

## The FOMC in 1978

The turbulent 1970s tested the resilience of Americans. A recession and stubborn inflation opened the decade; price and wage controls followed. OPEC's coming-of-age disrupted supplies and raised oil prices; an unpopular foreign war ended in retreat after a declaration of victory; and, for the first time in American history, both the president and vice president resigned under threat of impeachment. Against this backdrop, the Federal Open Market Committee (FOMC) struggled to temper a rising inflation trend while promoting full employment and maximum economic growth.

The year 1978 marks the transition between moderate consumer price inflation (CPI) during 1976 and 1977 (5.0 percent and 6.6 percent, respectively) and the more-than-12 percent rates during 1979 and 1980: In 1978, the rate was 8.9 percent. The year also marks a shift in the social and political resolve to reduce inflation. At his final public appearance as Federal Reserve Chairman in January 1978, Arthur Burns expressed his frustration: "The need to fight inflation is widely recognized, but the will to do so is not yet strong enough. I have no doubt that the will...[for] unwinding the inflation will be forged someday."<sup>1</sup> In December, reflecting on a year in which inflation had again been half higher than anticipated, Burns noted with approval that "the political leaders of both our major parties have finally recognized that inflation is the nation's number one problem" and that "even the moves of the Federal Reserve to bring down the rate of growth of the money supply, which not long ago caused consternation in some government circles, are now being accepted with grace and even gentle approbation."<sup>2</sup>

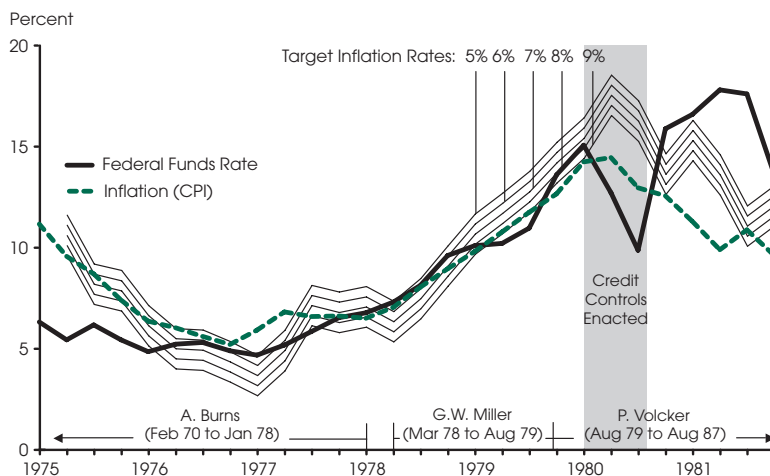
Recently released FOMC transcripts for 1978 show that three topics dominated each meeting: actions to defend the falling foreign exchange value of the dollar, the increasing rate of inflation, and the risk of recession. At the year's first meeting, Chairman Burns and Vice Chairman Volcker agreed that domestic monetary policy was the key to the exchange rate deterioration. Commenting on attempts to support the dollar, Burns noted that "our intervention [in foreign exchange markets] has demonstrated the futility of the exercise." But Burns was reluctant to tighten domestic monetary policy by increasing interest rates. Throughout his career, Burns argued that current economic conditions were driven largely by the public's expectations of the *future* pace of activity.<sup>3</sup> Sharp interest rate increases risked derailing the modest expansion of 1976-77, during which business investment already had been weak. Hesitancy

continued after G. William Miller became Chairman in late March. Most FOMC members appeared to believe inflation could be slowed only with policies that also slowed economic growth and thereby increased the risk of recession.<sup>4</sup> Notable exceptions were Reserve Bank presidents Roos of St. Louis and Willes of Minneapolis, who argued *uncertainty* about future monetary policy (and, hence, inflation) was the important factor threatening the pace of economic activity—not "tight" monetary policy.

The FOMC's actions during 1978 may be seen as attempts to stabilize inflation without undermining business confidence: They increased their federal funds rate target from 6<sup>3</sup>/<sub>4</sub> percent at the January 17 meeting to 10 percent at the December 19 meeting. The failure of these actions to dampen inflation is shown in the chart, which suggests the FOMC's rate targets were consistent with the realized 7 to 9 percent inflation rate incurred by the economy.

—Richard G. Anderson and Charles S. Gascon

**Federal Funds Rate and Taylor Rule Inflation Targets**



NOTE: GNP, potential GNP, and CPI data used to calculate inflation targets with the formula on p. 19 of this publication: real-time GNP data from ALFRED (<http://alfred.stlouisfed.org/>); quarterly potential GNP data from Clark, Peter K. "Potential GNP in the United States, 1948-80." *Review of Income and Wealth*, June 1979, 25(3), pp. 141-65; CPI data from the Bureau of Labor Statistics.

<sup>1</sup> [http://fraser.stlouisfed.org/historicaldocs/statements/download/27692/Burns\\_19780130.pdf](http://fraser.stlouisfed.org/historicaldocs/statements/download/27692/Burns_19780130.pdf).

<sup>2</sup> [http://www.aei.org/publications/pubID.15232,filter.all/pub\\_detail.asp](http://www.aei.org/publications/pubID.15232,filter.all/pub_detail.asp).

<sup>3</sup> Hetzel, Robert. "Arthur Burns and Inflation." *Federal Reserve Bank of Richmond Economic Quarterly*, Winter 1998, 84(1), pp. 21-44.

<sup>4</sup> This belief was not limited to FOMC members. In reflections on 1978-79, Ted Truman, at the time director of the Division of International Finance at the Federal Reserve Board, recalls Lyle Gramley, a member of the Council of Economic Advisers, arguing at a July 1978 OECD meeting that one more 25-basis-point increase in the federal funds rate target would push the economy into recession: Truman, Edwin. "Reflections." *Federal Reserve Bank of St. Louis Review*, March/ April 2005, 87(2, Part 2), pp. 353-57.

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

We welcome your comments addressed to:

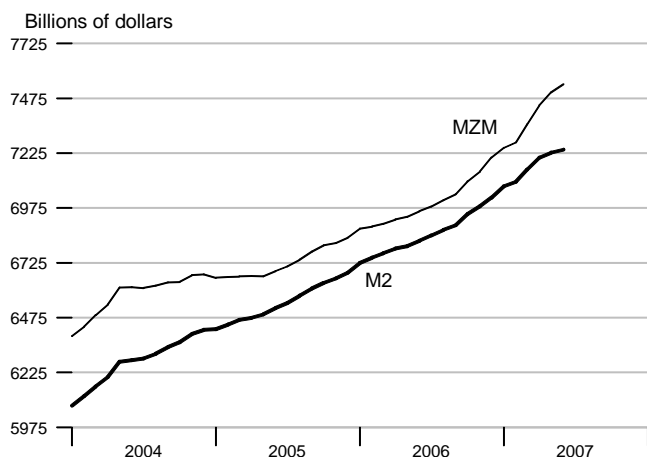
Editor, *Monetary Trends*  
Research Division  
Federal Reserve Bank of St. Louis  
P.O. Box 442  
St. Louis, MO 63166-0442

On March 23, 2006, the Board of Governors of the Federal Reserve System ceased the publication of the M3 monetary aggregate. It also ceased publishing the following components: large-denomination time deposits, RPs, and eurodollars.

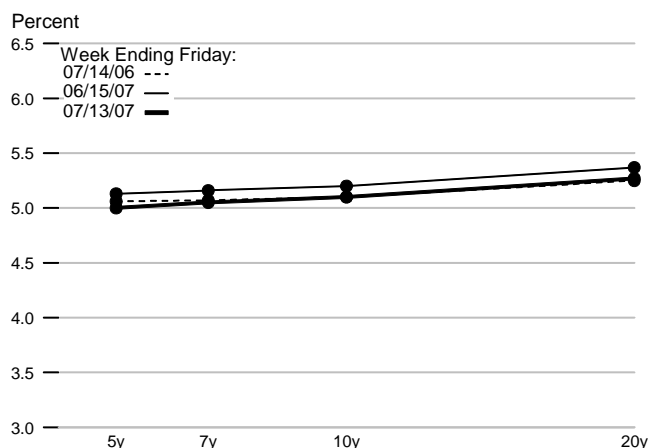
or to:

