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.

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

January 2005

THE FEDERAL RESERVE BANK of ST. LOUIS

Open Mouth Operations: A Swiss Case Study

Nearly all central banks, other than those that peg an exchange rate, now explicitly communicate policy changes through an announced target level for a short-term interest rate. Notably, in 1999, the Swiss National Bank replaced its monetary base target with an operating target for the 3-month Swiss franc interbank lending (LIBOR) rate that the central bank adjusts as part of its strategy to maintain price stability. One question that has arisen with interest rate targets is whether a central bank can cause the interest rate to move simply by expressing its intention to establish a new target level—so-called open *mouth* operations—or whether transactions of securities in the central bank's portfolio—open *market* operations—are necessary to initiate a shift in interest rates. (See Thornton, 2004, for such a study of U.S. monetary policy in the 1970s.[1])

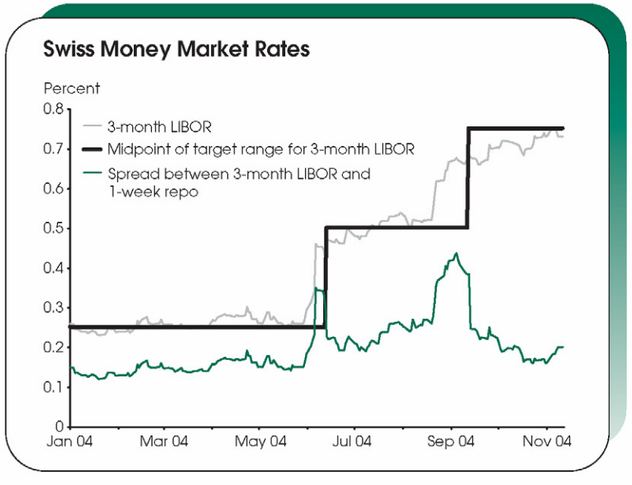
A narrow definition of open mouth operations concerns the ability of the central bank to achieve changes in its target interest rate without corresponding open market operations. A broader definition of open mouth operations, however, would include the proposition that the central bank can alter the slope of the yield curve at the very short end (at maturities between the overnight rate and 3 months, for example) through an announcement regarding a target rate change. Here we consider such a case study from the Swiss money market.

The Swiss National Bank targets the 3-month Swiss LIBOR rate, but it seeks to affect that rate by entering into securities repurchase (repo) agreements with commercial banks. The typical maturity of a repo agreement is a week and the typical spread between the 3-month LIBOR rate and the 1-week repo rate is approximately 15 basis points. Twice in 2004, the Swiss National Bank raised its target range for the Swiss LIBOR rate by 25 basis points. The midpoint of the target range is shown on the accompanying chart.

The market anticipated the first target change, which accounts for the preceding spike in the LIBOR-repo rate spread in June 2004. Nevertheless, money market participants did not appear to realize that the Swiss National Bank sought to implement the smallest initial rise in the repo rate that would achieve their new target for the LIBOR. The fact that the 3-month Swiss LIBOR rate immediately rose by the full 25 basis points, while the repo rate rose by only about 15 basis points, suggests that the Swiss National Bank used open mouth operations to increase the rate spread above its usual level of 15 basis points. By the time of the second target change in September 2004, however, the Swiss National Bank did not achieve its objective of raising the Swiss LIBOR rate by 25 basis points (to a level of 75 basis points) until it had raised the repo rate to a level of approximately 60 basis points—that is, not until the typical rate spread of about 15 basis points was restored. Together, these two episodes suggest that policy announcements—open mouth operations—*can* cause rate spreads to deviate temporarily from their expected levels, although not necessarily on a regular basis or for an extended period of time.

—Michael J. Dueker and Andreas M. Fischer

[1]Thornton, Daniel L. "The Fed and Short-term Interest Rates: Is It Open Market Operations, Open Mouth or Interest Rate Smoothing." *Journal of Banking and Finance*, March 2004, *28*, pp.475-98.



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

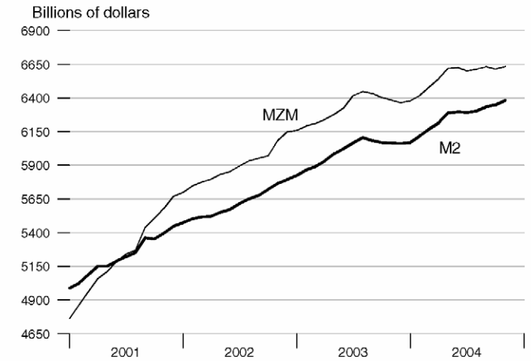
$$\Delta MB_t^* = \pi^* + (\text{10-year moving average growth of real GDP}) - (\text{4-year moving average of base velocity growth})$$

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.

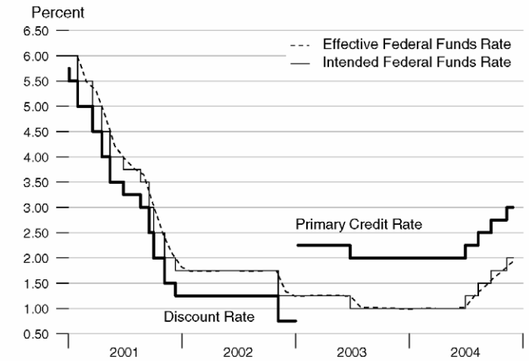
Page 11: **Implied One-Year Forward Rates** are calculated by this Bank from Treasury constant maturity yields. Yields to maturity, $R(m)$, for securities with $m = 1,\ldots, 10$ years to maturity are obtained by linear interpolation between

		M1	MZM	M2	M3
Percent change at an annual rate					
1999		2.00	12.41	7.54	8.75
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	6.31
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	6.94	7.02
	4	2.57	-3.00	-1.29	-1.13
2004	1	6.12	2.61	3.55	5.95
	2	6.26	10.53	9.71	10.82
	3	3.37	1.24	2.72	2.95
2002	Nov	2.65	23.05	9.33	18.68
	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	6.83
	Jul	2.27	17.05	7.96	10.69
	Aug	7.60	5.92	8.00	5.50
	Sep	-0.12	-2.63	-4.47	-1.33
	Oct	2.54	-5.65	-2.91	-3.12
	Nov	-0.63	-3.68	-0.62	-1.82
	Dec	9.38	-3.40	-0.63	0.02
2004	Jan	-5.37	2.54	1.53	7.94
	Feb	17.60	7.57	9.93	9.55
	Mar	17.66	11.22	9.34	12.12
	Apr	-2.42	11.57	9.47	10.54
	May	-0.70	14.10	13.98	13.52
	Jun	12.31	1.08	1.77	4.18
	Jul	-9.75	-4.14	-1.04	-2.34
	Aug	16.17	2.08	2.09	3.69
	Sep	3.60	3.30	5.99	4.37
	Oct	-0.90	-3.00	2.54	-3.04
	Nov	15.01	3.29	6.24	2.98

