

Does Inflation Targeting Make a Difference?

Over the past 15 years, an increasing number of central banks have adopted explicit inflation targeting as a framework for conducting monetary policy. Inflation targeting takes many forms, but at its heart is an announcement by the monetary authority of its quantitative point target (or range) for inflation, regular communication with the public on the progress being made toward hitting the target, and mechanisms by which the monetary authority is held accountable should it miss its target. Inflation targeting was adopted by a handful of mainly industrial countries in the early 1990s. Spurred by its perceived success, a large number of countries, including many emerging market economies, have recently adopted inflation targeting.

Despite the popularity of inflation targeting around the world, and a general perception that it “works,” most early research studies found little evidence that economic performance in non-inflation-targeting countries had suffered because they did not adopt inflation targeting. As more data have become available, however, recent studies have begun to unearth significant differences in the performance of inflation-targeting vs. non-inflation-targeting economies.

One such study found that inflation targeting affects the public’s expectations about inflation.¹ In particular, under an inflation-targeting regime, expectations about inflation, particularly at longer horizons, should be “anchored” by the target, and thus should be less affected by changes in actual inflation. The table uses estimates from this study to show how the public’s expectations of future inflation (five and ten years out) would change in the face of a 1-percentage-point increase in average realized inflation over the preceding three years. For a group of inflation-targeting countries, comprising Australia, Canada, New Zealand, Sweden, and the United Kingdom, the estimated response of inflation expectations to this increase in realized inflation is quite small. However, for the non-inflation-targeting economies, namely, the euro area, Japan and the United States, the estimated responses are large and statistically significant.

Having inflation expectations that are well anchored—that is, unresponsive to short-run changes in inflation—is of significant benefit to a country’s economy. Because expectations of higher future inflation will be negotiated into various sorts of pricing contracts, such as labor contracts, the public’s expectation of future inflation can be self-fulfilling. Thus, keeping inflation expectations anchored helps to keep inflation itself low and stable.

Of course, there are also potential drawbacks to the adoption of inflation targeting that might offset any potential benefit in terms of anchored inflation expectations. For example, some Federal Reserve policymakers have argued that inflation targeting removes the flexibility needed to respond to changing macroeconomic conditions, as well as unusual events. Whether or not the United States would experience a net benefit from adopting inflation targeting is an active topic of debate, both inside and outside of the Federal Reserve. The outcome of this debate will be important in shaping the Federal Reserve’s policy framework of the future.

—Jeremy Piger

¹ Levin, Andrew T.; Natalucci, Fabio M. and Piger, Jeremy M. “The Macroeconomic Effects of Inflation Targeting.” Federal Reserve Bank of St. Louis Review, July/August 2004, 86(4) (forthcoming).

Estimated Response of Inflation Expectations to Change in Realized Inflation

	Horizon of inflation expectations (years ahead)	
	5	10
Australia, Canada, New Zealand, Sweden, United Kingdom	0.09%	0.01%
Euro area, Japan, and United States	0.29%	0.24%
Euro area and United States	0.34%	0.24%

SOURCE: See footnote 1.

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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:

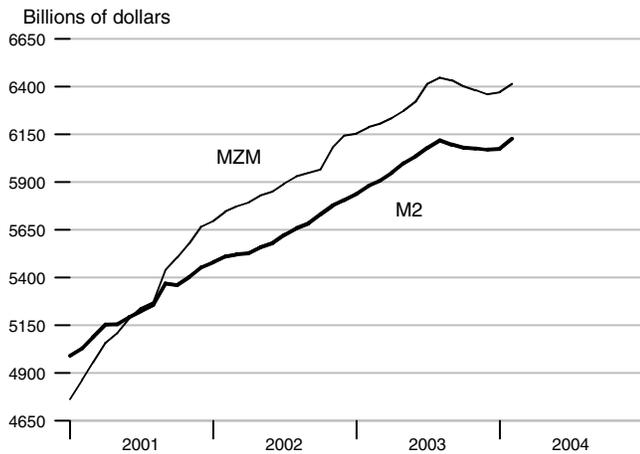
Editor, *Monetary Trends*
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St. Louis, MO 63166-0442

or to:

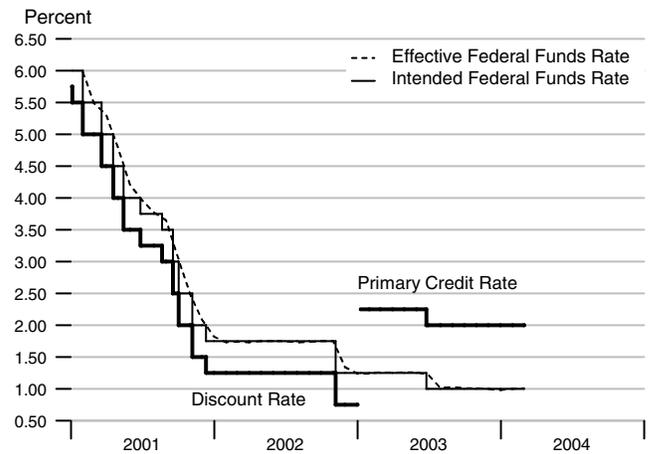
stlsFRED@stls.frb.org

Beginning this issue, page 11 includes inflation-indexed 10-year government yield spreads for France and the U.K.

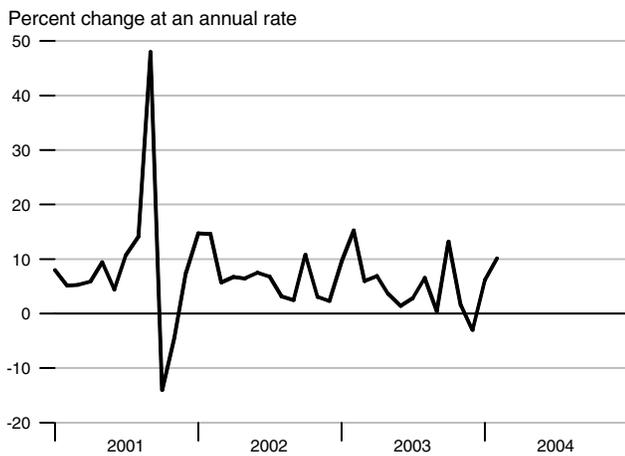
M2 and MZM



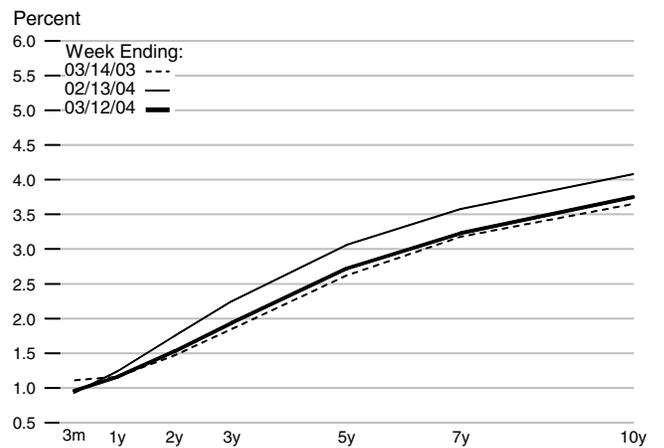
Reserve Market Rates



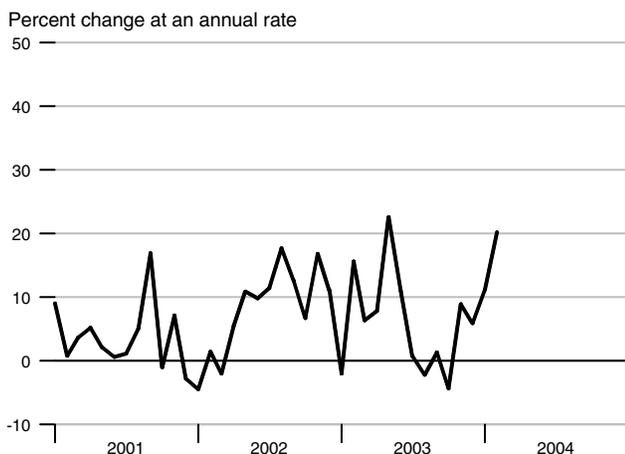
Adjusted Monetary Base



Treasury Yield Curve



Total Bank Credit

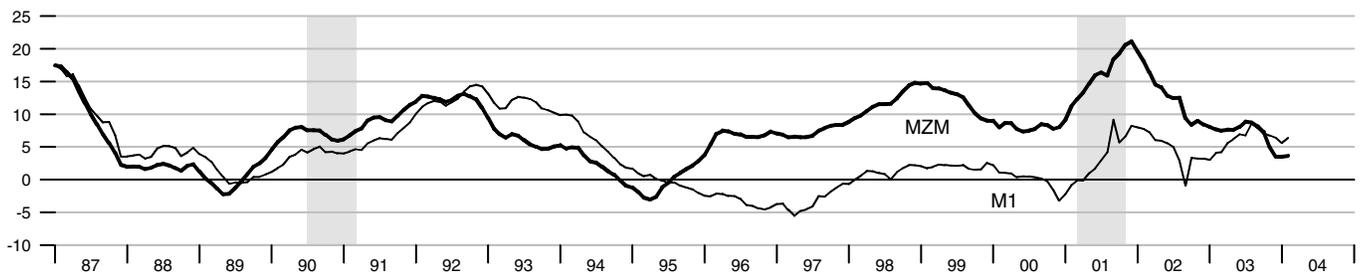


Interest Rates

	Dec 03	Jan 04	Feb 04
Federal Funds Rate	0.98	1.00	1.01
Prime Rate	4.00	4.00	4.00
Primary Credit Rate	2.00	2.00	2.00
Conventional Mortgage Rate	5.88	5.74	5.64
Treasury Yields:			
3-Month Constant Maturity	0.91	0.90	0.94
6-Month Constant Maturity	1.01	0.99	1.01
1-Year Constant Maturity	1.31	1.24	1.24
3-Year Constant Maturity	2.44	2.27	2.25
5-Year Constant Maturity	3.27	3.12	3.07
10-Year Constant Maturity	4.27	4.15	4.08

