Monetary*Trends*

Retail Sweep Programs and Money Demand

Since January 1994, the Federal Reserve has allowed depository institutions to "sweep" retail customer transaction deposits, which are subject to statutory reserve requirement ratios as high as 10 percent, into savings deposits that have a zero percent reserve requirement ratio. As of August 2002, an estimated $517.6 billion of transaction deposits, on a monthly average basis, was being so reclassified.[1] Recently, some economists have asked if retail sweep programs might affect the demand for M1, that is, the amount of transaction deposits held by households and businesses. Initially, at least, this seems unlikely. Generally, the sweeping of transaction deposits into saving deposits is invisible to customers, except perhaps for a fine-print insert with their monthly statement. As a result, a retail-deposit sweep does not change the amount of transaction deposits that a household perceives itself to own and, hence, it seems unlikely that the sweeping activity would affect money demand. But, this assertion could be incorrect. Reclassifying the deposit reduces the implicit reserve-requirement tax. Competitive market pressures might induce banks to pass the tax savings along to the customer. If so, the amount of transaction deposits demanded, ceteris paribus, could be larger.

Retail sweep programs should not be confused with banks' traditional business-oriented sweep programs in which checkable business deposits are converted, usually overnight, into savings deposits or off-balance sheet items such as repurchase agreements and shares in money market mutual funds. It seems likely that these sweeps *do* affect money demand because the business customer is an active participant and receives a significant part of the transaction's net earnings. Annual surveys published by the consulting firm Treasury Strategies, for example, suggest that business-oriented sweep activity increased tenfold during the 1990s, to approximately $270 billion in 2000. The surveys also conclude that business customers have received two-thirds, or more, of the earnings resulting from such sweep activity.[2]

Under provisions of the 1989 FIRREA legislation, the Federal Reserve Board has published each year since 1990 an annual survey of changes in retail banking fees.[3] In 1989, the Congress was concerned that banks would pass along to consumers higher deposit-insurance premiums. Today, because the estimated amount of transaction deposits involved in retail sweep programs is only slightly less than the amount of transaction deposits reported in M1 (in August, $555 billion), these same surveys might reveal whether reductions in the reserve-requirement tax were passed along to consumers. The survey data are consistent with this view: Since 1994, fees and minimum balance requirements for checkable accounts have increased somewhat less than the economy's overall rate of inflation, as measured by the chain-price index for personal consumption expenditure.
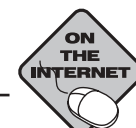
Yet, there must be substantial uncertainty regarding how much of these modest decreases in the real prices of retail banking services can be attributed to retail sweeps. The prices charged by depository institutions for retail banking services are affected by several factors, including input costs, productivity, and the competitiveness of banking markets. Also, some banks may have used earnings from retail sweep activity to increase offering rates on time deposits—thereby affecting the demand for the non-M1 component of M2, but not for M1. Finally, even though available surveys are consistent with the view that retail sweep programs perhaps have moderated increases in retail banking fees, the size might have been too small to affect significantly the quantity of transaction deposits demanded by households. At a 10 percent reserve-requirement ratio and, say, a 4 percent federal funds rate, the reserve-requirement "tax rate" on a $1,000 transaction deposit is 0.4 percent, or $4.00 per year.

—Richard G. Anderson

[1]Richard G. Anderson and Robert H. Rasche, "Retail Sweep Programs and Bank Reserves," Federal Reserve Bank of St. Louis *Review*, January/February 2001. For sweep-account data, see <http://research.stlouisfed.org/aggreg/swdata.html>.

[2]<www.treasurystrategies.com>.

[3]Timothy H. Hannon, "Retail Fees of Depository Institutions," *Federal Reserve Bulletin*, September 2002, pp. 405–13. <http://www.federalreserve.gov/pubs/bulletin/2002/0902lead.pdf>.

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 dated by the National Bureau of Economic Research.

3. The *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
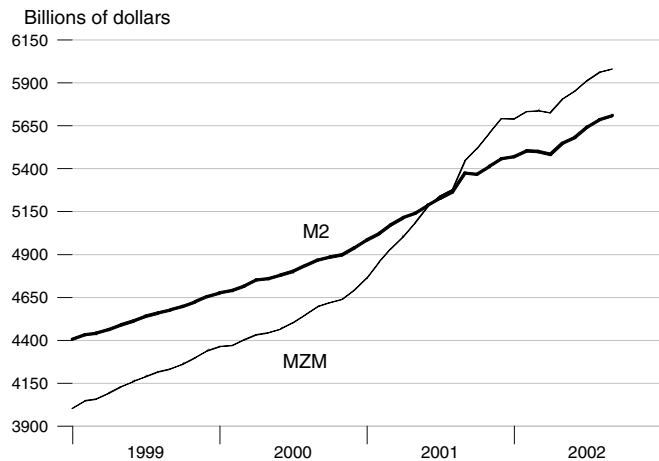> P.O. Box 442
> St. Louis, MO 63166

or to:
> webmaster@stls.frb.org

M2 and MZM

Billions of dollars

Reserve Market Rates

Percent

Discount Rate

Effective Federal Funds Rate ----
Intended Federal Funds Rate —

Adjusted Monetary Base

Percent change at an annual rate

Treasury Yield Curve

Percent

Week Ending:
10/12/01 ----
09/13/02 —
10/11/02 —

3m 1y 2y 3y 5y 7y 10y

Total Bank Credit

Percent change at an annual rate

Interest Rates

	Jul 02	Aug 02	Sep 02
Federal Funds Rate	1.73	1.74	1.75
Discount Rate	1.25	1.25	1.25
Prime Rate	4.75	4.75	4.75
Conventional Mortgage Rate	6.49	6.29	6.09
Treasury Yields:			
3-Month Constant Maturity	1.71	1.65	1.66
6-Month Constant Maturity	1.74	1.64	1.64
1-Year Constant Maturity	1.96	1.76	1.72
3-Year Constant Maturity	3.01	2.52	2.32
5-Year Constant Maturity	3.81	3.29	2.94
10-Year Constant Maturity	4.65	4.26	3.87

MZM and M1

Percent change from year ago

M2
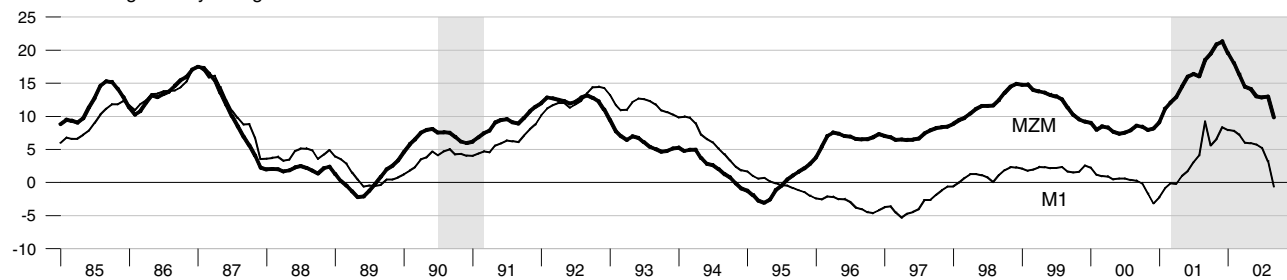
Percent change from year ago

M3
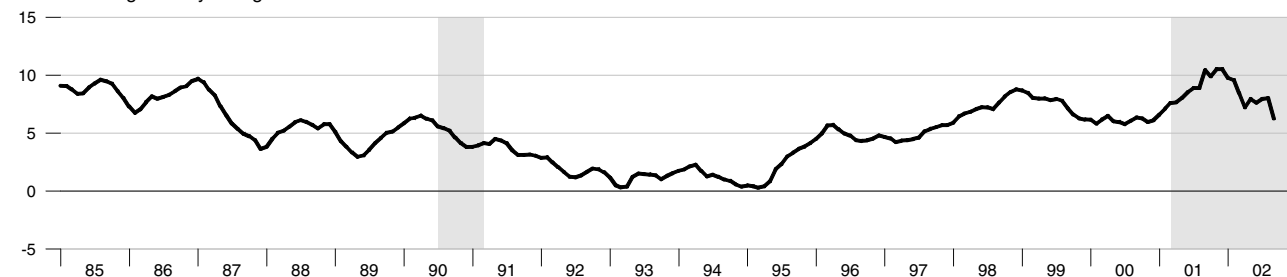
Percent change from year ago
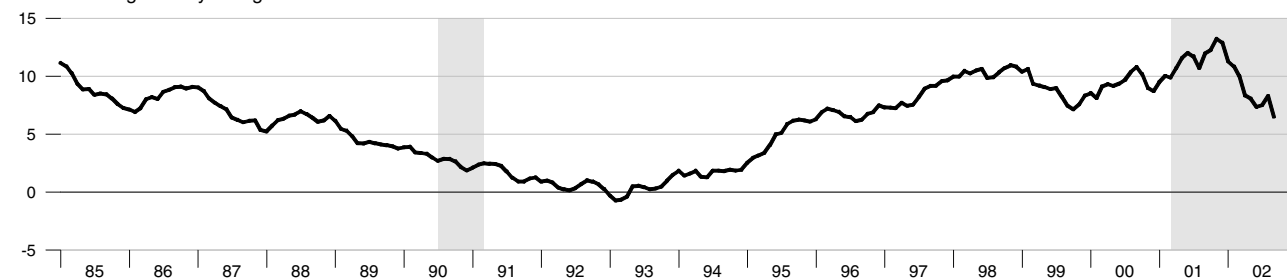
Monetary Services Index - M2

Percent change from year ago

Federal Reserve Bank of St. Louis
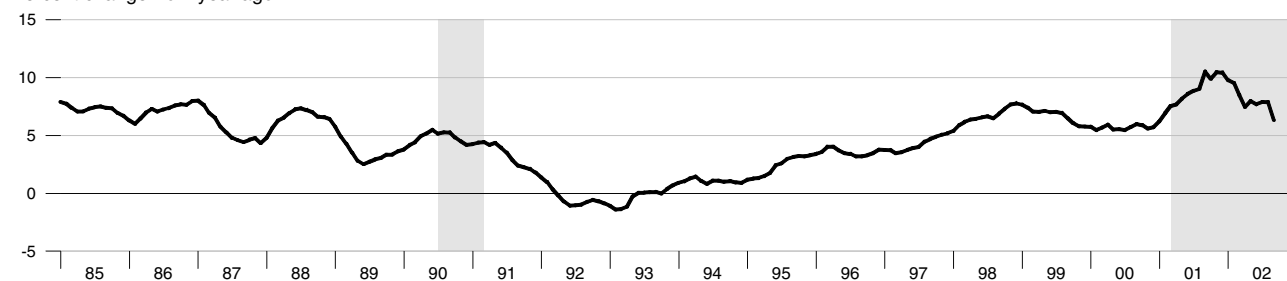
Adjusted Monetary Base

