June 2001

MonetaryTrends

THE FEDERAL RESERVE BANK of ST. LOUIS

Interest Rate Targets Abandoned

In March 2001, the Bank of Japan (BOJ) announced that it would no longer target the uncollateralized overnight call rate, which is similar to the U.S. federal funds rate. Instead, the BOJ now targets the outstanding balance of current accounts at the BOJ, which is similar to the reserve component of the U.S. monetary base, and has stated a goal of increasing current account balances by 25 percent (from 4 to 5 trillion yen) over the next six months.

Because the overnight call loan rate was approximately 0.15 percent when the BOJ announced its change in policy, many commentators already viewed Japan's monetary policy as exceptionally easy. Many argued that low interest rates left the BOJ with little room to ease further. Such statements, however, fail to recognize that monetary conditions are not necessarily easy when nominal interest rates are low—even exceptionally low.

Economists have long recognized that the level of nominal interest rates can be a misleading indicator of the stance of monetary policy. Inflation expectations and the growth of real economic activity influence the level of interest rates. If expected inflation declines or economic activity slows, nominal interest rates tend to fall unless the central bank attempts to offset these forces. If the central bank desires to maintain the current level of its overnight interest rate target, it must drain reserves from the banking system, which could result in a slowing of monetary growth.

Central banks usually lower their interest rate target when economic weakness or disinflation put downward pressure on interest rates. But, unless the central bank lowers its target sufficiently, the growth of bank reserves and the money stock could decline. In such circumstances, the behavior of interest rates and the growth of monetary aggregates can give conflicting signals. The reduction of the target rate suggests that policy has eased, whereas a slowing of the growth of reserves or the money stock suggests that policy has tightened. This conflict is often most apparent during periods of extreme economic distress.

Confusion over the meaning of low nominal overnight interest rates in Japan today is similar to confusion over the meaning of *high* nominal interest rates in the United States during the 1970s. During most of the decade, the Fed implemented monetary policy by targeting the federal funds rate. As inflation accelerated and market interest rates rose, the Fed followed suit by raising its federal funds rate target. For example, from early January 1978 to September 1979 the Fed raised its target for the federal funds rate by 5 percentage points from 6.5 percent to 11.5 percent. Many commentators interpreted these actions as a substantial tightening of monetary policy. Despite sharply higher interest rates, however, the growth rate of monetary aggregates and the inflation rate increased. By monetary growth measures, monetary policy was becoming easier, not tighter. The Federal Reserve eventually recognized that it had not tightened enough to subdue inflation, and in October 1979 the FOMC adopted new procedures designed to bring inflation under control by slowing monetary growth.

The case of Japan differs only in direction. In an economy with persistent deflation and negative output growth, declining or low nominal interest rates do not necessarily indicate easy monetary policy any more than high nominal interest rates signal tight monetary policy when output growth and inflation are rising. In adopting a monetary aggregate targeting procedure with an explicit target for reserve growth, the BOJ is signaling a willingness to pursue aggressive policies to combat economic weakness regardless of the level of the overnight nominal interest rate.

—Daniel L. Thornton and David C. Wheelock

Table*of*Contents

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

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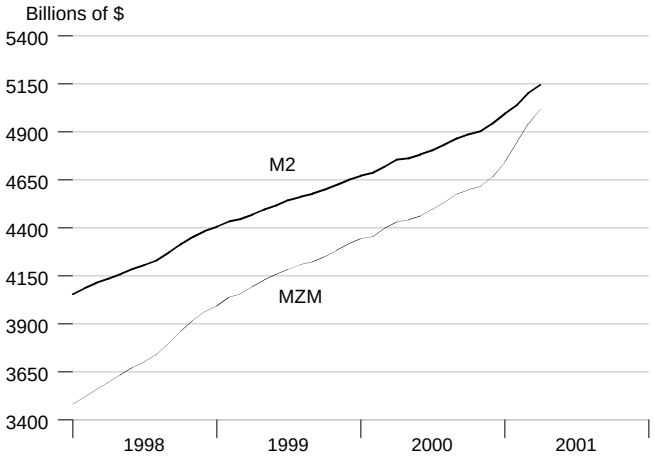
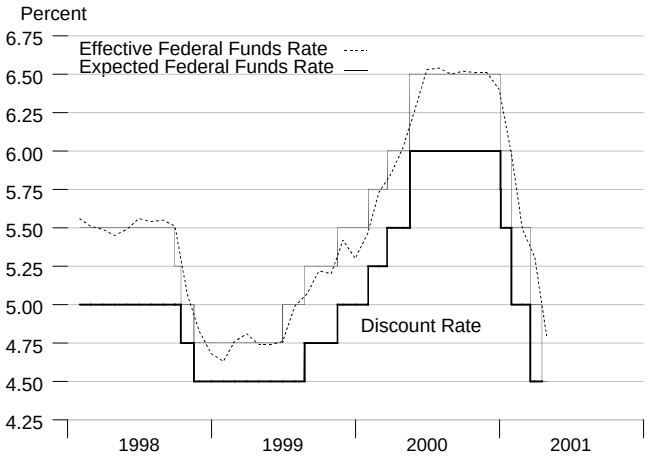
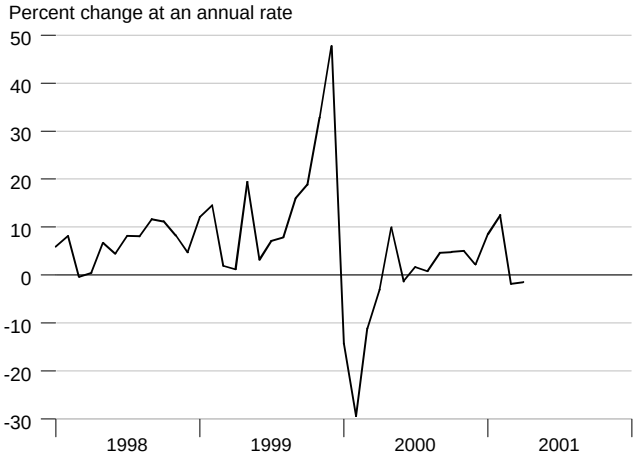
M2 and MZM



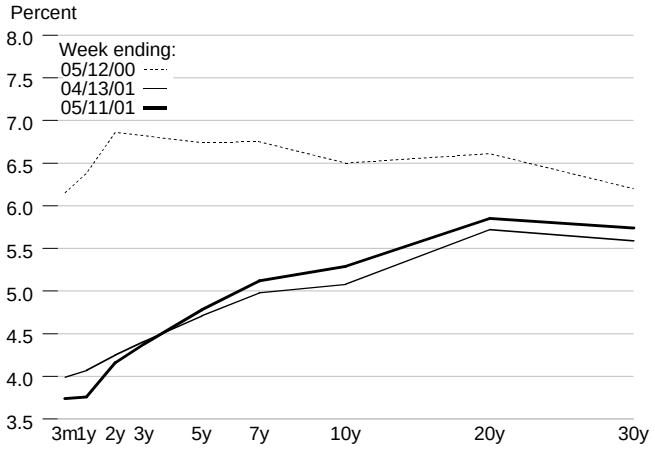
Reserve Market Rates



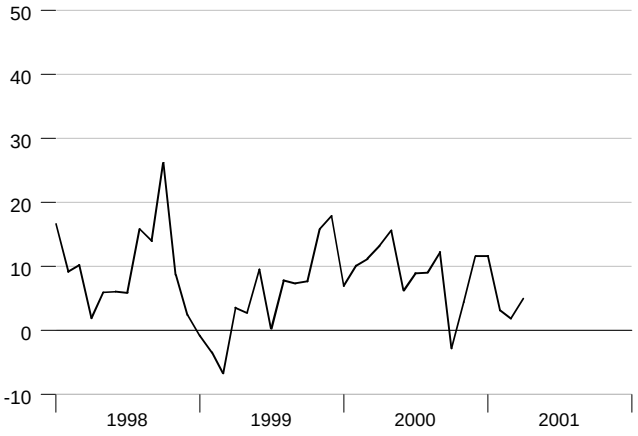
Adjusted Monetary Base



Treasury Yield Curve



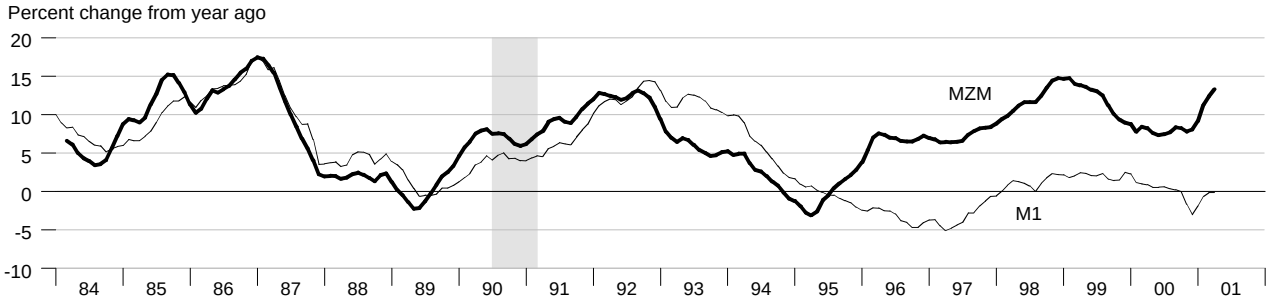
Total Bank Credit



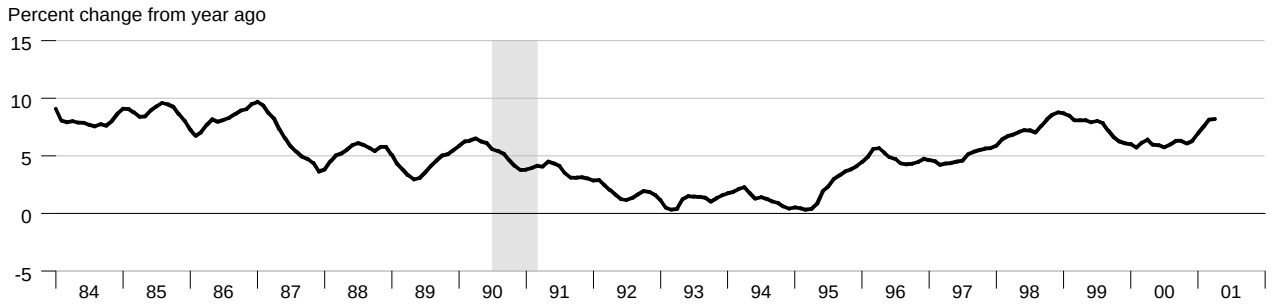
Interest Rates

	Feb 01	Mar 01	Apr 01
Federal Funds Rate	5.49	5.31	4.80
Discount Rate	5.00	4.81	4.28
Prime Rate	8.50	8.32	7.80
Conventional Mortgage Rate	7.05	6.95	7.08
Treasury Yields:			
3-month constant maturity	5.01	4.54	3.97
6-month constant maturity	4.89	4.44	3.99
1-year constant maturity	4.68	4.30	3.98
3-year constant maturity	4.71	4.43	4.42
5-year constant maturity	4.89	4.64	4.76
10-year constant maturity	5.10	4.89	5.14
30-year constant maturity	5.45	5.34	5.65