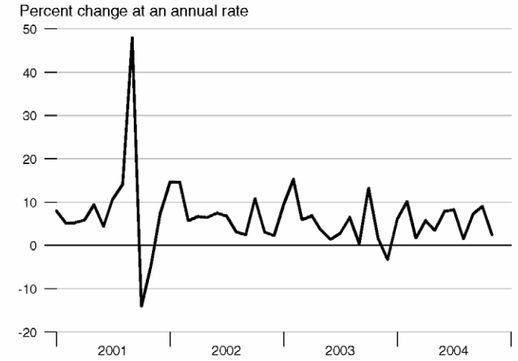
M2 and MZM



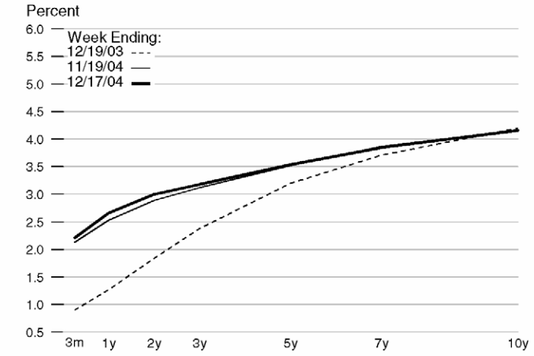
Reserve Market Rates



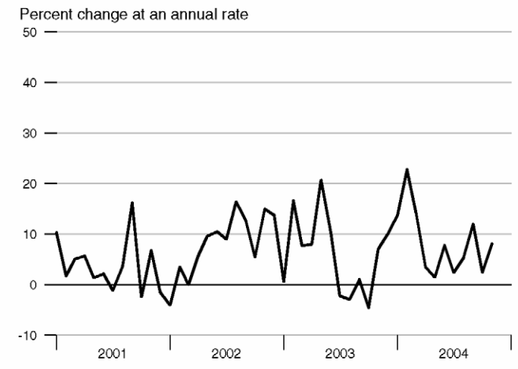
Adjusted Monetary Base



Treasury Yield Curve



Total Bank Credit

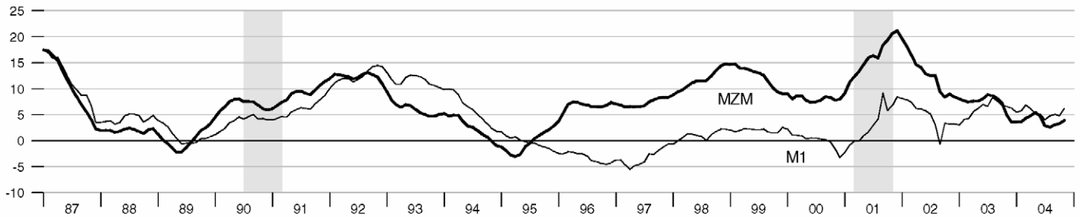


Interest Rates

	Sep 04	Oct 04	Nov 04
Federal Funds Rate	1.61	1.76	1.93
Prime Rate	4.58	4.75	4.93
Primary Credit Rate	2.58	2.75	2.93
Conventional Mortgage Rate	5.75	5.72	5.73
Treasury Yields:			
3-Month Constant Maturity	1.68	1.79	2.11
6-Month Constant Maturity	1.91	2.05	2.32
1-Year Constant Maturity	2.12	2.23	2.50
3-Year Constant Maturity	2.83	2.85	3.09
5-Year Constant Maturity	3.36	3.35	3.53
10-Year Constant Maturity	4.13	4.10	4.19

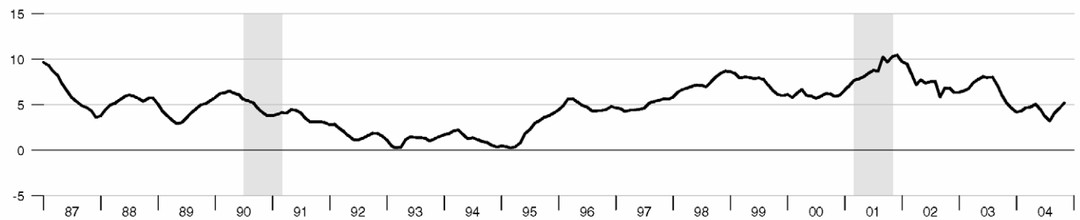
MZM and M1

Percent change from year ago



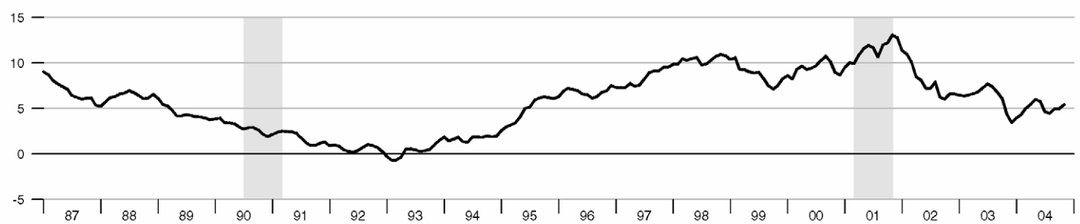
M2

Percent change from year ago



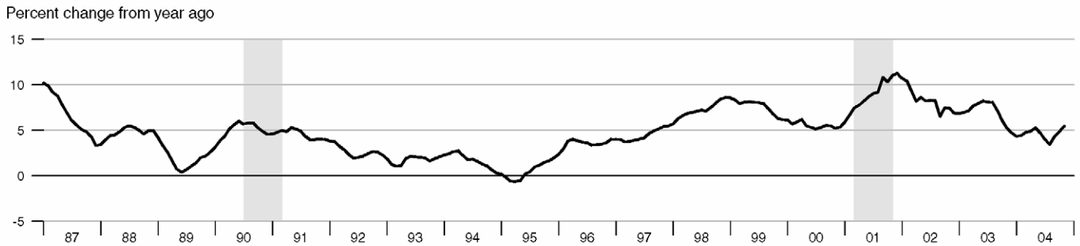
M3

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
1999		4.97	4.62		7.99	5.33	4.78	5.49	5.64	7.04	5.28	7.43
2000		6.24	5.73		9.23	6.46	6.00	6.22	6.03	7.62	5.58	8.06
2001		3.89	3.41		6.92	3.69	3.47	4.08	5.02	7.08	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
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	5.60
	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
2002	Nov	1.34	0.83		4.35	1.39	1.25	2.32	4.05	6.31	4.77	6.07
	Dec	1.24	0.75		4.25	1.34	1.21	2.23	4.03	6.21	4.70	6.05
2003	Jan	1.24			4.25	1.29	1.19	2.18	4.05	6.17	4.72	5.92
	Feb	1.26		2.25	4.25	1.27	1.19	2.05	3.90	5.95	4.57	5.84
	Mar	1.25		2.25	4.25	1.23	1.15	1.98	3.81	5.89	4.51	5.75
	Apr	1.26		2.25	4.25	1.24	1.15	2.06	3.96	5.74	4.60	5.81
	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	5.71
	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