Percent change from year ago
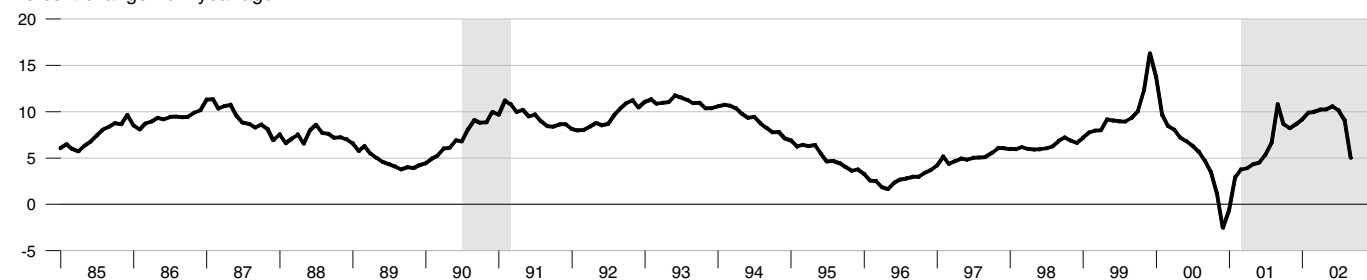
Domestic Nonfinancial Debt

Percent change from year ago
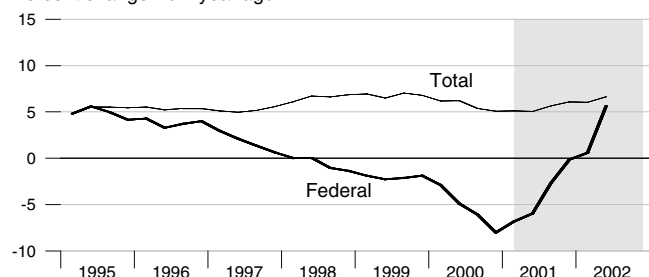
Currency Held by the Nonbank Public

Percent change from year ago
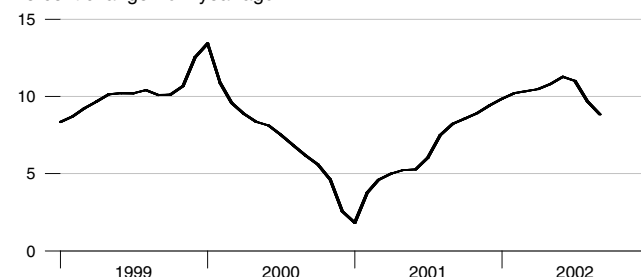
Time Deposits

Percent change from year ago
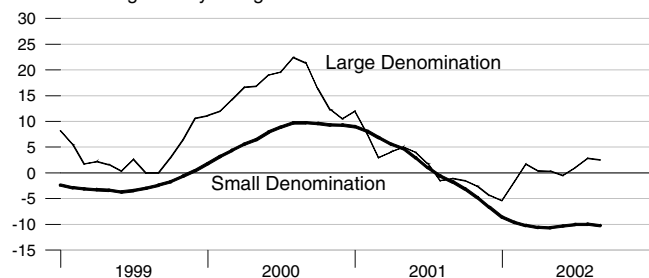
Checkable and Savings Deposits

Percent change from year ago
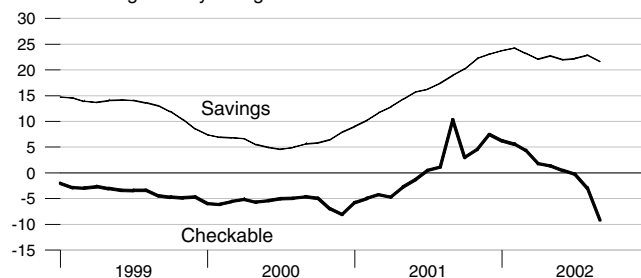
Money Market Mutual Fund Shares

Percent change from year ago
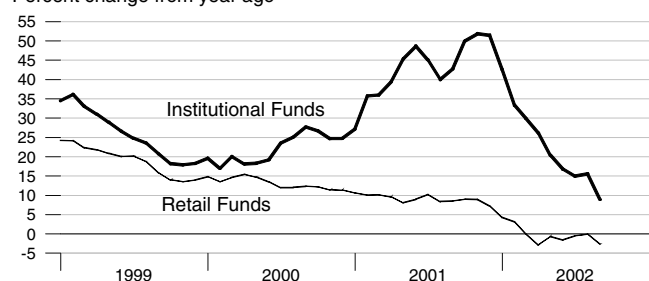
Repurchase Agreements and Eurodollars

Billions of dollars   Billions of dollars

Federal Reserve Bank of St. Louis
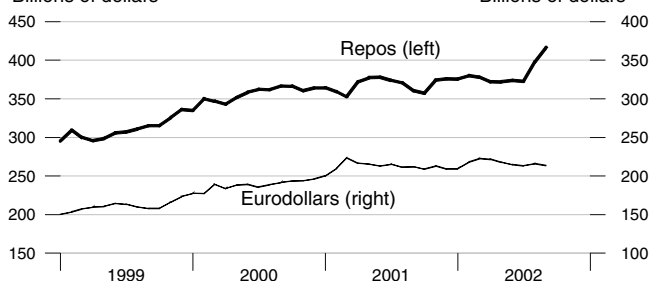
M1

Percent change at an annual rate
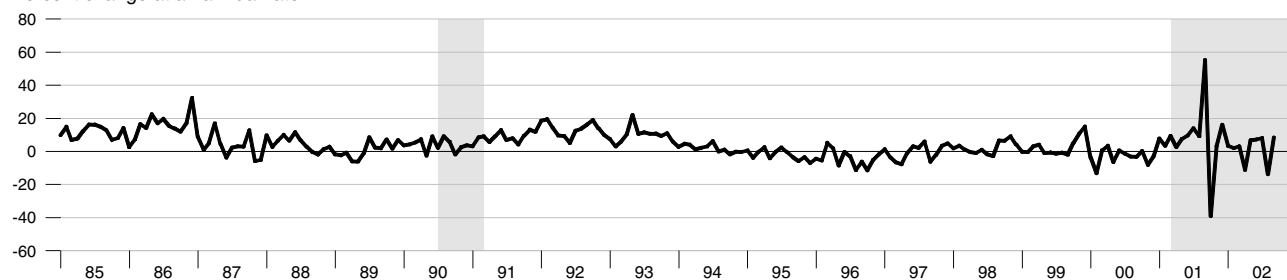
MZM

Percent change at an annual rate
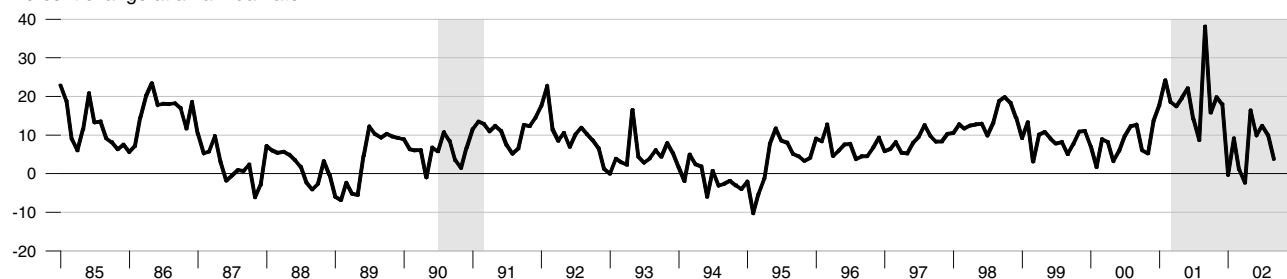
M2

Percent change at an annual rate
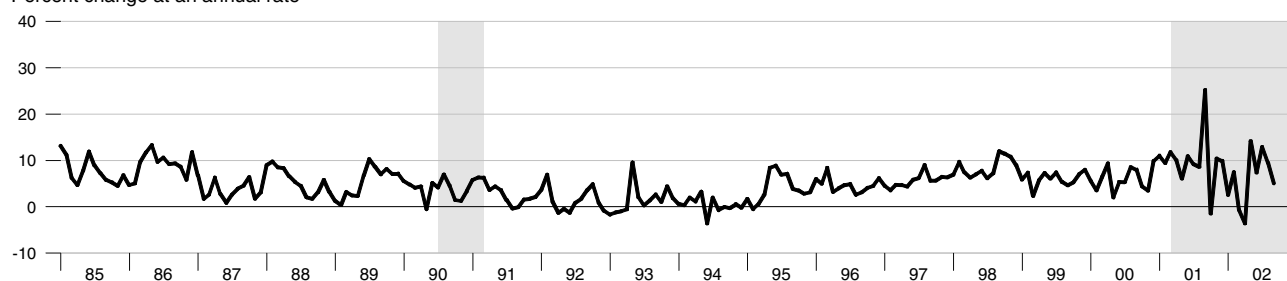
M3

Percent change at an annual rate
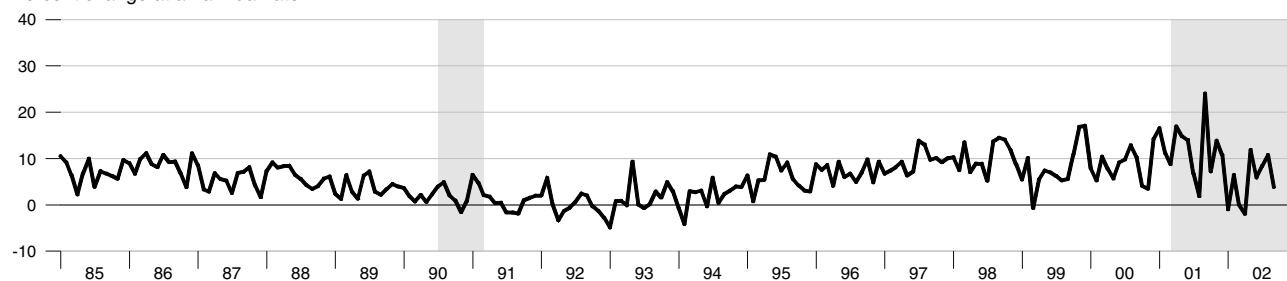
Adjusted and Required Reserves