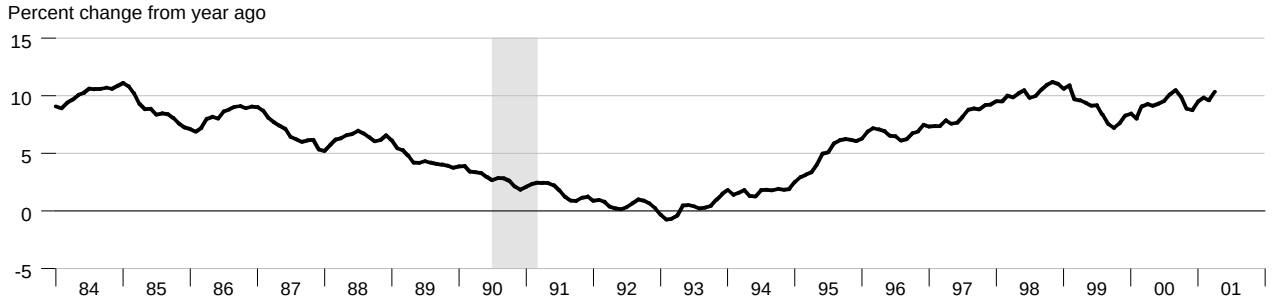
MZM and M1



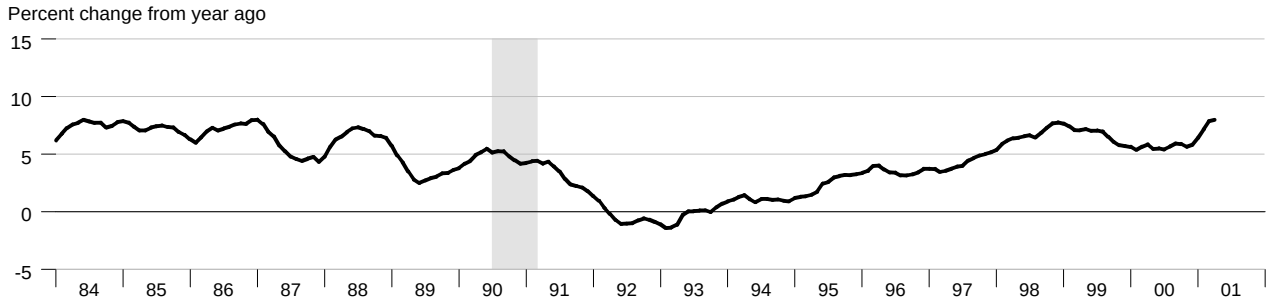
M2



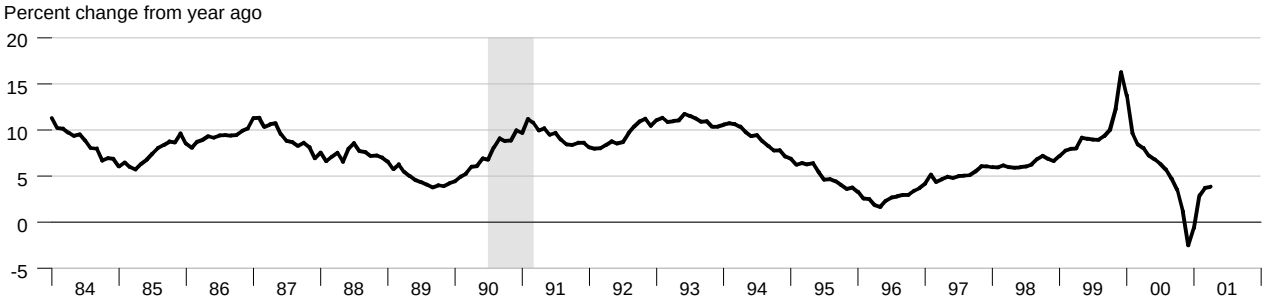
M3



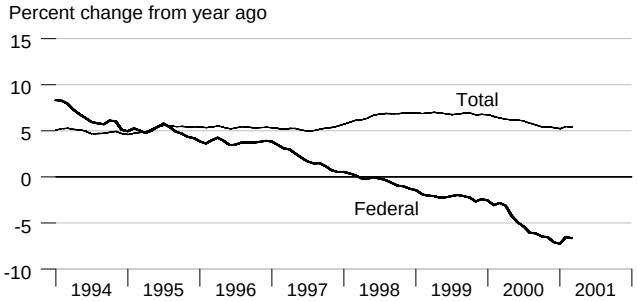
Monetary Services Index - M2



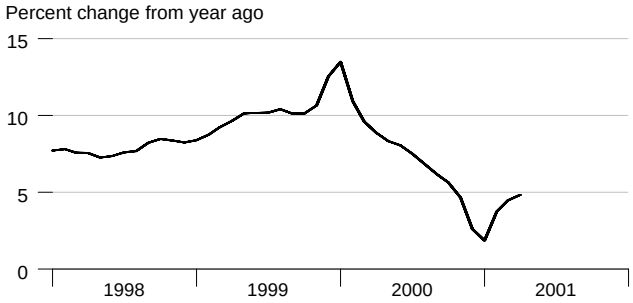
Adjusted Monetary Base



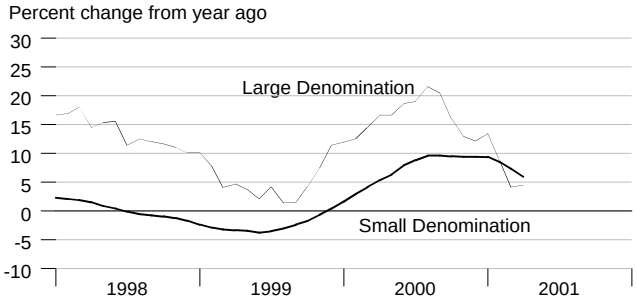
Domestic Nonfinancial Debt



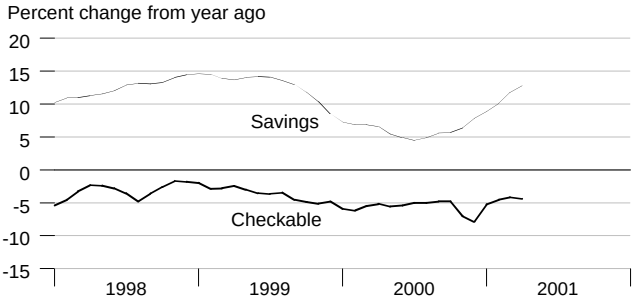
Currency Held by the Nonbank Public



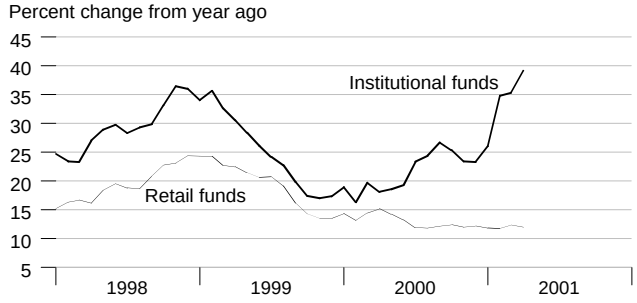
Time Deposits



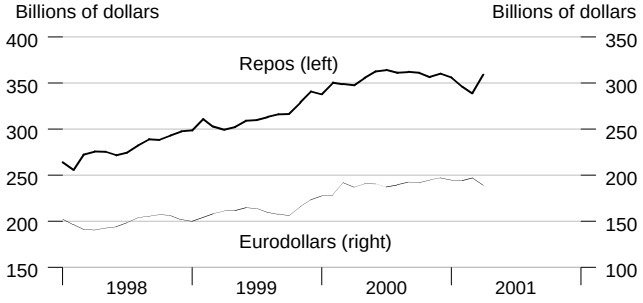
Checkable and Savings Deposits



Money Market Mutual Fund Shares

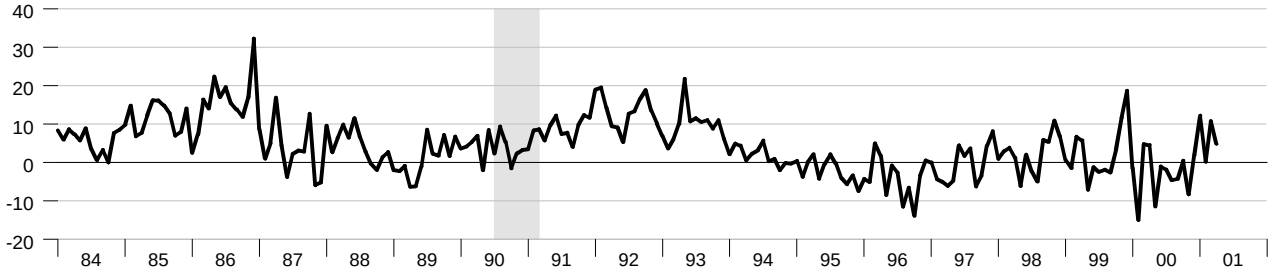


Repurchase Agreements and Eurodollars



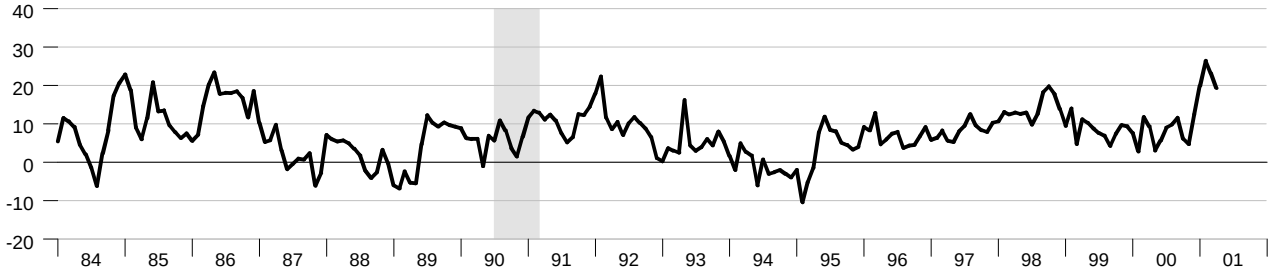
M1

Percent change at an annual rate



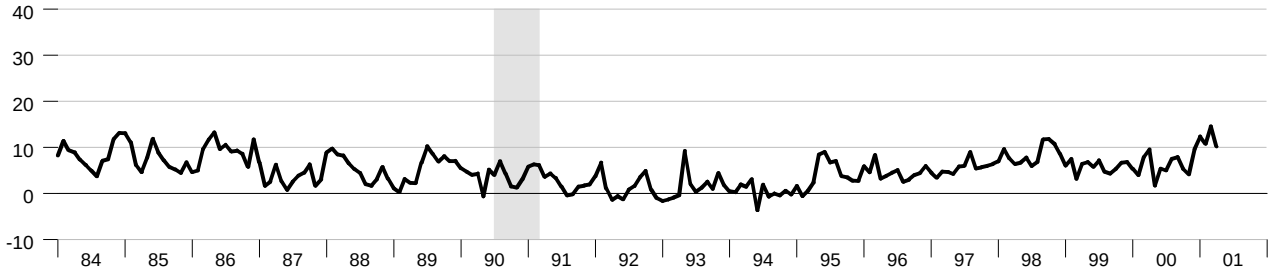
