	9377.166	6744.241	791.164	95.151	325.803
2002	Dec	1217.164	6147.858	5794.271	8565.816	5885.714	713.854	89.575	295.288
2003	Jan	1220.377	6159.117	5825.262	8579.733	5888.761	719.531	89.448	296.917
	Feb	1235.050	6192.694	5867.115	8617.241	5970.192	728.668	91.827	299.035
	Mar	1240.571	6210.043	5890.968	8648.610	6008.532	732.286	91.291	300.261
	Apr	1246.088	6241.490	5933.710	8686.000	6048.777	736.490	92.281	302.424
	May	1257.657	6277.889	5985.033	8740.074	6152.828	738.664	91.427	304.999
	Jun	1271.027	6327.363	6026.013	8790.038	6206.221	739.536	91.559	307.079
	Jul	1273.427	6417.275	6065.934	8868.479	6194.614	741.241	93.485	309.146
	Aug	1281.494	6448.911	6106.331	8908.921	6179.834	745.242	95.383	311.196
	Sep	1281.365	6434.777	6083.550	8898.860	6185.099	745.496	94.876	310.107
	Oct	1284.081	6404.472	6068.802	8875.710	6161.556	753.680	95.233	309.412
	Nov	1283.408	6384.834	6065.662	8862.346	6198.065	754.634	94.768	309.364
	Dec	1293.441	6366.763	6062.456	8862.582	6249.562	752.618	92.360	309.218
2004	Jan	1287.655	6380.246	6070.183	8921.037	6320.786	756.453	92.552	309.812
	Feb	1306.539	6420.480	6120.397	8991.746	6440.746	762.852	95.247	312.315
	Mar	1325.770	6480.507	6168.017	9082.269	6517.651	763.951	95.297	314.663
	Apr	1323.089	6542.187	6215.910	9161.747	6536.500	767.620	96.489	317.216
	May	1322.306	6617.242	6286.499	9264.524	6544.590	769.879	95.190	320.964
	Jun	1335.869	6621.316	6293.900	9296.389	6587.195	774.970	96.364	321.334
	Jul	1325.033	6598.005	6288.023	9281.674	6601.716	780.300	95.253	321.285
	Aug	1342.900	6610.632	6300.188	9319.744	6630.895	781.299	95.504	321.789
	Sep	1346.940	6629.961	6332.793	9364.159	6696.788	786.033	98.051	323.449
	Oct	1345.616	6613.767	6346.883	9346.767	6709.337	791.929	96.902	324.369
	Nov	1362.025	6631.722	6380.404	9370.825	6750.024	793.566	96.161	326.123
	Dec	1362.994	6643.979	6397.603	9413.906	6773.361	787.998	92.389	326.918

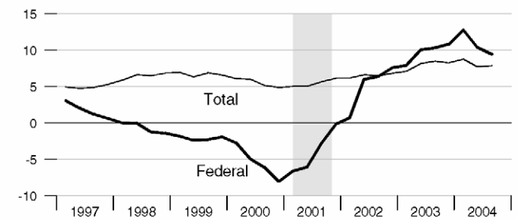
*All values are given in billions of dollars.