*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
	1999	1101.461	4170.400	4525.778	6270.090	4577.660	574.181	88.664	229.377
	2000	1103.415	4508.945	4801.426	6861.426	5025.436	607.106	84.511	242.164
	2001	1136.880	5221.045	5219.302	7643.244	5345.437	641.167	85.923	263.713
	2002	1192.000	5891.329	5614.522	8256.727	5597.300	697.072	87.914	285.710
	2003	1263.999	6322.136	5998.490	8778.116	6120.519	740.674	92.828	305.768
2002	1	1186.891	5741.671	5499.367	8093.191	5420.075	680.264	88.149	279.198
	2	1184.074	5828.695	5549.339	8173.235	5496.265	692.937	86.970	282.317
	3	1189.215	5927.549	5648.161	8287.348	5655.518	702.753	86.805	287.719
	4	1207.819	6067.400	5761.220	8473.135	5817.344	712.332	89.733	293.608
2003	1	1231.999	6187.285	5861.115	8615.195	5955.925	726.828	90.855	298.738
	2	1258.257	6282.248	5981.592	8738.630	6136.150	738.230	91.756	304.834
	3	1278.762	6433.655	6085.405	8891.896	6186.737	743.993	94.581	310.157
	4	1286.977	6385.356	6065.847	8866.745	6203.263	753.644	94.120	309.342
2004	1	1306.655	6427.078	6119.737	8998.553	6426.605	761.085	94.365	312.274
	2	1327.107	6596.245	6268.265	9242.053	6556.270	770.823	96.014	319.981
	3	1338.290	6616.659	6310.896	9310.191	6641.918	782.544	96.267	322.373
2002	Nov	1204.473	6084.497	5766.943	8491.874	5818.978	712.475	89.818	293.926
	Dec	1217.164	6147.858	5794.271	8565.816	5885.761	713.854	89.575	295.288
2003	Jan	1220.377	6159.117	5825.262	8579.733	5888.801	719.531	89.448	296.917
	Feb	1235.050	6192.694	5867.115	8617.241	5970.303	728.668	91.827	299.035
	Mar	1240.571	6210.043	5890.968	8648.610	6008.672	732.286	91.291	300.261
	Apr	1246.088	6241.490	5933.710	8686.000	6048.934	736.490	92.281	302.424
	May	1257.657	6277.889	5985.033	8740.074	6153.042	738.664	91.427	304.999
	Jun	1271.027	6327.364	6026.032	8789.815	6206.475	739.536	91.559	307.080
	Jul	1273.427	6417.275	6066.013	8868.123	6194.840	741.241	93.485	309.150
	Aug	1281.494	6448.912	6106.466	8908.734	6180.049	745.242	95.383	311.203
	Sep	1281.366	6434.778	6083.735	8898.831	6185.323	745.496	94.876	310.117
	Oct	1284.082	6404.473	6069.003	8875.668	6161.764	753.680	95.233	309.422
	Nov	1283.408	6384.834	6065.869	8862.208	6198.261	754.634	94.768	309.375
	Dec	1293.441	6366.762	6062.669	8862.360	6249.763	752.618	92.360	309.229
2004	Jan	1287.655	6380.246	6070.393	8920.963	6321.002	756.453	92.552	309.823
	Feb	1306.539	6420.480	6120.602	8991.954	6440.955	762.852	95.247	312.326
	Mar	1325.772	6480.509	6168.217	9082.743	6517.859	763.951	95.297	314.673
	Apr	1323.100	6542.995	6216.900	9162.484	6536.666	767.620	96.489	317.267
	May	1322.326	6619.900	6289.321	9265.699	6544.819	769.879	95.190	321.107
	Jun	1335.894	6625.840	6298.573	9297.975	6587.326	774.970	96.364	321.570
	Jul	1325.045	6602.957	6293.105	9279.867	6600.539	780.300	95.252	321.542
	Aug	1342.896	6614.403	6304.065	9308.410	6629.593	781.299	95.502	321.986
	Sep	1346.930	6632.618	6335.518	9342.296	6695.622	786.033	98.048	323.591
	Oct	1345.916	6616.028	6348.902	9318.596	6709.335	791.929	96.914	324.478
	Nov	1362.747	6634.169	6381.891	9341.699	6754.483	793.558	96.192	326.206

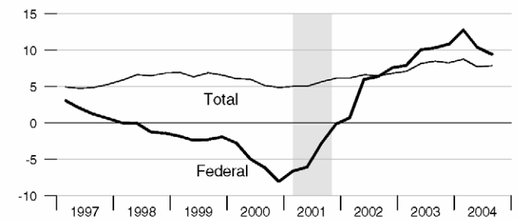
*All values are given in billions of dollars.