Billions of dollars

Adjusted

Required
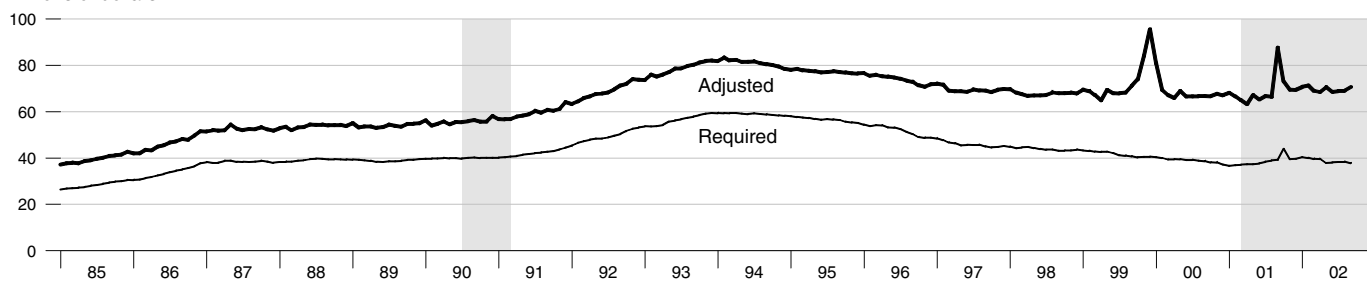
Total Borrowings, nsa

Billions of dollars
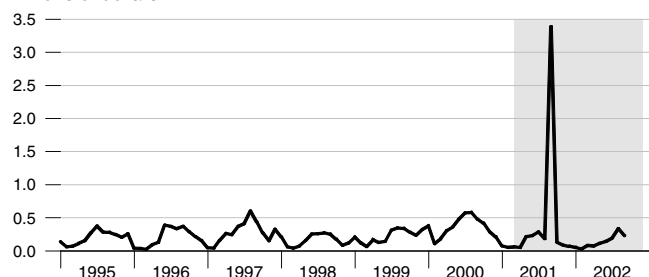
Excess Reserves plus RCB Contracts

Billions of dollars
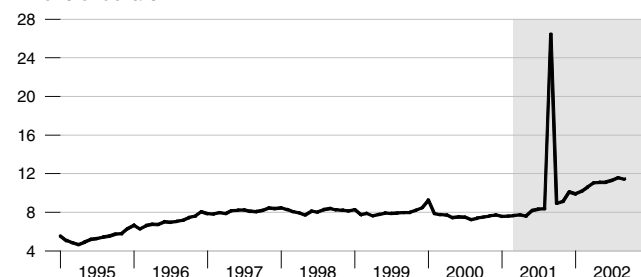
Nonfinancial Commercial Paper

Percent change from year ago

Consumer Credit

Percent change from year ago
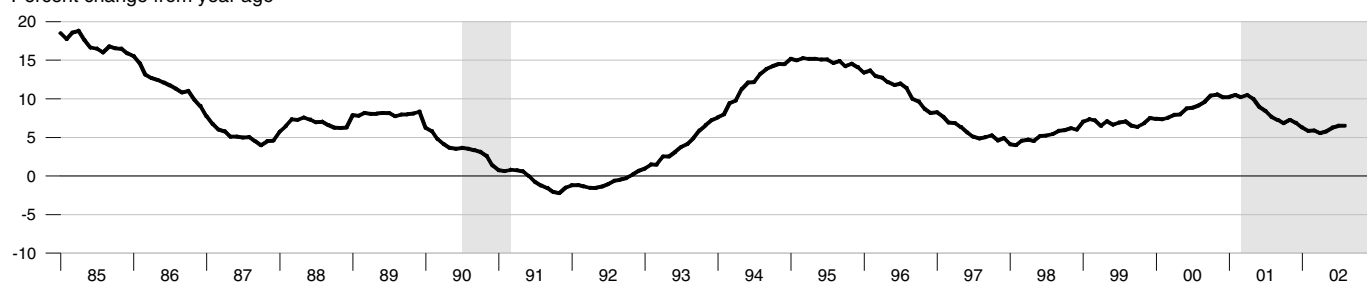
Inflation and Inflation Expectations

Percent

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.
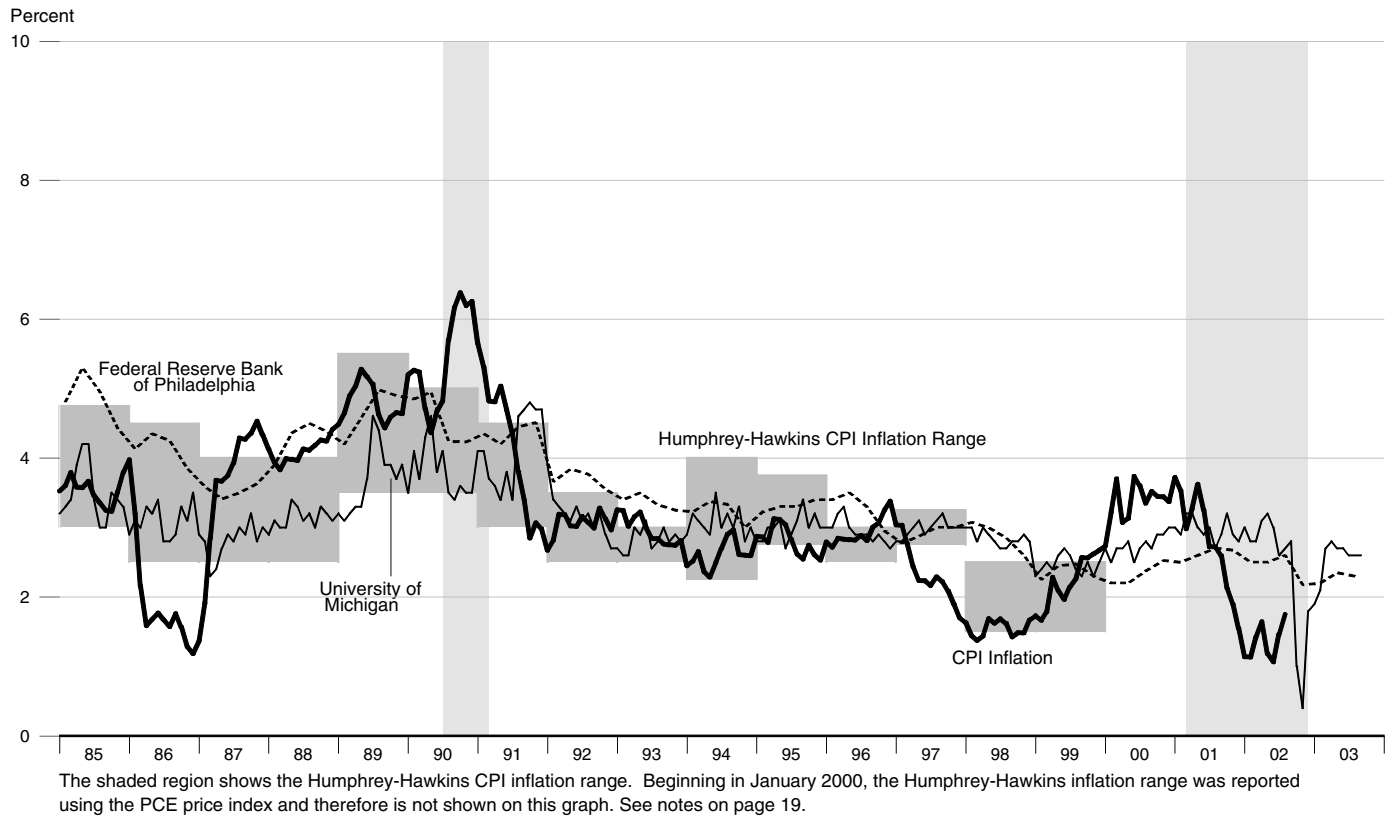
Treasury Security Yield Spreads
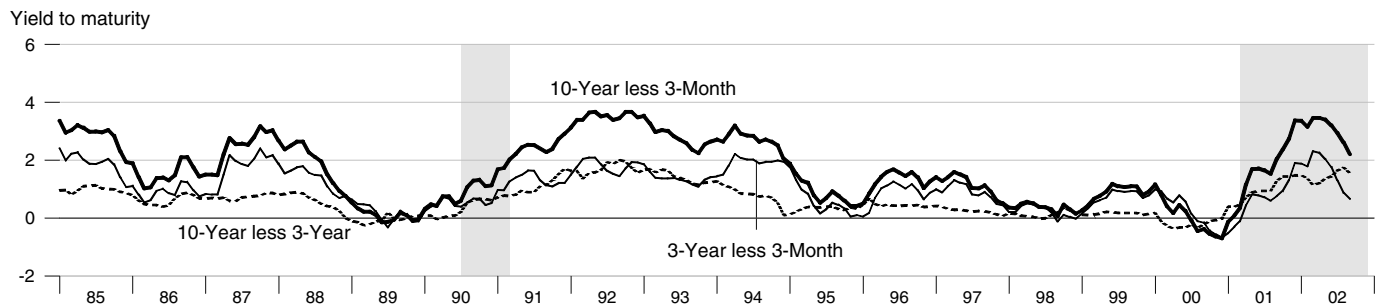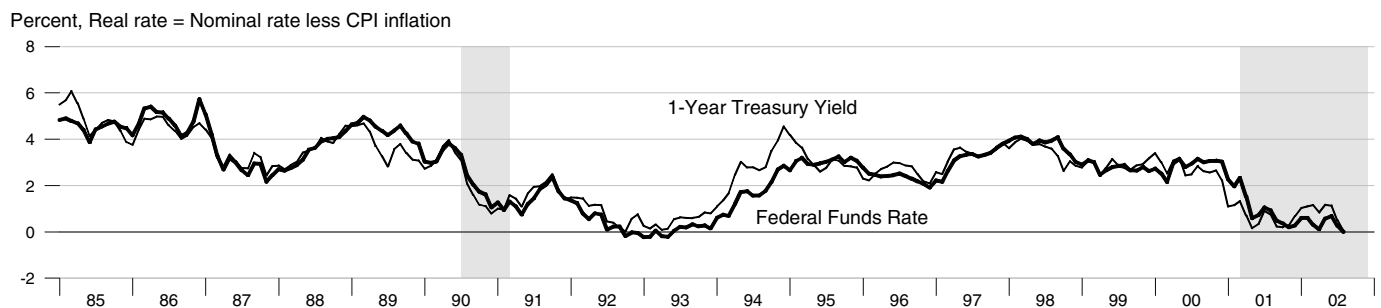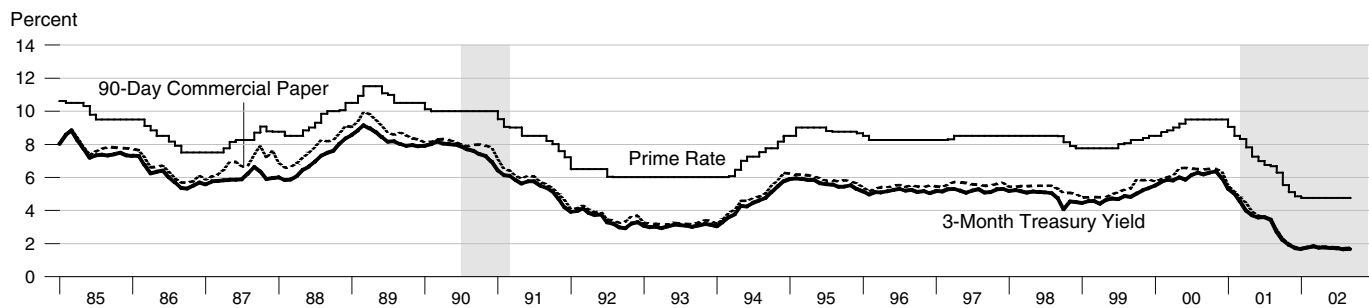
Yield to maturity