stlsFRED@stls.frb.org

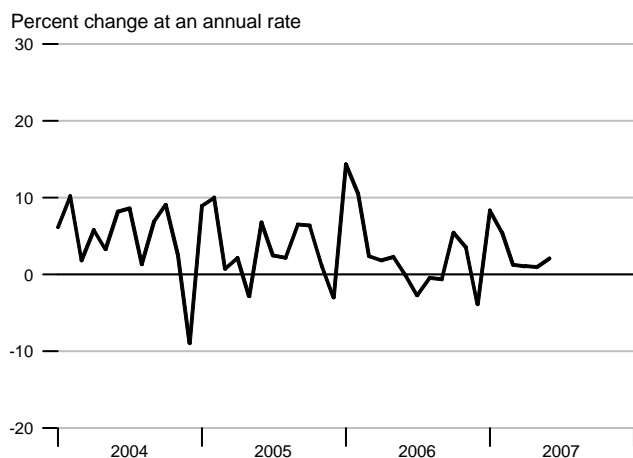
## M2 and MZM



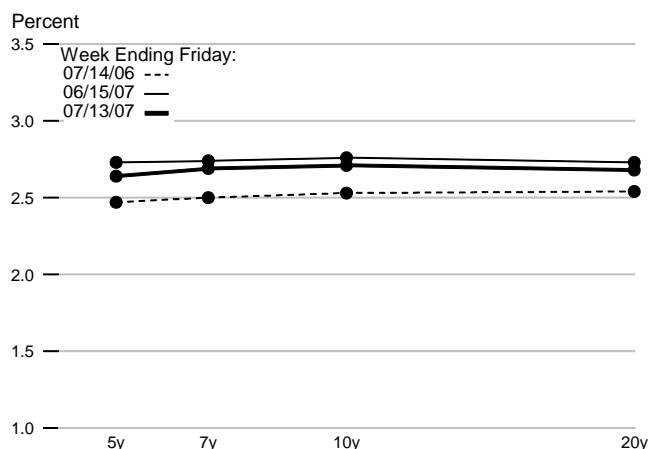
## Treasury Yield Curve



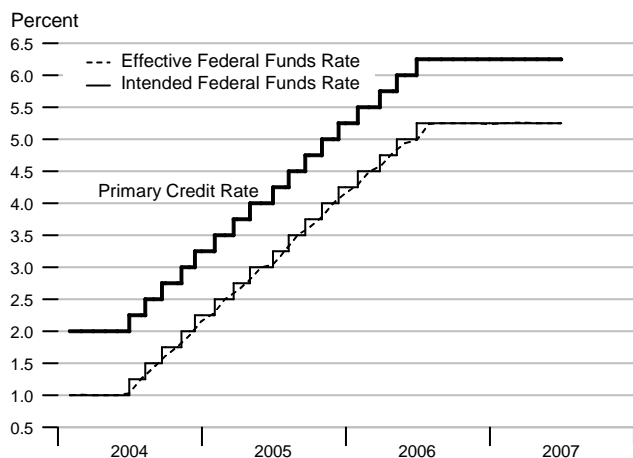
## Adjusted Monetary Base



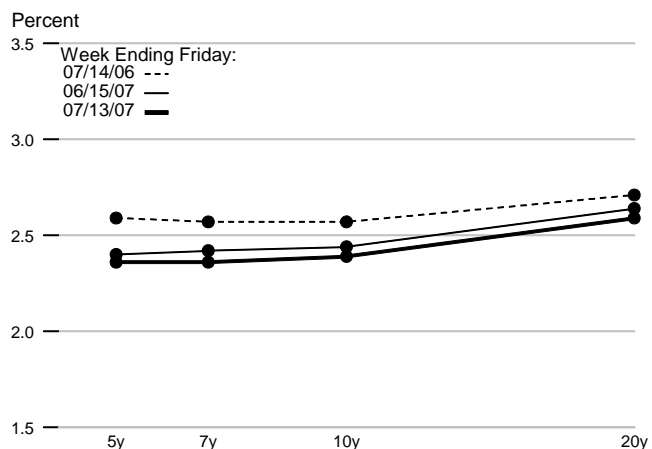
## Real Treasury Yield Curve



## Reserve Market Rates

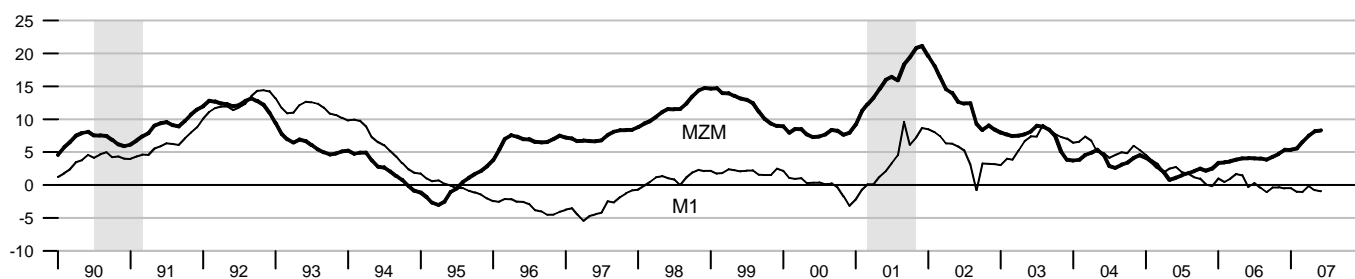


## Inflation-Indexed Treasury Yield Spreads



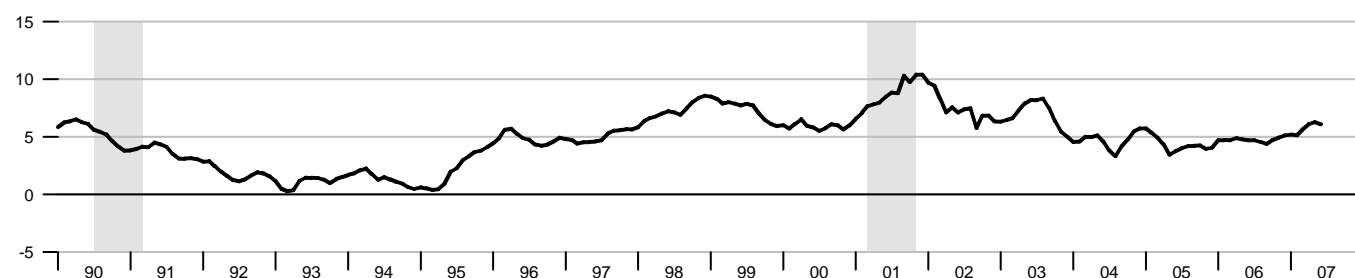
## MZM and M1

Percent change from year ago



## M2

Percent change from year ago



## M3\*

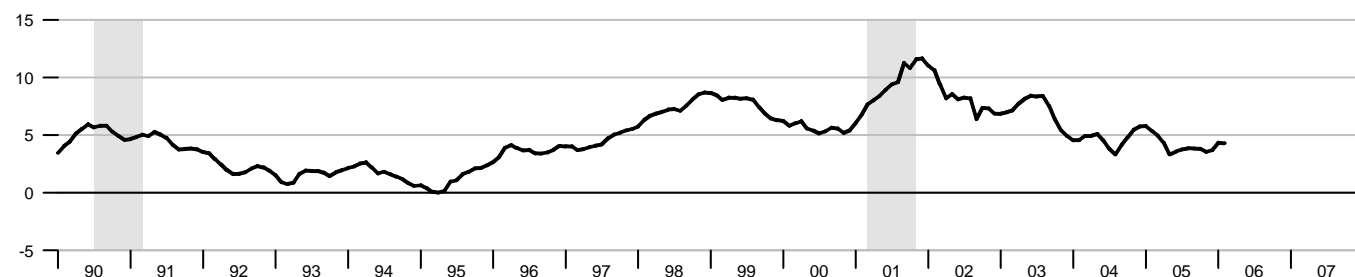
Percent change from year ago



\*See table of contents for changes to the series.

## Monetary Services Index - M2\*\*

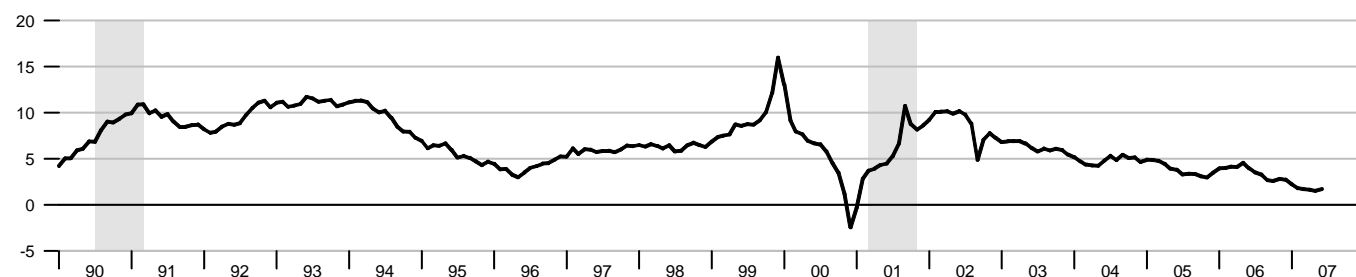
Percent change from year ago



\*\*We will not update the MSI series until we revise the code to accommodate the discontinuation of M3.

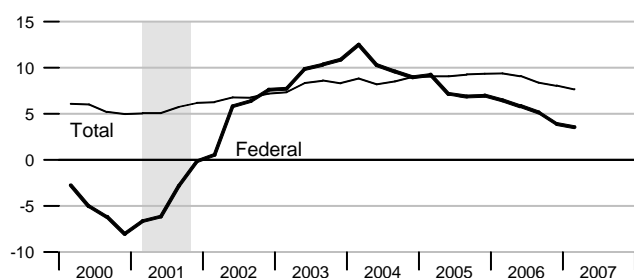
## Adjusted Monetary Base

Percent change from year ago



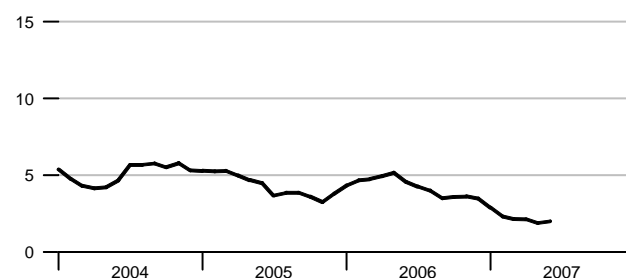
## Domestic Nonfinancial Debt

Percent change from year ago



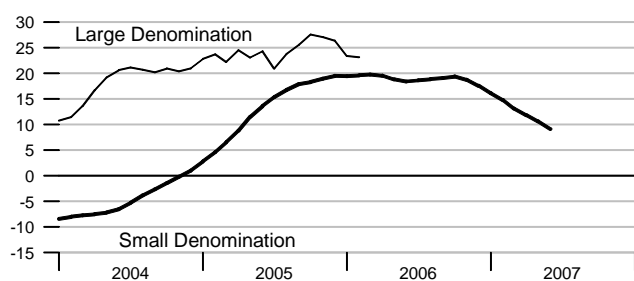
## Currency Held by the Nonbank Public

Percent change from year ago



## Time Deposits\*

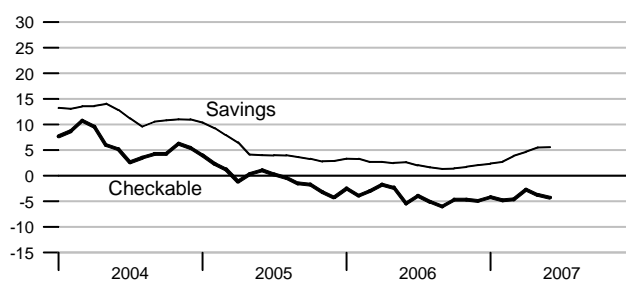
Percent change from year ago



\*See table of contents for changes to the series.

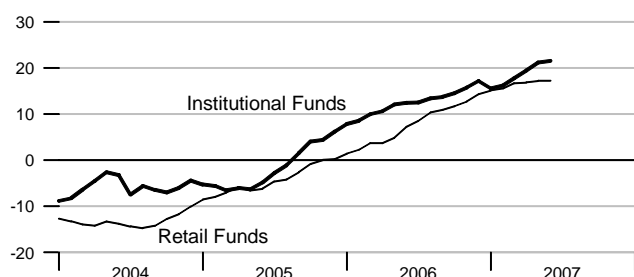
## Checkable and Savings Deposits

Percent change from year ago



## Money Market Mutual Fund Shares

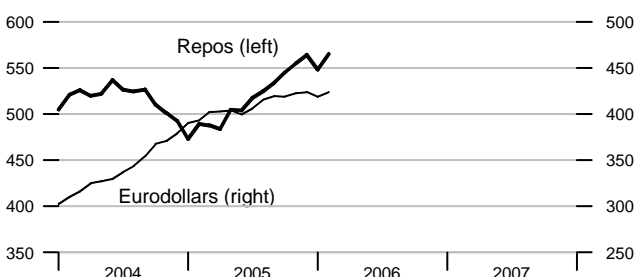
Percent change from year ago



## Repurchase Agreements and Eurodollars\*

Billions of dollars

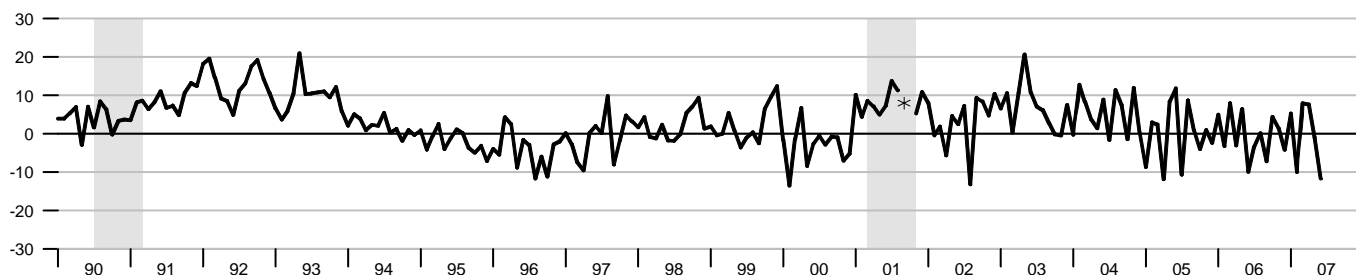
Billions of dollars



\*See table of contents for changes to these series.