Adjusted Monetary Base

Percent change from year ago

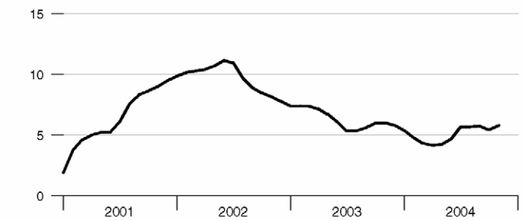
Domestic Nonfinancial Debt

Percent change from year ago



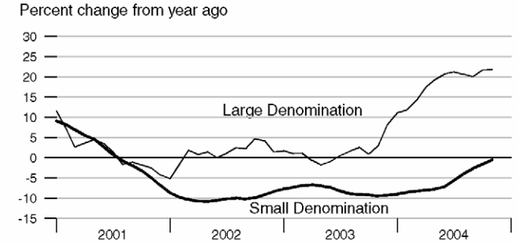
Currency Held by the Nonbank Public

Percent change from year ago



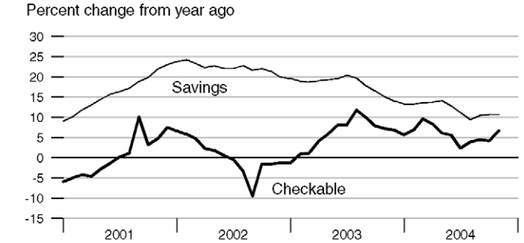
Time Deposits

Percent change from year ago



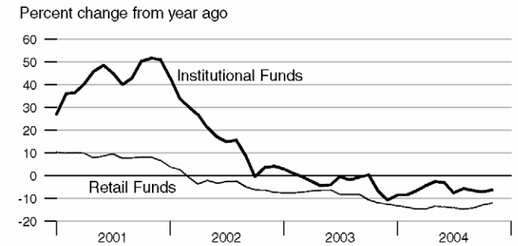
Checkable and Savings Deposits

Percent change from year ago



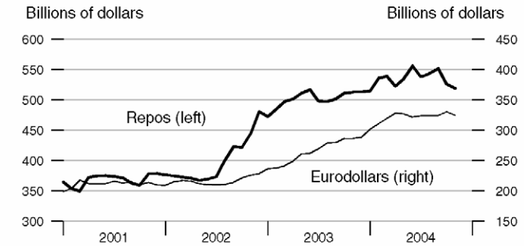
Money Market Mutual Fund Shares

Percent change from year ago



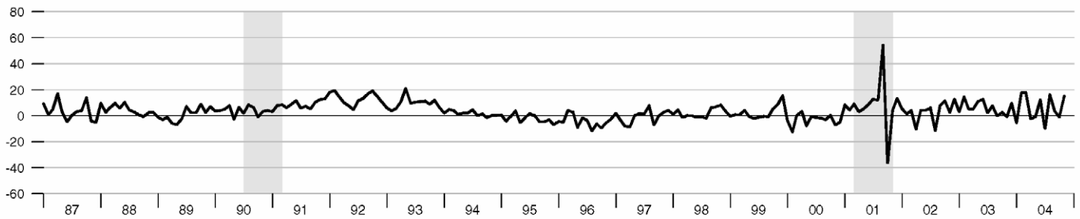
Repurchase Agreements and Eurodollars

Billions of dollars | Billions of dollars



M1

Percent change at an annual rate

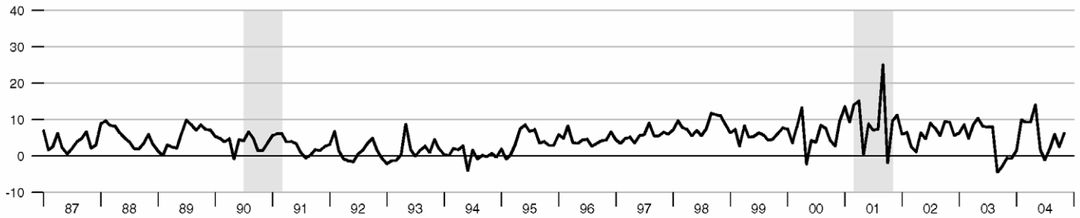


MZM

Percent change at an annual rate

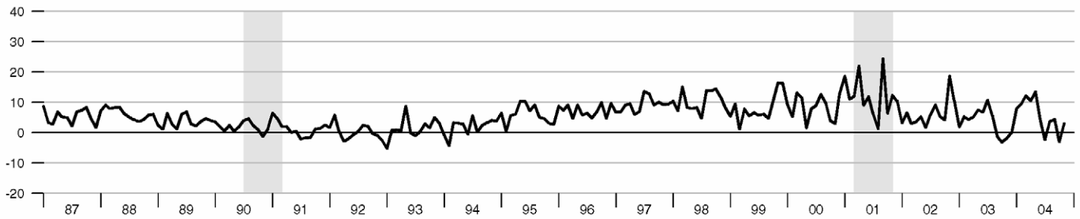
M2

Percent change at an annual rate

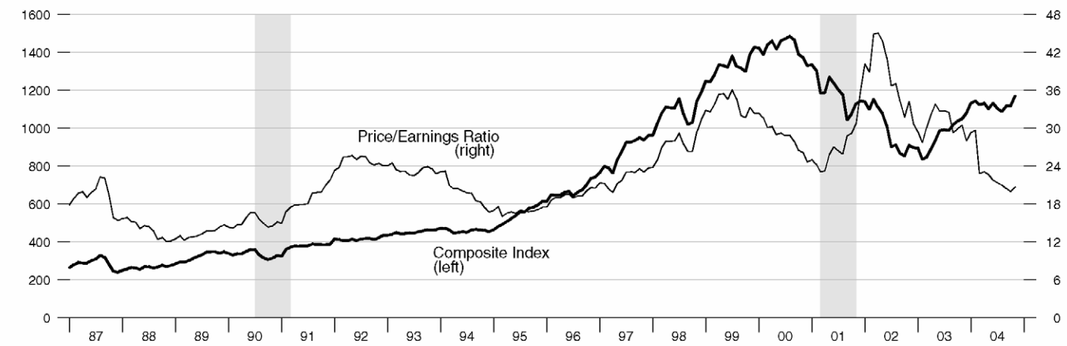


M3

Percent change at an annual rate



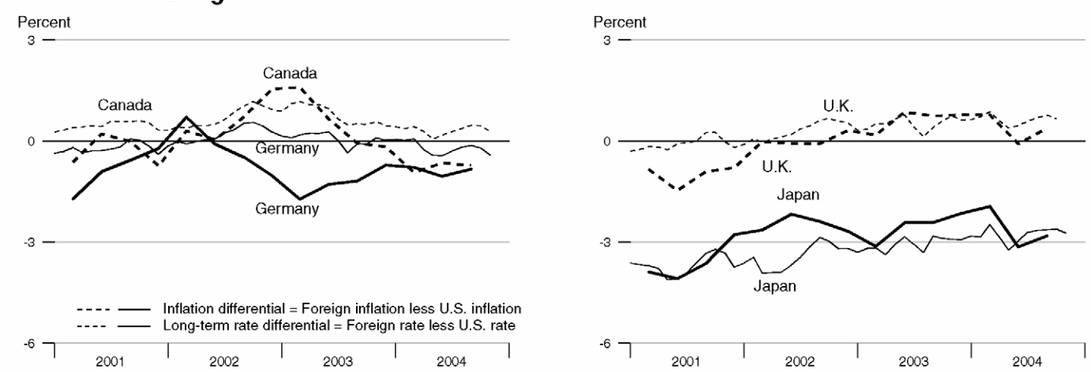
Standard & Poor's 500



Recent Inflation and Long-Term Interest Rates

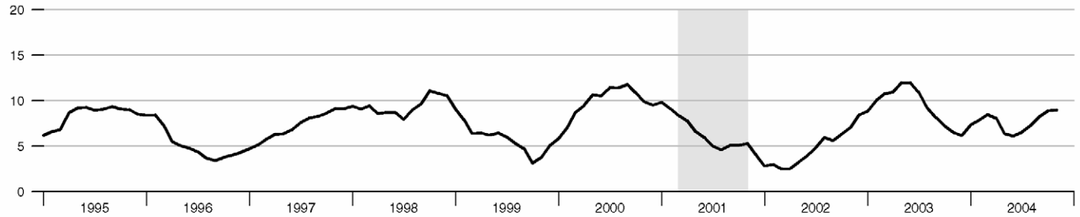
	Consumer Price Inflation Rates (Percent change from year ago)				Long-Term Government Bond Rates (Percent)			