Real Interest Rates

Percent, Real rate = Nominal rate less CPI inflation

Short-Term Interest Rates

Percent

90-Day Commercial Paper

Prime Rate

3-Month Treasury Yield

85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02

Long-Term Interest Rates

Percent

Conventional Mortgage

Corporate Aaa

10-Year Treasury Yield

85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02

Long-Term Interest Rates

Percent

Corporate Baa

10-Year Treasury Yield

1999 2000 2001 2002

Short-Term Interest Rates

Percent

90-Day Commercial Paper

3-Month Treasury Yield

1999 2000 2001 2002
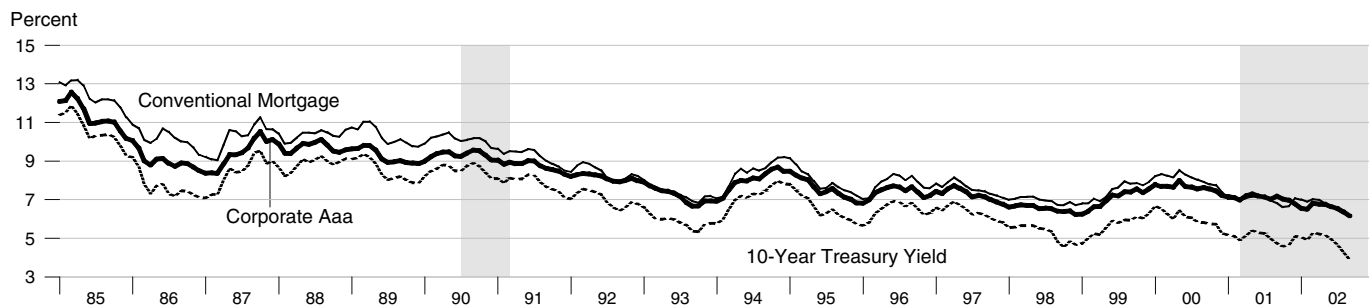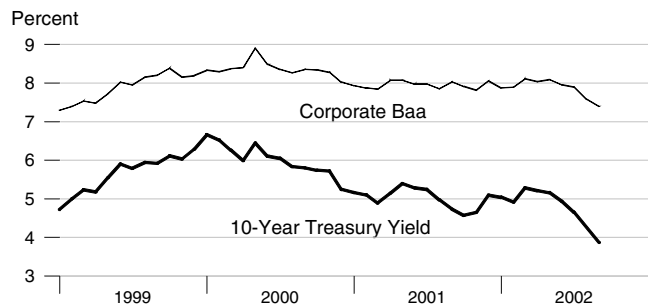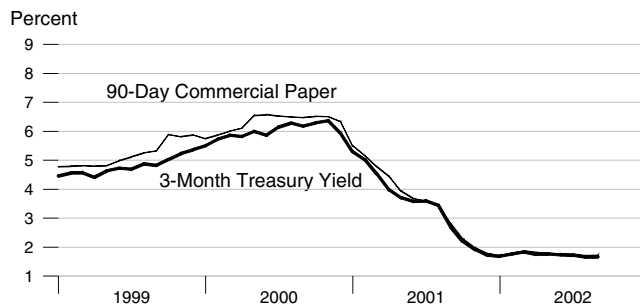
FOMC Intended Federal Funds Rate and Discount Rate

Percent

Intended Federal Funds Rate

Discount Rate

85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02

Federal Reserve Bank of St. Louis

Federal Funds Rate and Inflation Targets

Percent

4% 3% 2% 1% 0% Target Inflation Rates

Actual

1993 1994 1995 1996 1997 1998 1999 2000 2001 2002

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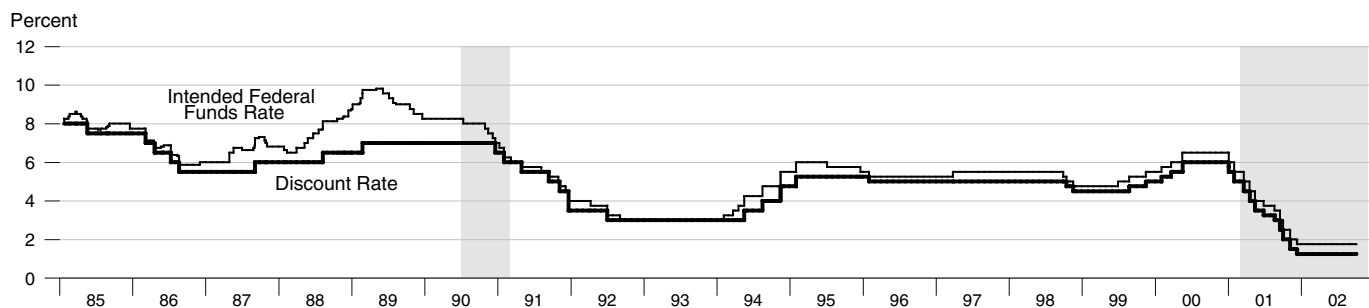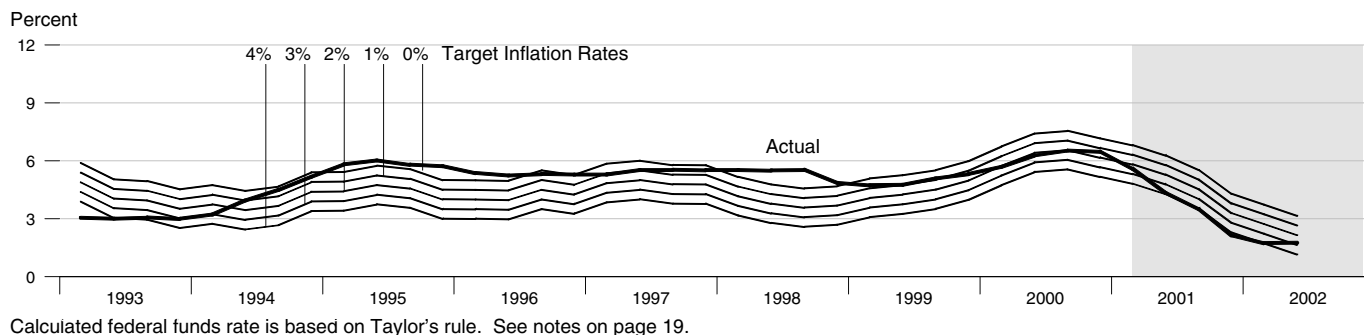
Components of Taylor's Rule

Actual and Potential Real GDP

Billions of chain-weighted 1996 dollars

Actual

Potential

1993 1994 1995 1996 1997 1998 1999 2000 2001 2002
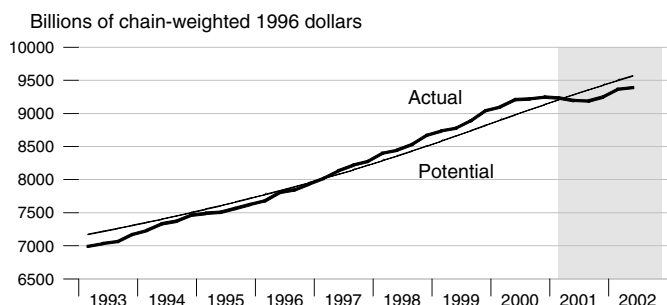
PCE Inflation and Projections

Percent change from year ago

1993 1994 1995 1996 1997 1998 1999 2000 2001 2002

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

Monetary Base Growth* and Inflation Targets

Percent

Actual

0% 1% 2% 3% 4% Target Inflation Rates

1993 1994 1995 1996 1997 1998 1999 2000 2001 2002
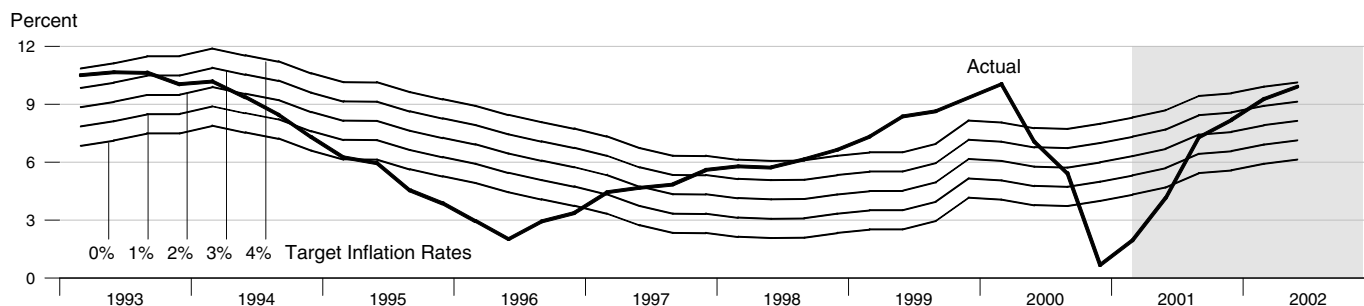
*Modified for the effects of sweeps programs on reserve demand.
Calculated base growth is based on McCallum's rule. Actual base growth is percent change from year ago. See notes on page 19.