## M1

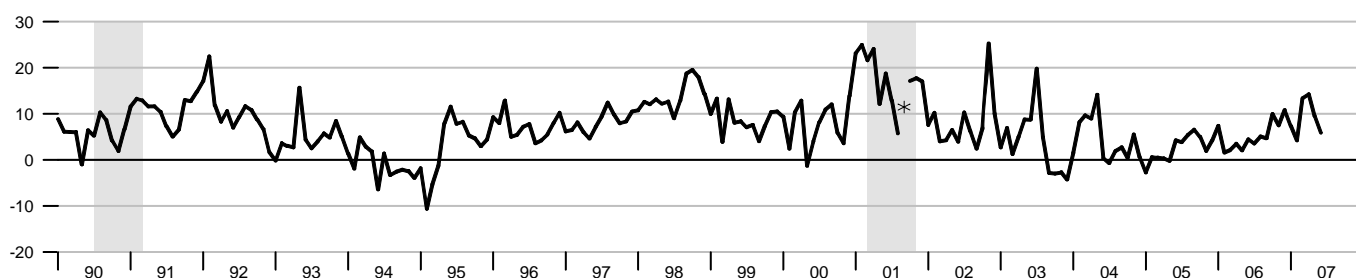
Percent change at an annual rate



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

## MZM

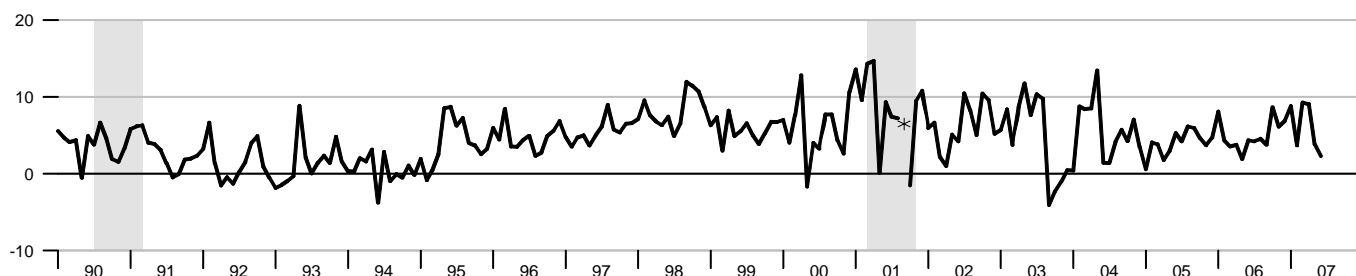
Percent change at an annual rate



\*Actual value for September 2001 is 39.41 percent rate.

## M2

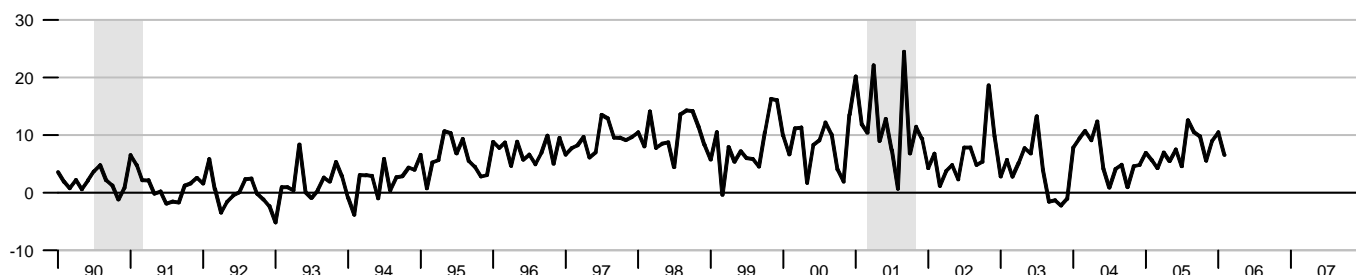
Percent change at an annual rate



\*Actual value for September 2001 is 24.90 percent rate.

## M3\*

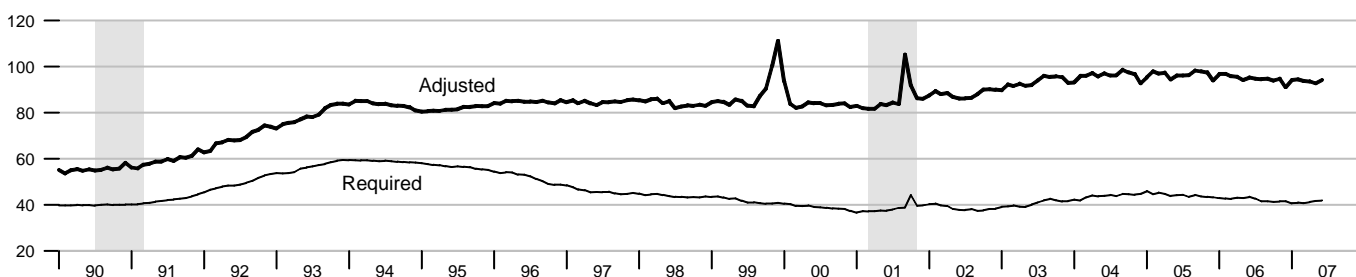
Percent change at an annual rate



\*See table of contents for changes to the series.

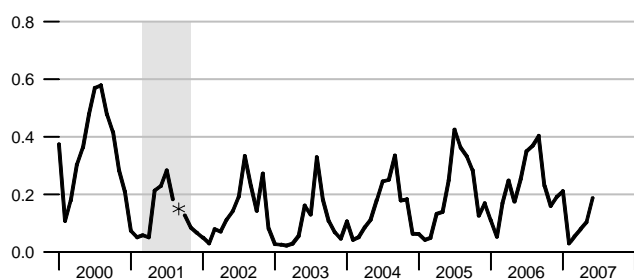
## Adjusted and Required Reserves

Billions of dollars



## Total Borrowings, nsa

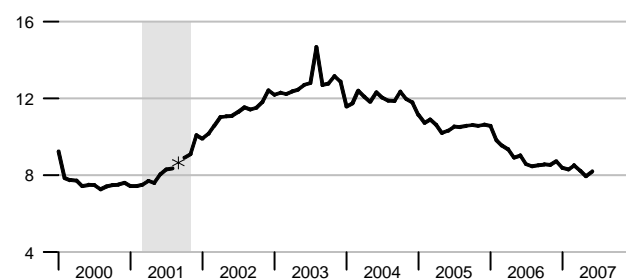
Billions of dollars



\*Actual value for September 2001 is \$3.4 billion.

## Excess Reserves plus RCB Contracts

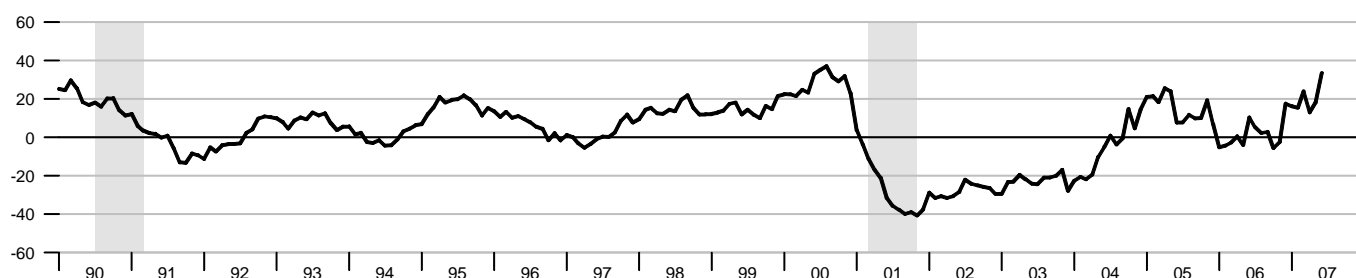
Billions of dollars



\*Actual value for September 2001 is \$26.43 billion.

## Nonfinancial Commercial Paper

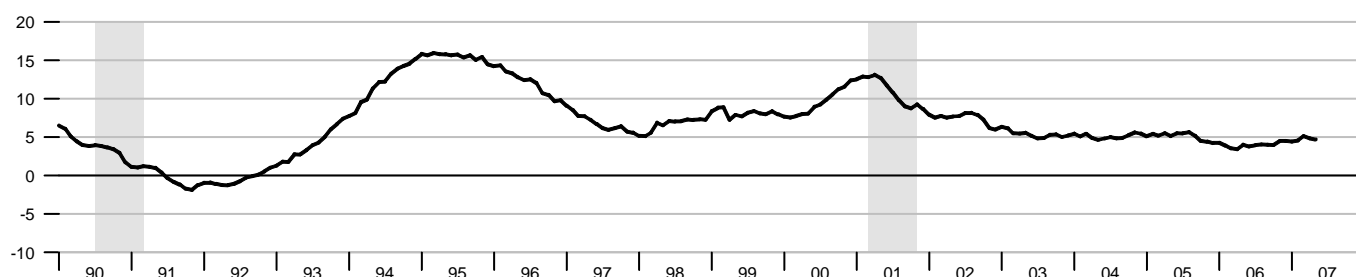
Percent change from year ago



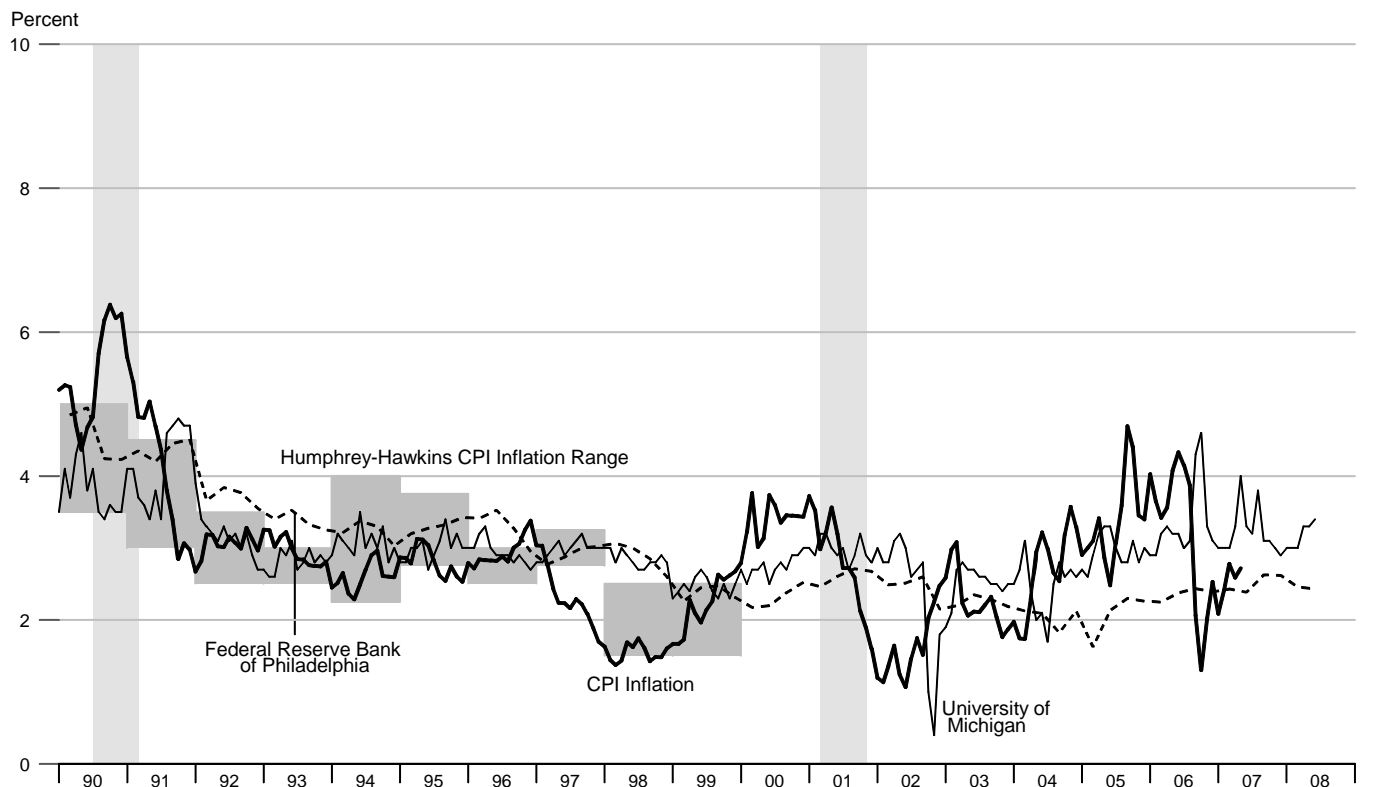
As of April 10, 2006, the Federal Reserve Board made major changes to its commercial paper calculations.  
For more information, please refer to <http://www.federalreserve.gov/releases/cp/about.htm>.

