Monetary *Trends*

February 2013

This publication contains charts and tables
compiled by the Data Desk staff
of the Federal Reserve Bank of St. Louis.

The data are related to U.S. monetary and financial conditions,
with an emphasis on various measures of the monetary policy stance.

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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: $[(x_\tau/x_{\tau-1})-1]\times 1200$. 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: $[(x_\tau/x_{\tau-12})-1]\times 100$.

We welcome your comments addressed to:

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

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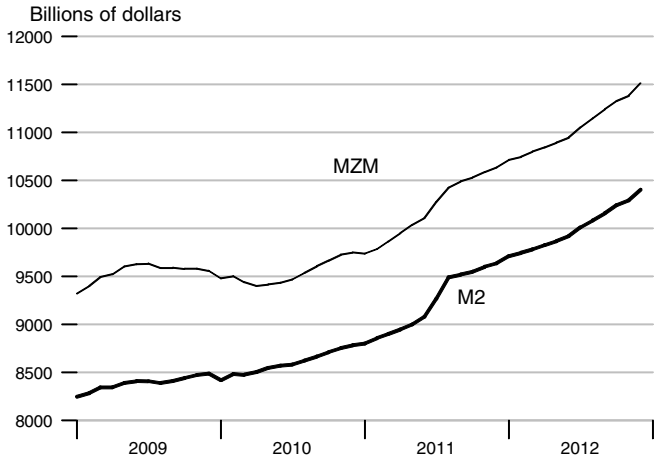
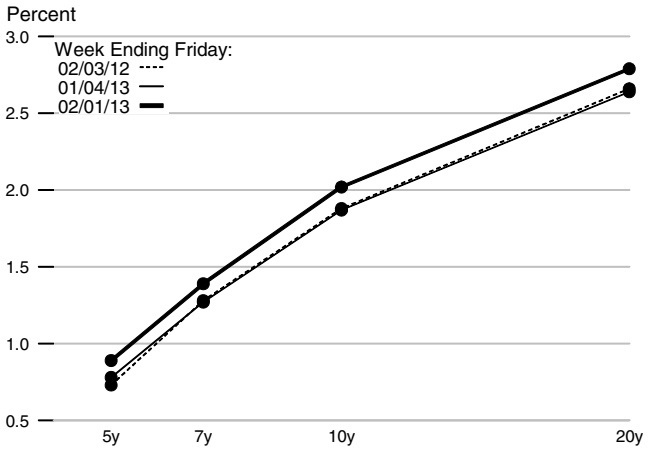
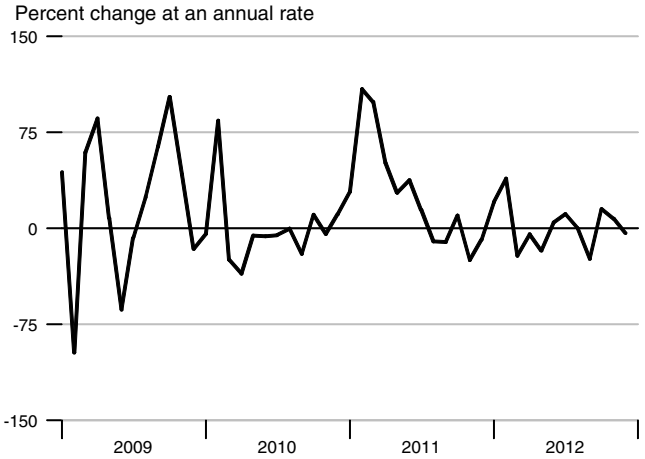
M2 and MZM