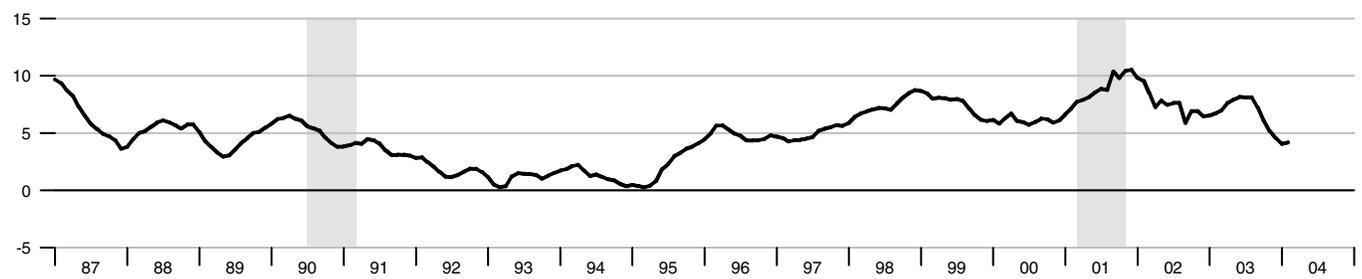
MZM and M1

Percent change from year ago



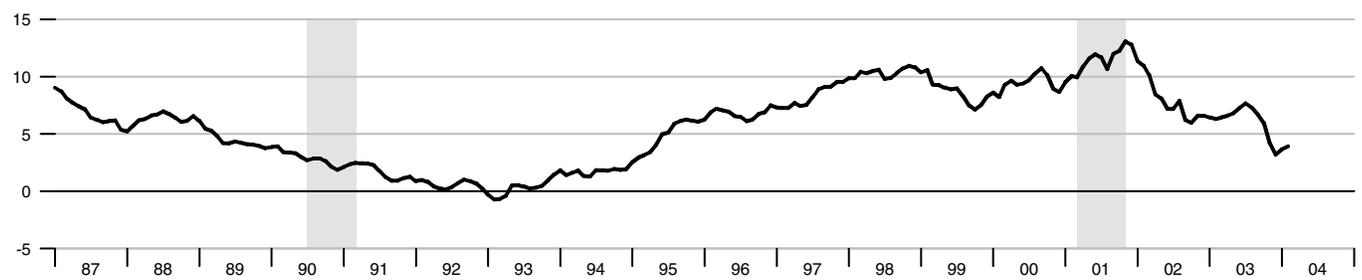
M2

Percent change from year ago



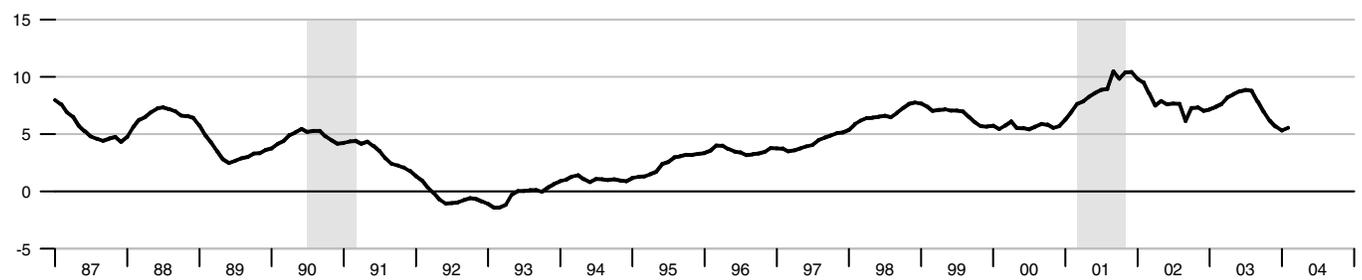
M3

Percent change from year ago



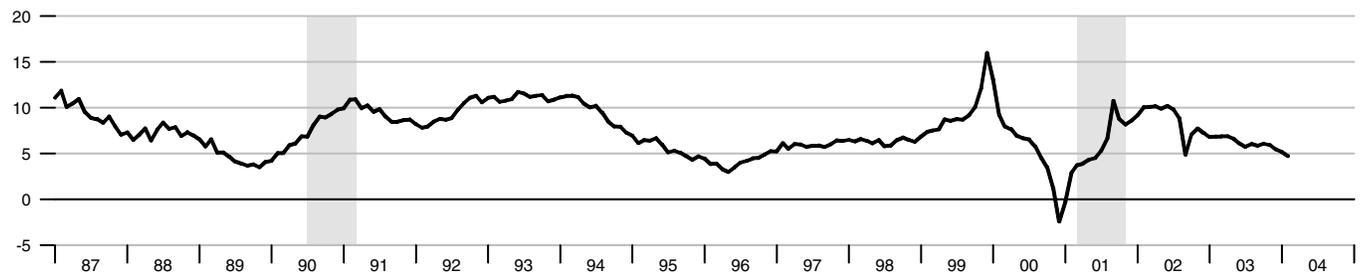
Monetary Services Index - M2

Percent change from year ago



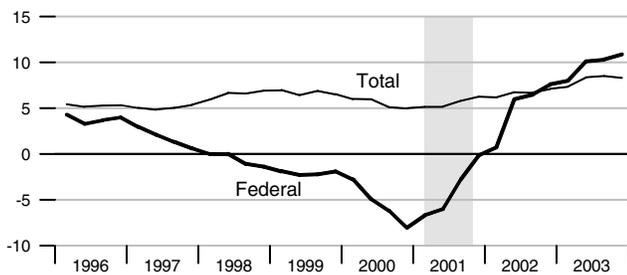
Adjusted Monetary Base

Percent change from year ago



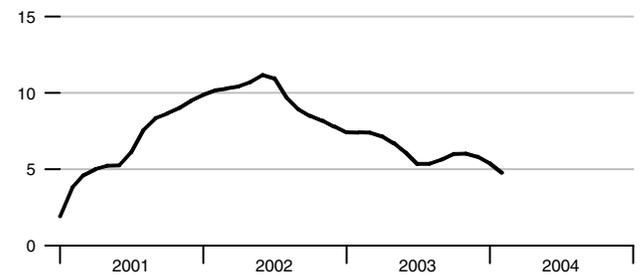
Domestic Nonfinancial Debt

Percent change from year ago



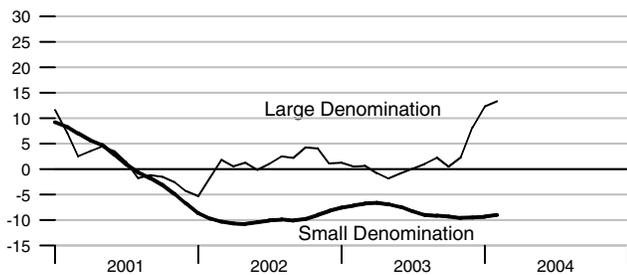
Currency Held by the Nonbank Public

Percent change from year ago



Time Deposits

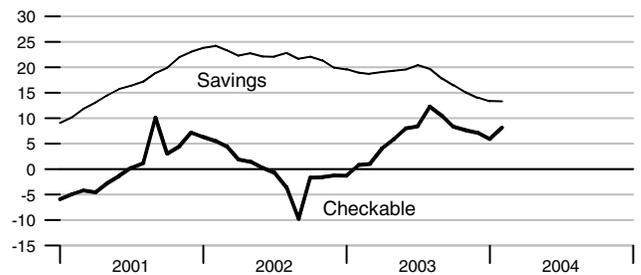
Percent change from year ago



Note: For information regarding recent money stock revisions, please refer to the March 4, 2004, H.6 release at federalreserve.gov/releases/h6/.