Components of McCallum's Rule

Monetary Base Velocity Growth
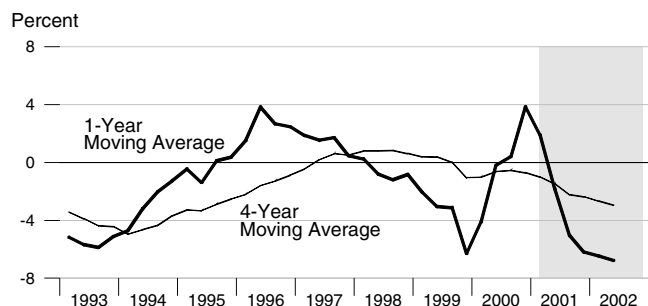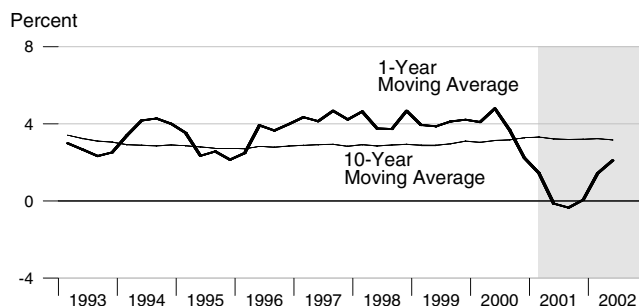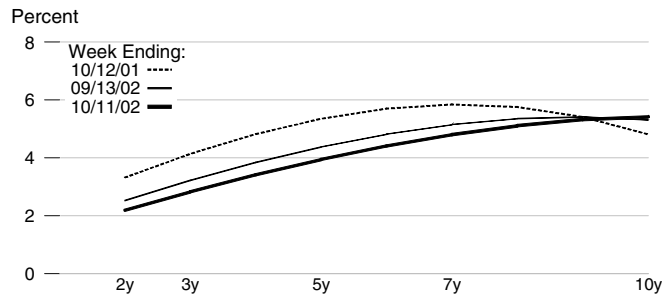
Percent

1-Year
Moving Average

4-Year
Moving Average

1993 1994 1995 1996 1997 1998 1999 2000 2001 2002

Real Output Growth

Percent

1-Year
Moving Average

10-Year
Moving Average

1993 1994 1995 1996 1997 1998 1999 2000 2001 2002

Implied One-Year Forward Rates

Percent

Week Ending:
10/12/01 ------
09/13/02 ——
10/11/02 ▬▬

Rates on 3-Month Eurodollar Futures

Percent, daily data

Nov 2002

Dec 2002

Oct 2002

Rates on Selected
Fed Funds Futures Contracts

Percent, daily data

Oct 2002

Nov 2002

Dec 2002

Implied Yields on Fed Funds Futures

Percent

09/13/2002

08/16/2002

10/11/2002

Inflation-Protected Treasury Yields

Percent, weekly data

10-Year

30-Year

Inflation-Protected Treasury Yield Spreads

Percent, weekly data

10-Year

30-Year

Inflation-Indexed 30-Year Bonds

Percent, weekly data

Canada

U.S.

U.K.

Inflation-Indexed 10-Year Bonds

Percent, weekly data

U.S.

U.K.

MZM Velocity and Opportunity Cost

Velocity = Nominal GDP / MZM

Opportunity cost

Velocity

Opportunity Cost (3-mo T-bill rate less MZM own rate)

M2 Velocity and Opportunity Cost

Velocity = Nominal GDP / M2

Opportunity cost

Velocity

Opportunity Cost (5-yr T-bond rate less M2 own rate)

Opportunity Cost (3-mo T-bill rate less M2 own rate)
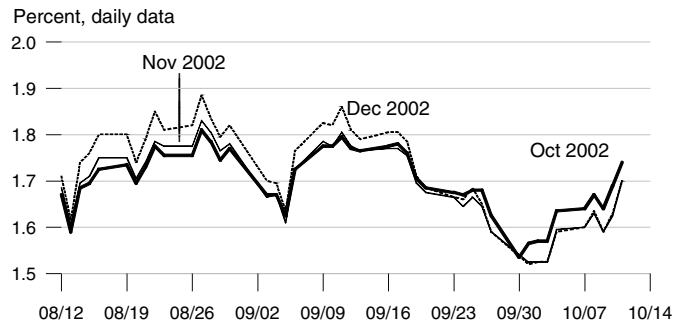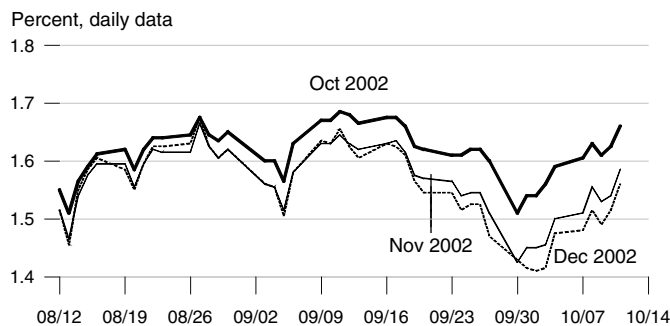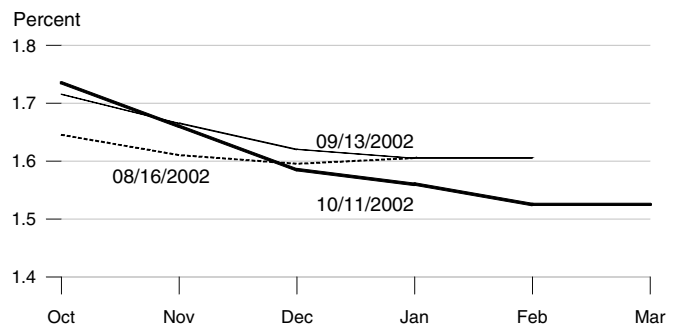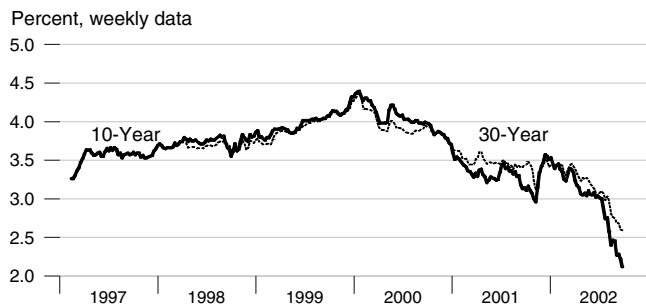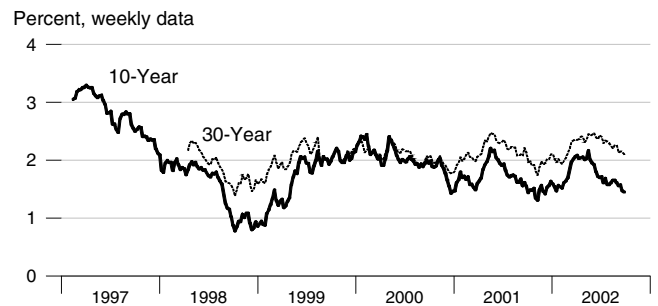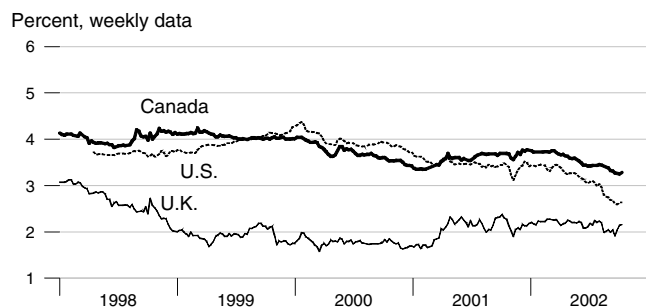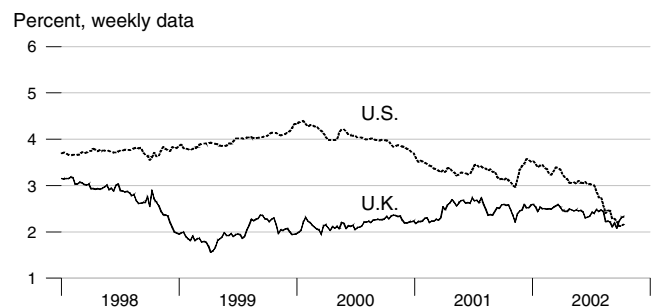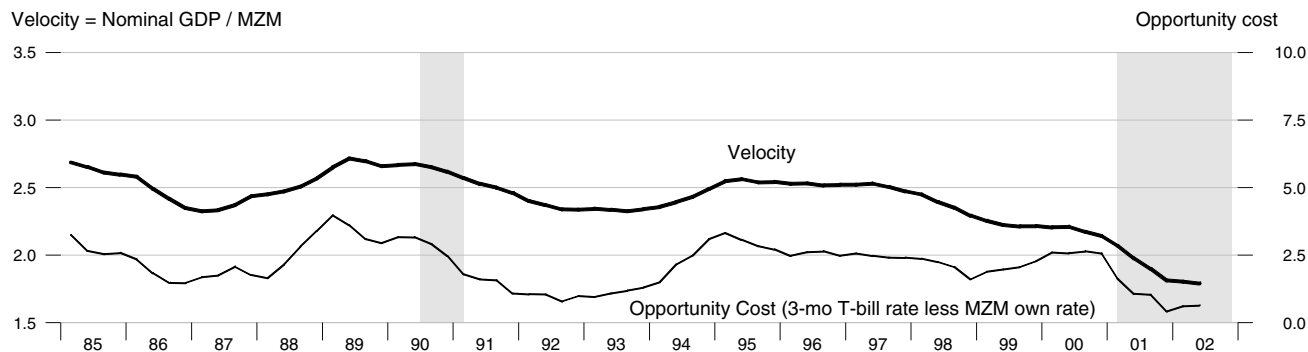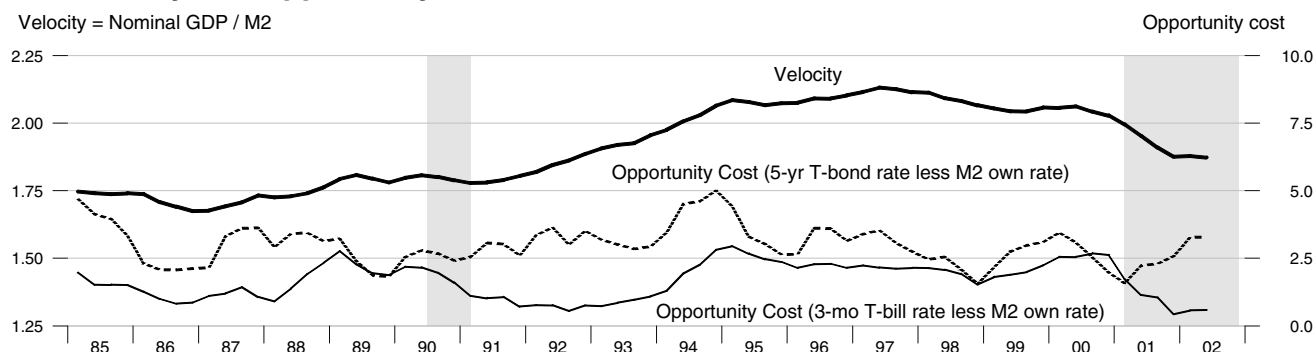
M2, MZM, and Nominal GDP