Adjusted Monetary Base

Percent change from year ago

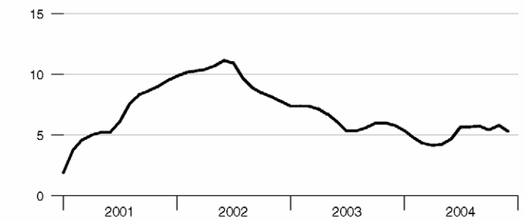
Domestic Nonfinancial Debt

Percent change from year ago



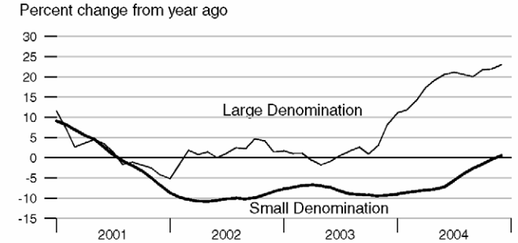
Currency Held by the Nonbank Public

Percent change from year ago



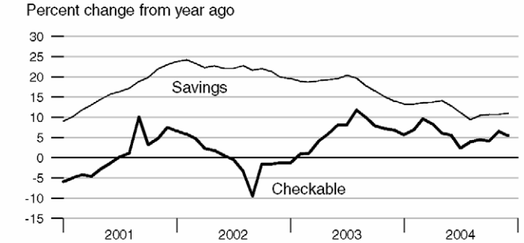
Time Deposits

Percent change from year ago



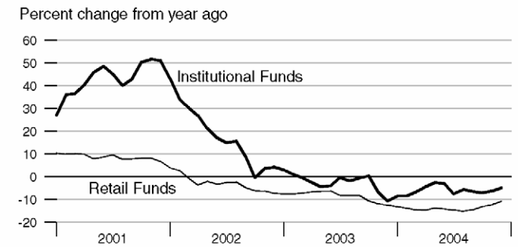
Checkable and Savings Deposits

Percent change from year ago



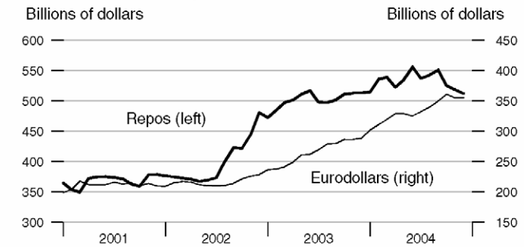
Money Market Mutual Fund Shares

Percent change from year ago



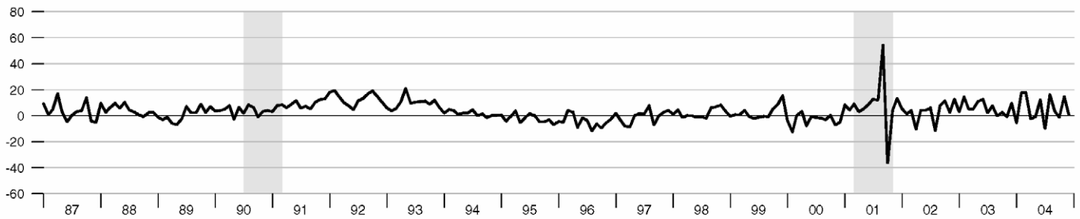
Repurchase Agreements and Eurodollars

Billions of dollars | Billions of dollars



M1

Percent change at an annual rate

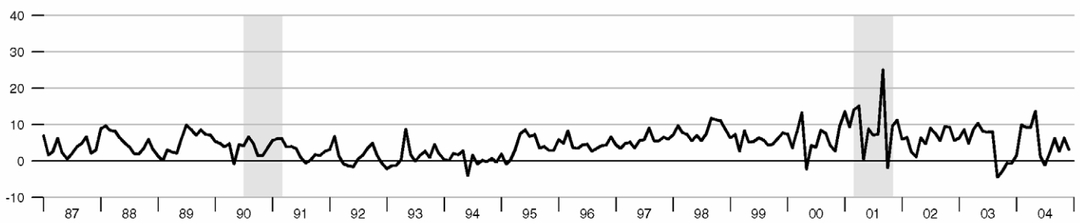


MZM

Percent change at an annual rate