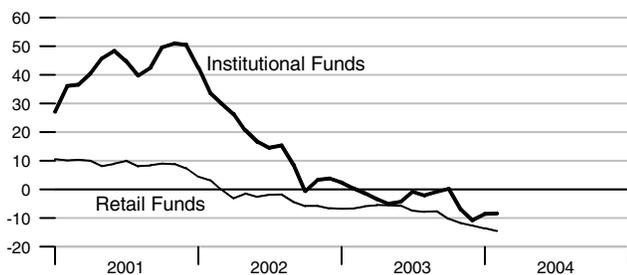
Checkable and Savings Deposits

Percent change from year ago



Money Market Mutual Fund Shares

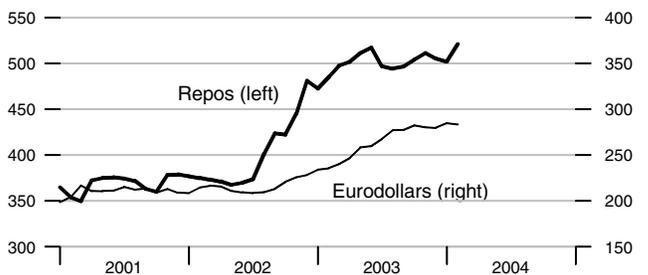
Percent change from year ago



Repurchase Agreements and Eurodollars

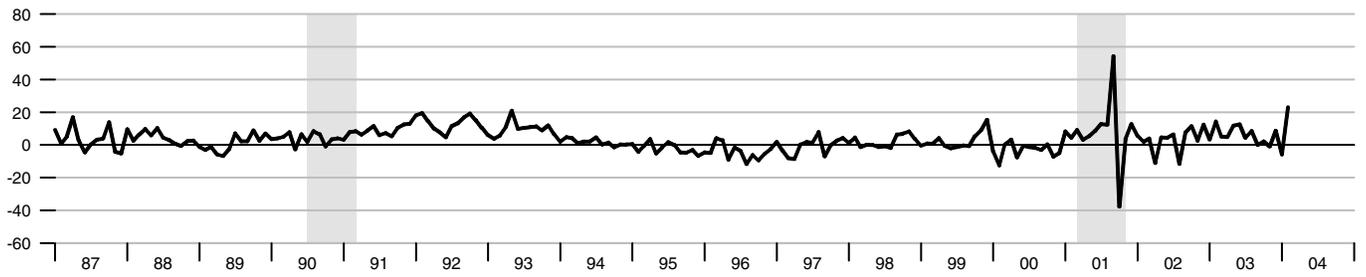
Billions of dollars

Billions of dollars



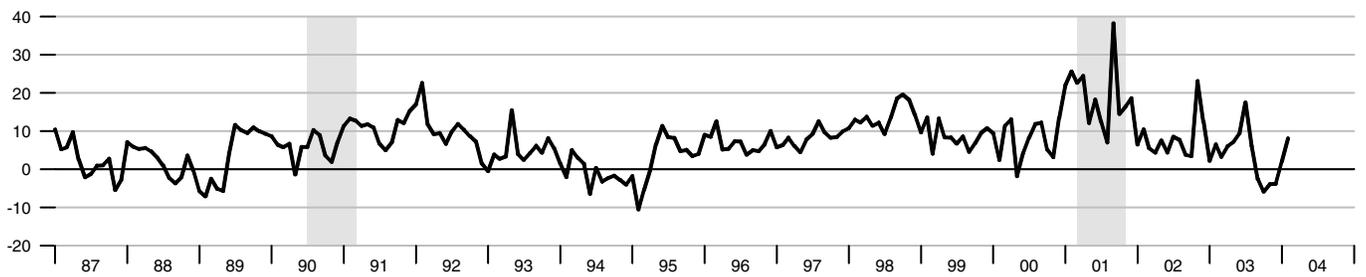
M1

Percent change at an annual rate



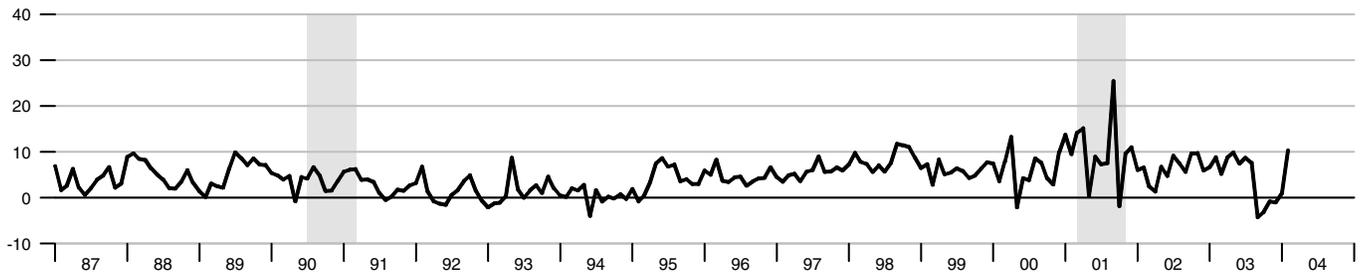
M2M

Percent change at an annual rate



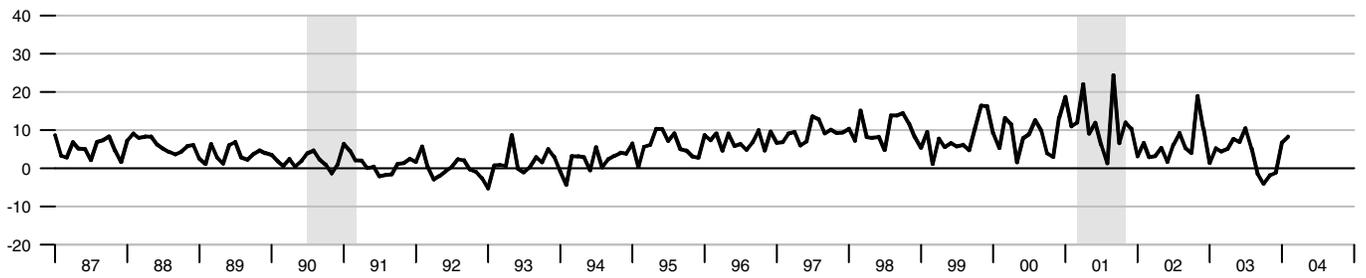
M2

Percent change at an annual rate



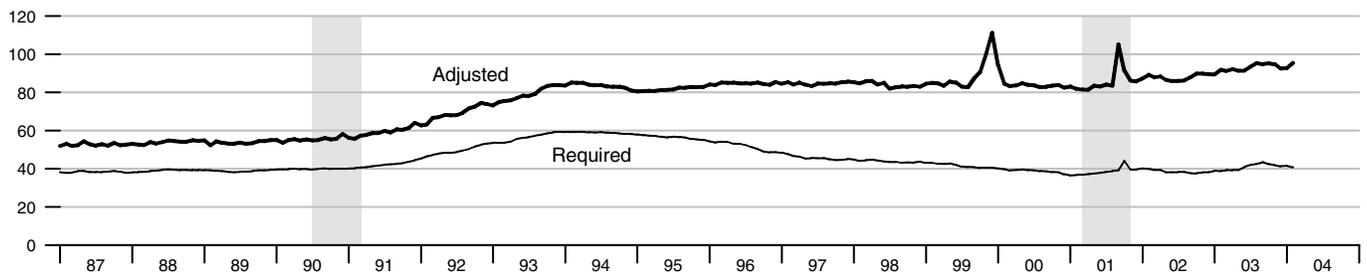
M3

Percent change at an annual rate



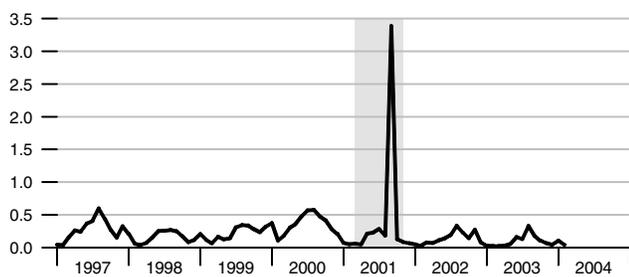
Adjusted and Required Reserves

Billions of dollars



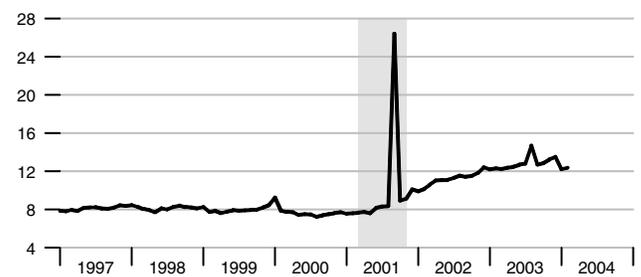
Total Borrowings, nsa

Billions of dollars



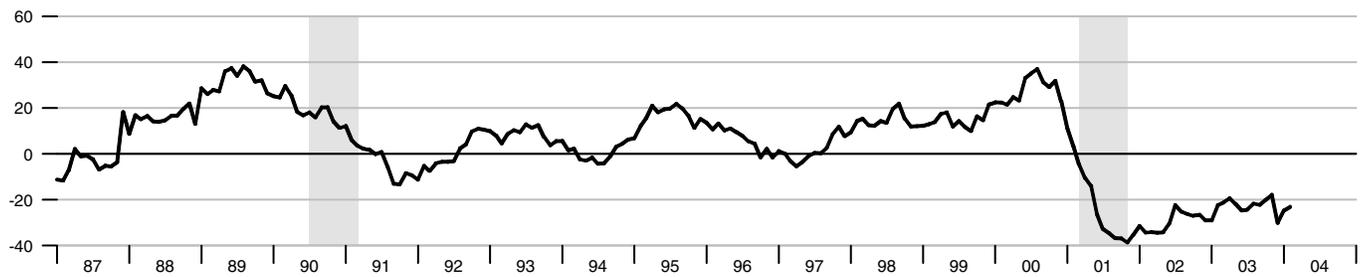
Excess Reserves plus RCB Contracts

Billions of dollars



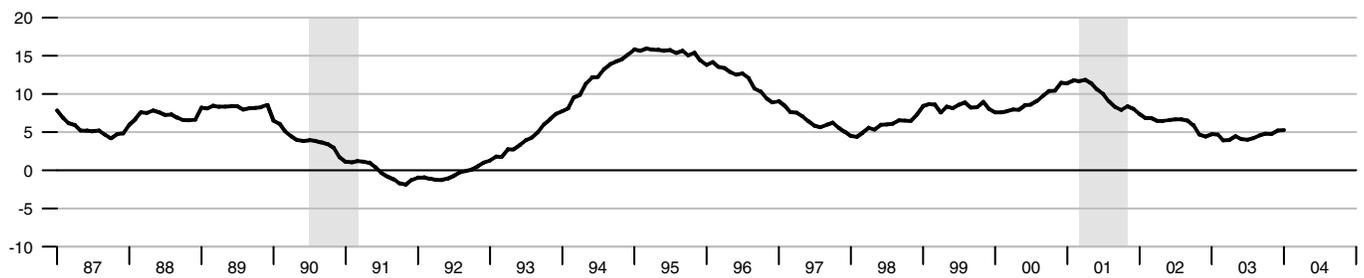
Nonfinancial Commercial Paper

Percent change from year ago

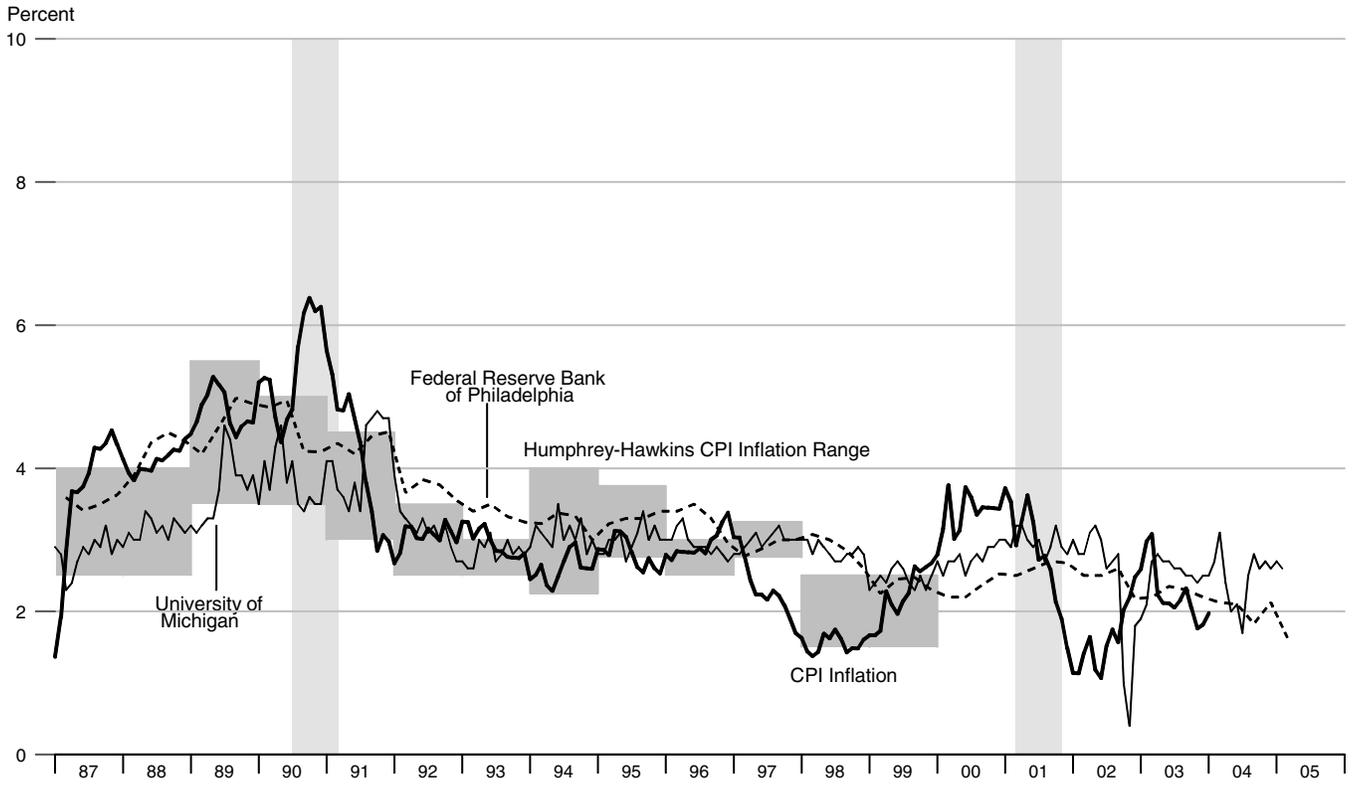