Billions of dollars
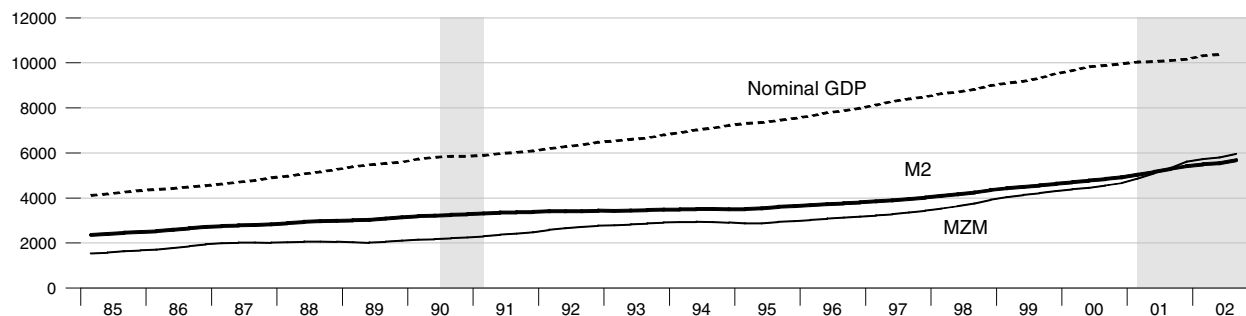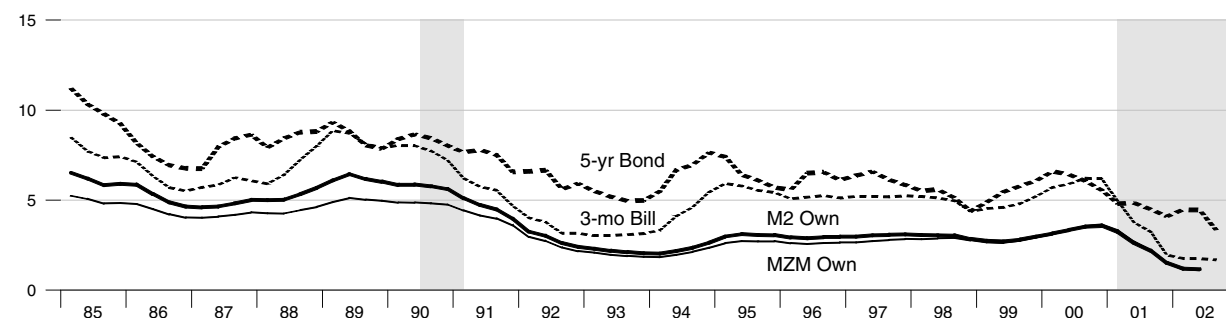
Nominal GDP

M2

MZM

Interest Rates

Percent

5-yr Bond

3-mo Bill

M2 Own

MZM Own

Gross Domestic Product

Percent change from year ago
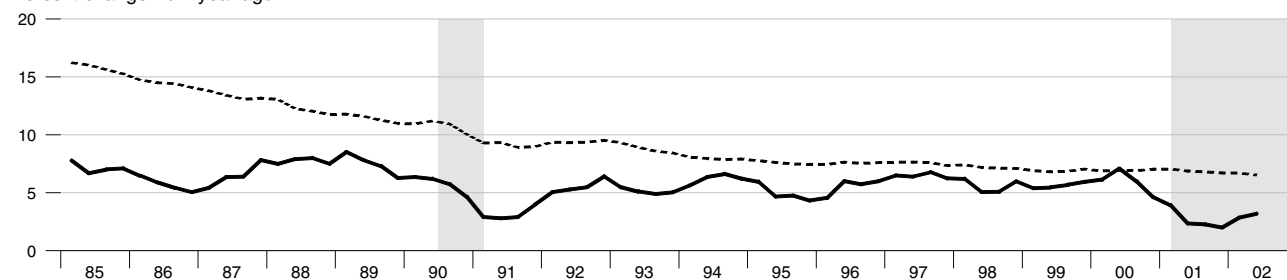
Dashed lines indicate 10-year moving averages.

Real Gross Domestic Product

Percent change from year ago
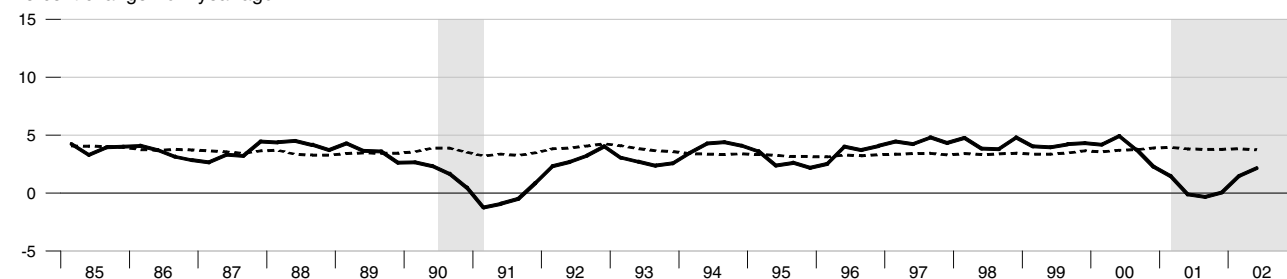
Dashed lines indicate 10-year moving averages.

Gross Domestic Product Price Index

Percent change from year ago
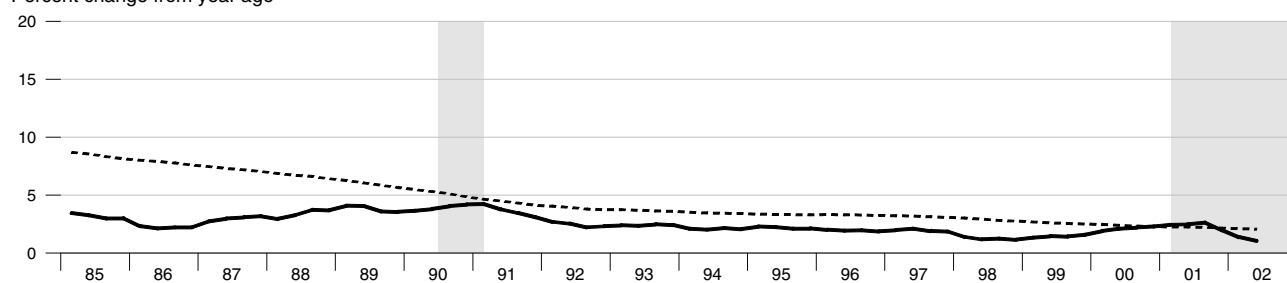
Dashed lines indicate 10-year moving averages.

M2

Percent change from year ago

Dashed lines indicate 10-year moving averages.
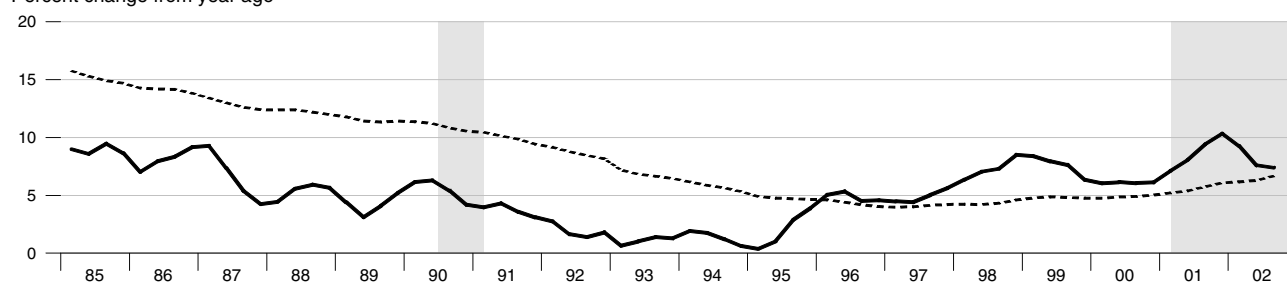
Federal Reserve Bank of St. Louis