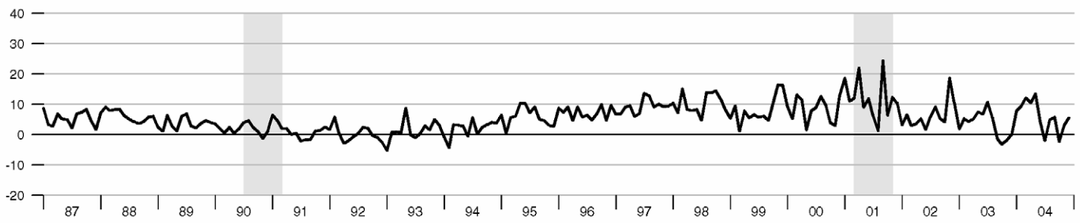
M2

Percent change at an annual rate

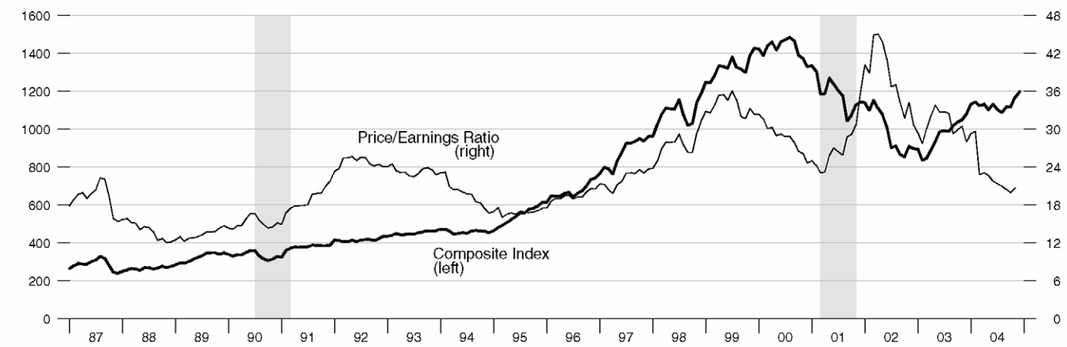


M3

Percent change at an annual rate



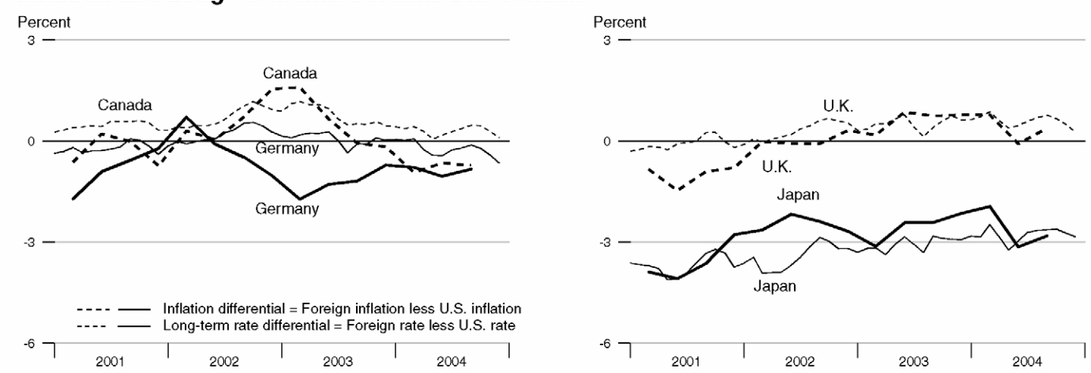
Standard & Poor's 500



Recent Inflation and Long-Term Interest Rates

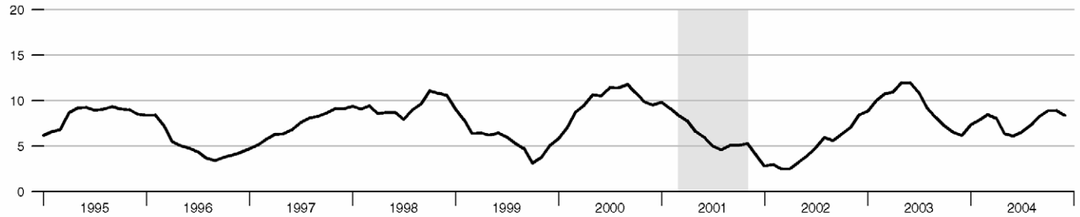
	Consumer Price Inflation Rates (Percent change from year ago)				Long-Term Government Bond Rates (Percent)			
	2004Q1	2004Q2	2004Q3	2004Q4	Sep04	Oct04	Nov04	Dec04
United States	1.80	2.84	2.71	3.39	4.13	4.10	4.19	4.23
Canada	0.87	2.18	1.99	.	4.60	4.56	4.48	4.33
France	1.80	2.38	2.28	.	4.09	3.98	3.86	.
Germany	1.02	1.79	1.88	.	4.02	3.89	3.78	3.58
Italy	2.29	2.33	2.23	.	4.25	4.13	4.00	3.79
Japan	-0.14	-0.31	-0.10	.	1.50	1.49	1.46	1.40
United Kingdom	2.58	2.75	3.09	.	4.90	4.77	4.69	4.50