MZM

Percent change at an annual rate



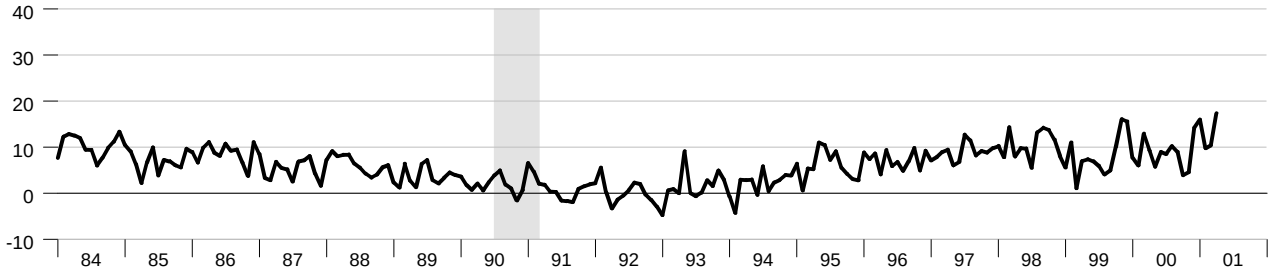
M2

Percent change at an annual rate

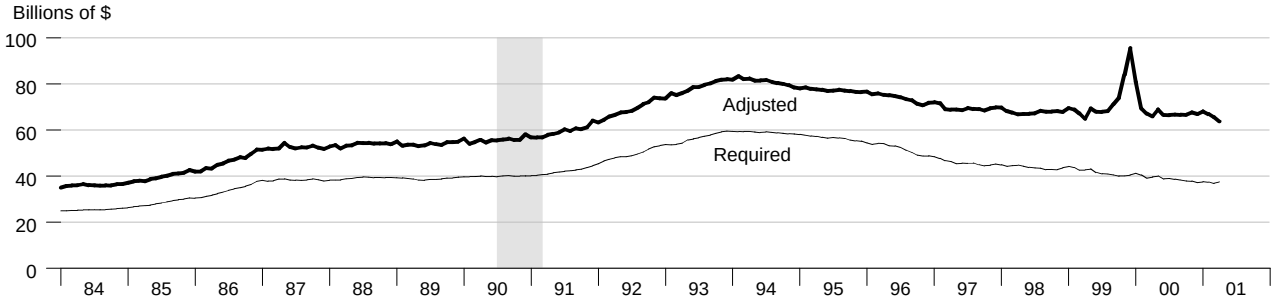


M3

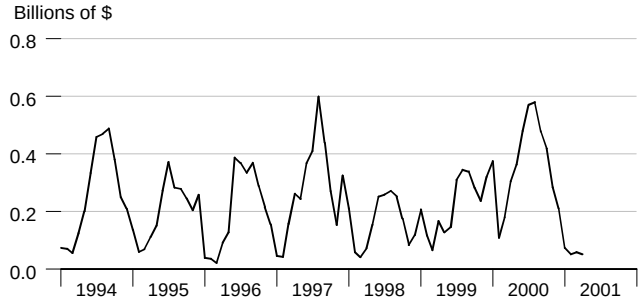
Percent change at an annual rate



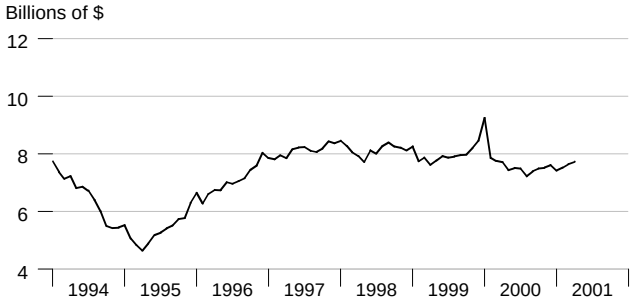
Adjusted and Required Reserves



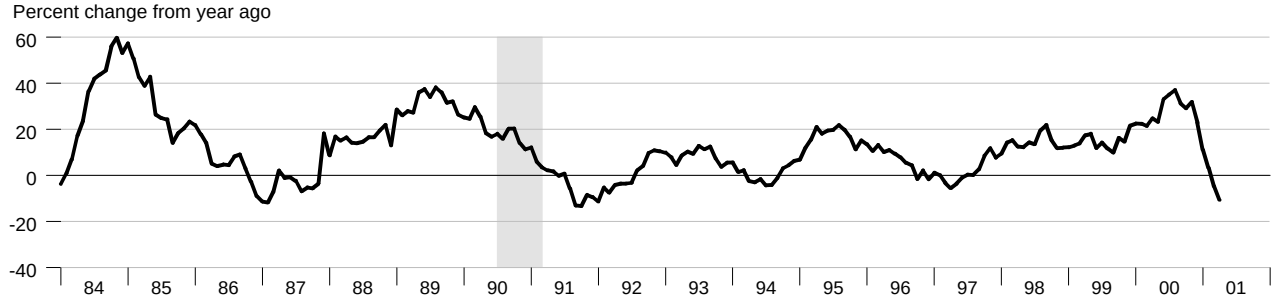
Total Borrowings, nsa



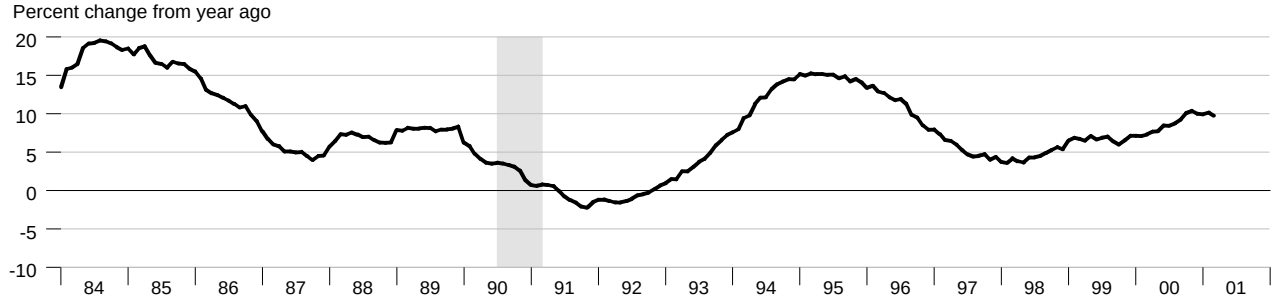
Excess Reserves plus RCB Contracts



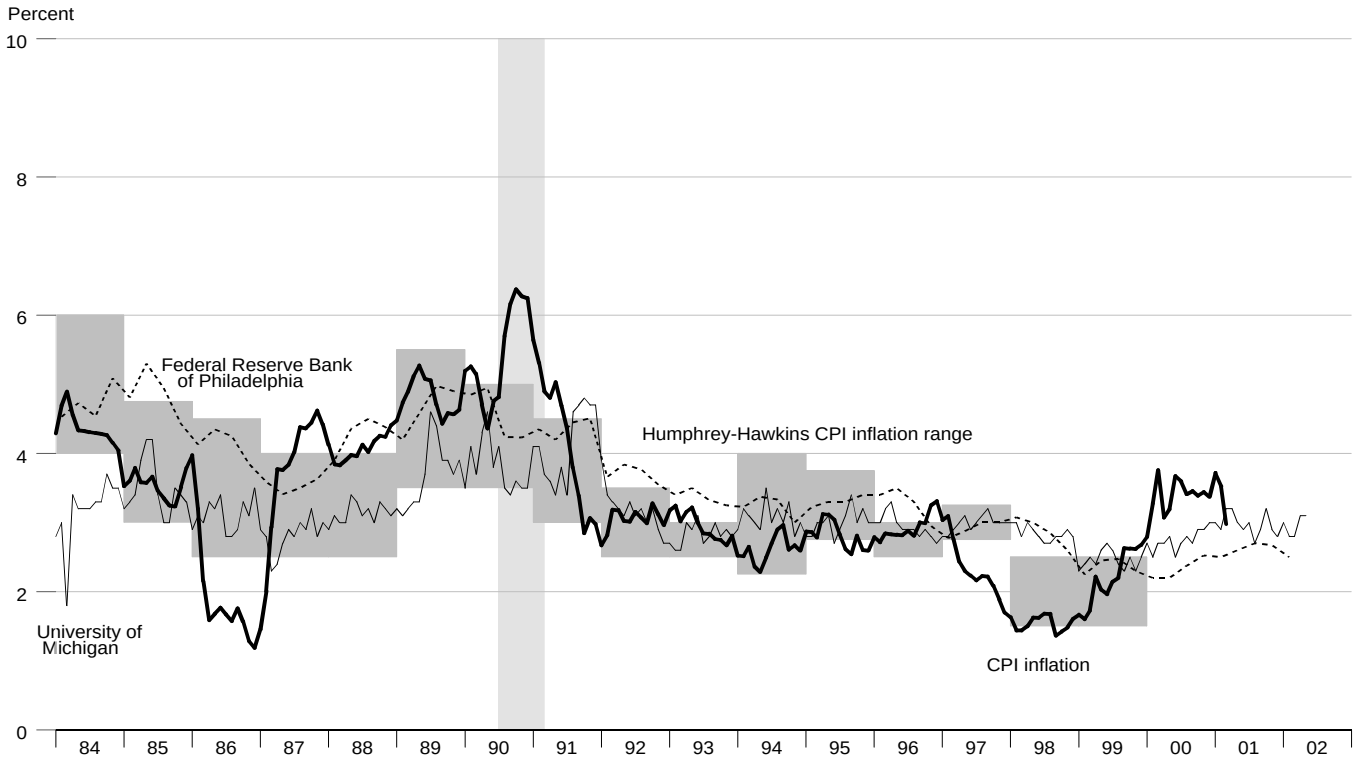
Nonfinancial Commercial Paper



Consumer Credit

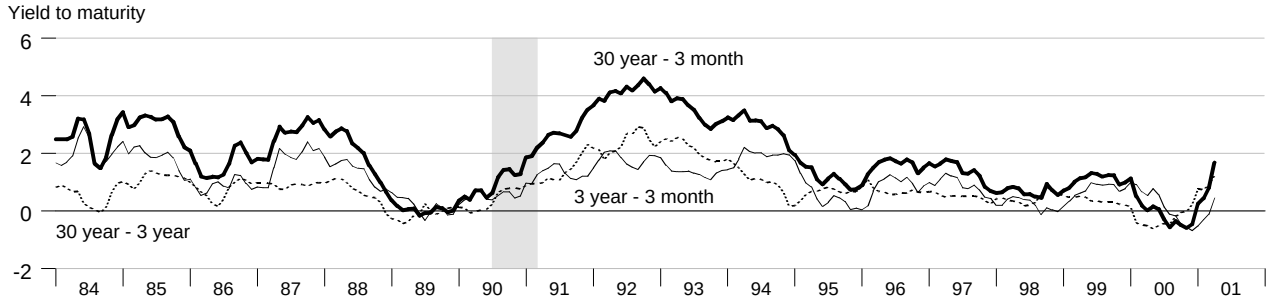


Inflation and Inflation Expectations

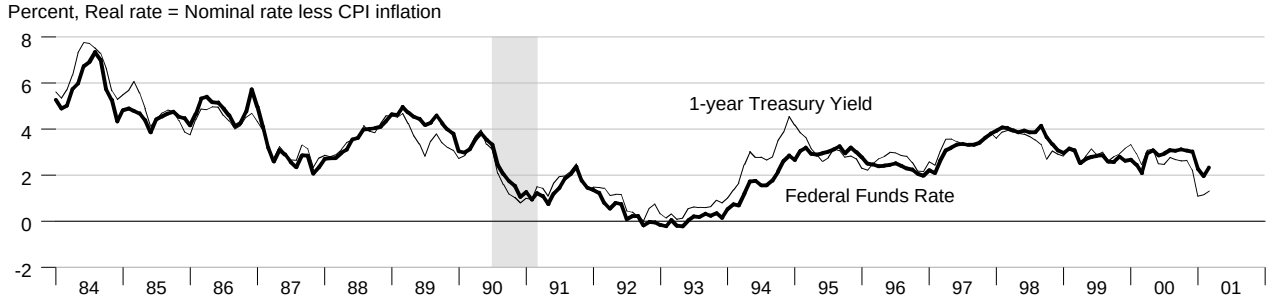