	2003Q4	2004Q1	2004Q2	2004Q3	Aug04	Sep04	Oct04	Nov04
United States	1.87	1.80	2.84	2.71	4.28	4.13	4.10	4.19
Canada	1.71	0.87	2.18	1.99	4.65	4.60	4.56	4.48
France	2.19	1.80	2.38	2.28	4.11	4.09	3.98	.
Germany	1.16	1.02	1.79	1.88	4.10	4.00	3.90	3.78
Italy	2.53	2.29	2.33	2.23	4.28	4.25	4.13	4.00
Japan	-0.27	-0.14	-0.31	-0.10	1.63	1.50	1.49	1.46
United Kingdom	2.65	2.58	2.75	3.09	4.98	4.90	4.77	.

Inflation and Long-Term Interest Rate Differentials



Bank Credit

Percent change from year ago

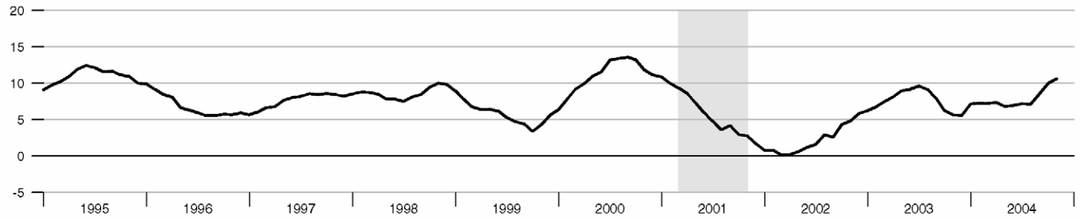


Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago

Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago

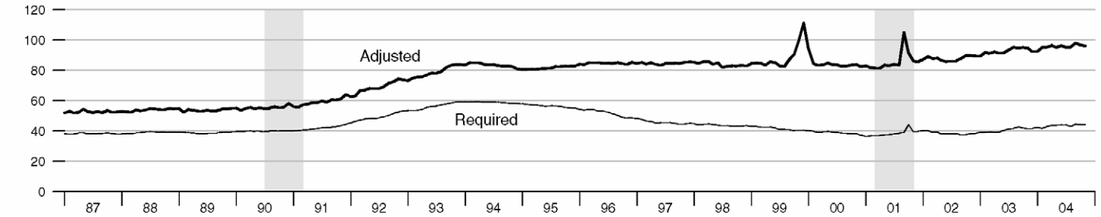


Commercial and Industrial Loans at Commercial Banks

Percent change from year ago

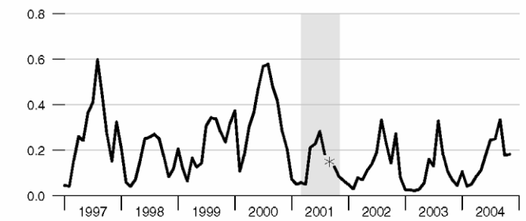
Adjusted and Required Reserves

Billions of dollars



Total Borrowings, nsa

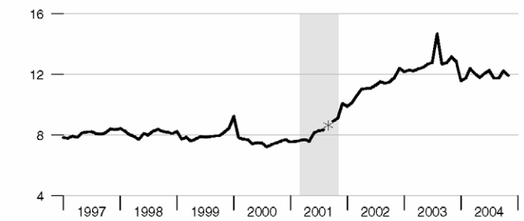
Billions of dollars



*Actual value for September 2001 is $3.4 billion.

Excess Reserves plus RCB Contracts

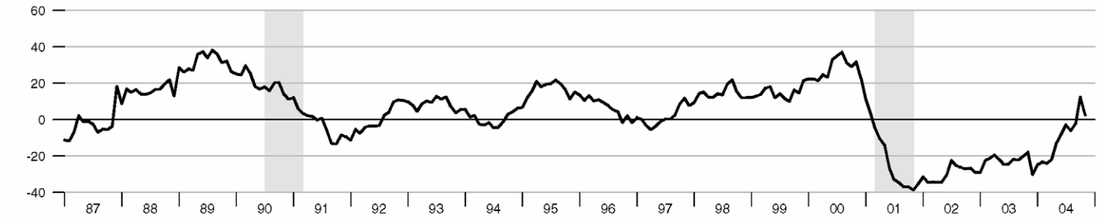
Billions of dollars



*Actual value for September 2001 is $26.43 billion.