Inflation and Long-Term Interest Rate Differentials



Bank Credit

Percent change from year ago

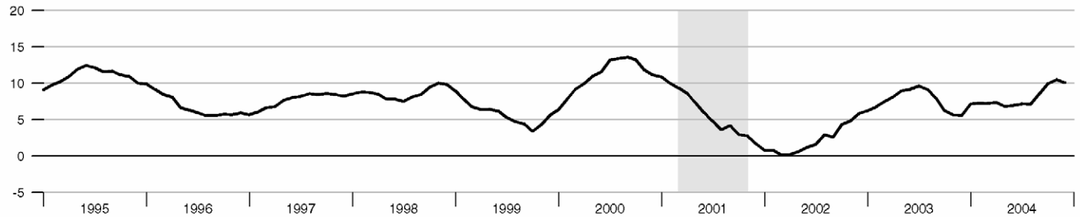


Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago

Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago

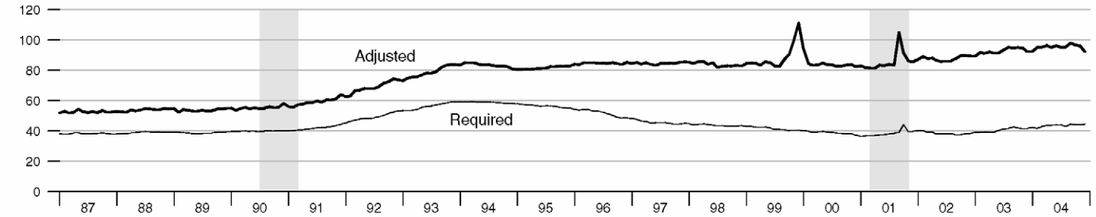


Commercial and Industrial Loans at Commercial Banks

Percent change from year ago

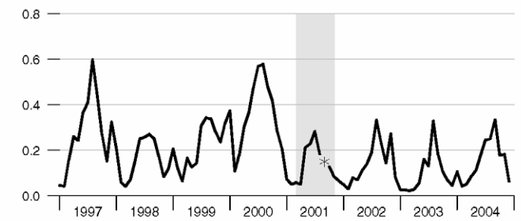
Adjusted and Required Reserves

Billions of dollars



Total Borrowings, nsa

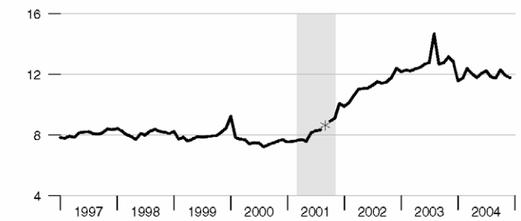
Billions of dollars



*Actual value for September 2001 is $3.4 billion.

Excess Reserves plus RCB Contracts

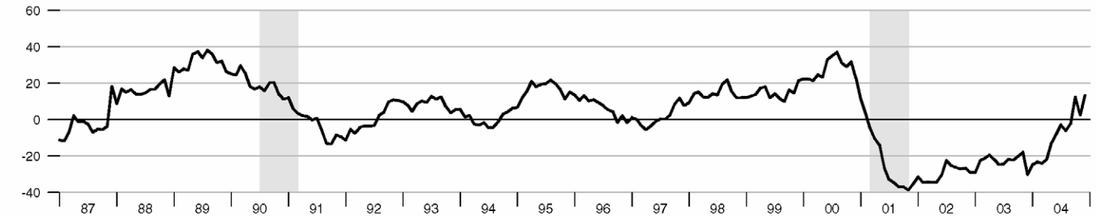
Billions of dollars



*Actual value for September 2001 is $26.43 billion.

Nonfinancial Commercial Paper

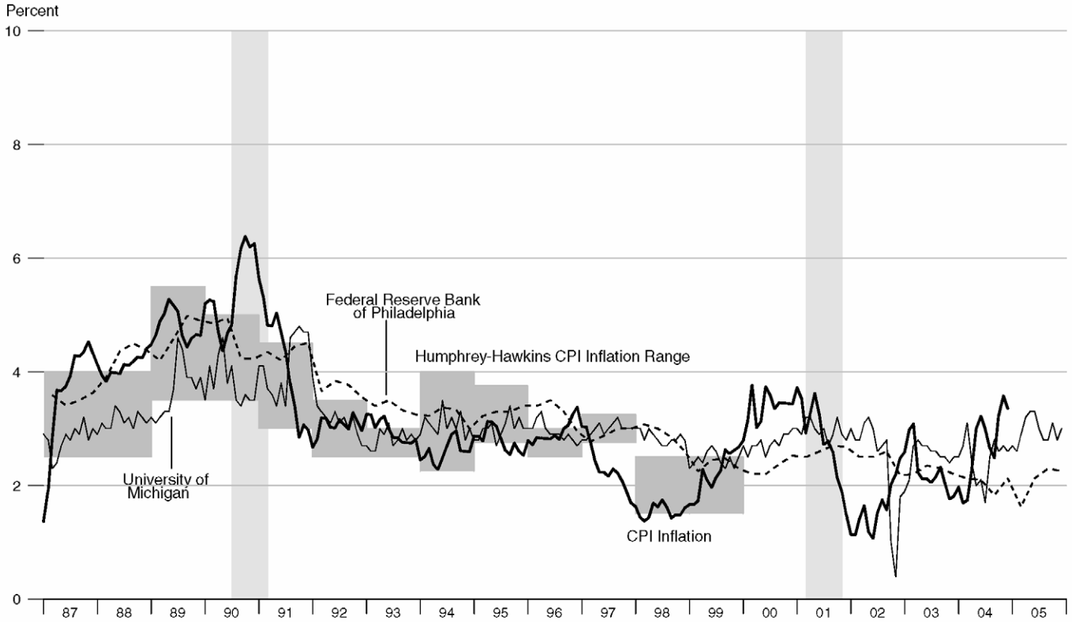
Percent change from year ago



Consumer Credit

Percent change from year ago

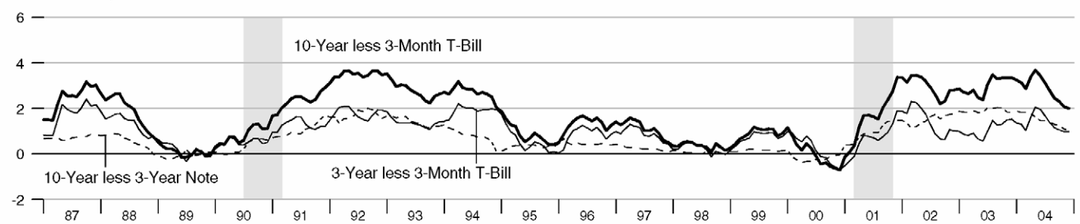
Inflation and Inflation Expectations



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.