Bank Credit

Percent change from year ago
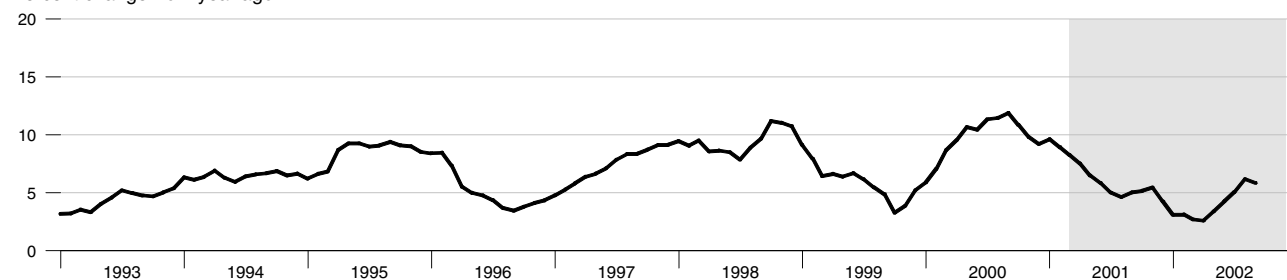
Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago
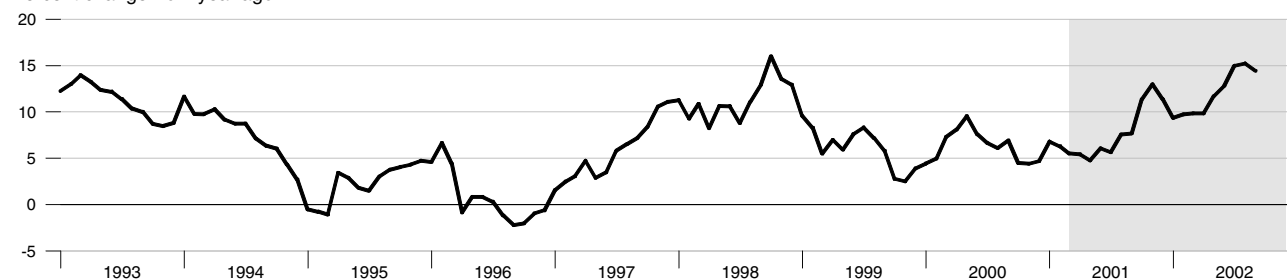
Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago
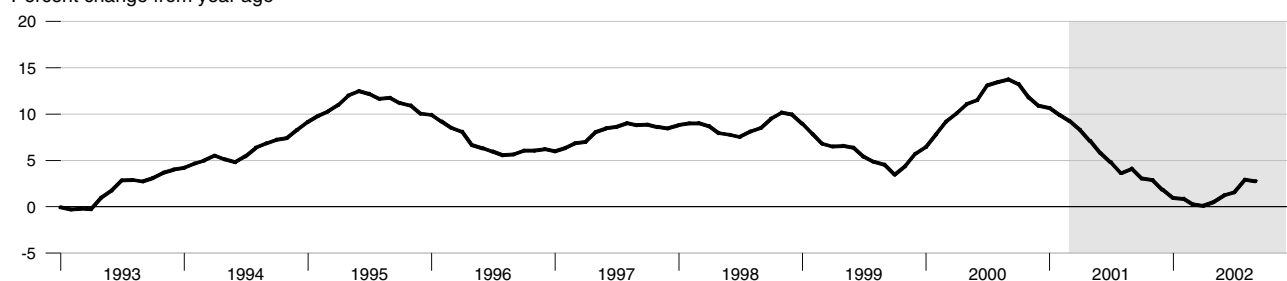
Commercial and Industrial Loans at Commercial Banks

Percent change from year ago
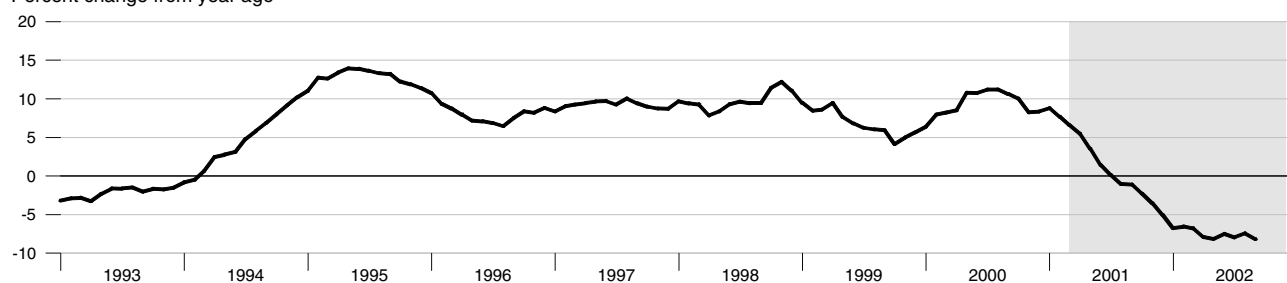
Standard & Poor's 500
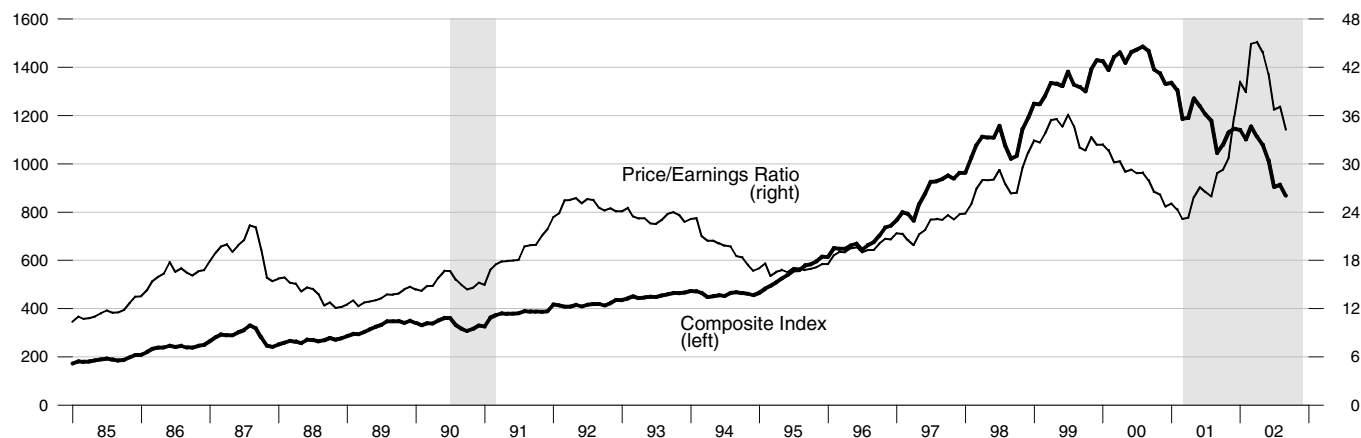
Recent Inflation and Long-Term Interest Rates

	Consumer Price Inflation Rates				Long-Term Government Bond Rates			
	Percent change from year ago				Percent			
	2001Q3	2001Q4	2002Q1	2002Q2	Jun02	Jul02	Aug02	Sep02
United States	2.66	1.89	1.25	1.30	4.93	4.65	4.26	3.87
Canada	2.69	1.10	1.53	1.33	5.75	5.73	5.57	5.35
France	1.79	1.43	2.13	1.63	5.45	5.48	4.99	.
Germany	2.46	1.79	1.90	1.16	5.00	4.87	4.59	4.38
Italy	2.80	2.40	2.41	2.27	5.26	5.11	4.83	.
Japan	-0.84	-0.98	-1.40	-0.90	1.24	1.20	1.13	1.01
United Kingdom	1.80	1.04	1.21	1.23	5.12	5.01	4.71	.

Inflation and Long-Term Interest Rate Differentials
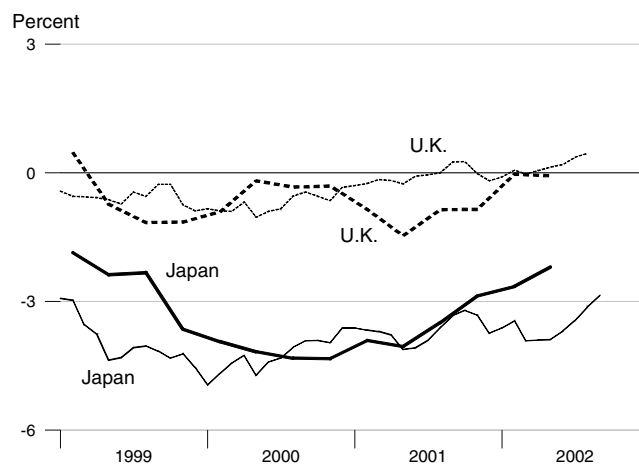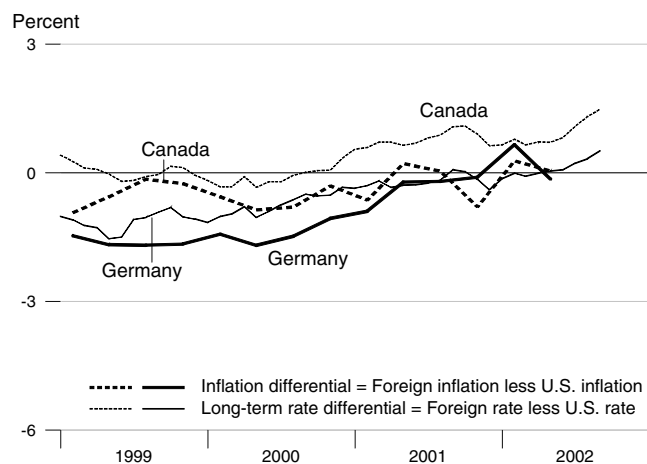
		Money Stock			Bank	Adjusted		
		M1	MZM	M2	M3	Credit	Monetary Base	Reserves	MSI M2
	1997	1069.292	3320.211	3920.471	5210.736	3956.445	478.708	69.523	226.512
	1998	1079.990	3707.960	4206.697	5751.030	4329.598	508.942	67.808	241.525
	1999	1101.865	4167.926	4524.074	6253.682	4587.501	557.865	72.360	257.839
	2000	1104.049	4505.488	4799.289	6839.267	5034.175	590.821	68.319	272.473
	2001	1136.965	5215.994	5218.527	7618.870	5351.260	623.788	68.974	296.191
2000	1	1112.681	4377.714	4693.075	6625.812	4841.550	593.102	72.390	266.754
	2	1108.119	4446.510	4762.956	6754.809	4991.857	586.045	67.097	270.315
	3	1102.127	4548.170	4834.001	6923.667	5119.709	589.054	66.636	274.443
	4	1093.270	4649.558	4907.126	7052.778	5183.584	595.084	67.151	278.380
2001	1	1100.703	4849.789	5026.116	7275.526	5273.863	604.848	66.543	285.124
	2	1117.304	5089.060	5147.010	7526.930	5321.580	610.939	65.201	292.318
	3	1161.909	5320.335	5288.030	7717.725	5369.711	633.771	73.522	300.381
	4	1167.942	5604.792	5412.952	7955.300	5439.884	645.594	70.629	306.939
2002	1	1184.736	5719.770	5490.806	8055.242	5430.152	663.333	70.295	311.512
	2	1183.001	5794.099	5537.348	8122.669	5503.012	674.116	69.181	314.834
	3	1191.350	5951.000	5678.712	8290.555	5674.979	684.691	69.516	322.464
2000	Sep	1099.091	4595.454	4866.726	6987.710	5165.552	590.694	66.689	276.229
	Oct	1099.233	4618.490	4884.372	7011.446	5153.280	593.064	66.688	277.197
	Nov	1091.722	4638.680	4898.461	7031.811	5174.371	595.549	67.686	277.938
	Dec	1088.856	4691.505	4938.544	7115.077	5223.102	596.639	67.078	280.004
2001	Jan	1095.844	4760.919	4983.687	7213.087	5264.753	600.886	68.095	282.508
	Feb	1098.905	4856.679	5022.809	7280.148	5269.105	607.234	66.556	284.993
	Mar	1107.361	4931.769	5071.851	7333.343	5287.730	606.425	64.979	287.871
	Apr	1109.741	5003.400	5114.257	7436.522	5310.878	605.800	63.239	290.326
	May	1116.618	5085.157	5140.098	7528.295	5326.784	613.259	67.119	292.055
	Jun	1125.552	5178.622	5186.674	7615.973	5327.079	613.759	65.246	294.573
	Jul	1138.562	5239.244	5226.312	7658.666	5331.234	619.440	66.654	296.726
	Aug	1147.242	5277.215	5263.744	7670.550	5353.206	627.455	66.378	299.200
	Sep	1199.923	5444.546	5374.035	7823.958	5424.693	654.419	87.534	305.218
	Oct	1160.805	5516.280	5367.321	7871.063	5418.693	644.249	72.955	304.610
	Nov	1163.751	5607.033	5413.594	7961.679	5455.409	644.415	69.476	307.005
	Dec	1179.271	5691.064	5457.942	8033.158	5445.551	648.118	69.457	309.201
2002	Jan	1182.472	5689.425	5469.495	8026.709	5427.606	655.871	70.667	310.089
	Feb	1184.385	5732.404	5503.295	8069.624	5433.173	667.213	71.242	312.118
	Mar	1187.352	5737.481	5499.628	8069.393	5429.677	666.914	68.976	312.329
	Apr	1176.291	5726.202	5483.029	8056.438	5448.876	667.686	68.476	311.967
	May	1182.827	5804.129	5547.483	8135.718	5507.179	676.057	70.542	315.292
	Jun	1189.886	5851.965	5581.533	8175.850	5552.980	678.604	68.525	317.244
	Jul	1197.778	5911.985	5641.197	8232.654	5600.101	682.344	68.939	320.097
	Aug	1184.033	5961.125	5685.536	8306.220	5683.065	684.471	69.021	322.758
	Sep	1192.240	5979.889	5709.403	8332.791	5741.772	687.259	70.589	324.537