Consumer Credit

Percent change from year ago

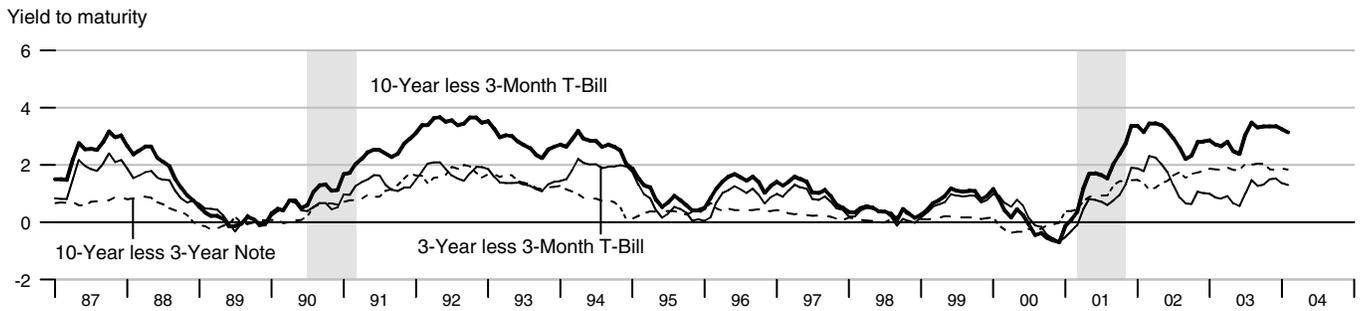


Inflation and Inflation Expectations

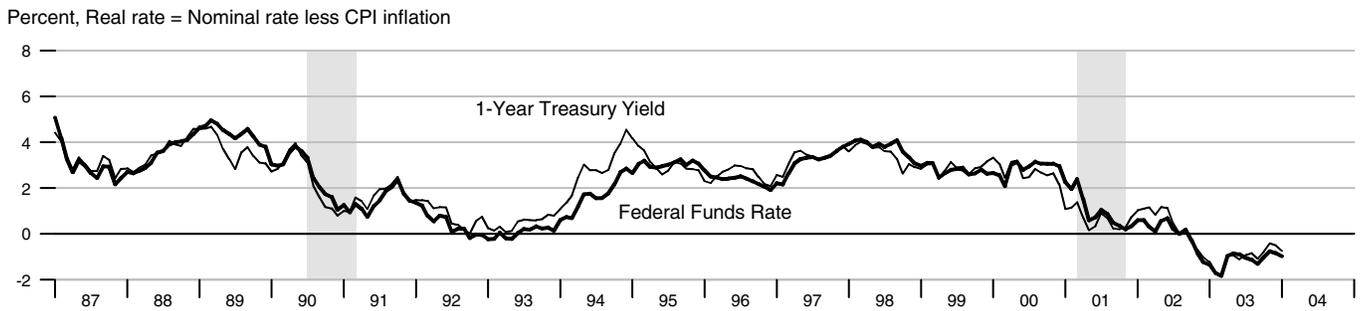


The shaded region shows the Humphrey-Hawkins CPI inflation range. Beginning in January 2000, the Humphrey-Hawkins inflation range was reported using the PCE price index and therefore is not shown on this graph. See notes on page 19.

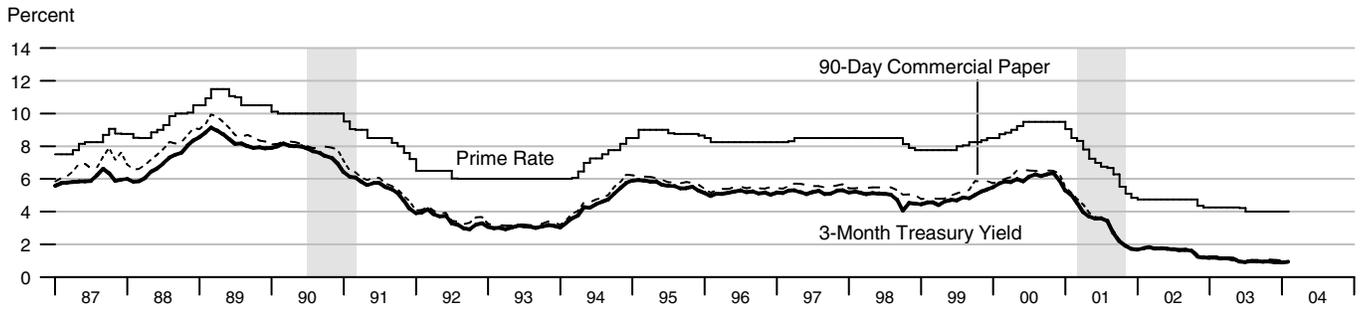
Treasury Security Yield Spreads



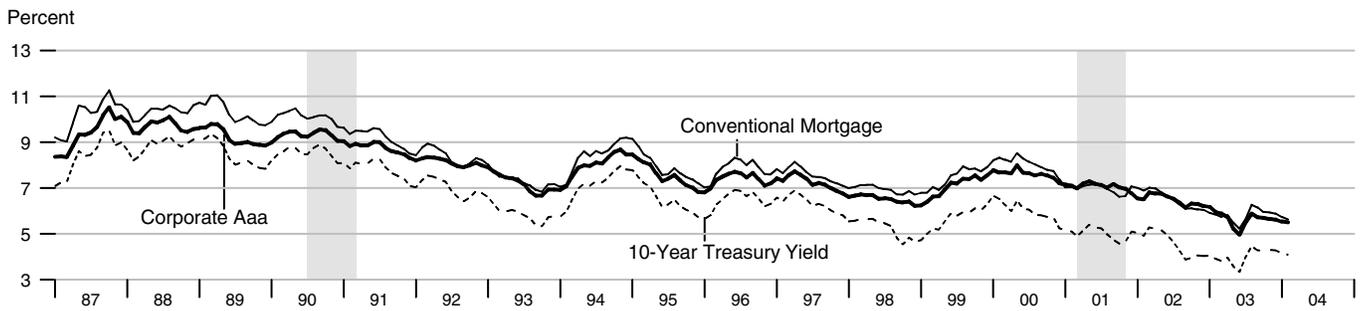
Real Interest Rates



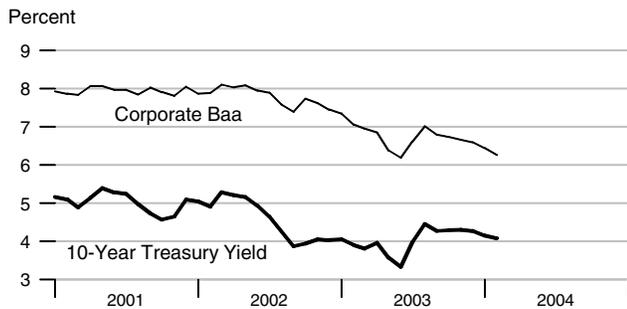
Short-Term Interest Rates



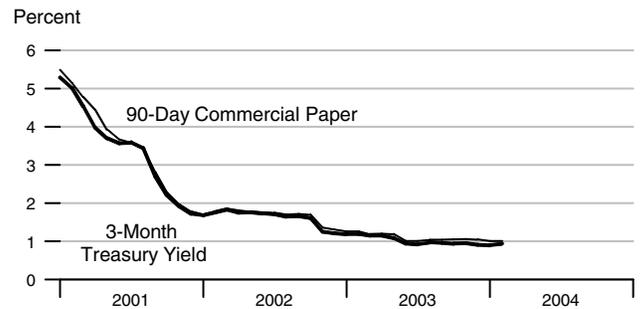
Long-Term Interest Rates



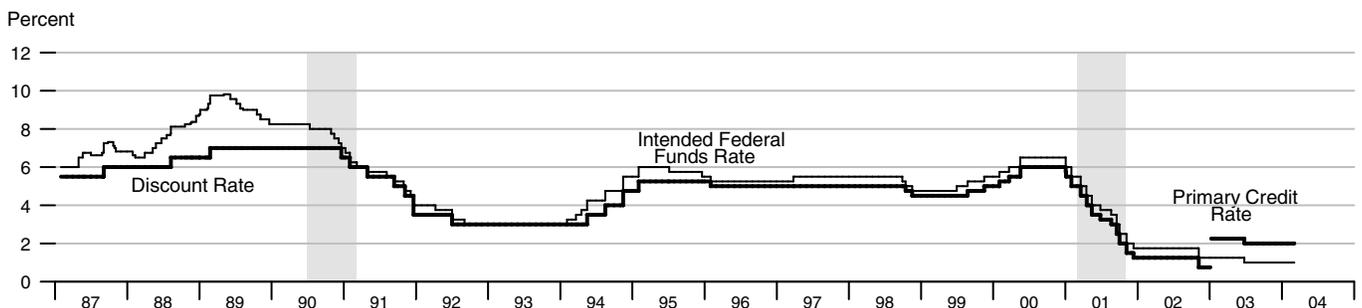
Long-Term Interest Rates



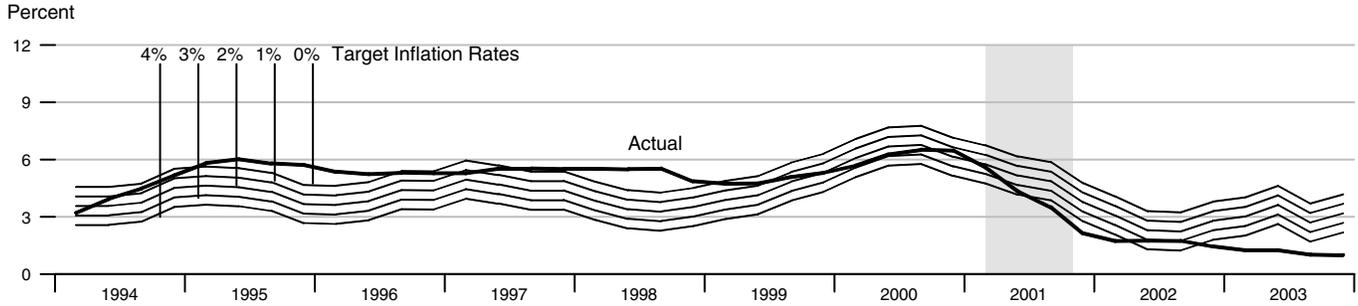
Short-Term Interest Rates



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



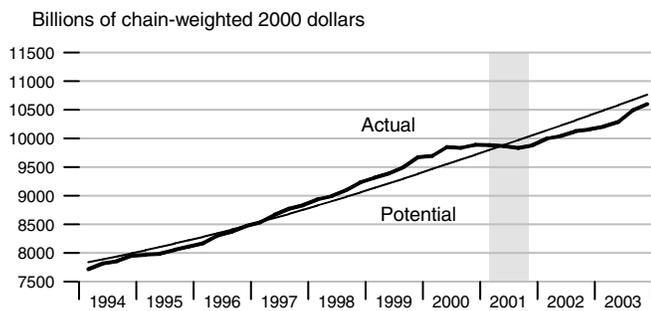
Federal Funds Rate and Inflation Targets



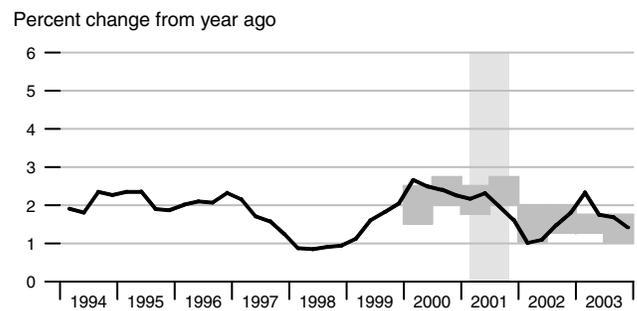
Calculated federal funds rate is based on Taylor's rule. See notes on page 19.