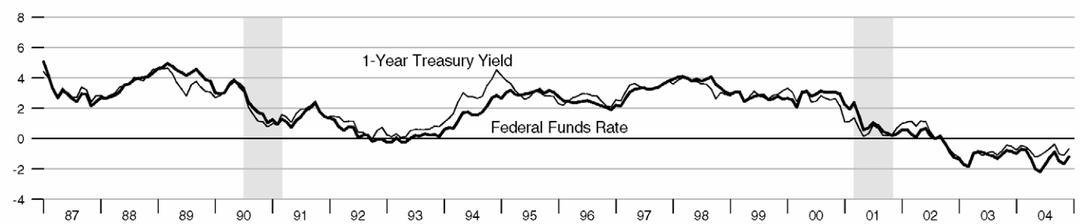
Treasury Security Yield Spreads

Yield to maturity



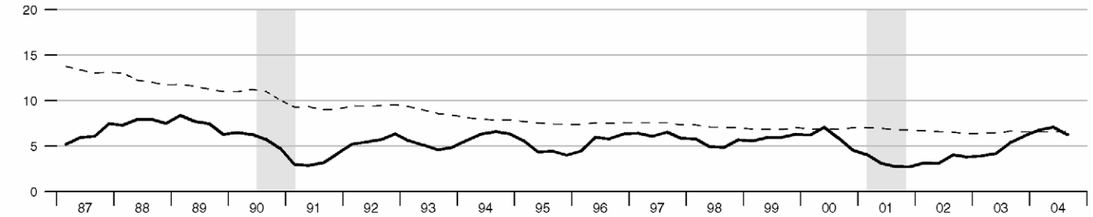
Real Interest Rates

Percent, Real rate = Nominal rate less CPI inflation



Gross Domestic Product

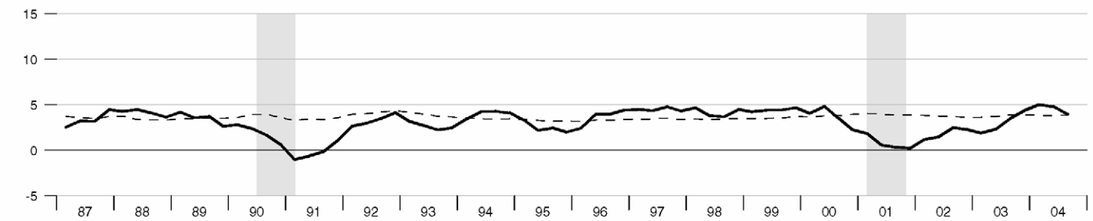
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Real Gross Domestic Product

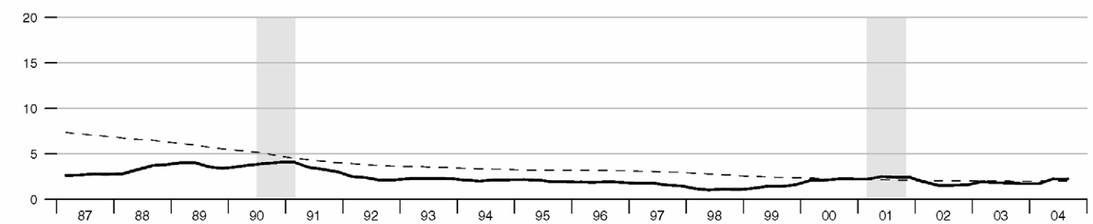
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Gross Domestic Product Price Index

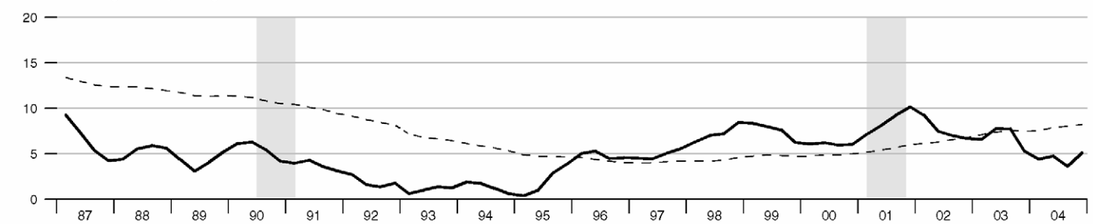
Percent change from year ago



Dashed lines indicate 10-year moving averages.