The shaded region shows the Humphrey-Hawkins CPI inflation range. Beginning in January 2000, the Humphrey-Hawkins inflation range was reported using the PCE price index and therefore is not shown on this graph. See page 19 for information.

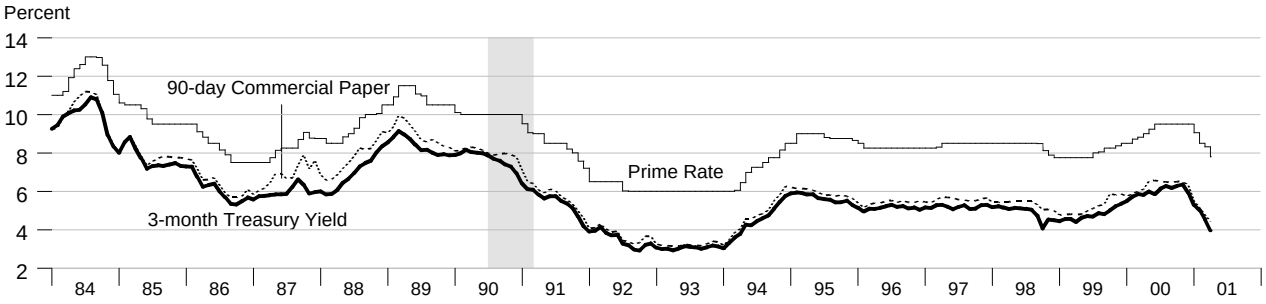
Treasury Security Yield Spreads



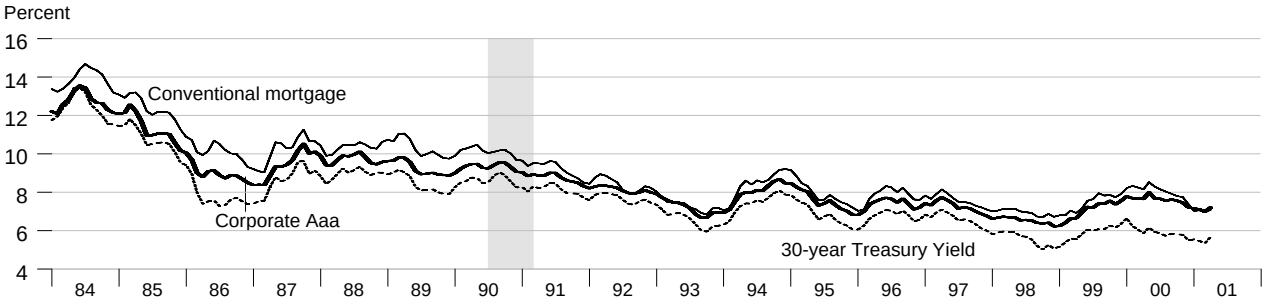
Real Interest Rates



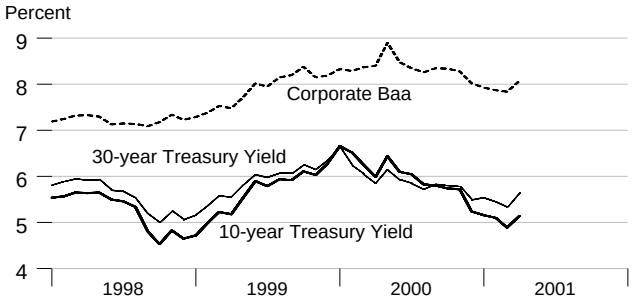
Short Term Interest Rates



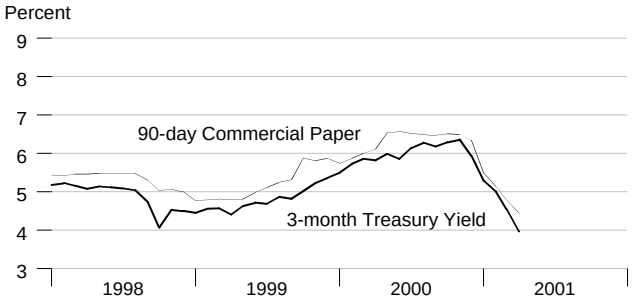
Long Term Interest Rates



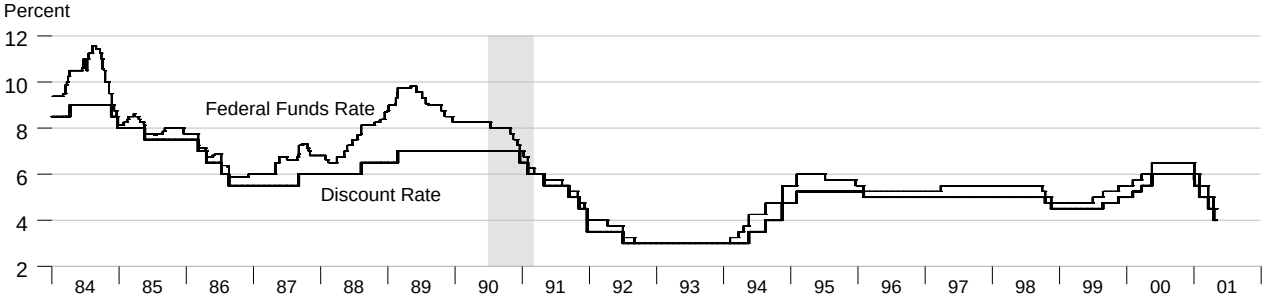
Long Term Interest Rates



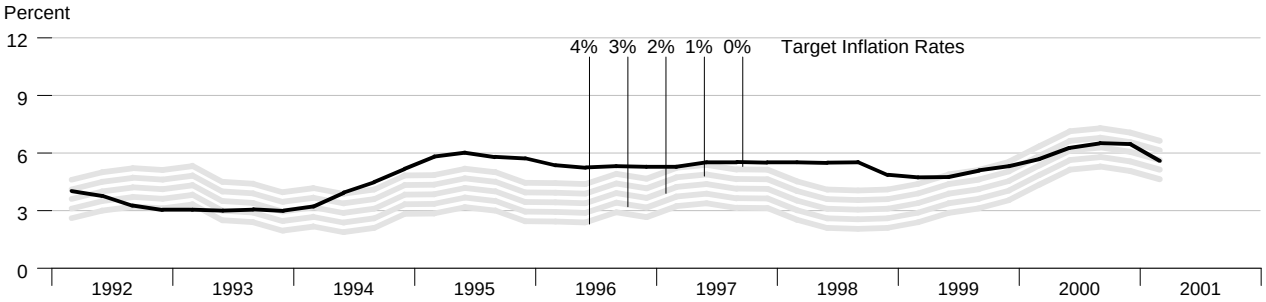
Short Term Interest Rates



FOMC Expected Federal Funds Rate and Discount Rate

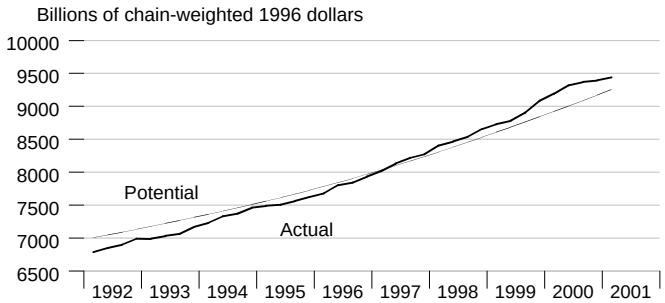


Federal Funds Rate and Inflation Targets

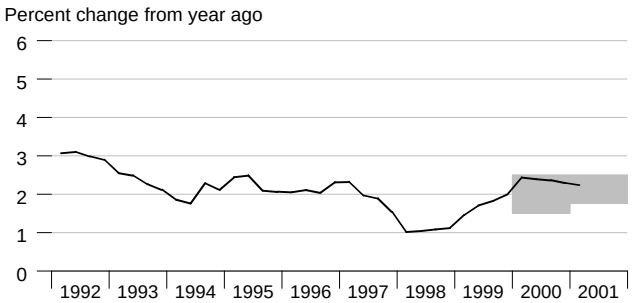


Calculated federal funds rate is based on Taylor's rule. See notes on page 19.