Components of Taylor's Rule

Actual and Potential Real GDP

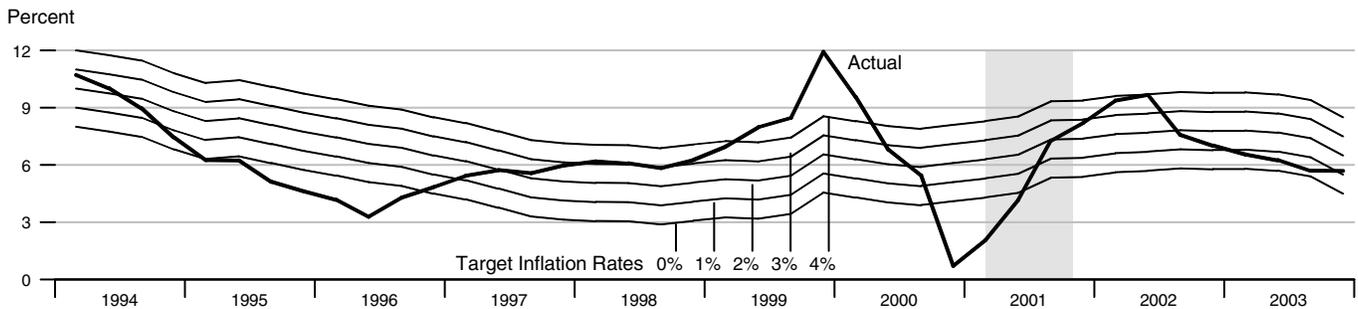


PCE Inflation and Projections



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

Monetary Base Growth* and Inflation Targets

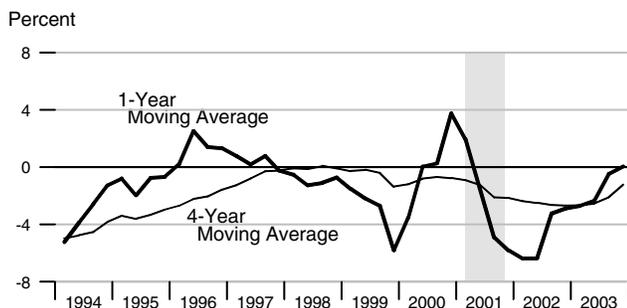


*Modified for the effects of sweeps programs on reserve demand.

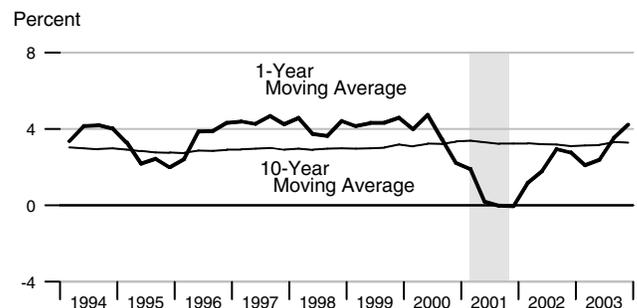
Calculated base growth is based on McCallum's rule. Actual base growth is percent change from year ago. See notes on page 19.

Components of McCallum's Rule

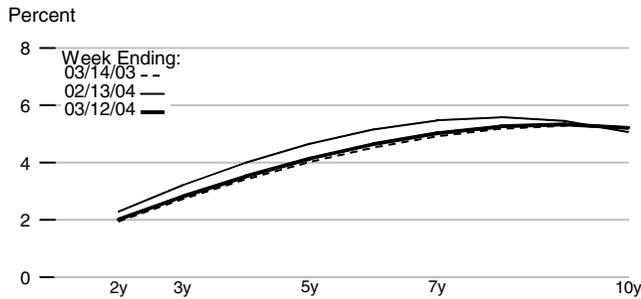
Monetary Base Velocity Growth



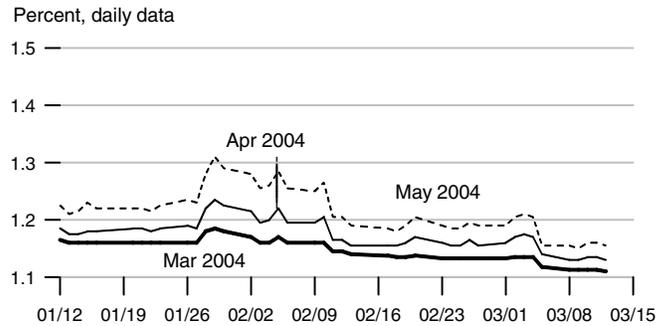
Real Output Growth



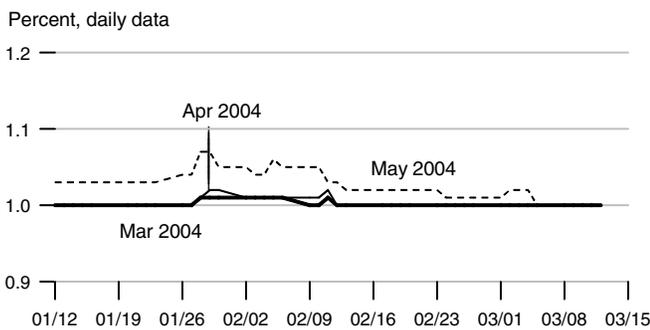
Implied One-Year Forward Rates



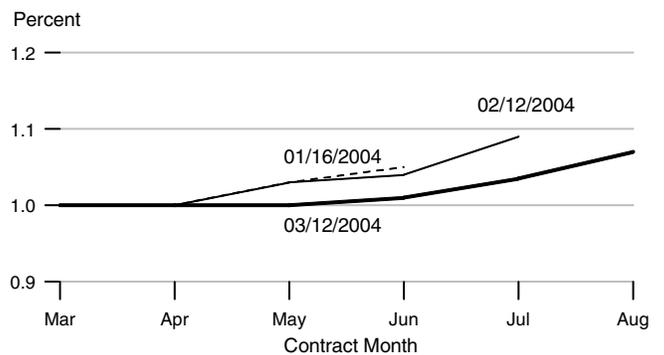
Rates on 3-Month Eurodollar Futures



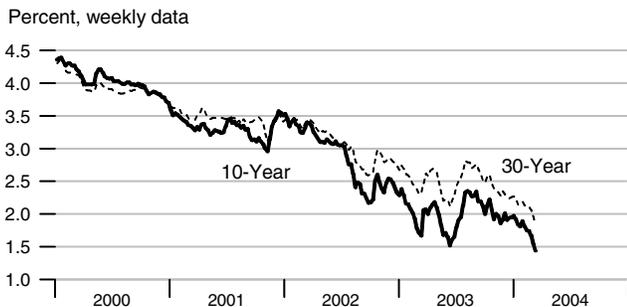
Rates on Selected Federal Funds Futures Contracts



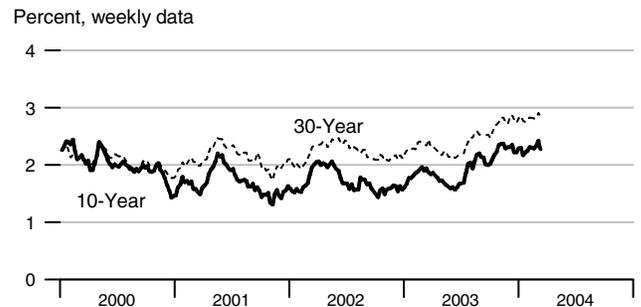
Rates on Federal Funds Futures on Selected Dates



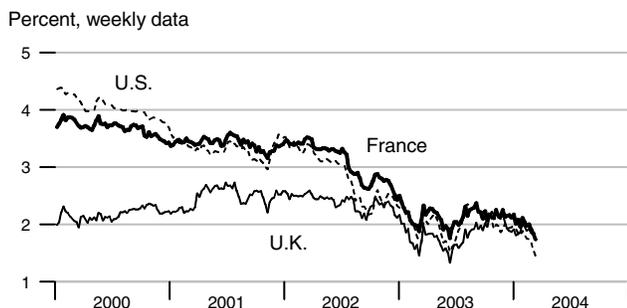
Inflation-Indexed Treasury Securities



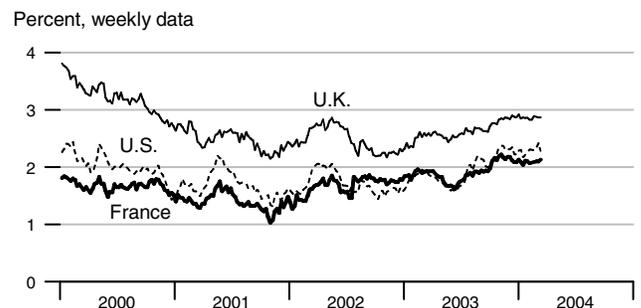
Inflation-Indexed Treasury Yield Spreads