M2

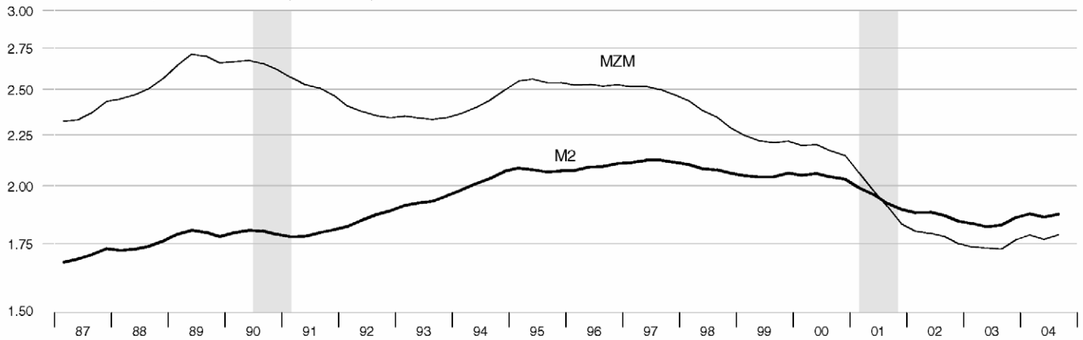
Percent change from year ago



Dashed lines indicate 10-year moving averages.