Actual and Potential Real GDP

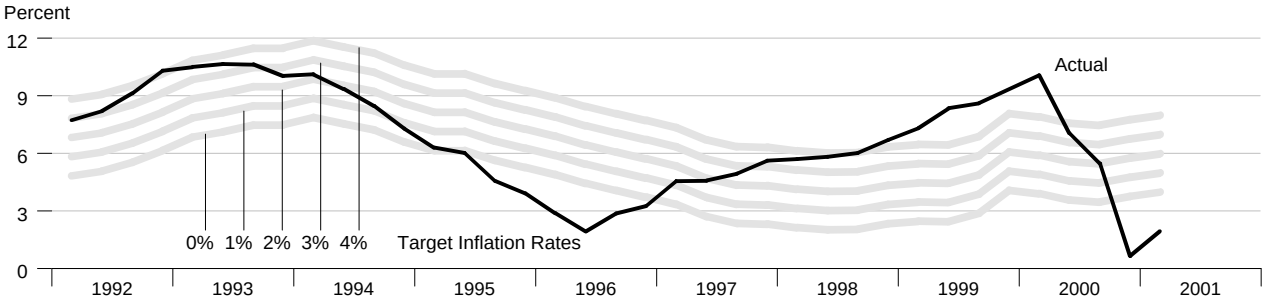


PCE Inflation and Projections



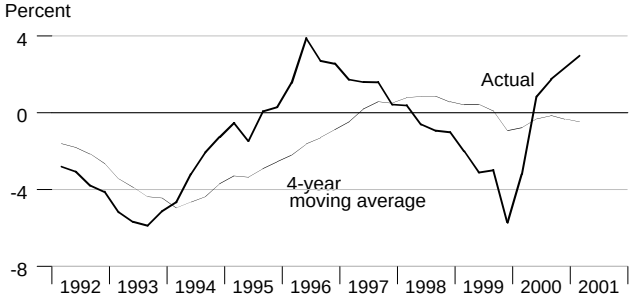
The shaded region shows the range of projections published in the Monetary Policy Report to Congress. See page 19 for information.

Monetary Base Growth* and Inflation Targets

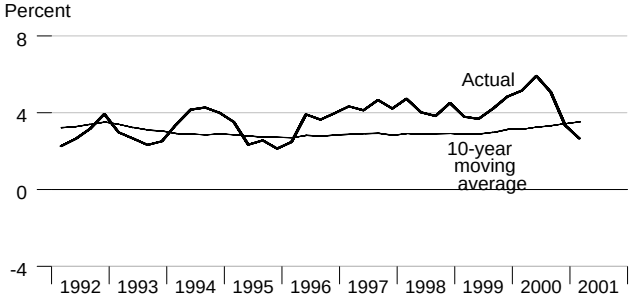


*Modified for the effects of sweeps programs on reserve demand.
Calculated base growth is based on McCallum's rule. Actual base growth is percent change from year ago. See notes on page 19.

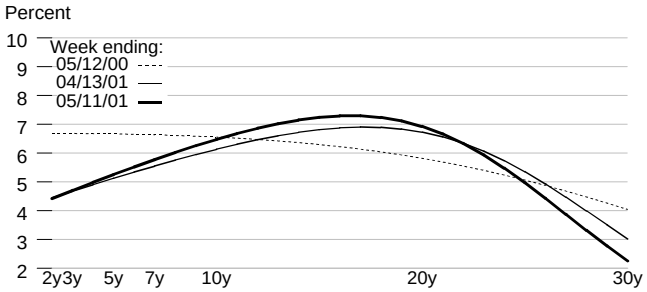
Monetary Base Velocity Growth



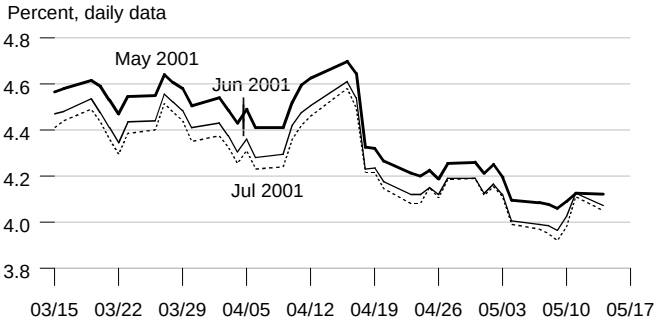
Real Output Growth



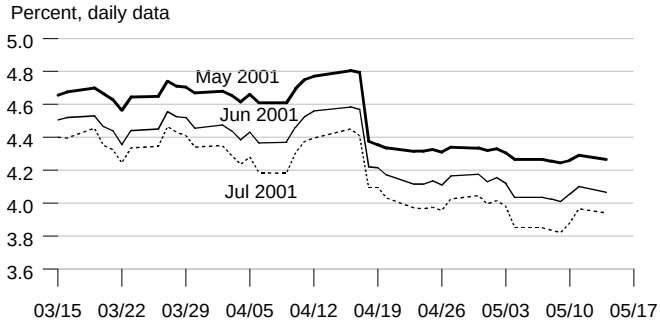
Implied One-Year Forward Rates



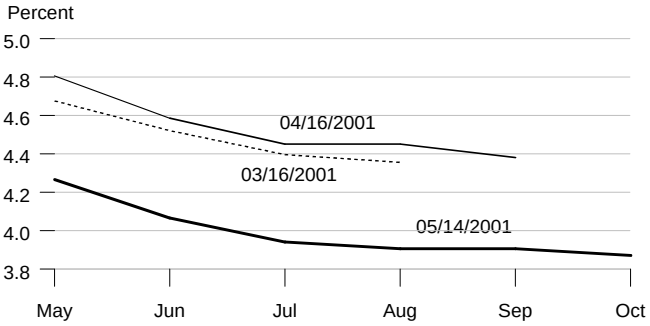
Rates on 3-Month Eurodollar Futures



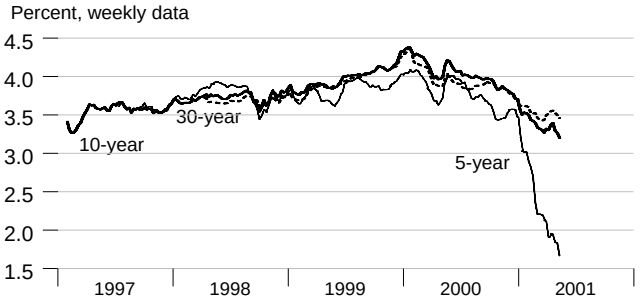
Rates on Selected Fed Funds Futures Contracts



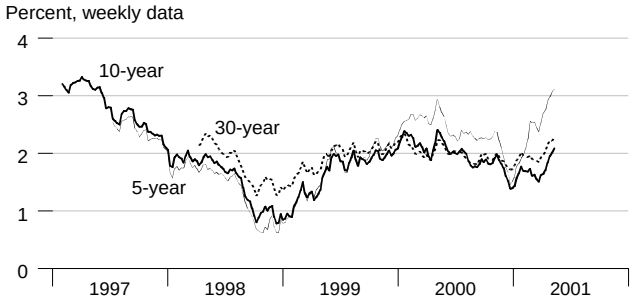
Implied Yields on Fed Funds Futures



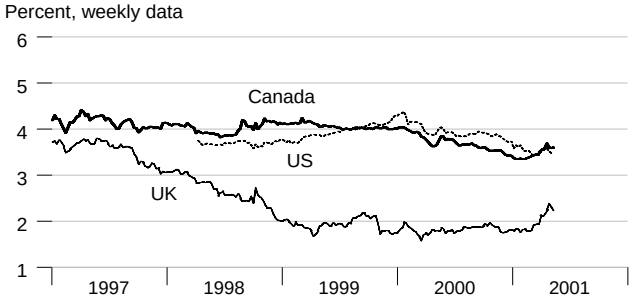
Inflation-Protected Treasury Yields



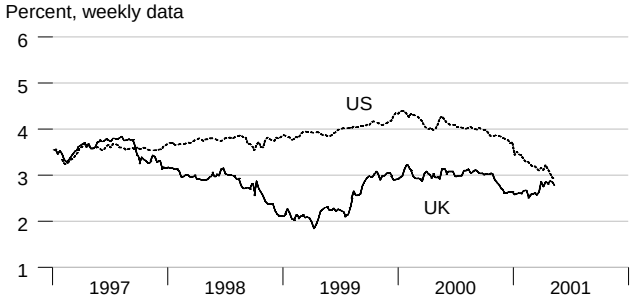
Inflation-Protected Treasury Yield Spreads