## Consumer Credit

Percent change from year ago

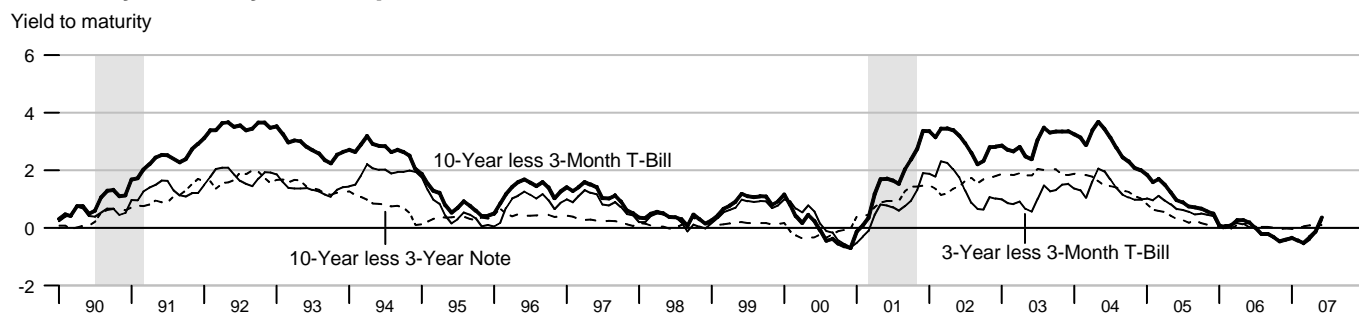


## Inflation and 1-Year-Ahead Inflation Expectations



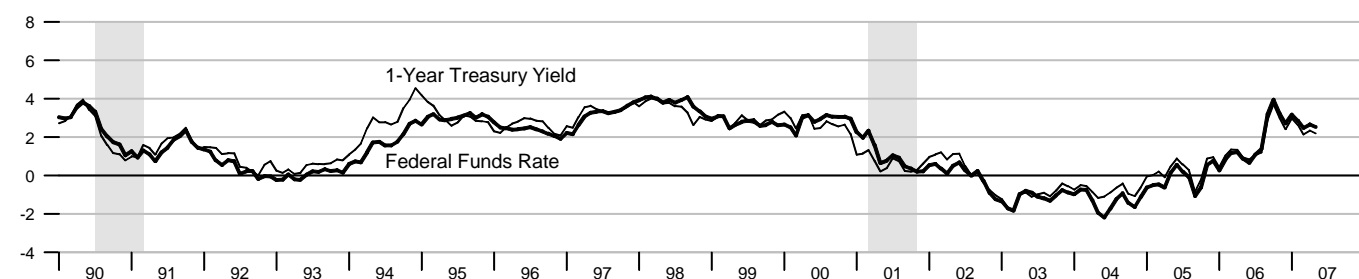
The shaded region shows the Humphrey-Hawkins CPI inflation range. Beginning in January 2000, the Humphrey-Hawkins inflation range was reported using the PCE price index and therefore is not shown on this graph. See notes on page 19.

## Treasury Security Yield Spreads



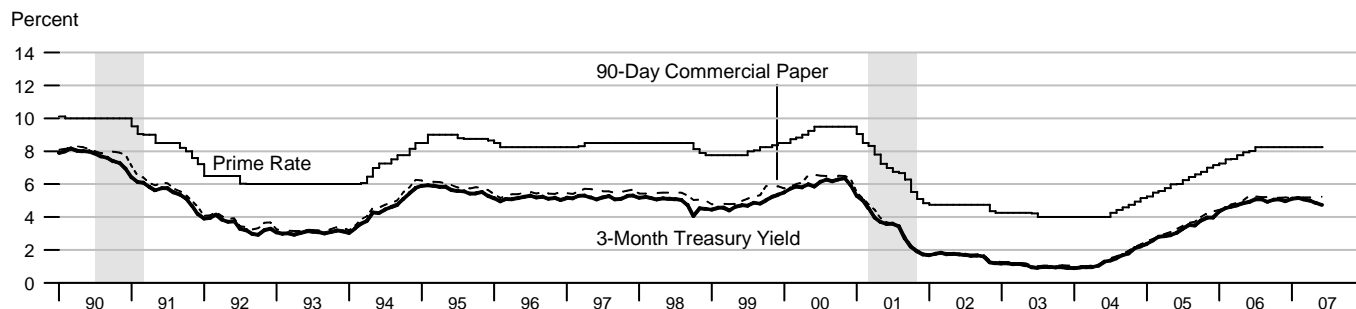
## Real Interest Rates

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

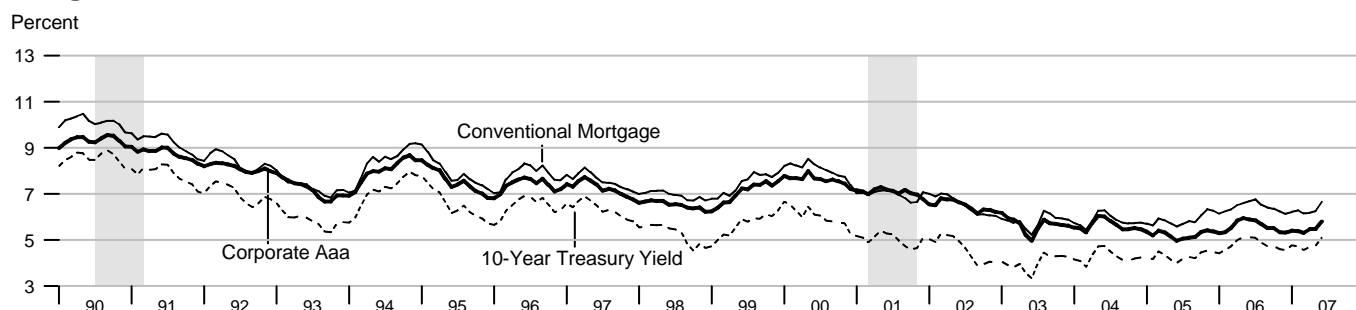




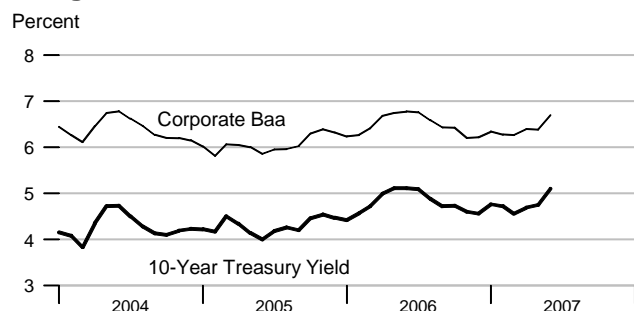
## Short-Term Interest Rates



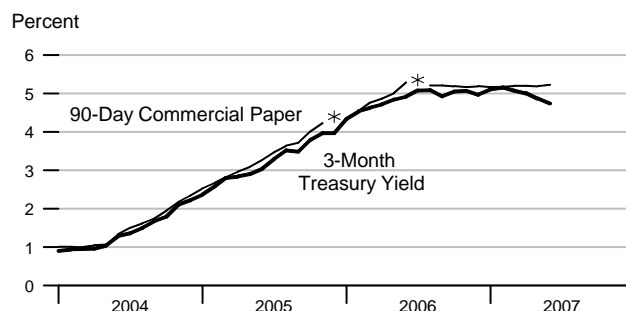
## Long-Term Interest Rates



## Long-Term Interest Rates

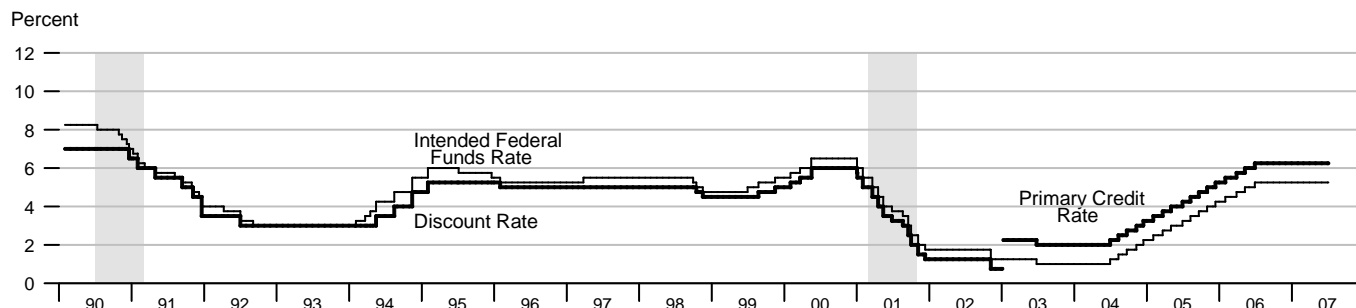


## Short-Term Interest Rates

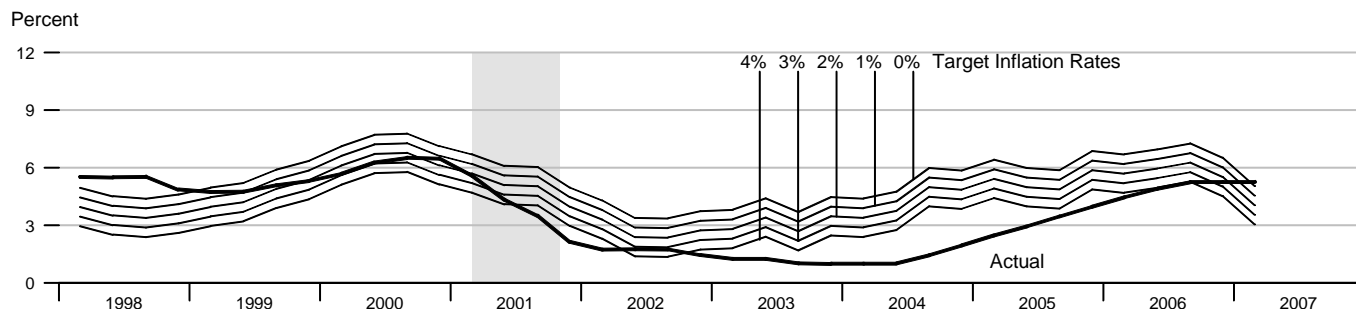


\*90-Day Commercial Paper data are not available for December 2005, January 2006, and July 2006.