Inflation-Indexed 10-Year Government Notes

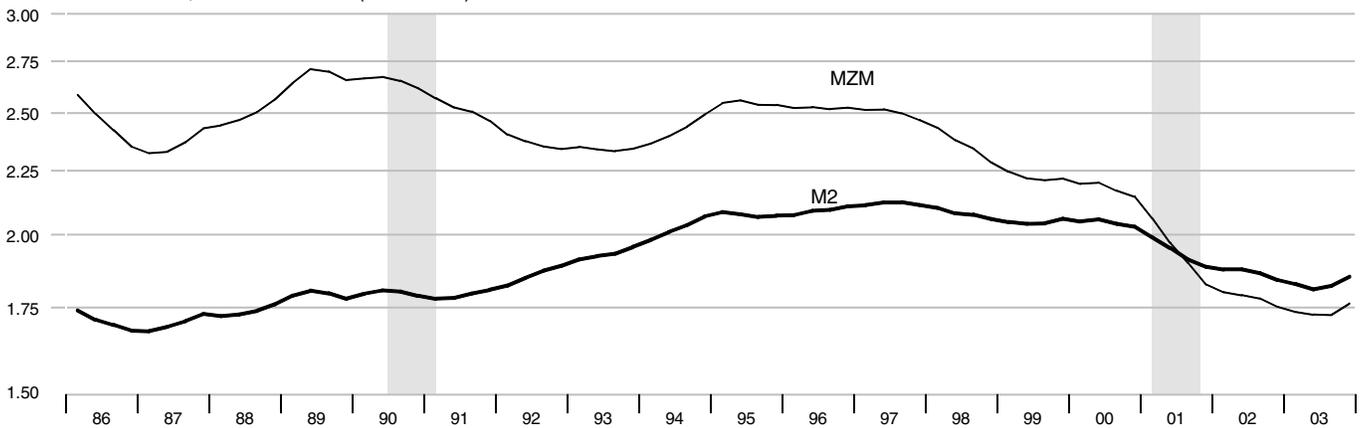


Inflation-Indexed 10-Year Government Yield Spreads



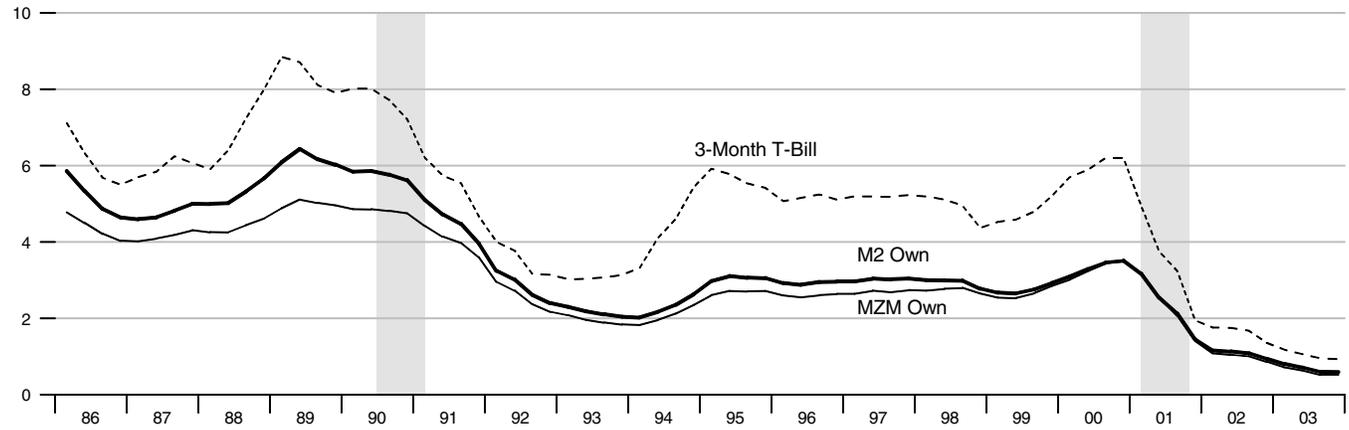
Velocity

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



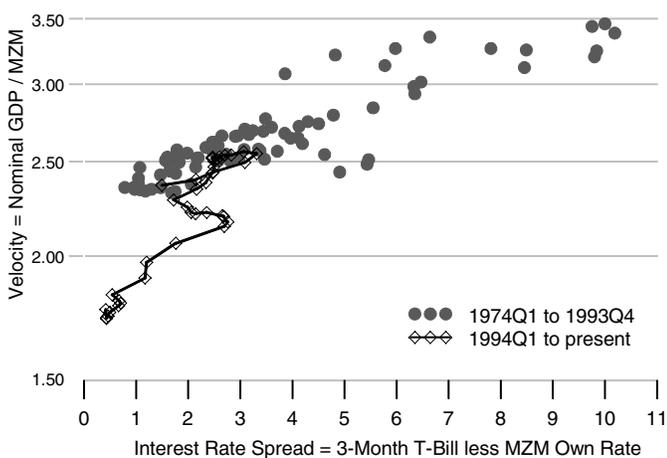
Interest Rates

Percent



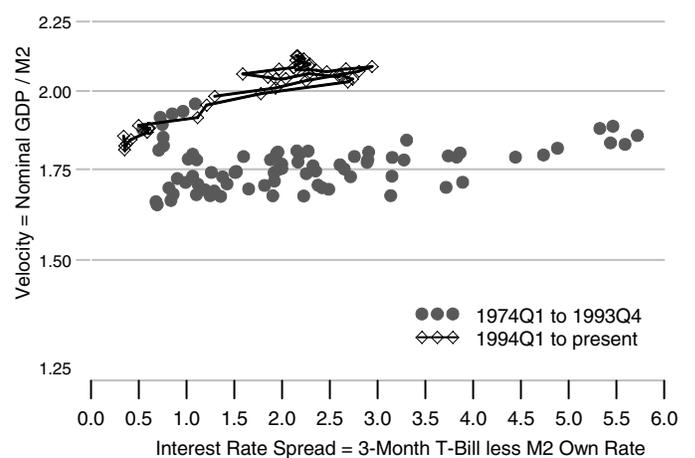
MZM Velocity and Interest Rate Spread

Ratio Scale



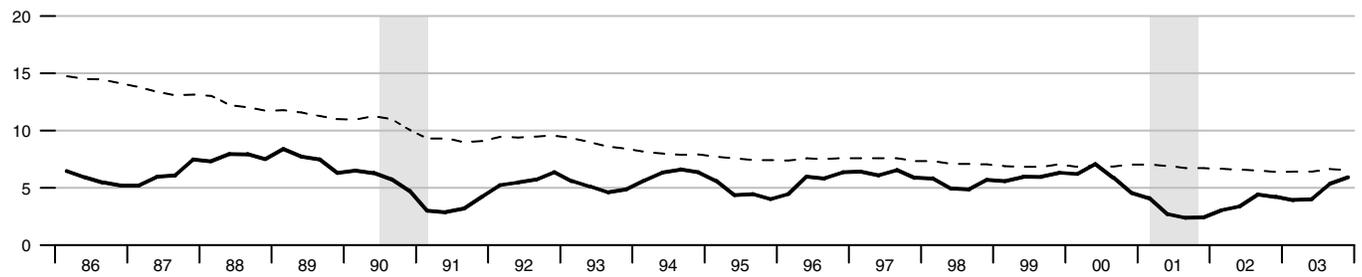
M2 Velocity and Interest Rate Spread

Ratio Scale



Gross Domestic Product

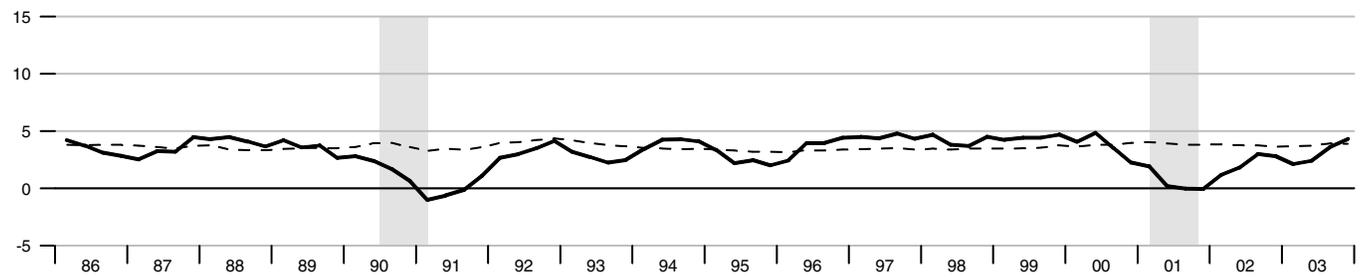
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Real Gross Domestic Product

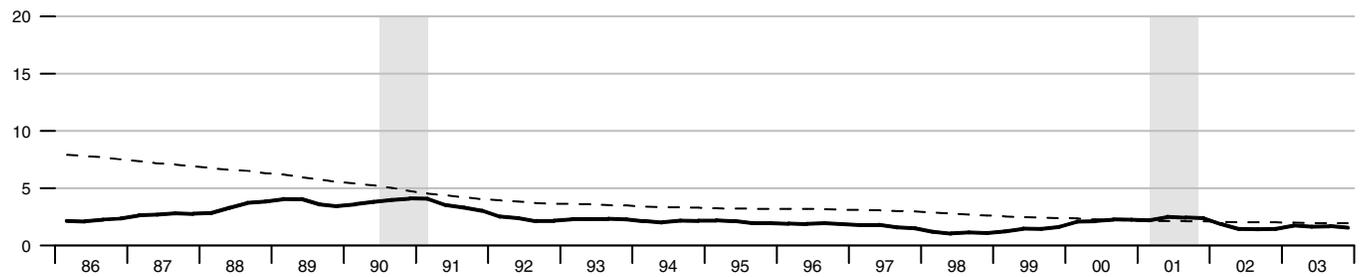
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Gross Domestic Product Price Index

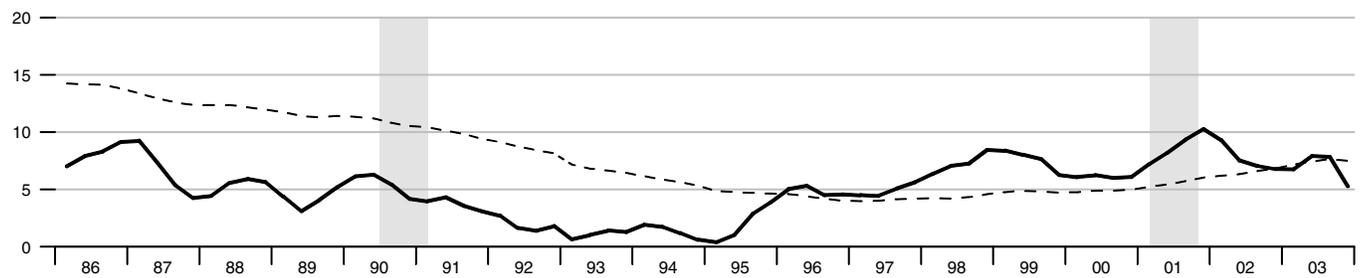
Percent change from year ago



Dashed lines indicate 10-year moving averages.

M2

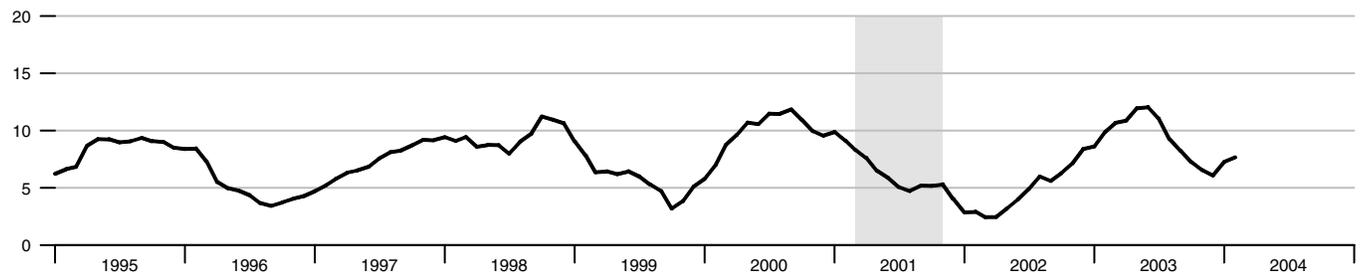
Percent change from year ago



Dashed lines indicate 10-year moving averages.