Nonfinancial Commercial Paper

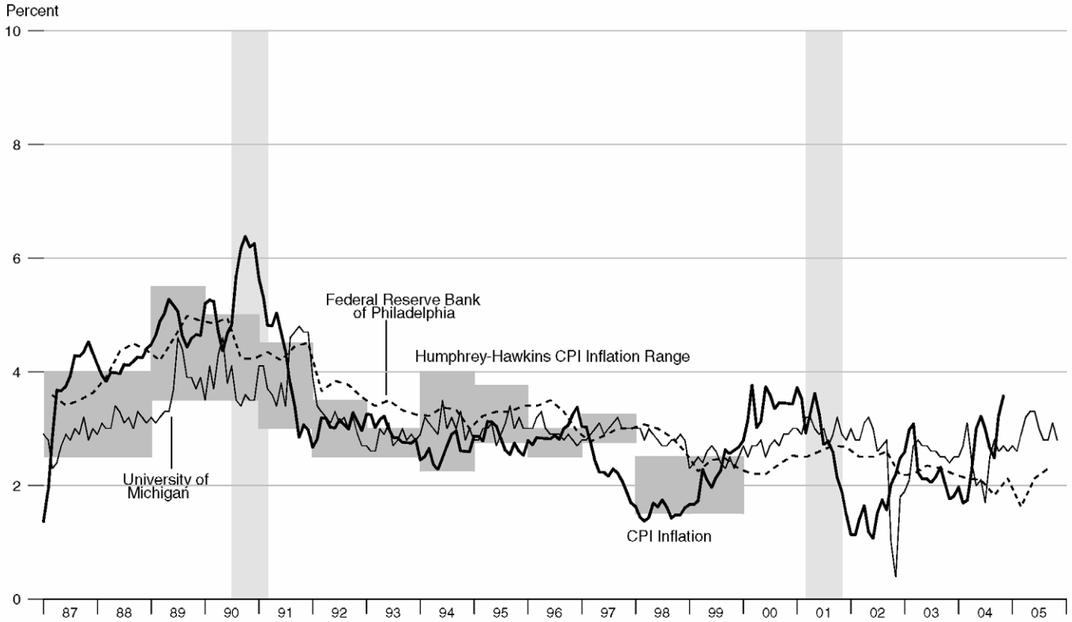
Percent change from year ago



Consumer Credit

Percent change from year ago

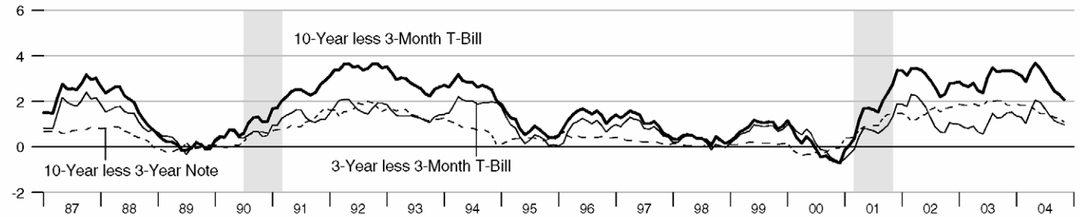
Inflation and Inflation Expectations



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.

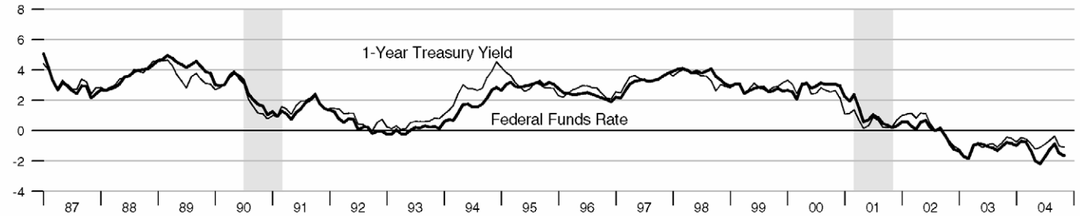
Treasury Security Yield Spreads

Yield to maturity



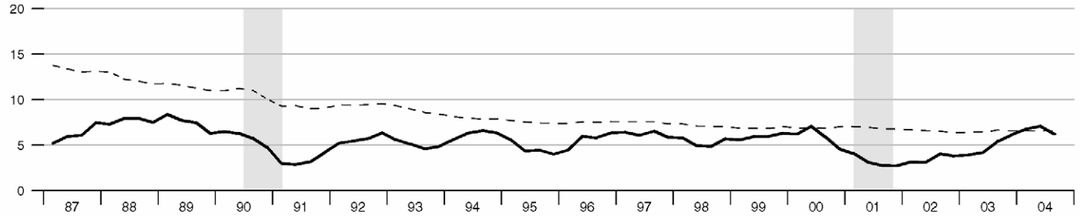
Real Interest Rates

Percent, Real rate = Nominal rate less CPI inflation



Gross Domestic Product

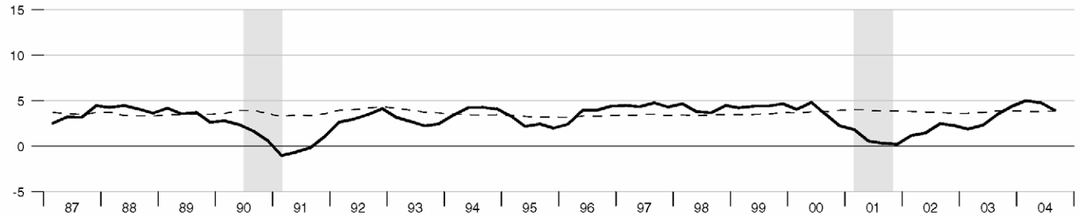
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Real Gross Domestic Product

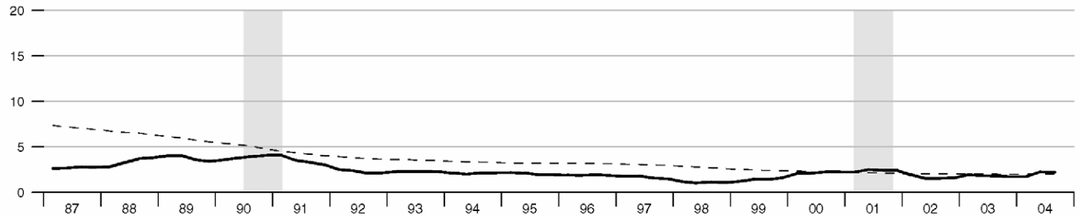
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Gross Domestic Product Price Index

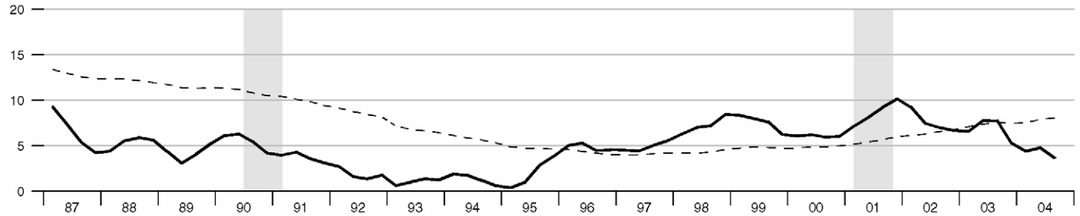
Percent change from year ago



Dashed lines indicate 10-year moving averages.

M2

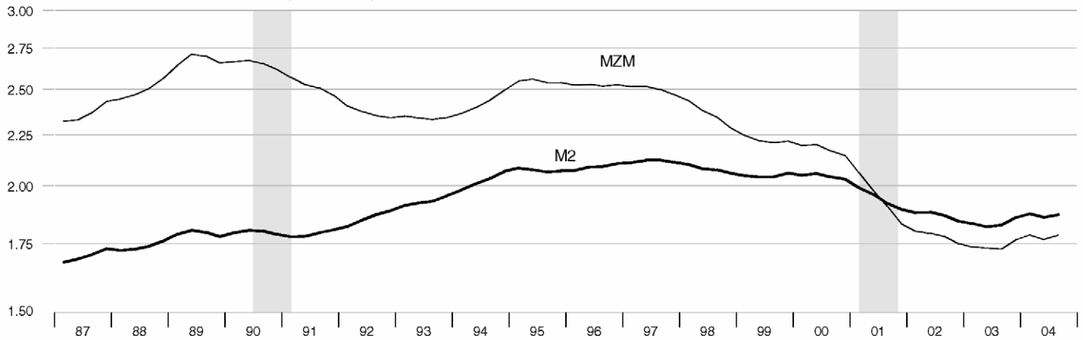
Percent change from year ago



Dashed lines indicate 10-year moving averages.