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



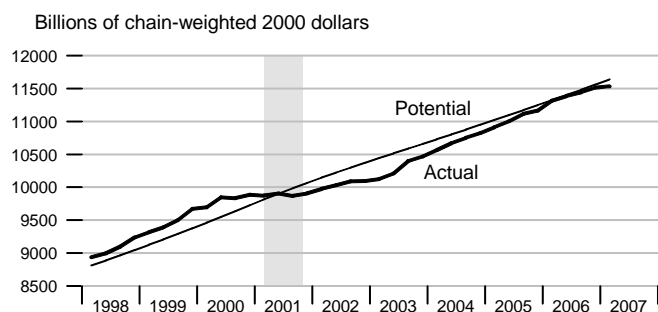
## Federal Funds Rate and Inflation Targets



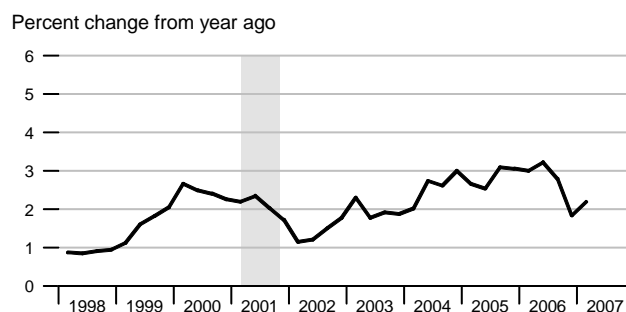
Calculated federal funds rate is based on Taylor's rule. See notes on page 19.

## Components of Taylor's Rule

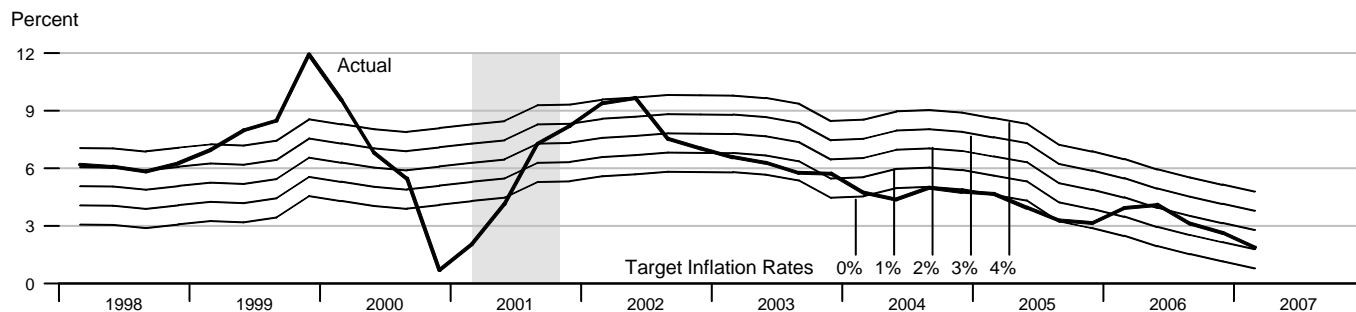
### Actual and Potential Real GDP



### PCE Inflation



## Monetary Base Growth\* and Inflation Targets

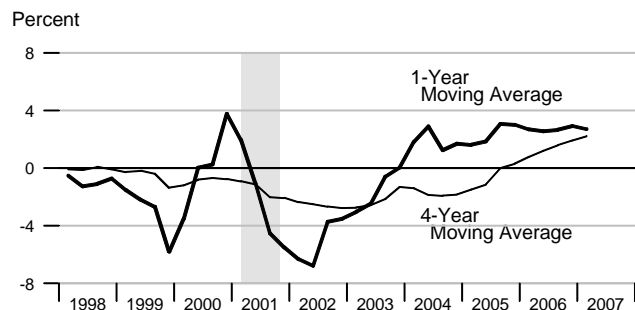


\*Modified for the effects of sweeps programs on reserve demand.

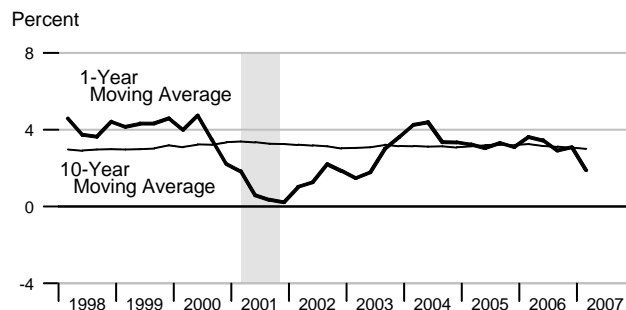
Calculated base growth is based on McCallum's rule. Actual base growth is percent change from year ago. See notes on page 19.

## Components of McCallum's Rule

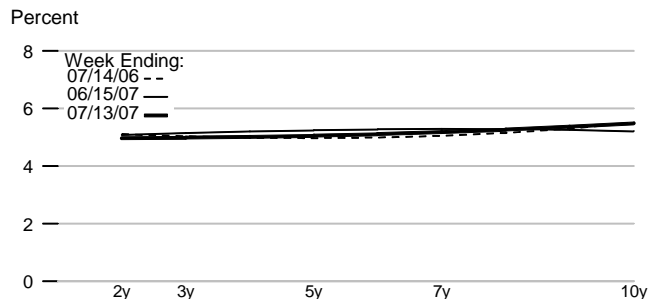
### Monetary Base Velocity Growth



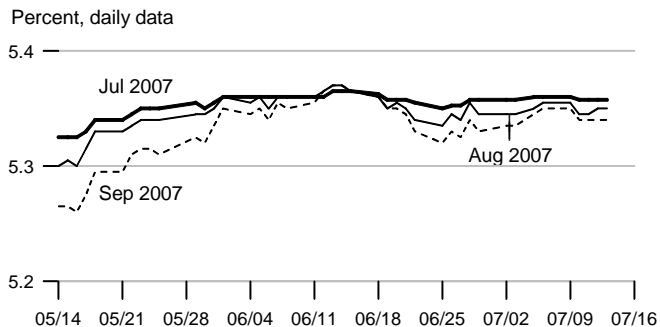
### Real Output Growth



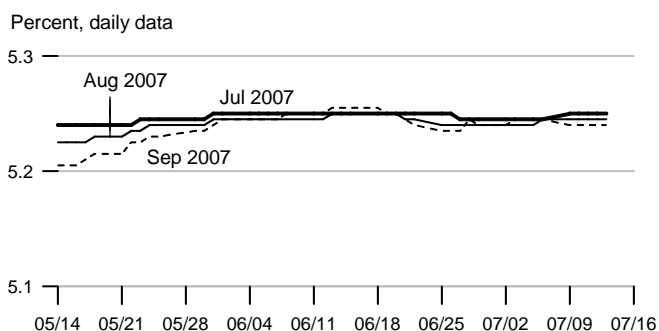
## Implied One-Year Forward Rates



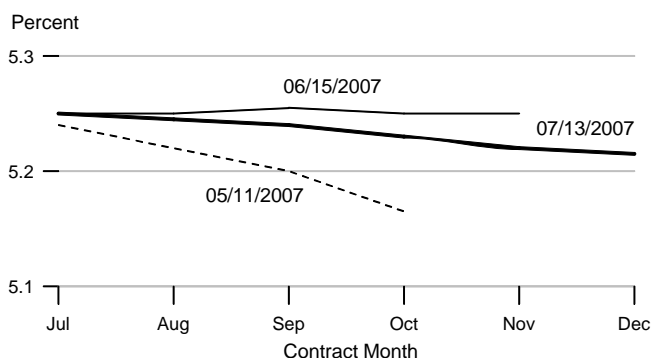
## Rates on 3-Month Eurodollar Futures



## Rates on Selected Federal Funds Futures Contracts

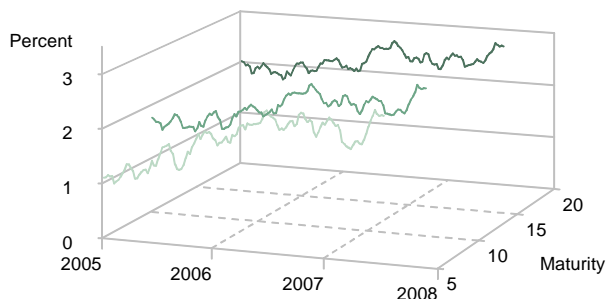


## Rates on Federal Funds Futures on Selected Dates



## Inflation-Indexed Treasury Securities

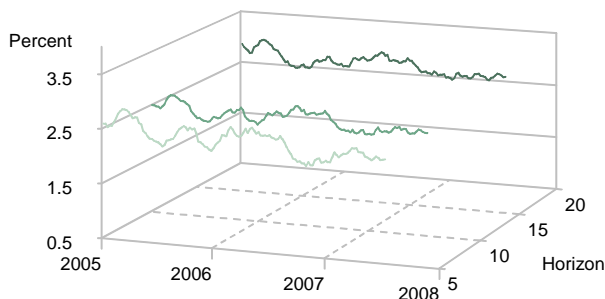
Weekly data



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

## Inflation-Indexed Treasury Yield Spreads

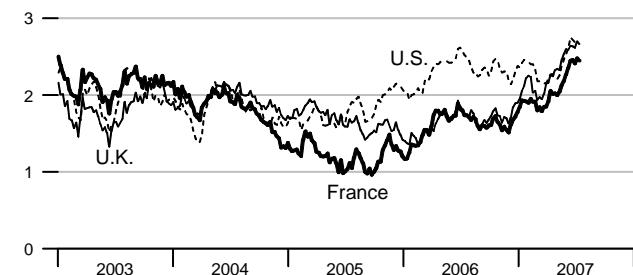
Weekly data



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

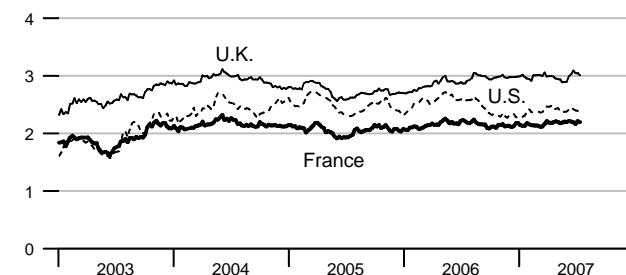
## Inflation-Indexed 10-Year Government Notes