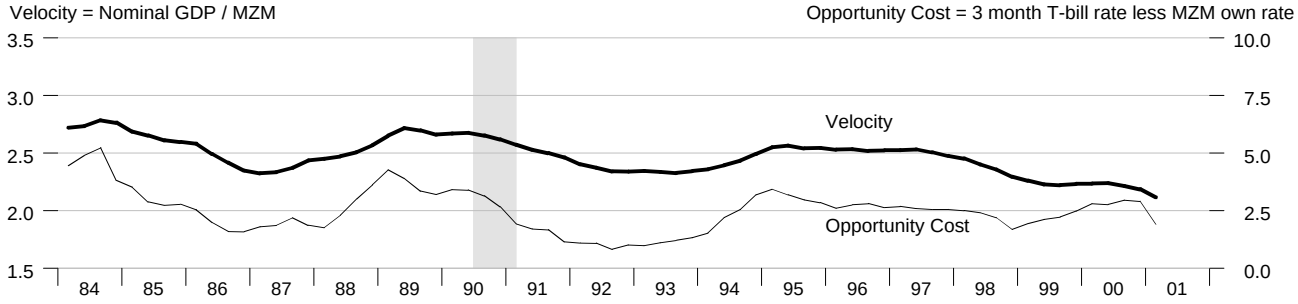
Inflation-Indexed 30-Year Bonds



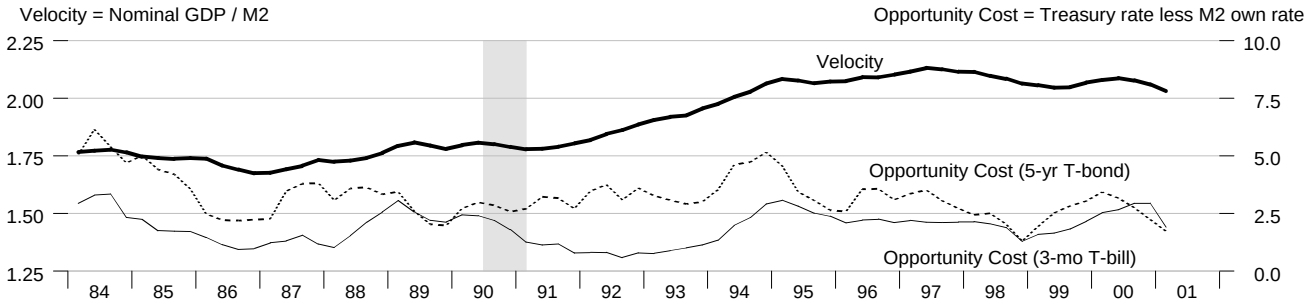
Inflation-Indexed 10-Year Bonds



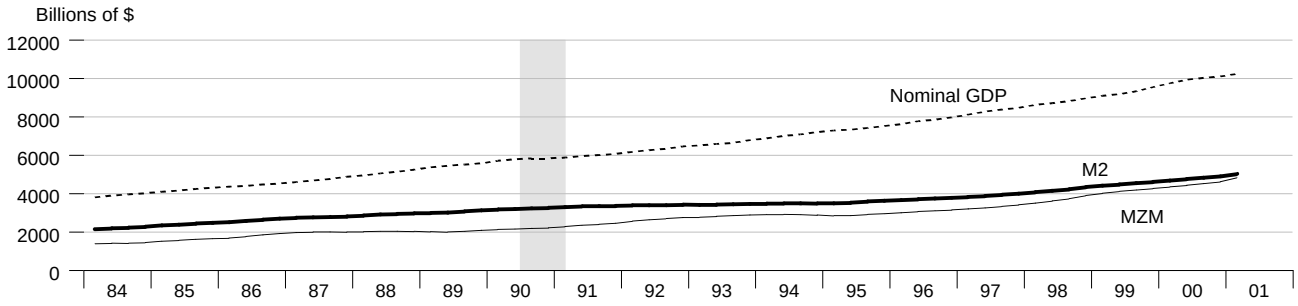
MZM Velocity and Opportunity Cost



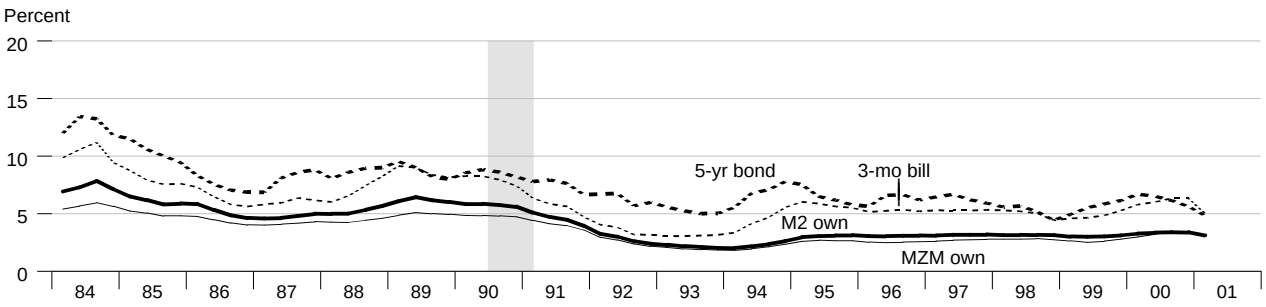
M2 Velocity and Opportunity Cost



M2, MZM and Nominal GDP

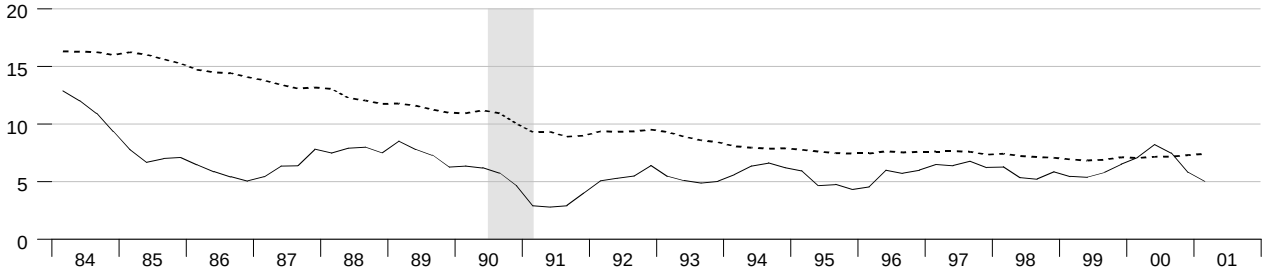


Interest Rates



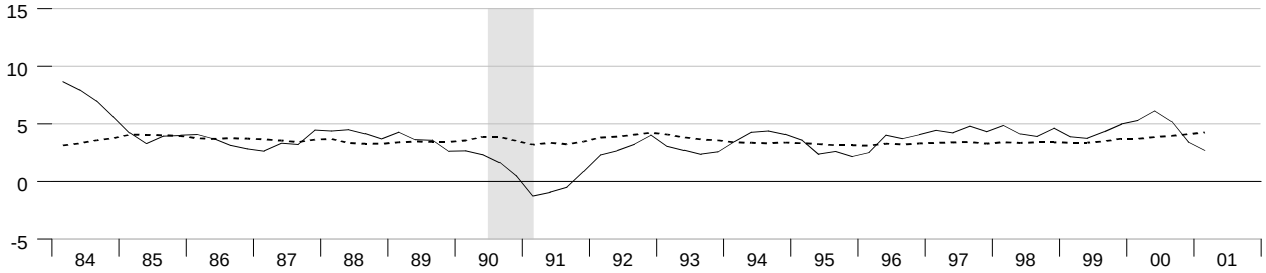
Gross Domestic Product

Percent change from year ago



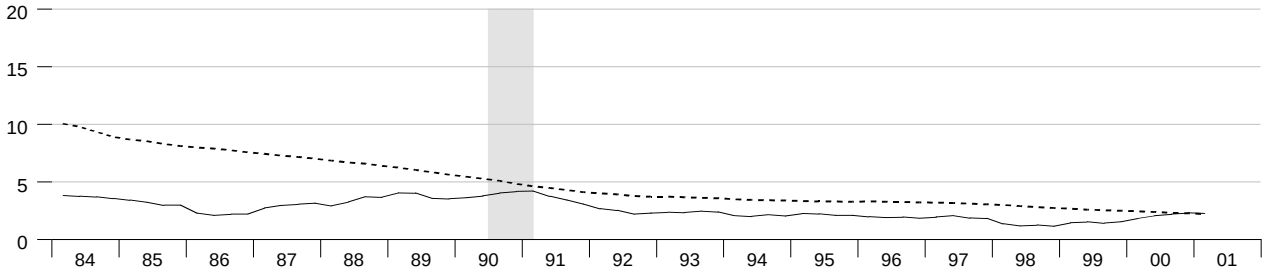
Real Gross Domestic Product

Percent change from year ago



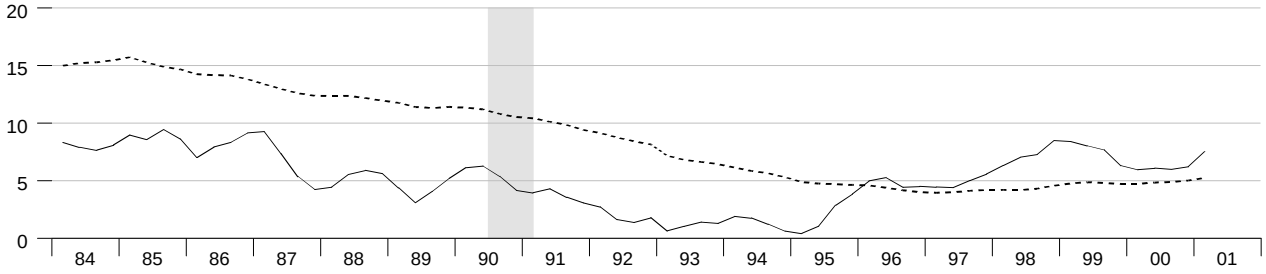
Gross Domestic Product Price Index

Percent change from year ago



M2

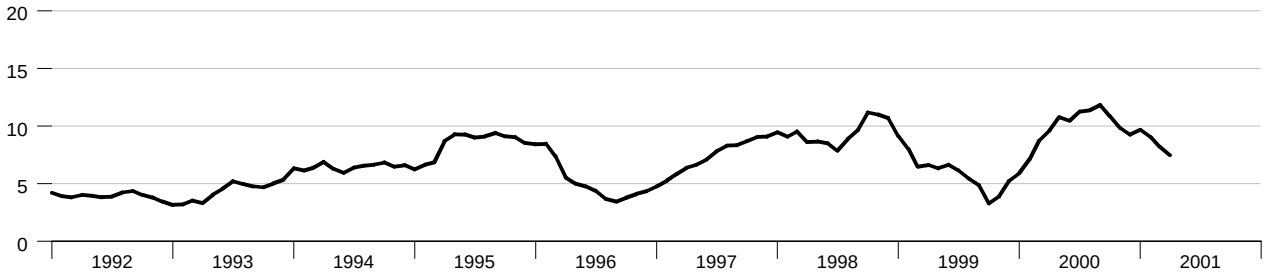
Percent change from year ago



Dashed lines indicate 10-year moving averages

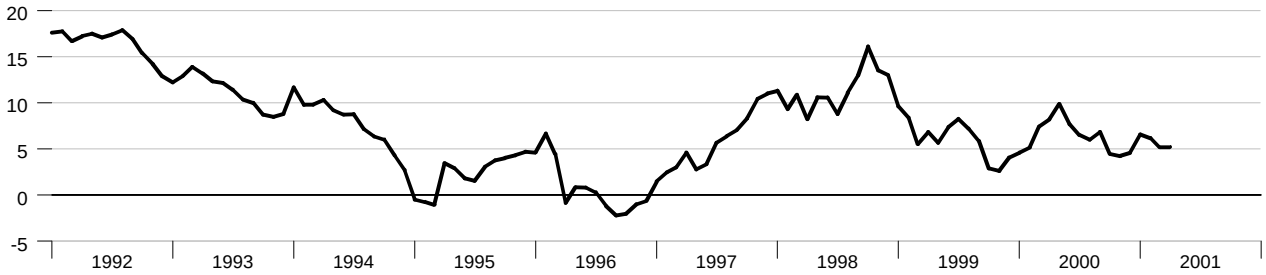
Bank Credit

Percent change from year ago



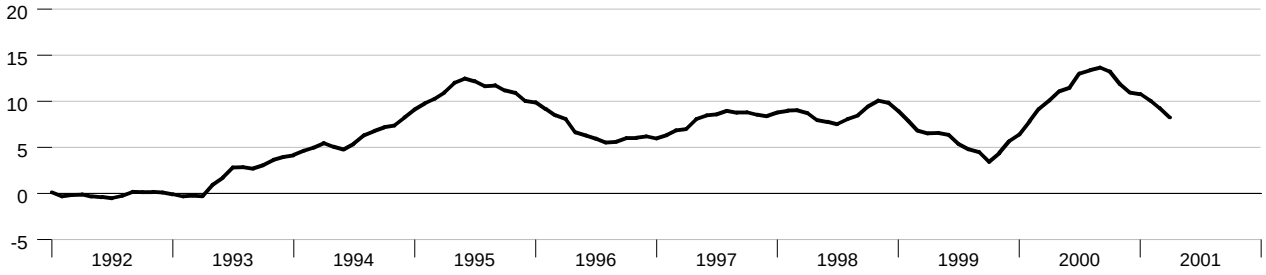
Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago