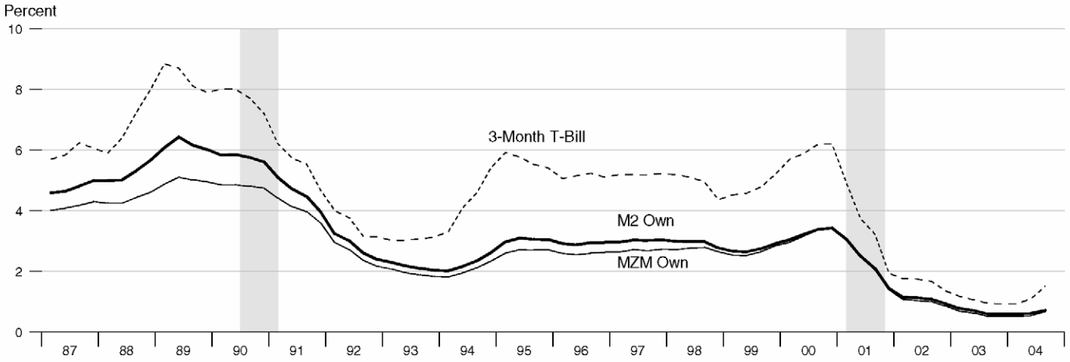
Velocity

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



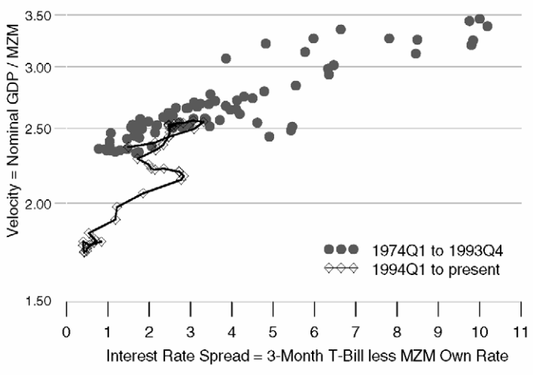
Interest Rates

Percent



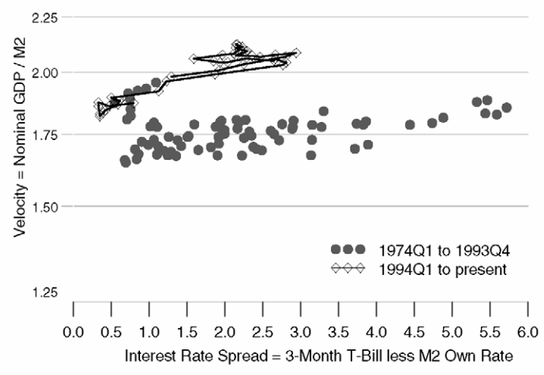
MZM Velocity and Interest Rate Spread

Ratio Scale



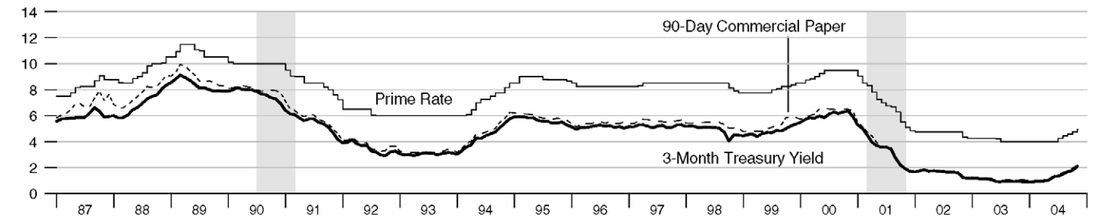
M2 Velocity and Interest Rate Spread

Ratio Scale



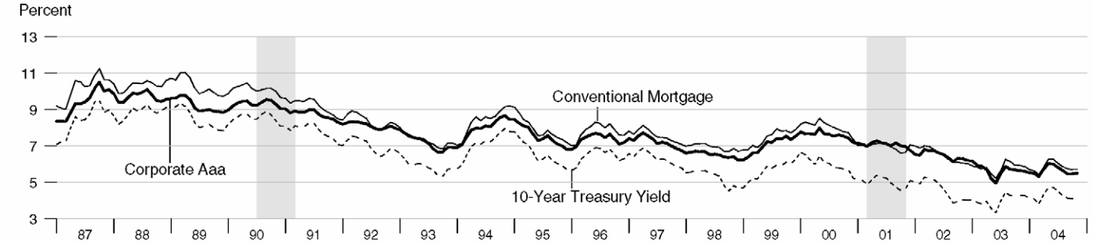
Short-Term Interest Rates

Percent



Long-Term Interest Rates

Percent

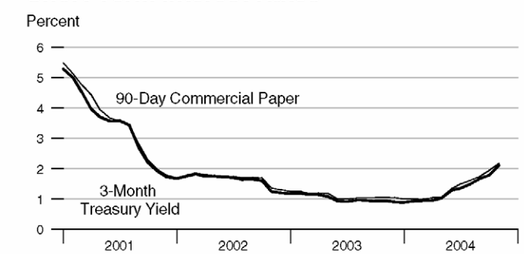


Long-Term Interest Rates

Percent

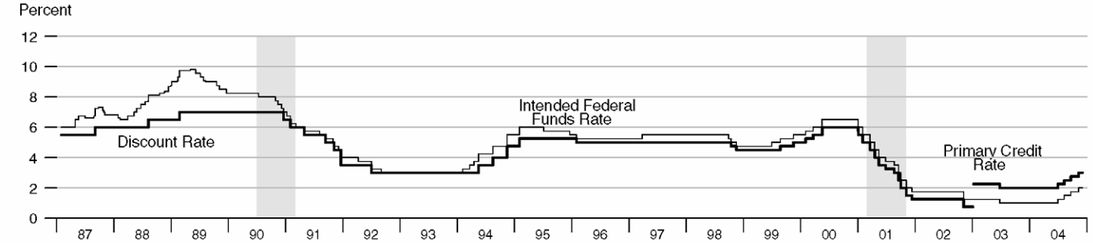
Short-Term Interest Rates

Percent



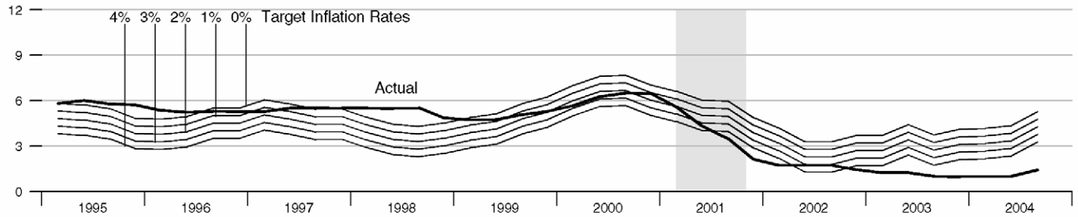
FOMC Intended Federal Funds Rate, Discount Rate, and Primary Credit Rate

Percent



Federal Funds Rate and Inflation Targets

Percent

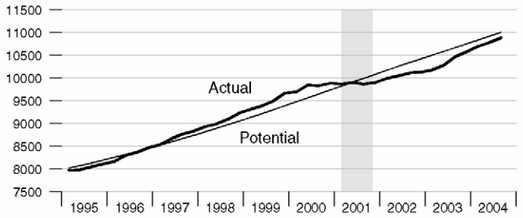


Calculated federal funds rate is based on Taylor's rule. See notes on page 19.