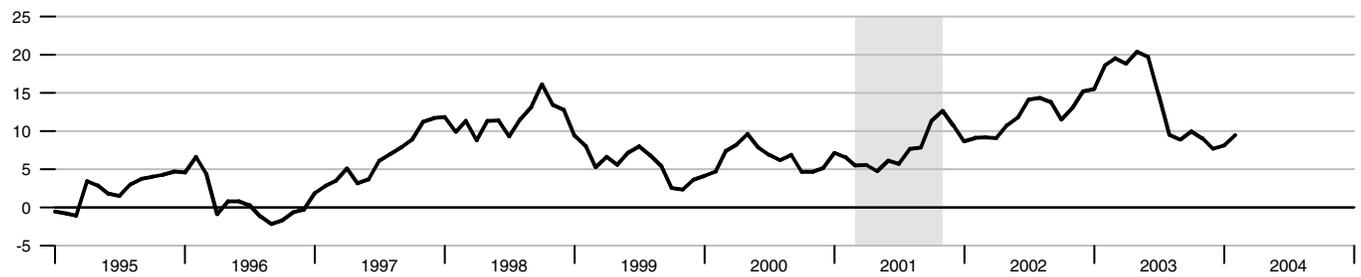
Bank Credit

Percent change from year ago



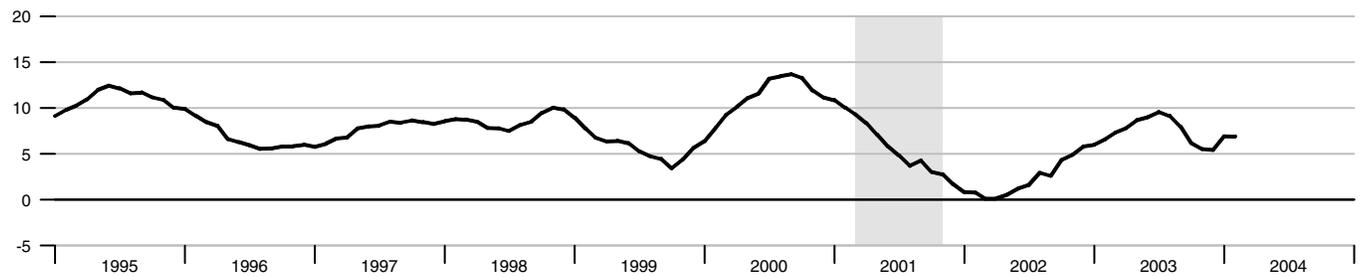
Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago



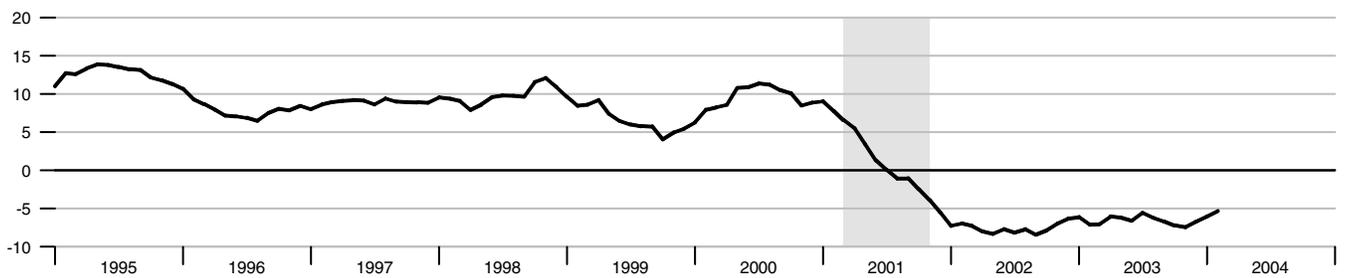
Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago

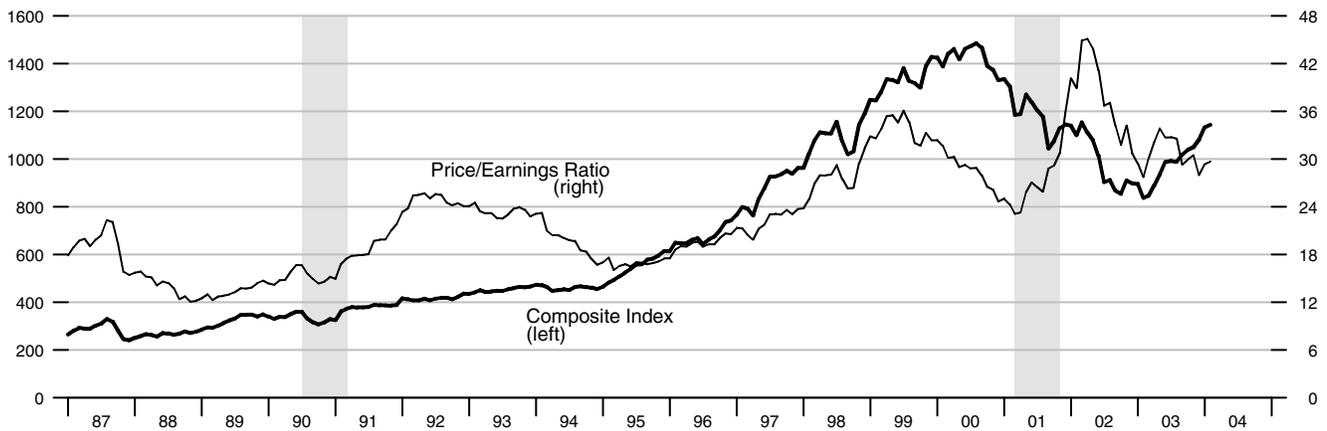


Commercial and Industrial Loans at Commercial Banks

Percent change from year ago



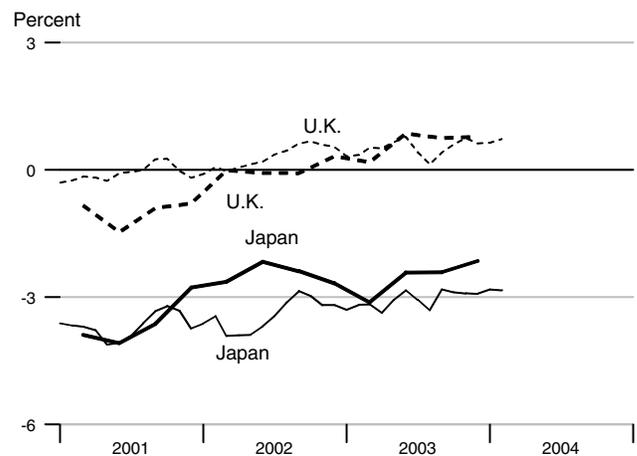
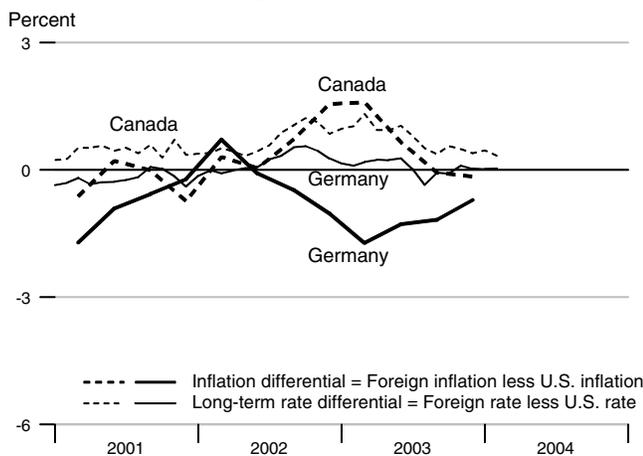
Standard & Poor's 500



Recent Inflation and Long-Term Interest Rates

	Consumer Price Inflation Rates				Long-Term Government Bond Rates			
	Percent change from year ago				Percent			
	2003Q1	2003Q2	2003Q3	2003Q4	Nov03	Dec03	Jan04	Feb04
United States	2.88	2.15	2.18	1.87	4.30	4.27	4.15	4.08
Canada	4.47	2.81	2.11	1.71	4.79	4.66	4.61	4.41
France	2.38	1.92	1.95	2.19	4.54	4.38	4.36	.
Germany	1.16	0.87	1.00	1.16	4.40	4.30	4.17	4.11
Italy	2.72	2.70	2.74	2.53	4.51	4.46	4.32	4.34
Japan	-0.23	-0.27	-0.23	-0.27	1.39	1.35	1.33	1.24
United Kingdom	3.07	3.01	2.93	2.66	5.05	4.89	4.79	4.81

Inflation and Long-Term Interest Rate Differentials



		Money Stock				Bank	Adjusted		
		M1	MZM	M2	M3	Credit	Monetary Base	Reserves	MSI M2
1999		1101.461	4170.167	4525.993	6252.643	4579.881	574.181	88.664	257.940
2000		1103.437	4508.280	4801.878	6841.776	5029.355	607.106	84.511	272.588
2001		1136.500	5219.570	5222.885	7621.597	5348.791	641.167	85.931	296.386
2002		1190.125	5887.643	5621.579	8231.804	5600.319	697.071	87.927	319.537
2003		1263.035	6318.562	6010.888	8744.740	6122.687	740.707	92.848	343.973
2001	1	1100.804	4861.370	5035.832	7281.368	5275.009	619.676	82.207	285.563
	2	1116.621	5117.421	5166.836	7549.546	5316.697	629.484	82.722	293.217
	3	1160.698	5316.296	5283.406	7715.287	5366.697	651.930	90.905	300.179
	4	1167.878	5583.190	5405.467	7940.186	5436.760	663.578	87.887	306.586
2002	1	1185.211	5738.413	5504.075	8069.397	5419.618	680.264	88.156	312.109
	2	1181.936	5824.714	5555.591	8147.108	5487.913	692.937	86.979	315.680
	3	1187.477	5923.860	5655.401	8262.705	5661.545	702.753	86.821	321.630
	4	1205.875	6063.583	5771.247	8448.007	5832.201	712.330	89.753	328.727
2003	1	1229.847	6183.096	5875.219	8585.902	5946.486	726.824	90.847	335.184
	2	1255.849	6277.586	5994.667	8709.566	6126.241	738.229	91.750	342.444
	3	1279.328	6432.040	6097.965	8859.780	6199.566	744.024	94.581	348.946
	4	1287.114	6381.525	6075.701	8823.711	6218.453	753.750	94.214	349.320
2002	Feb	1184.554	5746.141	5510.404	8077.609	5424.799	681.914	89.237	312.403
	Mar	1188.391	5772.487	5521.488	8097.369	5415.616	685.165	87.937	313.287
	Apr	1177.508	5793.465	5527.635	8119.323	5440.137	689.008	88.352	313.968
	May	1181.982	5829.715	5558.579	8155.353	5489.359	692.736	86.586	315.844
	Jun	1186.317	5850.963	5580.559	8166.648	5534.242	697.068	85.999	317.229
	Jul	1192.608	5892.418	5623.042	8208.520	5586.914	701.032	86.101	319.473
	Aug	1181.130	5930.221	5658.272	8271.607	5669.181	702.878	86.383	321.742
	Sep	1188.693	5948.940	5684.888	8307.987	5728.541	704.350	87.978	323.676
	Oct	1200.029	5965.993	5730.746	8335.917	5760.533	710.665	89.827	326.419
	Nov	1202.601	6080.784	5777.203	8467.506	5841.089	712.473	89.839	329.035
	Dec	1214.994	6143.973	5805.793	8540.598	5894.982	713.851	89.594	330.728
2003	Jan	1218.414	6155.325	5838.166	8550.566	5885.012	719.529	89.444	332.918
	Feb	1232.904	6188.624	5881.045	8587.779	5961.453	728.659	91.818	335.492
	Mar	1238.223	6205.339	5906.445	8619.361	5992.993	732.283	91.279	337.141
	Apr	1243.363	6236.325	5949.716	8655.888	6031.984	736.485	92.277	339.764
	May	1255.507	6273.530	5998.537	8711.342	6145.385	738.665	91.422	342.635
	Jun	1268.678	6322.904	6035.747	8761.468	6201.354	739.537	91.552	344.933
	Jul	1273.331	6414.964	6079.516	8837.913	6204.949	741.243	93.478	347.768
	Aug	1282.303	6447.523	6118.102	8876.176	6193.504	745.276	95.405	350.026
	Sep	1282.350	6433.634	6096.278	8865.250	6200.244	745.554	94.861	349.045
	Oct	1284.626	6402.237	6080.269	8835.645	6177.792	753.735	95.271	349.130
	Nov	1283.752	6381.279	6076.024	8821.943	6223.464	754.697	94.820	349.346
	Dec	1292.965	6361.058	6070.811	8813.546	6254.104	752.819	92.552	349.483
2004	Jan	1286.767	6372.097	6075.459	8862.936	6312.144	756.653	92.763	350.625
	Feb	1311.395	6414.979	6127.627	8924.214	6418.377	763.025	95.483	354.125

*All values are given in billions of dollars.