Percent, weekly data



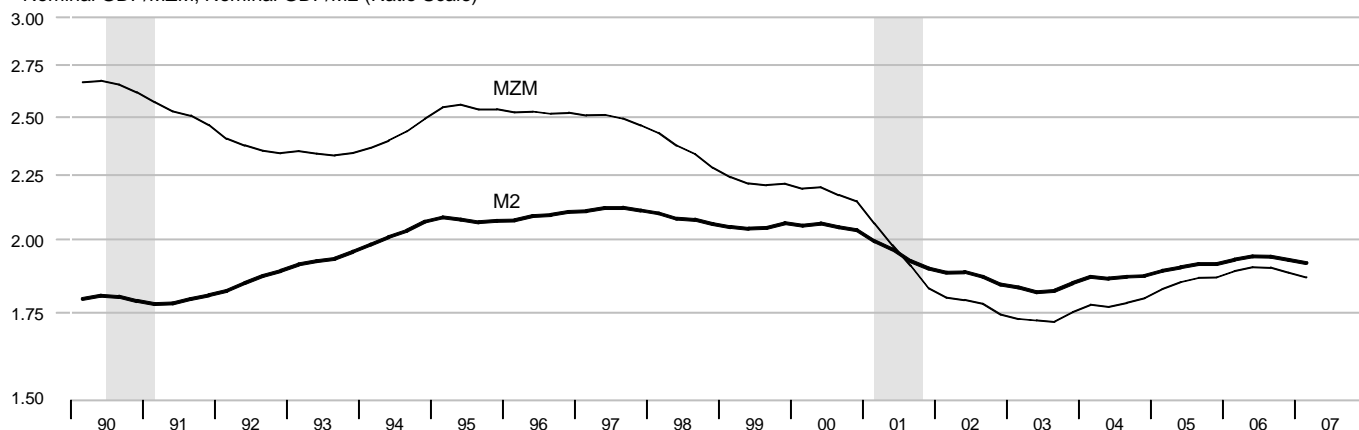
## Inflation-Indexed 10-Year Government Yield Spreads

Percent, weekly data



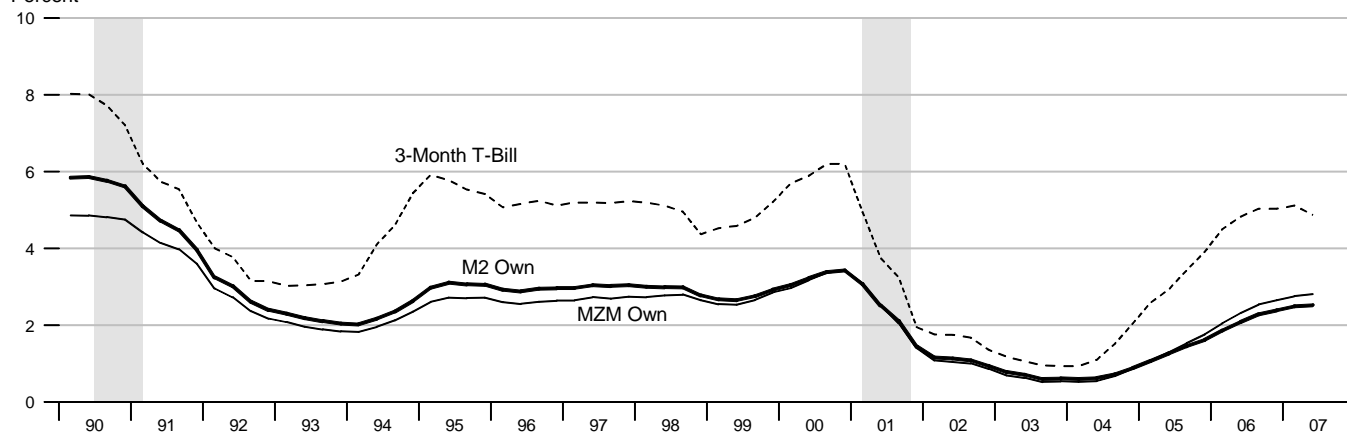
## Velocity

Nominal GDP/M2M, Nominal GDP/M2 (Ratio Scale)



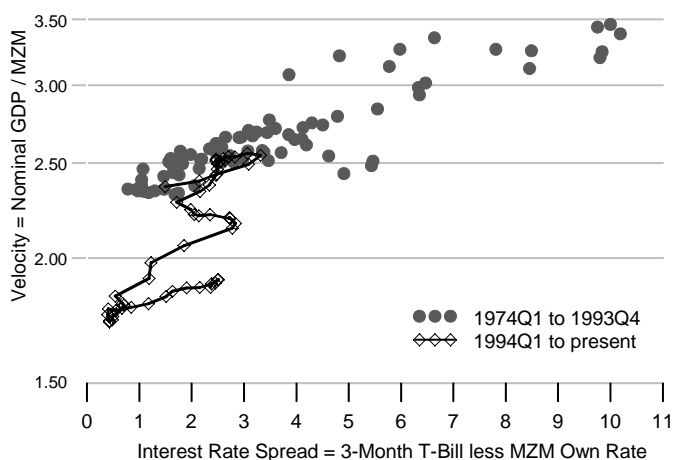
## Interest Rates

Percent



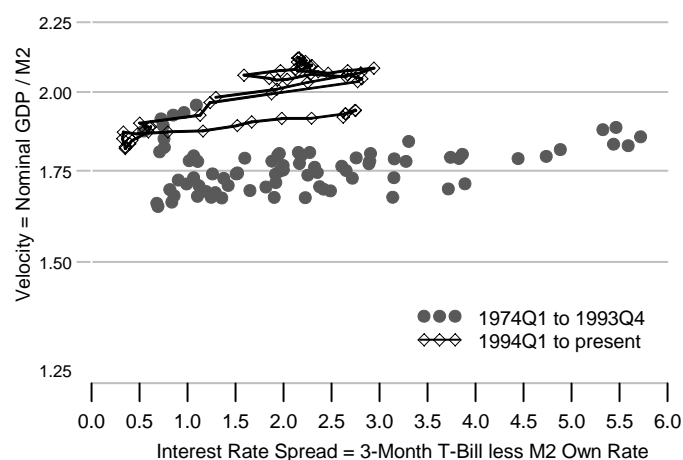
## M2M Velocity and Interest Rate Spread

Ratio Scale



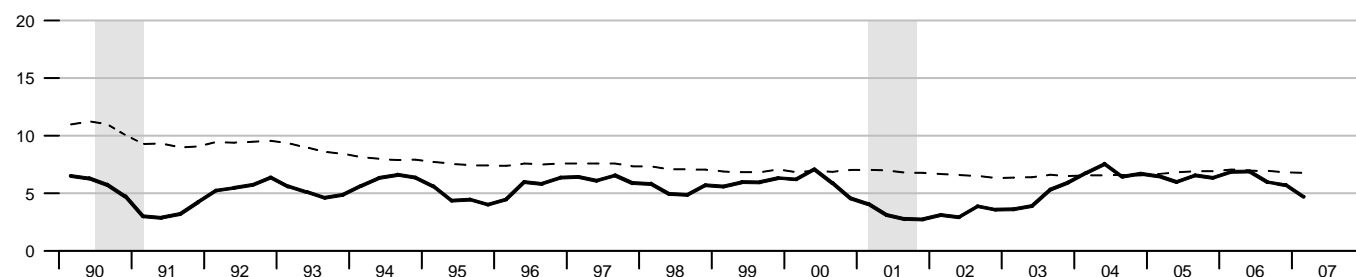
## M2 Velocity and Interest Rate Spread

Ratio Scale



## Gross Domestic Product

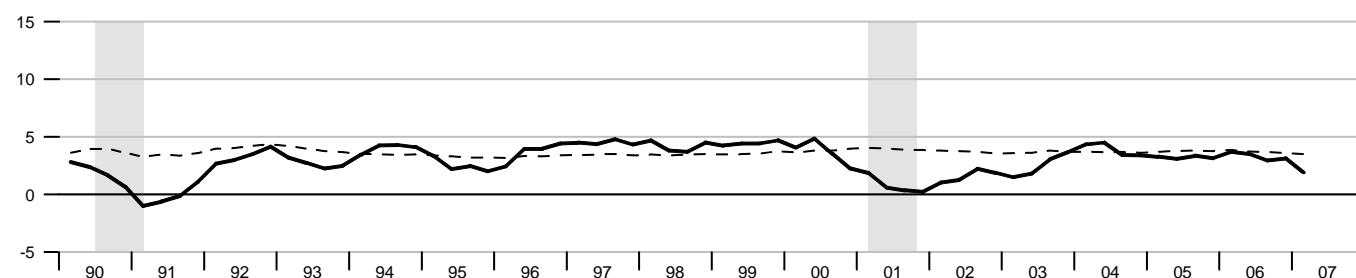
Percent change from year ago



Dashed lines indicate 10-year moving averages.

## Real Gross Domestic Product

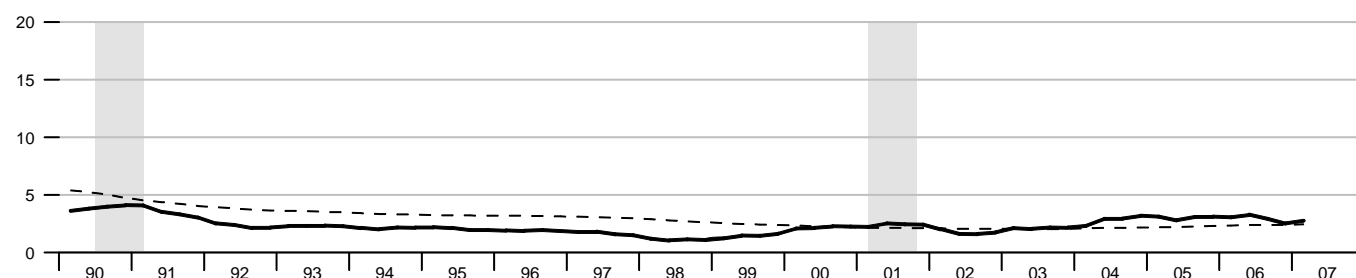
Percent change from year ago



Dashed lines indicate 10-year moving averages.

## Gross Domestic Product Price Index

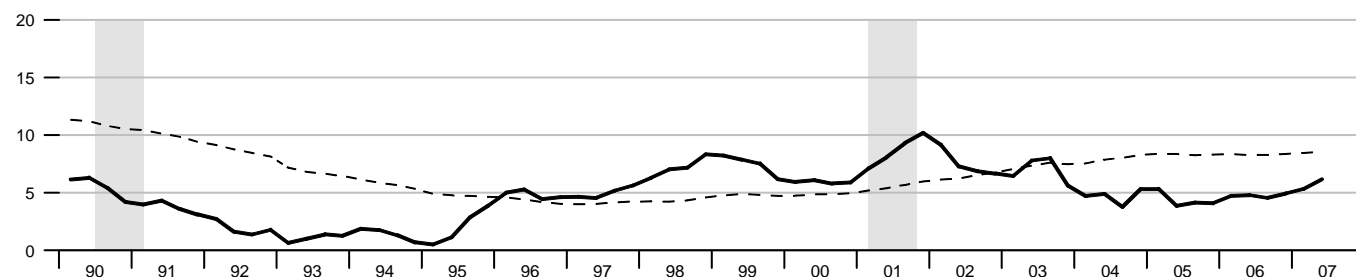
Percent change from year ago



Dashed lines indicate 10-year moving averages.