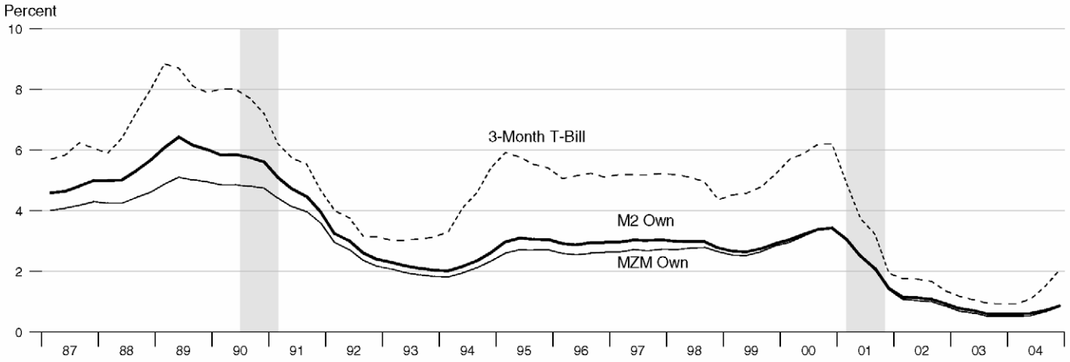
Velocity

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



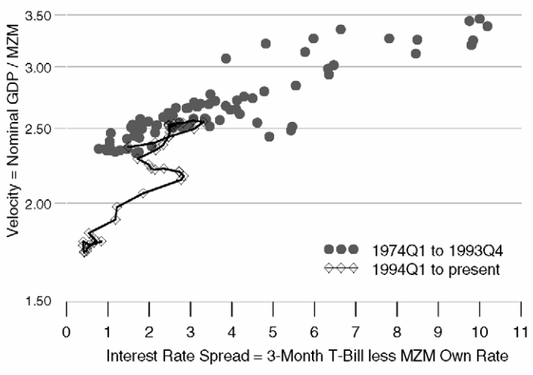
Interest Rates

Percent



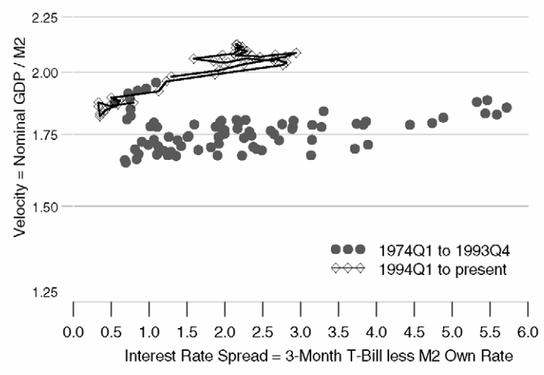
MZM Velocity and Interest Rate Spread

Ratio Scale



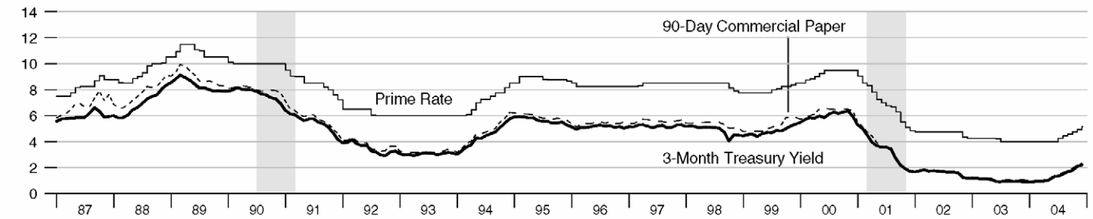
M2 Velocity and Interest Rate Spread

Ratio Scale



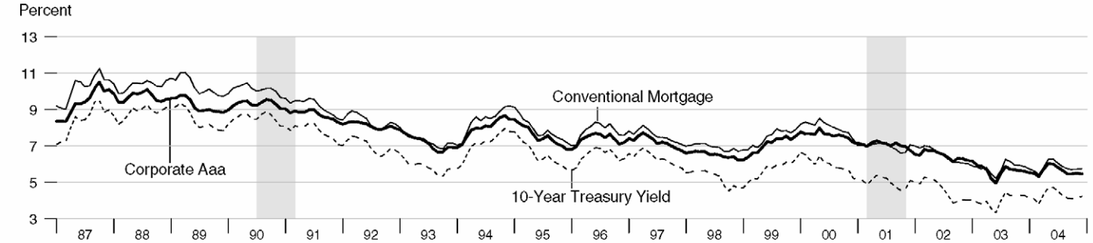
Short-Term Interest Rates

Percent



Long-Term Interest Rates

Percent

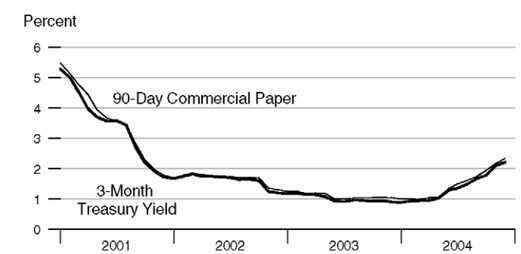


Long-Term Interest Rates

Percent

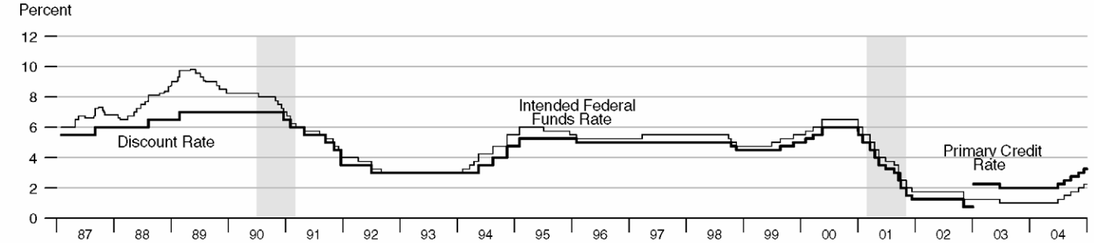
Short-Term Interest Rates

Percent



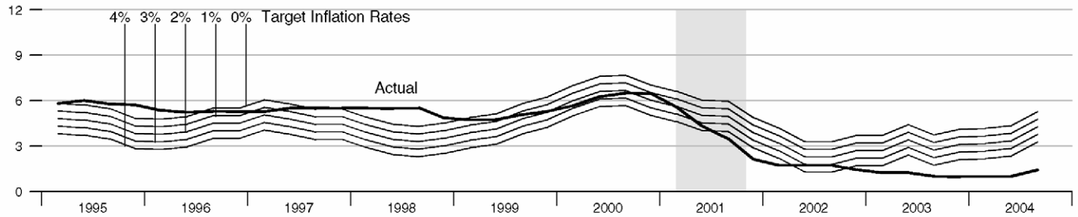
FOMC Intended Federal Funds Rate, Discount Rate, and Primary Credit Rate

Percent



Federal Funds Rate and Inflation Targets

Percent

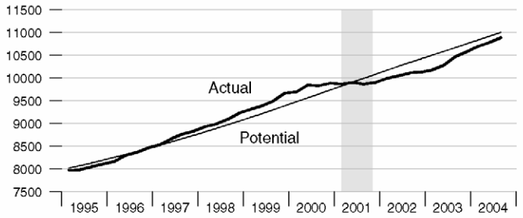


Calculated federal funds rate is based on Taylor's rule. See notes on page 19.