		Federal	Discount	Primary	Prime	3-mo	Treasury Yields			Corporate	S & L	Conventional
		Funds	Rate	Credit Rate	Rate	CDs	3-mo	3-yr	10-yr	Aaa Bonds	Aaa Bonds	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
2001	1	5.59	5.11		8.62	5.26	4.95	4.64	5.05	7.08	5.03	7.01
	2	4.33	3.83		7.34	4.10	3.75	4.43	5.27	7.22	5.11	7.13
	3	3.50	3.06		6.57	3.34	3.24	3.93	4.98	7.11	4.95	6.97
	4	2.13	1.64		5.16	2.06	1.94	3.33	4.77	6.92	4.97	6.78
2002	1	1.73	1.25		4.75	1.82	1.76	3.75	5.08	6.62	5.02	6.97
	2	1.75	1.25		4.75	1.83	1.75	3.77	5.10	6.71	5.01	6.81
	3	1.74	1.25		4.75	1.76	1.67	2.62	4.26	6.35	4.72	6.29
	4	1.44	0.94		4.45	1.49	1.36	2.27	4.01	6.28	4.71	6.08
2003	1	1.25		2.25	4.25	1.26	1.18	2.07	3.92	6.00	4.60	5.83
	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
2002	Feb	1.74	1.25		4.75	1.82	1.76	3.55	4.91	6.51	4.93	6.89
	Mar	1.73	1.25		4.75	1.91	1.83	4.14	5.28	6.81	5.09	7.01
	Apr	1.75	1.25		4.75	1.87	1.75	4.01	5.21	6.76	5.09	6.99
	May	1.75	1.25		4.75	1.82	1.76	3.80	5.16	6.75	5.03	6.81
	Jun	1.75	1.25		4.75	1.81	1.73	3.49	4.93	6.63	4.92	6.65
	Jul	1.73	1.25		4.75	1.79	1.71	3.01	4.65	6.53	4.81	6.49
	Aug	1.74	1.25		4.75	1.73	1.65	2.52	4.26	6.37	4.78	6.29
	Sep	1.75	1.25		4.75	1.76	1.66	2.32	3.87	6.15	4.58	6.09
	Oct	1.75	1.25		4.75	1.73	1.61	2.25	3.94	6.32	4.66	6.11
	Nov	1.34	0.83		4.35	1.39	1.25	2.32	4.05	6.31	4.77	6.07
	Dec	1.24	0.75		4.25	1.34	1.21	2.23	4.03	6.21	4.70	6.05
2003	Jan	1.24			4.25	1.29	1.19	2.18	4.05	6.17	4.72	5.92
	Feb	1.26		2.25	4.25	1.27	1.19	2.05	3.90	5.95	4.57	5.84
	Mar	1.25		2.25	4.25	1.23	1.15	1.98	3.81	5.89	4.51	5.75
	Apr	1.26		2.25	4.25	1.24	1.15	2.06	3.96	5.74	4.60	5.81
	May	1.26		2.25	4.25	1.22	1.09	1.75	3.57	5.22	4.16	5.48
	Jun	1.22		2.20	4.22	1.04	0.94	1.51	3.33	4.97	4.07	5.23
	Jul	1.01		2.00	4.00	1.05	0.92	1.93	3.98	5.49	4.59	5.63
	Aug	1.03		2.00	4.00	1.08	0.97	2.44	4.45	5.88	4.82	6.26
	Sep	1.01		2.00	4.00	1.08	0.96	2.23	4.27	5.72	4.63	6.15
	Oct	1.01		2.00	4.00	1.10	0.94	2.26	4.29	5.70	4.64	5.95
	Nov	1.00		2.00	4.00	1.11	0.95	2.45	4.30	5.65	4.50	5.93
	Dec	0.98		2.00	4.00	1.10	0.91	2.44	4.27	5.62	4.41	5.88
2004	Jan	1.00		2.00	4.00	1.06	0.90	2.27	4.15	5.54	4.42	5.74
	Feb	1.01		2.00	4.00	1.05	0.94	2.25	4.08	5.50	4.26	5.64

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

		M1	MZM	M2	M3
Percent change at an annual rate					
1999		2.00	12.41	7.56	8.74
2000		0.18	8.11	6.10	9.42
2001		3.00	15.78	8.77	11.40
2002		4.72	12.80	7.63	8.01
2003		6.13	7.32	6.93	6.23
<hr/>					
2001	1	2.83	19.22	10.89	13.45
	2	5.75	21.07	10.41	14.73
	3	15.79	15.54	9.02	8.78
	4	2.47	20.08	9.24	11.66
2002	1	5.94	11.12	7.30	6.51
	2	-1.11	6.02	3.74	3.85
	3	1.88	6.81	7.19	5.68
	4	6.20	9.43	8.19	8.97
2003	1	7.95	7.88	7.21	6.53
	2	8.46	6.11	8.13	5.76
	3	7.48	9.84	6.89	6.90
	4	2.43	-3.14	-1.46	-1.63
<hr/>					
2002	Feb	1.89	10.43	6.58	6.63
	Mar	3.89	5.50	2.41	2.94
	Apr	-10.99	4.36	1.34	3.25
	May	4.56	7.51	6.72	5.33
	Jun	4.40	4.37	4.75	1.66
	Jul	6.36	8.50	9.14	6.15
	Aug	-11.55	7.70	7.52	9.22
	Sep	7.68	3.79	5.64	5.28
	Oct	11.44	3.44	9.68	4.03
	Nov	2.57	23.09	9.73	18.94
	Dec	12.37	12.47	5.94	10.36
	<hr/>				
2003	Jan	3.38	2.22	6.69	1.40
	Feb	14.27	6.49	8.81	5.22
	Mar	5.18	3.24	5.18	4.41
	Apr	4.98	5.99	8.79	5.09
	May	11.72	7.16	9.85	7.69
	Jun	12.59	9.44	7.44	6.90
	Jul	4.40	17.47	8.70	10.47
	Aug	8.46	6.09	7.62	5.20
	Sep	0.04	-2.58	-4.28	-1.48
	Oct	2.13	-5.86	-3.15	-4.01
	Nov	-0.82	-3.93	-0.84	-1.86
	Dec	8.61	-3.80	-1.03	-1.14
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2004	Jan	-5.75	2.08	0.92	6.72
	Feb	22.97	8.08	10.30	8.30

Definitions

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

MZM (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 Humphrey-Hawkins Act testimony each year. Beginning February 2000, the FOMC began using the personal consumption expenditures (PCE) price index to report its inflation range and therefore is not shown on this graph. **CPI Inflation** is the percentage change from a year ago in the consumer price index for all urban consumers. **Real Interest Rates** are ex post measures, equal to nominal rates minus CPI inflation.

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

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

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

to five alternative target inflation rates, $\pi^* = 0, 1, 2, 3, 4$ percent, where f_t^* is the implied federal funds rate, 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

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

to five alternative target inflation rates, $\pi^* = 0, 1, 2, 3, 4$ percent, where 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 $m = 1, \dots, 10$ 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** are yields on the most recently issued inflation-indexed securities of 10- and 30-year original maturities. **Inflation-Indexed 10-Year Government Notes** shows the yield of an inflation-indexed note that is scheduled to mature in approximately (but not greater than) 10 years. The current French note has a maturity date of 7/25/2013, the current U.K. note has a maturity date of 8/16/2013, and the current U.S. note has a maturity date of 1/15/2014. **Inflation-Indexed Treasury Yield Spreads** and **Inflation-Indexed 10-Year Government Yield Spreads** equal the difference between the yields on the most recently issued inflation-indexed securities and the unadjusted security yields of similar maturity.

Page 12: Velocity (for MZM and M2) equals the ratio of GDP, measured in current dollars, to the level of the monetary aggregate. **MZM and M2 Own Rates** are weighted averages of the rates received by households and firms on the assets included in the aggregates. Prior to 1982, the 3-month T-bill rates are secondary market yields. From 1982 forward, rates are 3-month constant maturity yields.

Page 13: Real Gross Domestic Product is GDP as measured in chained 2000 dollars. The **Gross Domestic Product Price Index** is the implicit price deflator for GDP, which is defined by the Bureau of Economic Analysis, U.S. Department of Commerce, as the ratio of GDP measured in current dollars to GDP measured in chained 2000 dollars.

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

Page 15: Inflation Rate Differentials are the differences between the foreign consumer price inflation rates and year-over-year changes in the U.S. all-items Consumer Price Index.

Page 17: Treasury Yields are Treasury constant maturities as reported in the Board of Governors of the Federal Reserve System's H.15 release.

Sources

Agence France Trésor: French note yields.

Bank of Canada: Canadian note yields.

Bank of England: U.K. note yields.

Board of Governors of the Federal Reserve System:

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

Bureau of Economic Analysis: GDP.

Bureau of Labor Statistics: CPI.

Chicago Board of Trade: Federal funds futures contract.

Chicago Mercantile Exchange: Eurodollar futures.

Congressional Budget Office: Potential real GDP.

Federal Reserve Bank of Philadelphia: Survey of Professional Forecasters inflation expectations.

Federal Reserve Bank of St. Louis: Adjusted monetary base and adjusted reserves, monetary services index, MZM own rate, one-year forward rates.

Organization for Economic Cooperation and Development: International interest and inflation rates.

Standard & Poor's: Stock price-earnings ratio, stock price composite index.

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

U.S. Department of the Treasury: U.S. security yields.

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