## M2

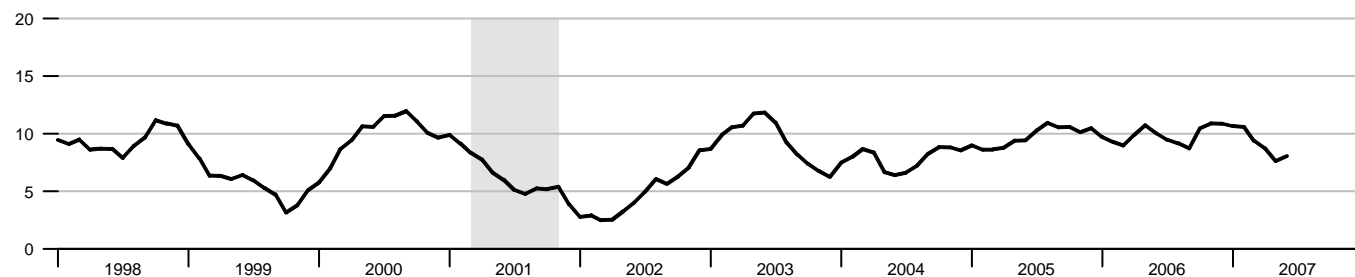
Percent change from year ago



Dashed lines indicate 10-year moving averages.

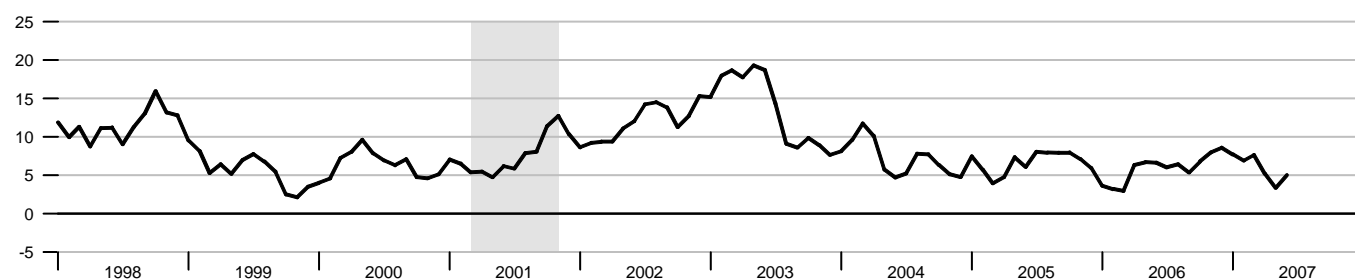
## Bank Credit

Percent change from year ago



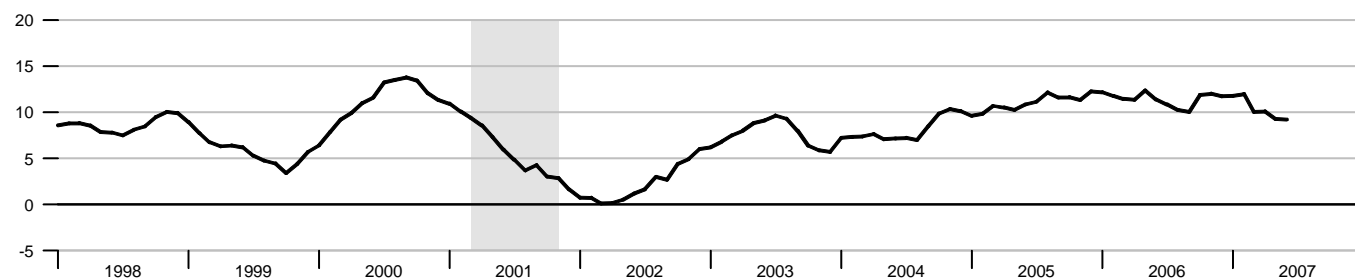
## Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago



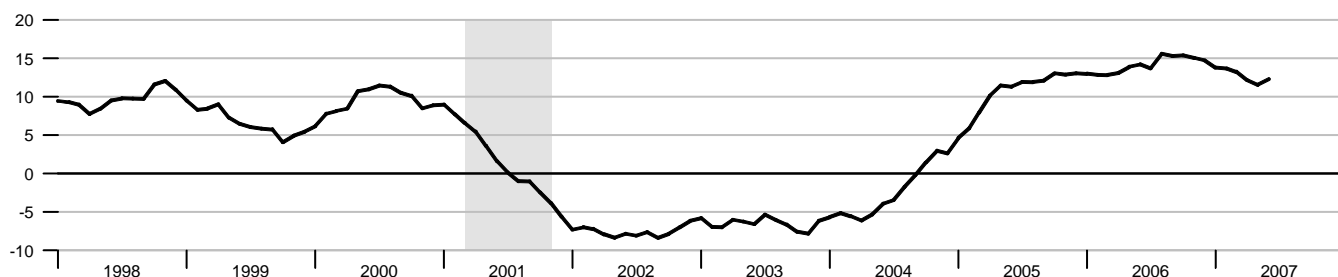
## Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago

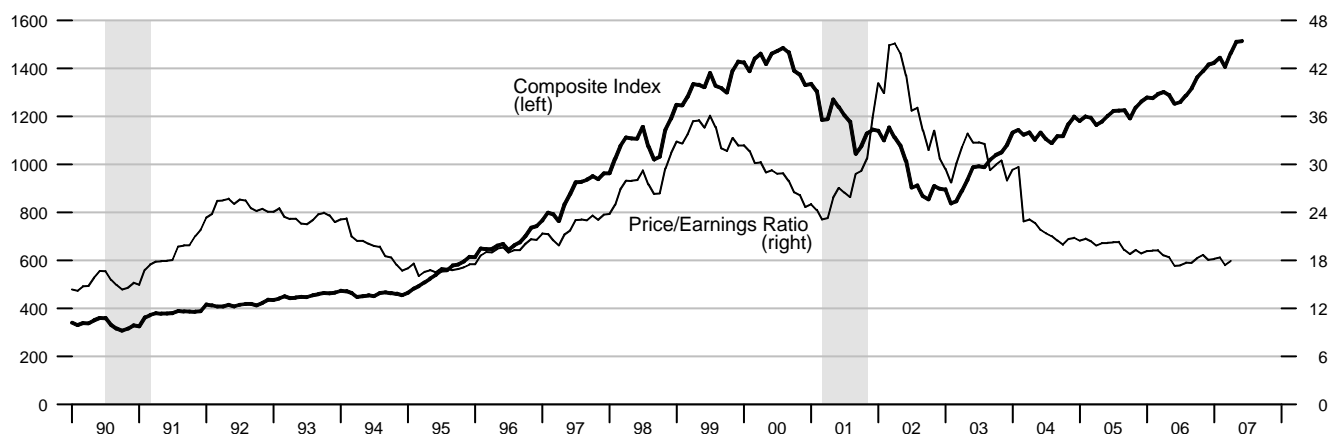


## Commercial and Industrial Loans at Commercial Banks

Percent change from year ago



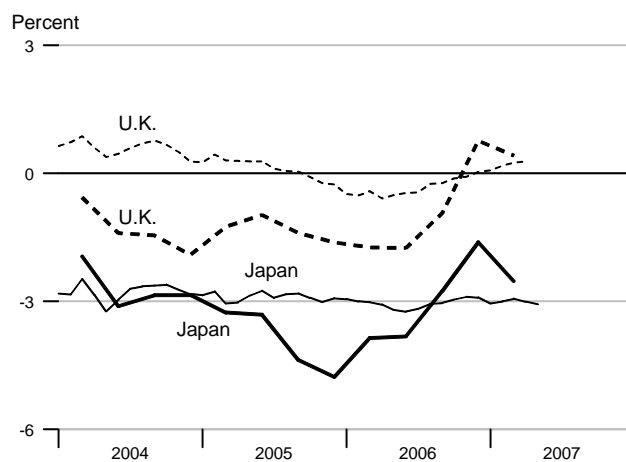
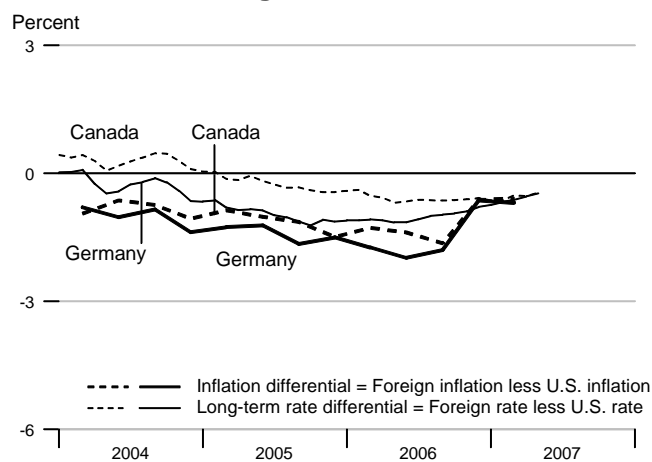
## Standard & Poor's 500



## Recent Inflation and Long-Term Interest Rates

	Consumer Price Inflation Rates				Long-Term Government Bond Rates			
	Percent change from year ago				Percent			
	2006Q2	2006Q3	2006Q4	2007Q1	Feb07	Mar07	Apr07	May07
United States	3.99	3.36	1.95	2.43	4.72	4.56	4.69	4.75
Canada	2.60	1.72	1.32	1.83	4.09	4.04	4.16	4.29
France	1.92	1.68	1.34	1.16	4.10	4.00	4.21	.
Germany	2.01	1.56	1.31	1.74	4.05	3.94	4.15	4.28
Italy	2.23	2.17	1.82	1.73	4.28	4.18	4.37	4.49
Japan	0.17	0.60	0.33	-0.10	1.72	1.62	1.68	1.68
United Kingdom	2.24	2.43	2.71	2.84	4.90	4.81	4.97	.