*All values are given in billions of dollars.

		Federal Funds	Discount Rate	Prime Rate	3-mo CDs	Treasury Yields 3-mo	3-yr	10-yr	Corporate Aaa Bonds	S & L Aaa Bonds	Conventional Mortgage
	1997	5.46	5.00	8.44	5.62	5.20	6.10	6.35	7.26	5.32	7.60
	1998	5.35	4.92	8.35	5.47	4.91	5.14	5.26	6.53	4.93	6.94
	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	4.99	6.97
2000	1	5.68	5.19	8.69	6.03	5.70	6.56	6.48	7.71	5.82	8.26
	2	6.27	5.74	9.25	6.57	5.89	6.52	6.18	7.77	5.72	8.32
	3	6.52	6.00	9.50	6.63	6.20	6.16	5.89	7.61	5.45	8.03
	4	6.47	6.00	9.50	6.59	6.20	5.63	5.57	7.40	5.32	7.64
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	4.87	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
2000	Sep	6.52	6.00	9.50	6.60	6.18	6.02	5.80	7.62	5.40	7.91
	Oct	6.51	6.00	9.50	6.67	6.29	5.85	5.74	7.55	5.46	7.80
	Nov	6.51	6.00	9.50	6.65	6.36	5.79	5.72	7.45	5.38	7.75
	Dec	6.40	6.00	9.50	6.45	5.94	5.26	5.24	7.21	5.11	7.38
2001	Jan	5.98	5.52	9.05	5.62	5.29	4.77	5.16	7.15	4.99	7.03
	Feb	5.49	5.00	8.50	5.26	5.01	4.71	5.10	7.10	5.09	7.05
	Mar	5.31	4.81	8.32	4.89	4.54	4.43	4.89	6.98	5.00	6.95
	Apr	4.80	4.28	7.80	4.53	3.97	4.42	5.14	7.20	5.14	7.08
	May	4.21	3.73	7.24	4.02	3.70	4.51	5.39	7.29	5.15	7.15
	Jun	3.97	3.47	6.98	3.74	3.57	4.35	5.28	7.18	5.03	7.16
	Jul	3.77	3.25	6.75	3.66	3.59	4.31	5.24	7.13	4.79	7.13
	Aug	3.65	3.16	6.67	3.48	3.44	4.04	4.97	7.02	4.89	6.95
	Sep	3.07	2.77	6.28	2.87	2.69	3.45	4.73	7.17	4.93	6.82
	Oct	2.49	2.02	5.53	2.31	2.20	3.14	4.57	7.03	4.89	6.62
	Nov	2.09	1.58	5.10	2.03	1.91	3.22	4.65	6.97	4.85	6.66
	Dec	1.82	1.33	4.84	1.83	1.72	3.62	5.09	6.77	5.18	7.07
2002	Jan	1.73	1.25	4.75	1.74	1.68	3.56	5.04	6.55	5.05	7.00
	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

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

		M1	MZM	M2	M3
Percent change from previous period					
	1997	-3.31	7.22	4.88	8.29
	1998	1.00	11.68	7.30	10.37
	1999	2.03	12.40	7.54	8.74
	2000	0.20	8.10	6.08	9.36
	2001	2.98	15.77	8.74	11.40
2000	1	0.07	1.85	1.48	2.67
	2	-0.41	1.57	1.49	1.95
	3	-0.54	2.29	1.49	2.50
	4	-0.80	2.23	1.51	1.86
2001	1	0.68	4.31	2.42	3.16
	2	1.51	4.93	2.41	3.46
	3	3.99	4.54	2.74	2.53
	4	0.52	5.35	2.36	3.08
2002	1	1.44	2.05	1.44	1.26
	2	-0.15	1.30	0.85	0.84
	3	0.71	2.71	2.55	2.07
2000	Sep	-0.28	1.05	0.66	0.86
	Oct	0.01	0.50	0.36	0.34
	Nov	-0.68	0.44	0.29	0.29
	Dec	-0.26	1.14	0.82	1.18
2001	Jan	0.64	1.48	0.91	1.38
	Feb	0.28	2.01	0.79	0.93
	Mar	0.77	1.55	0.98	0.73
	Apr	0.21	1.45	0.84	1.41
	May	0.62	1.63	0.51	1.23
	Jun	0.80	1.84	0.91	1.16
	Jul	1.16	1.17	0.76	0.56
	Aug	0.76	0.72	0.72	0.16
	Sep	4.59	3.17	2.10	2.00
	Oct	-3.26	1.32	-0.12	0.60
	Nov	0.25	1.65	0.86	1.15
	Dec	1.33	1.50	0.82	0.90
2002	Jan	0.27	-0.03	0.21	-0.08
	Feb	0.16	0.76	0.62	0.53
	Mar	0.25	0.09	-0.07	-0.00
	Apr	-0.93	-0.20	-0.30	-0.16
	May	0.56	1.36	1.18	0.98
	Jun	0.60	0.82	0.61	0.49
	Jul	0.66	1.03	1.07	0.69
	Aug	-1.15	0.83	0.79	0.89
	Sep	0.69	0.31	0.42	0.32

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: M2 minus small-denomination time deposits, plus institutional money market mutual funds. The label MZM was coined by William Poole (1991) for this aggregate, proposed earlier by Motley (1988).

M2: M1 plus savings deposits (including money market deposit accounts) and small-denomination (less than $100,000) time deposits issued by financial institutions; and shares in retail money market mutual funds (funds with initial investments of less than $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).

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 series, a 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) and research.stlouisfed.org/aggreg/newbase.html.

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; additional data are available 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 *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: **MZM**, or "Money, Zero Maturity," includes the zero maturity, or immediately available, components of M3. MZM equals M2 minus small-denomination time deposits, plus institutional money market mutual funds (that is, the money market mutual funds included in M3 but excluded from M2). 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. For analytical purposes,

MZM largely replaces M1. The **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 Department 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/fred/data/wkly.html. See also *Federal Reserve Bulletin*, table 1.35. The 30-year constant maturity series was discontinued by the Treasury Department 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 *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

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

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 $((y_t - y_{t-40})/40) \times 4 \times 100$, where y_t is the log of real GDP. The four-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 available 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 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 Fed Funds Futures Contracts** each trace through time the yield on three specific contracts. **Implied Yields on Fed Funds Futures** displays a single day's snapshot of yields for contracts expiring in the months shown on the horizontal axis. **Inflation-Protected Treasury Yields** are yields on the most recently issued inflation-protected securities of 10- and 30-year original maturities. **Inflation-Protected Treasury Yield Spreads** equal, for 10- and 30-year maturities, the difference between the yields on the most recently issued inflation-protected securities and the unadjusted bond yields of similar maturity. **Inflation-Indexed 30-Year Bonds** shows the yield of an inflation-indexed bond that is scheduled to mature in approximately (but not greater than) 30 years. The current bond for Canada has a maturity date of 12/01/2031, the current U.K. bond has a maturity date of 7/22/2030, and the current U.S. bond has a maturity date of 4/15/2032. **Inflation-Indexed 10-Year Bonds** shows the yield of an inflation-indexed bond that is scheduled to mature in approximately (but not greater than) 10 years. The current U.K. bond has a maturity date of 8/23/2011 and the current U.S. bond has a maturity date of 1/15/2011.

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. Two alternative opportunity costs are shown, one relative to the 3-month Treasury constant maturity yield, the other to the 5-year constant maturity yield.

Page 13: **Real Gross Domestic Product** is GDP as measured in chained 1996 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 1996 dollars.

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

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

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