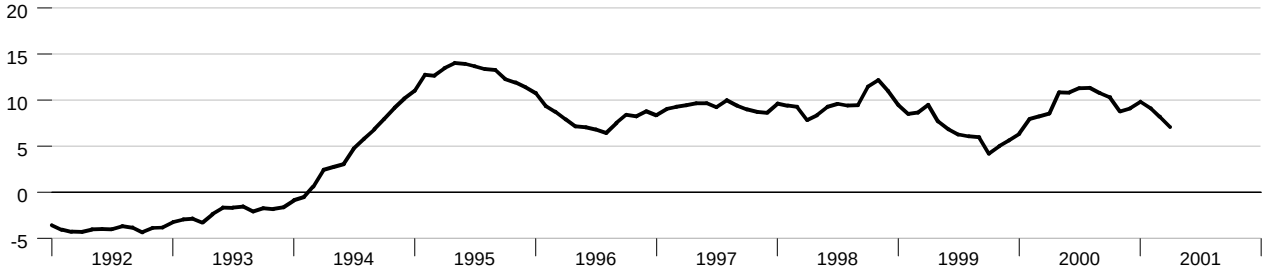
Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago

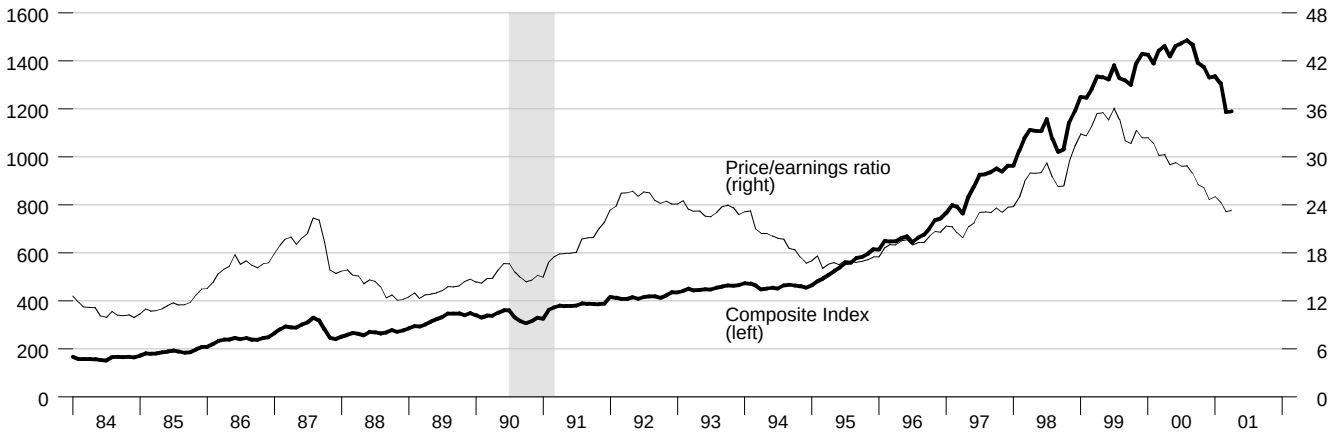


Commercial and Industrial Loans at Commercial Banks

Percent change from year ago



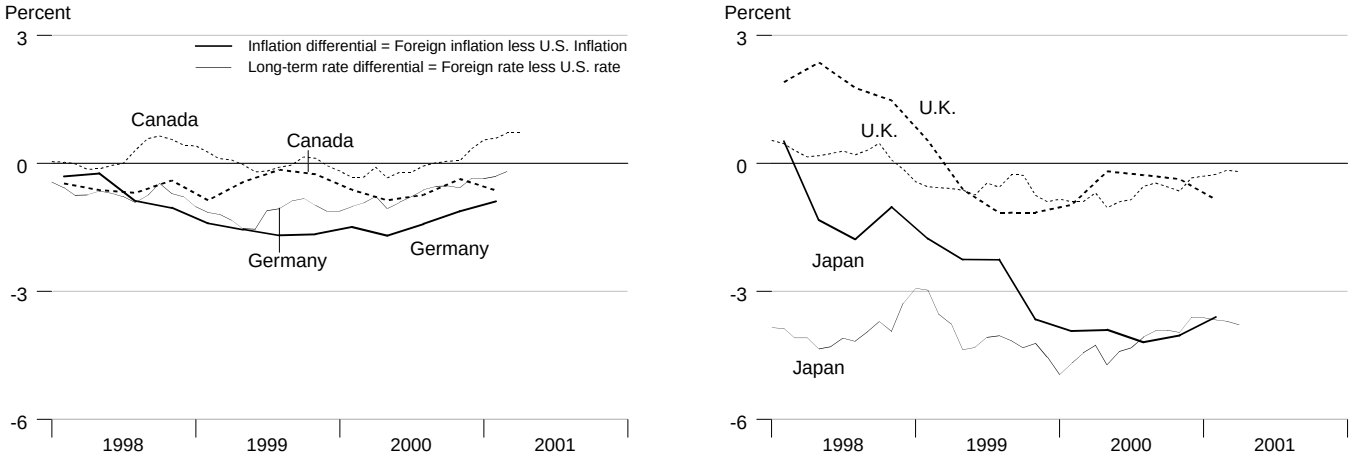
Standard and Poor's 500



Inflation and Long-Term Interest Rates

	Trend in Consumer Price Inflation Rates Percent change from year ago				Recent Long-Term Government Bond Rates Percent			
	2000Q2	2000Q3	2000Q4	2001Q1	Jan01	Feb01	Mar01	Apr01
United States	3.31	3.47	3.44	3.41	5.16	5.10	4.89	5.14
Canada	2.45	2.73	3.08	2.77	5.71	5.69	5.60	5.85
France	1.49	1.89	1.89	1.29	5.48	5.60	5.36	.
Germany	1.62	2.05	2.32	2.52	4.80	4.80	4.70	.
Italy	2.50	2.63	2.67	2.89	5.19	5.19	5.13	5.27
Japan	-0.59	-0.72	-0.59	-0.20	1.54	1.43	1.19	1.36
United Kingdom	3.13	3.20	3.07	2.55	4.86	4.84	4.73	4.95

Inflation and Long-Term Interest Rates Differentials



		Money Stock				Bank			
		M1	MZM	M2	M3	Credit	Monetary Base	Reserves	MSI M2
	1996	1105.818	3093.199	3738.999	4809.090	3685.328	455.572	73.952	217.454
	1997	1069.145	3315.632	3921.118	5203.986	3953.600	478.708	69.523	226.579
	1998	1079.795	3703.061	4207.085	5738.854	4326.699	508.942	67.808	241.598
	1999	1101.546	4160.720	4526.378	6251.415	4584.525	557.864	72.359	257.981
	2000	1104.054	4492.456	4800.887	6830.362	5031.560	590.823	68.271	272.568
1999	1	1098.625	4029.042	4427.907	6094.274	4517.116	536.334	68.521	252.727
	2	1102.740	4126.072	4493.084	6189.352	4527.988	545.912	67.392	256.180
	3	1095.559	4205.053	4560.659	6279.783	4585.423	557.969	69.050	259.730
	4	1109.259	4282.714	4623.862	6442.250	4707.571	591.242	84.473	263.287
2000	1	1114.900	4364.451	4691.482	6613.904	4844.278	593.096	72.385	266.767
	2	1109.873	4444.384	4766.544	6762.315	4993.116	586.041	67.093	270.537
	3	1099.791	4534.339	4833.998	6911.455	5112.085	589.062	66.577	274.457
	4	1091.651	4626.651	4911.525	7033.775	5176.759	595.094	67.029	278.513
2001	1	1104.721	4842.497	5044.749	7252.576	5278.789	604.766	66.835	285.840
1999	Apr	1107.502	4092.708	4468.843	6152.143	4509.164	539.608	64.898	254.960
	May	1100.945	4127.672	4494.313	6190.026	4519.522	548.331	69.334	256.240
	Jun	1099.774	4157.835	4516.095	6225.888	4555.277	549.796	67.944	257.340
	Jul	1097.526	4184.062	4543.190	6256.887	4556.345	553.060	67.879	258.720
	Aug	1095.763	4208.119	4561.128	6278.255	4585.933	556.711	68.158	259.740
	Sep	1093.388	4222.979	4577.659	6304.206	4613.990	564.135	71.113	260.730
	Oct	1096.442	4248.874	4598.039	6357.559	4643.458	572.989	73.928	261.850
	Nov	1107.078	4282.995	4623.578	6442.751	4704.630	588.669	84.017	263.240
	Dec	1124.256	4316.274	4649.968	6526.440	4774.626	612.068	95.475	264.770
2000	Jan	1122.785	4343.580	4670.788	6568.107	4802.296	604.790	80.818	265.840
	Feb	1108.758	4353.617	4686.415	6601.287	4842.698	589.978	69.252	266.510
	Mar	1113.156	4396.156	4717.242	6672.317	4887.841	584.520	67.084	267.950
	Apr	1117.322	4430.015	4754.815	6723.889	4941.649	583.046	65.907	269.870
	May	1106.647	4441.155	4761.686	6756.273	5005.832	587.857	68.883	270.230
	Jun	1105.649	4461.981	4783.132	6806.782	5031.868	587.219	66.490	271.510
	Jul	1103.947	4495.367	4803.272	6855.253	5069.262	588.034	66.457	272.740
	Aug	1099.681	4532.064	4833.422	6913.605	5107.476	588.446	66.674	274.440
	Sep	1095.745	4575.587	4865.300	6965.508	5159.517	590.705	66.599	276.190
	Oct	1096.127	4598.703	4887.047	6988.305	5147.505	593.067	66.589	277.280
	Nov	1088.532	4616.715	4904.128	7014.953	5166.434	595.554	67.591	278.100
	Dec	1090.293	4664.536	4943.399	7098.067	5216.337	596.661	66.907	280.160
2001	Jan	1101.324	4741.872	4994.342	7192.518	5266.893	600.908	68.020	282.910
	Feb	1101.499	4846.012	5039.366	7251.110	5280.625	607.157	66.889	285.610
	Mar	1111.339	4939.608	5100.538	7314.099	5288.848	606.234	65.596	289.000
	Apr	1115.808	5018.992	5143.998	7419.910	5310.644	605.500	63.732	291.410