Components of Taylor's Rule

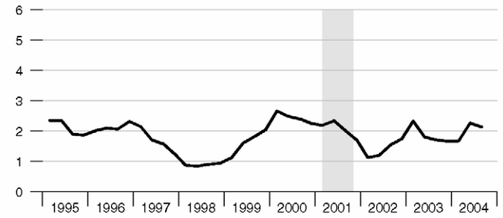
Actual and Potential Real GDP

Billions of chain-weighted 2000 dollars



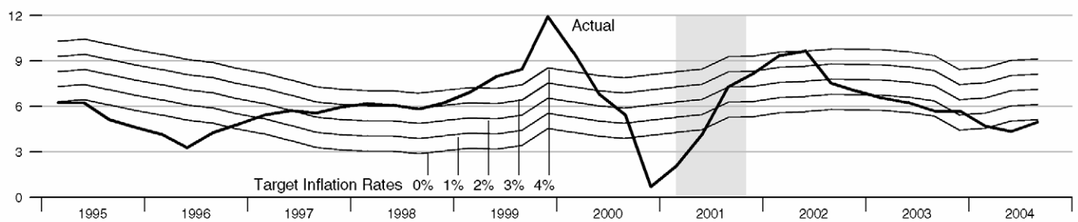
PCE Inflation

Percent change from year ago



Monetary Base Growth* and Inflation Targets

Percent

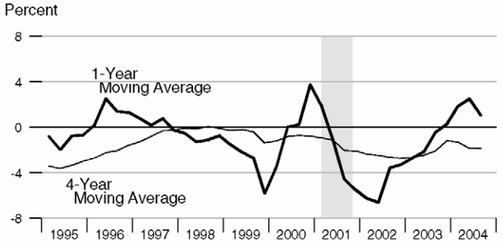


*Modified for the effects of sweeps programs on reserve demand.
Calculated base growth is based on McCallum's rule. Actual base growth is percent change from year ago. See notes on page 19.

Components of McCallum's Rule

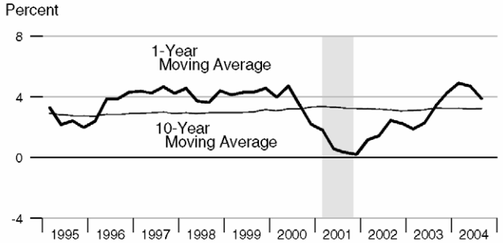
Monetary Base Velocity Growth

Percent



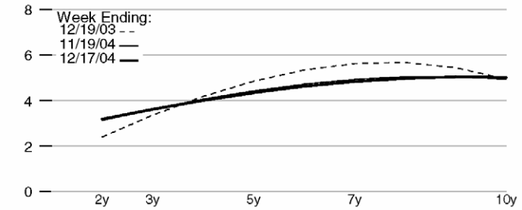
Real Output Growth

Percent



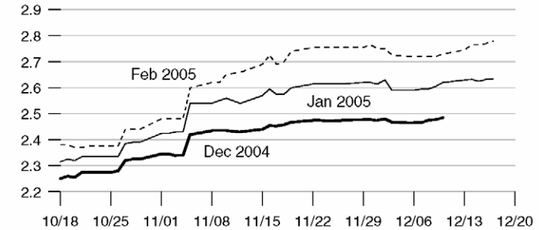
Implied One-Year Forward Rates

Percent



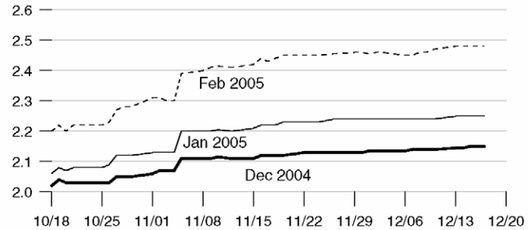
Rates on 3-Month Eurodollar Futures

Percent, daily data



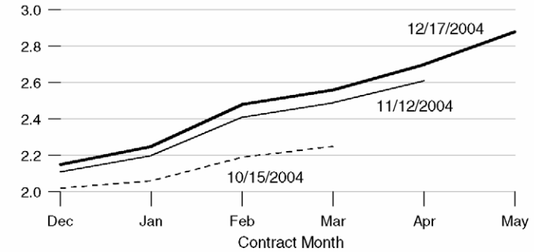
Rates on Selected Federal Funds Futures Contracts

Percent, daily data



Rates on Federal Funds Futures on Selected Dates

Percent

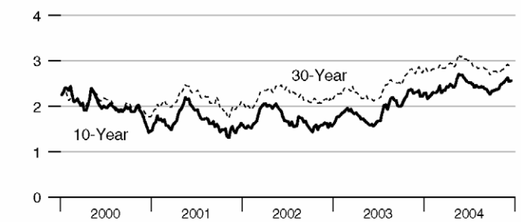


Inflation-Indexed Treasury Securities

Percent, weekly data

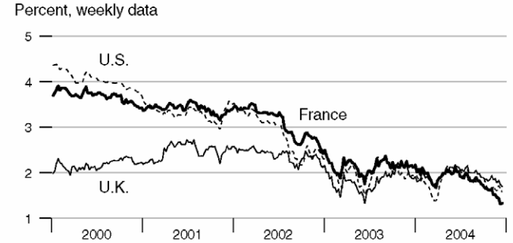
Inflation-Indexed Treasury Yield Spreads

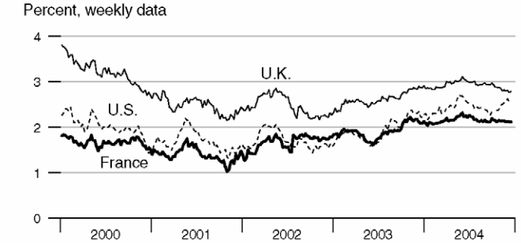
Percent, weekly data



Inflation-Indexed 10-Year Government Notes

Percent, weekly data



Inflation-Indexed 10-Year Government Yield Spreads

Percent, weekly data