## Inflation and Long-Term Interest Rate Differentials



		Money Stock				Bank	Adjusted		
		M1	MZM	M2	M3*	Credit	Monetary Base	Reserves	MSI M2**
2002		1196.216	5888.698	5600.132	8259.055	5598.547	697.075	88.132	294.080
2003		1273.497	6325.448	5989.841	8787.321	6119.427	740.938	93.321	315.192
2004		1344.404	6576.555	6269.611	9234.718	6598.362	776.768	96.125	329.873
2005		1371.683	6723.194	6542.042	9786.477	7241.723	806.626	96.546	343.539
2006		1374.929	6996.947	6852.572	10270.74	7955.942	835.011	94.873	
2005	1	1368.350	6660.042	6443.594	9528.052	6985.984	798.378	96.763	339.356
	2	1368.566	6671.882	6494.265	9670.405	7152.984	802.565	95.987	341.280
	3	1375.343	6741.246	6574.780	9859.294	7347.380	809.023	96.923	344.766
	4	1374.471	6819.604	6655.529	10088.16	7480.542	816.537	96.510	348.753
2006	1	1379.238	6891.368	6747.330		7637.193	830.532	96.478	
	2	1381.649	6939.298	6805.359		7884.258	836.330	95.014	
	3	1369.913	7009.874	6873.936		8018.008	834.531	94.737	
	4	1368.918	7147.249	6983.665		8284.308	838.651	93.264	
2007	1	1367.619	7293.262	7106.382		8417.419	846.332	94.134	
	2	1373.259	7494.656	7224.251		8525.438	849.913	93.536	
2005	Jun	1380.691	6687.200	6518.619	9725.292	7209.046	804.942	96.136	342.235
	Jul	1368.443	6708.722	6541.567	9762.435	7279.794	806.594	96.160	343.275
	Aug	1378.316	6739.074	6575.087	9864.629	7355.029	808.055	96.319	344.739
	Sep	1379.269	6775.943	6607.685	9950.818	7407.317	812.419	98.291	346.285
	Oct	1374.668	6804.341	6633.196	10031.96	7442.506	816.722	97.974	347.590
	Nov	1375.740	6815.371	6653.712	10078.49	7472.359	817.462	97.544	348.603
	Dec	1373.006	6839.100	6679.680	10154.03	7526.761	815.426	94.012	350.067
2006	Jan	1378.666	6881.183	6724.626	10242.79	7569.744	825.161	96.774	353.032
	Feb	1374.976	6890.337	6748.683	10298.68	7640.231	832.400	96.850	353.943
	Mar	1384.073	6902.583	6768.681		7701.605	834.035	95.810	
	Apr	1380.561	6922.767	6789.935		7800.795	835.306	95.563	
	May	1387.927	6934.706	6800.730		7919.866	836.887	94.190	
	Jun	1376.459	6960.421	6825.411		7932.113	836.796	95.290	
	Jul	1372.559	6981.092	6849.458		7970.401	834.899	94.801	
	Aug	1372.691	7010.539	6875.362		8029.572	834.567	94.631	
	Sep	1364.488	7037.992	6896.988		8054.052	834.128	94.779	
	Oct	1369.457	7096.259	6946.694		8220.996	837.899	93.958	
	Nov	1371.027	7140.642	6982.178		8286.653	840.381	94.758	
	Dec	1366.269	7204.847	7022.122		8345.275	837.672	91.077	
2007	Jan	1372.227	7249.164	7073.598		8378.086	843.477	94.165	
	Feb	1360.834	7274.819	7095.392		8449.983	847.313	94.465	
	Mar	1369.796	7355.804	7150.157		8424.187	848.205	93.771	
	Apr	1378.503	7443.026	7204.234		8481.902	848.961	93.584	
	May	1377.346	7501.976	7227.322		8523.906	849.655	92.779	
	Jun	1363.929	7538.966	7241.197		8570.505	851.124	94.244	

Note: All values are given in billions of dollars. \*See table of contents for changes to the series.

\*\*We will not update the MSI series until we revise the code to accommodate the discontinuation of M3.



		Federal Funds	Primary Credit	Prime Rate	3-mo CDs	Treasury Yields			Corporate Aaa Bonds	Municipal Aaa Bonds	Conventional Mortgage
			Rate	Rate		3-mo	3-yr	10-yr			
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
2005		3.21	4.19	6.19	3.51	3.21	3.93	4.29	5.23	4.28	5.86
2006		4.96	5.96	7.96	5.15	4.85	4.77	4.79	5.59	4.15	6.41
2005	1	2.47	3.44	5.44	2.78	2.58	3.61	4.30	5.32	4.23	5.76
	2	2.94	3.91	5.91	3.23	2.93	3.73	4.16	5.15	4.15	5.72
	3	3.46	4.43	6.43	3.74	3.43	3.98	4.21	5.09	4.28	5.76
	4	3.98	4.97	6.97	4.30	3.91	4.37	4.49	5.38	4.45	6.22
2006	1	4.46	5.43	7.43	4.72	4.50	4.58	4.57	5.39	4.29	6.24
	2	4.91	5.90	7.90	5.18	4.83	4.98	5.07	5.89	4.36	6.60
	3	5.25	6.25	8.25	5.39	5.03	4.87	4.90	5.68	4.13	6.56
	4	5.25	6.25	8.25	5.32	5.03	4.65	4.63	5.39	3.82	6.24
2007	1	5.26	6.25	8.25	5.31	5.12	4.68	4.68	5.36	3.91	6.22
	2	5.25	6.25	8.25	5.32	4.87	4.76	4.85	5.58	4.12	6.37
2005 Jun		3.04	4.01	6.01	3.38	3.04	3.69	4.00	4.96	4.08	5.58
Jul		3.26	4.25	6.25	3.57	3.29	3.91	4.18	5.06	4.18	5.70
Aug		3.50	4.44	6.44	3.77	3.52	4.08	4.26	5.09	4.33	5.82
Sep		3.62	4.59	6.59	3.87	3.49	3.96	4.20	5.13	4.34	5.77
Oct		3.78	4.75	6.75	4.13	3.79	4.29	4.46	5.35	4.49	6.07
Nov		4.00	5.00	7.00	4.31	3.97	4.43	4.54	5.42	4.42	6.33
Dec		4.16	5.15	7.15	4.45	3.97	4.39	4.47	5.37	4.46	6.27
2006	Jan	4.29	5.26	7.26	4.56	4.34	4.35	4.42	5.29	4.27	6.15
	Feb	4.49	5.50	7.50	4.72	4.54	4.64	4.57	5.35	4.33	6.25
	Mar	4.59	5.53	7.53	4.88	4.63	4.74	4.72	5.53	4.29	6.32
	Apr	4.79	5.75	7.75	5.03	4.72	4.89	4.99	5.84	4.36	6.51
	May	4.94	5.93	7.93	5.15	4.84	4.97	5.11	5.95	4.38	6.60
	Jun	4.99	6.02	8.02	5.35	4.92	5.09	5.11	5.89	4.35	6.68
	Jul	5.24	6.25	8.25	5.46	5.08	5.07	5.09	5.85	4.41	6.76
	Aug	5.25	6.25	8.25	5.38	5.09	4.85	4.88	5.68	4.10	6.52
	Sep	5.25	6.25	8.25	5.34	4.93	4.69	4.72	5.51	3.87	6.40
	Oct	5.25	6.25	8.25	5.33	5.05	4.72	4.73	5.51	3.91	6.36
	Nov	5.25	6.25	8.25	5.32	5.07	4.64	4.60	5.33	3.81	6.24
	Dec	5.24	6.25	8.25	5.32	4.97	4.58	4.56	5.32	3.76	6.14
2007	Jan	5.25	6.25	8.25	5.32	5.11	4.79	4.76	5.40	3.89	6.22
	Feb	5.26	6.25	8.25	5.31	5.16	4.75	4.72	5.39	3.95	6.29
	Mar	5.26	6.25	8.25	5.30	5.08	4.51	4.56	5.30	3.88	6.16
	Apr	5.25	6.25	8.25	5.31	5.01	4.60	4.69	5.47	3.99	6.18
	May	5.25	6.25	8.25	5.31	4.87	4.69	4.75	5.47	4.04	6.26
	Jun	5.25	6.25	8.25	5.33	4.74	5.00	5.10	5.79	4.34	6.66

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

		M1	M2M	M2	M3*
Percent change at an annual rate					
2002		4.91	12.76	7.47	7.98
2003		6.46	7.42	6.96	6.40
2004		5.57	3.97	4.67	5.09
2005		2.03	2.23	4.35	5.97
2006		0.24	4.07	4.75	4.95
2005	1	-0.60	0.02	3.09	5.63
	2	0.06	0.71	3.15	5.98
	3	1.98	4.16	4.96	7.81
	4	-0.25	4.65	4.91	9.29
2006	1	1.39	4.21	5.52	
	2	0.70	2.78	3.44	
	3	-3.40	4.07	4.03	
	4	-0.29	7.84	6.39	
2007	1	-0.38	8.17	7.03	
	2	1.65	11.05	6.63	
2005	Jun	11.79	4.24	5.28	7.48
	Jul	-10.65	3.86	4.22	4.58
	Aug	8.66	5.43	6.15	12.56
	Sep	0.83	6.57	5.95	10.48
	Oct	-4.00	5.03	4.63	9.79
	Nov	0.94	1.95	3.71	5.57
	Dec	-2.38	4.18	4.68	8.99
	Jan	4.95	7.38	8.07	10.49
	Feb	-3.21	1.60	4.29	6.55
	Mar	7.94	2.13	3.56	
	Apr	-3.04	3.51	3.77	
	May	6.40	2.07	1.91	
2006	Jun	-9.92	4.45	4.36	
	Jul	-3.40	3.56	4.23	
	Aug	0.12	5.06	4.54	
	Sep	-7.17	4.70	3.77	
	Oct	4.37	9.93	8.65	
	Nov	1.38	7.51	6.13	
	Dec	-4.16	10.79	6.87	
	Jan	5.23	7.38	8.80	
	Feb	-9.96	4.25	3.70	
	Mar	7.90	13.36	9.26	
	Apr	7.63	14.23	9.08	
	May	-1.01	9.50	3.85	
	Jun	-11.69	5.92	2.30	

\*See table of contents for changes to the series.

## Definitions

**M1:** The sum of currency held outside the vaults of depository institutions, Federal Reserve Banks, and the U.S. Treasury; travelers checks; and demand and other checkable deposits issued by financial institutions (except demand deposits due to the Treasury and depository institutions), minus cash items in process of collection and Federal Reserve float.

**MZM (money, zero maturity):** M2 minus small-denomination time deposits, plus institutional money market mutual funds (that is, those included in M3 but excluded from M2). The label MZM was coined by William Poole (1991); the aggregate itself was proposed earlier by Motley (1988).

**M2:** M1 plus savings deposits (including money market deposit accounts) and small-denomination (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](http://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](http://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** and **Real Treasury Yield Curve** show constant maturity yields calculated by the U.S. Treasury for securities 5, 7, 10, and 20 years to maturity. **Inflation-Indexed Treasury Yield Spreads** are a

measure of inflation compensation at those horizons, and it is simply the nominal constant maturity yield less the real constant maturity yield. Daily data and descriptions are available at [research.stlouisfed.org/fred2/](http://research.stlouisfed.org/fred2/). See also *Statistical Supplement to the Federal Reserve Bulletin*, table 1.35. The 30-year constant maturity series was discontinued by the Treasury as of February 18, 2002.

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

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

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

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

**Page 10:** **Federal Funds Rate and Inflation Targets** shows the observed federal funds rate, quarterly, and the level of the funds rate implied by applying Taylor's (1993) equation

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

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

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

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](http://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  $m = 1, \dots, 10$  years to maturity are obtained by linear interpolation between reported yields. These yields are smoothed by fitting the regression suggested by Nelson and Siegel (1987),

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

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

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

where duration is approximated as  $D(m) = (1 - e^{-R(m) \times m})/R(m)$ . These rates are linear approximations to the true instantaneous forward rates; see Shiller (1990). For a discussion of the use of forward rates as indicators of inflation expectations, see Sharpe (1997). **Rates on 3-Month Eurodollar Futures and Rates on Selected Federal Funds Futures Contracts** trace through time the yield on three specific contracts. **Rates on Federal Funds Futures on Selected Dates** displays a single day's snapshot of yields for contracts expiring in the months shown on the horizontal axis. **Inflation-Indexed Treasury Securities and Yield Spreads** are those plotted on page 3. **Inflation-Indexed 10-Year Government Notes** shows the yield of an inflation-indexed note that is scheduled to mature in approximately (but not greater than) 10 years. The current French note has a maturity date of 7/25/2015, the current U.K. note has a maturity date of 8/16/2013, and the current U.S. note has a maturity date of 1/15/2017. **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/](http://research.stlouisfed.org/publications/review/).