*All values are given in billions of dollars

		Federal Funds	Discount Rate	Prime Rate	3-mo CDs	Treasury Yields 3 mo	3 yr	30 yr	Corporate Aaa Bonds	S & L Aaa Bonds	Conventional Mortgage
	1996	5.30	5.02	8.27	5.39	5.15	5.99	6.70	7.37	5.52	7.80
	1997	5.46	5.00	8.44	5.62	5.20	6.10	6.61	7.26	5.32	7.60
	1998	5.35	4.92	8.35	5.47	4.91	5.14	5.58	6.53	4.93	6.94
	1999	4.97	4.62	7.99	5.33	4.78	5.49	5.87	7.04	5.28	7.43
	2000	6.24	5.73	9.23	6.46	6.00	6.22	5.94	7.62	5.58	8.06
1999	1	4.73	4.50	7.75	4.90	4.53	4.87	5.37	6.42	4.87	6.88
	2	4.75	4.50	7.75	4.98	4.59	5.35	5.80	6.93	5.05	7.20
	3	5.09	4.60	8.10	5.38	4.79	5.71	6.04	7.33	5.42	7.80
	4	5.31	4.87	8.37	6.06	5.20	6.00	6.25	7.49	5.79	7.83
2000	1	5.68	5.19	8.69	6.03	5.70	6.56	6.30	7.71	5.82	8.26
	2	6.27	5.74	9.25	6.57	5.89	6.52	5.98	7.77	5.72	8.32
	3	6.52	6.00	9.50	6.63	6.20	6.16	5.80	7.61	5.45	8.03
	4	6.47	6.00	9.50	6.59	6.20	5.63	5.69	7.40	5.32	7.64
2001	1	5.59	5.11	8.62	5.26	4.95	4.64	5.44	7.08	5.03	7.01
1999	Apr	4.74	4.50	7.75	4.88	4.41	5.03	5.55	6.64	4.89	6.92
	May	4.74	4.50	7.75	4.92	4.63	5.33	5.81	6.93	5.05	7.15
	Jun	4.76	4.50	7.75	5.13	4.72	5.70	6.04	7.23	5.22	7.55
	Jul	4.99	4.50	8.00	5.24	4.69	5.62	5.98	7.19	5.24	7.63
	Aug	5.07	4.56	8.06	5.41	4.87	5.77	6.07	7.40	5.47	7.94
	Sep	5.22	4.75	8.25	5.50	4.82	5.75	6.07	7.39	5.56	7.82
	Oct	5.20	4.75	8.25	6.13	5.02	5.94	6.26	7.55	5.78	7.85
	Nov	5.42	4.86	8.37	6.00	5.23	5.92	6.15	7.36	5.77	7.74
	Dec	5.30	5.00	8.50	6.05	5.36	6.14	6.35	7.55	5.82	7.91
2000	Jan	5.46	5.00	8.50	5.95	5.50	6.49	6.63	7.78	5.91	8.21
	Feb	5.73	5.24	8.73	6.01	5.73	6.65	6.23	7.68	5.88	8.33
	Mar	5.85	5.34	8.83	6.14	5.86	6.53	6.05	7.68	5.68	8.24
	Apr	6.02	5.50	9.00	6.28	5.82	6.36	5.85	7.64	5.60	8.15
	May	6.27	5.71	9.24	6.71	5.99	6.77	6.15	7.99	5.87	8.52
	Jun	6.53	6.00	9.50	6.73	5.86	6.43	5.93	7.67	5.69	8.29
	Jul	6.54	6.00	9.50	6.67	6.14	6.28	5.85	7.65	5.53	8.15
	Aug	6.50	6.00	9.50	6.61	6.28	6.17	5.72	7.55	5.43	8.03
	Sep	6.52	6.00	9.50	6.60	6.18	6.02	5.83	7.62	5.40	7.91
	Oct	6.51	6.00	9.50	6.67	6.29	5.85	5.80	7.55	5.46	7.80
	Nov	6.51	6.00	9.50	6.65	6.36	5.79	5.78	7.45	5.38	7.75
	Dec	6.40	6.00	9.50	6.45	5.94	5.26	5.49	7.21	5.11	7.38
2001	Jan	5.98	5.52	9.05	5.62	5.29	4.77	5.54	7.15	4.99	7.03
	Feb	5.49	5.00	8.50	5.26	5.01	4.71	5.45	7.10	5.09	7.05
	Mar	5.31	4.81	8.32	4.89	4.54	4.43	5.34	6.98	5.00	6.95
	Apr	4.80	4.28	7.80	4.53	3.97	4.42	5.65	7.20		7.08

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

		M1	MZM	M2	M3
Percent change from previous period					
	1996	-3.21	6.56	4.79	6.75
	1997	-3.32	7.19	4.87	8.21
	1998	1.00	11.68	7.29	10.28
	1999	2.01	12.36	7.59	8.93
	2000	0.23	7.97	6.06	9.26
1999	1	0.83	2.98	1.80	1.89
	2	0.37	2.41	1.47	1.56
	3	-0.65	1.91	1.50	1.46
	4	1.25	1.85	1.39	2.59
2000	1	0.51	1.91	1.46	2.66
	2	-0.45	1.83	1.60	2.24
	3	-0.91	2.02	1.42	2.21
	4	-0.74	2.04	1.60	1.77
2001	1	1.20	4.67	2.71	3.11
1999	Apr	0.48	0.93	0.54	0.58
	May	-0.59	0.85	0.57	0.62
	Jun	-0.11	0.73	0.48	0.58
	Jul	-0.20	0.63	0.60	0.50
	Aug	-0.16	0.57	0.39	0.34
	Sep	-0.22	0.35	0.36	0.41
	Oct	0.28	0.61	0.45	0.85
	Nov	0.97	0.80	0.56	1.34
	Dec	1.55	0.78	0.57	1.30
2000	Jan	-0.13	0.63	0.45	0.64
	Feb	-1.25	0.23	0.33	0.51
	Mar	0.40	0.98	0.66	1.08
	Apr	0.37	0.77	0.80	0.77
	May	-0.96	0.25	0.14	0.48
	Jun	-0.09	0.47	0.45	0.75
	Jul	-0.15	0.75	0.42	0.71
	Aug	-0.39	0.82	0.63	0.85
	Sep	-0.36	0.96	0.66	0.75
	Oct	0.03	0.51	0.45	0.33
	Nov	-0.69	0.39	0.35	0.38
	Dec	0.16	1.04	0.80	1.18
2001	Jan	1.01	1.66	1.03	1.33
	Feb	0.02	2.20	0.90	0.81
	Mar	0.89	1.93	1.21	0.87
	Apr	0.40	1.61	0.85	1.45

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). Due to distortions caused by regulatory changes, the largest of which the introduction of money market accounts, data for MZM begin March 1983 in this publication.

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 firms except depository institutions and money market mutual funds.

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 http://www.stls.frb.org/research/newbase.html.

Monetary Services Index: an index which 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 http://www.stls.frb.org/research/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 http://www.stls.frb.org/research/swdata.html. For analytical purposes, MZM largely replaces M1. The **Discount Rate** and **Expected 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. **Treasury Yield Curve** shows constant maturity yields calculated by the U.S. Treasury Department for securities with 3 months and 1, 2, 3, 5, 7,10, 20 and 30 years to maturity. Daily data and a description are available at http://www.stls.frb.org/fred/data/wkly.html. See also *Federal Reserve Bulletin*, table 1.35.

Page 5: **Total Checkable Deposits** is the sum of demand and other checkable deposits. **Total Savings Deposits** is the sum of money market deposit accounts (MMDA), 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 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 CPI for all urban consumers. **Real Interest Rates** are ex post measures, equal to nominal rates minus CPI inflation.

Page 9: **FOMC Expected Federal Funds Rate** is the level (or midpoint of the range, if applicable) of the federal funds rate that the staff of the Federal Open Market Committee expected to be consistent with the desired degree of pressure on bank reserve positions.

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), y_{t-1} is the log of the previous period's level of real GDP, and y_{t-1}^P is the log of an estimate of the previous period's level of potential output. **Potential real output** 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

http://www.stls.frb.org/research/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 $m = 1,...,$ 30 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)

$$f(m) = [D(m)R(m) - D(m\text{-}1)] / [D(m) - D(m\text{-}1)]$$

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. 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 Yield Spreads** equal, for 5, 10, and 30 year maturities, the difference between the Treasury constant maturity yield and the yield on the most recently issued inflation-protected security. **Inflation-Indexed Bonds** for Canada are the 31-year bond with a maturity date of 12/01/2026; for the U.K., the 37.5-year bond with a maturity date of 07/17/2024 and the 12.1-year bond with a maturity date of 10/21/2004; and, for the U.S., the 30-year bond with a maturity date of 04/15/2028 and the 10-year bond with a maturity date of 01/15/2007.

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 1992 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 1992 dollars.

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

Sources

Bank of Canada
Canadian inflation-linked bond yields.

Bank of England
U.K. inflation-linked bond yields.

Board of Governors of the Federal Reserve System
Monetary aggregates and components, nonfinancial debt: 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 and G.13 releases; nonfinancial commercial paper: Board of Governors web site; M2 and MZM own rates.

Bureau of Economic Analysis
Gross domestic product.

Bureau of Labor Statistics
Consumer price index.

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

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

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

University of Michigan Survey Research Center
Median expected price change.

Congressional Budget Office
Potential real GDP.

Dow Jones and Co. (Wall Street Journal)
Federal funds futures contracts, Eurodollar futures.

Standard and Poors Inc.
Stock price-earnings ratio, stock price composite index.

U.S. Department of the Treasury
U.S. inflation-protected security yields.

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Note: Articles from this Bank's *Review* are available on the Internet at www.stls.frb.org/research/index.html.