Components of Taylor's Rule

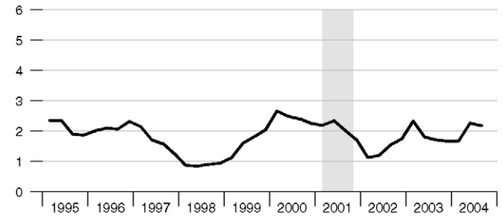
Actual and Potential Real GDP

Billions of chain-weighted 2000 dollars



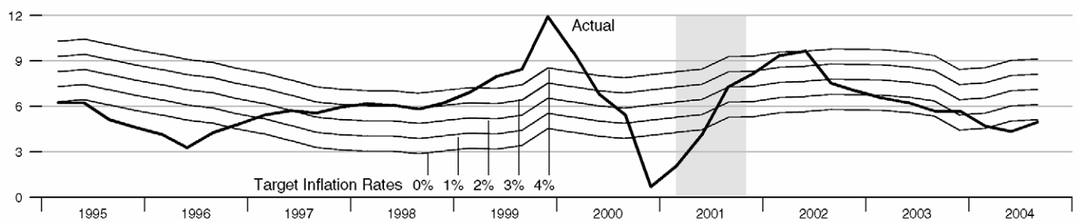
PCE Inflation

Percent change from year ago



Monetary Base Growth* and Inflation Targets

Percent

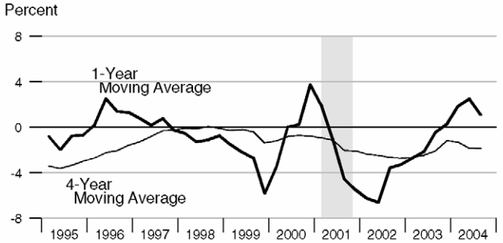


*Modified for the effects of sweeps programs on reserve demand.
Calculated base growth is based on McCallum's rule. Actual base growth is percent change from year ago. See notes on page 19.

Components of McCallum's Rule

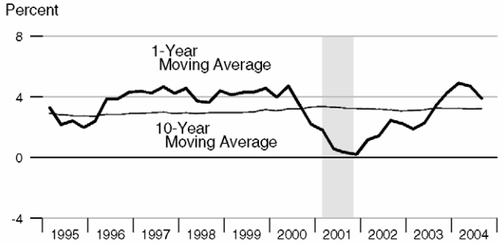
Monetary Base Velocity Growth

Percent



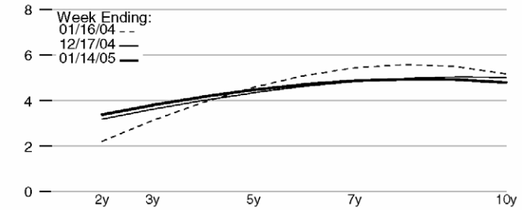
Real Output Growth

Percent



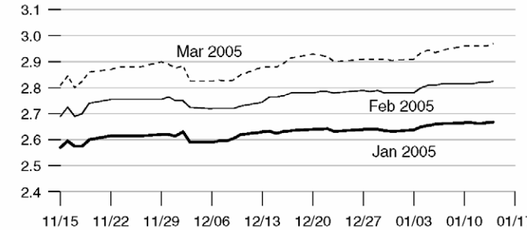
Implied One-Year Forward Rates

Percent



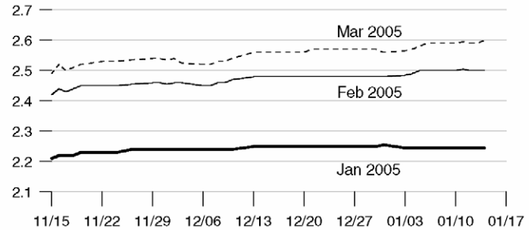
Rates on 3-Month Eurodollar Futures

Percent, daily data



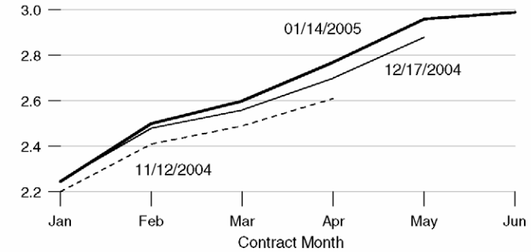
Rates on Selected Federal Funds Futures Contracts

Percent, daily data



Rates on Federal Funds Futures on Selected Dates

Percent

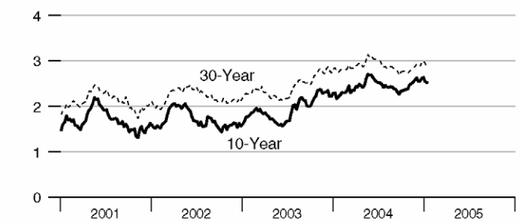


Inflation-Indexed Treasury Securities

Percent, weekly data

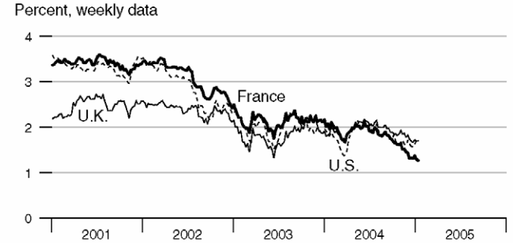
Inflation-Indexed Treasury Yield Spreads

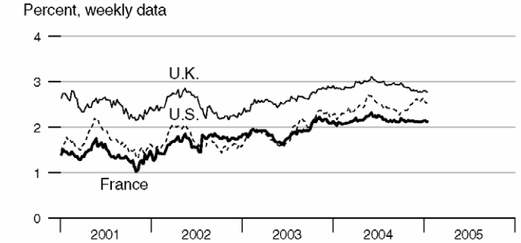
Percent, weekly data



Inflation-Indexed 10-Year Government Notes

Percent, weekly data



Inflation-Indexed 10-Year Government Yield Spreads

Percent, weekly data