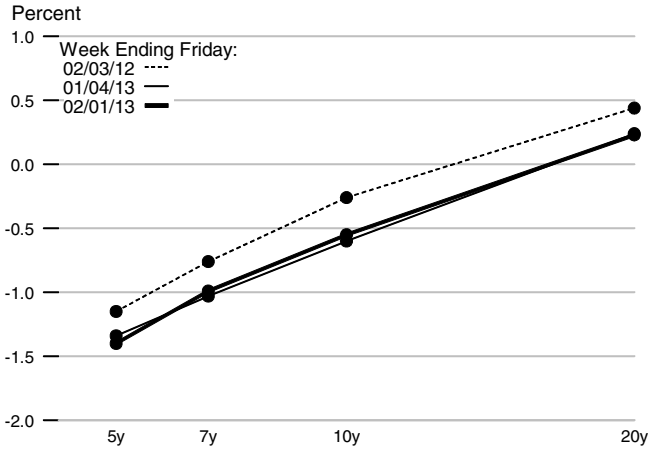
Treasury Yield Curve



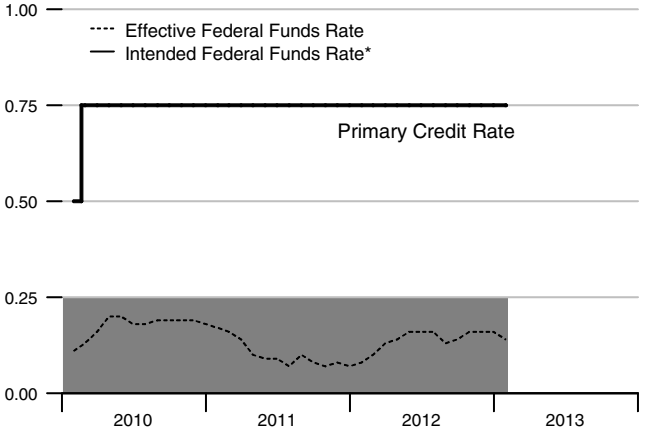
Adjusted Monetary Base



Real Treasury Yield Curve

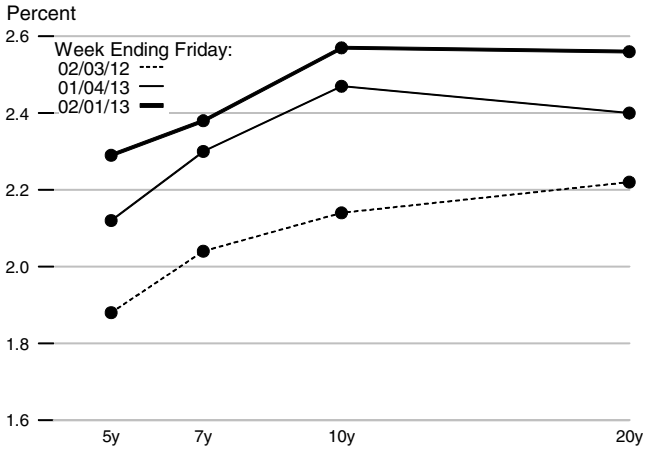


Reserve Market Rates



*Note: Effective December 16, 2008, FOMC reports the Intended Federal Funds Rate as a range. Currently, Intended Federal Funds Rate is not plotted on this chart due to the note above.

Inflation-Indexed Treasury Yield Spreads

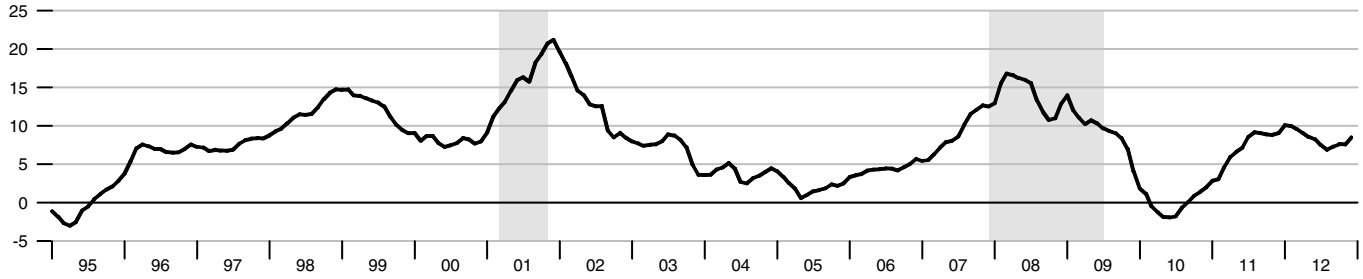


M1

Percent change from year ago

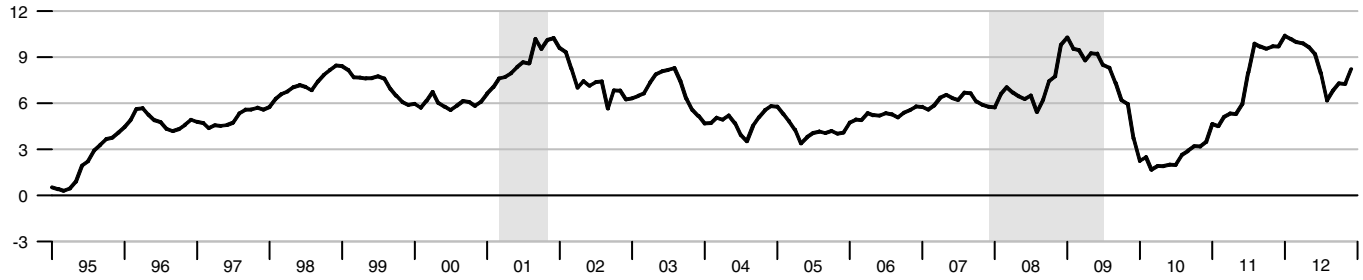
MZM

Percent change from year ago



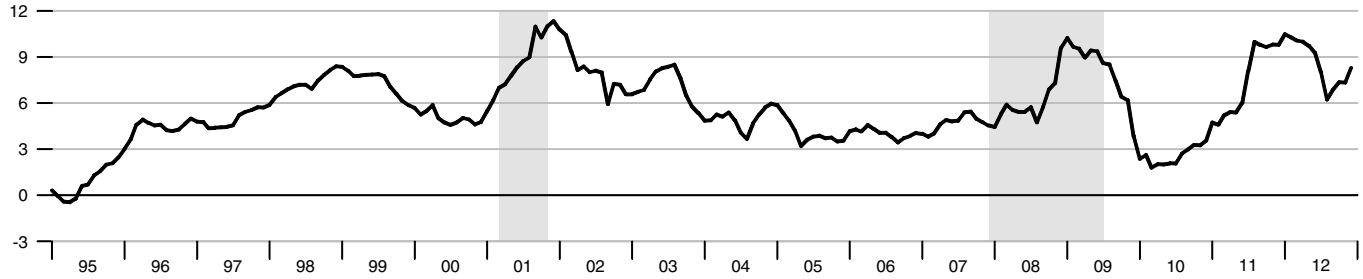
M2

Percent change from year ago



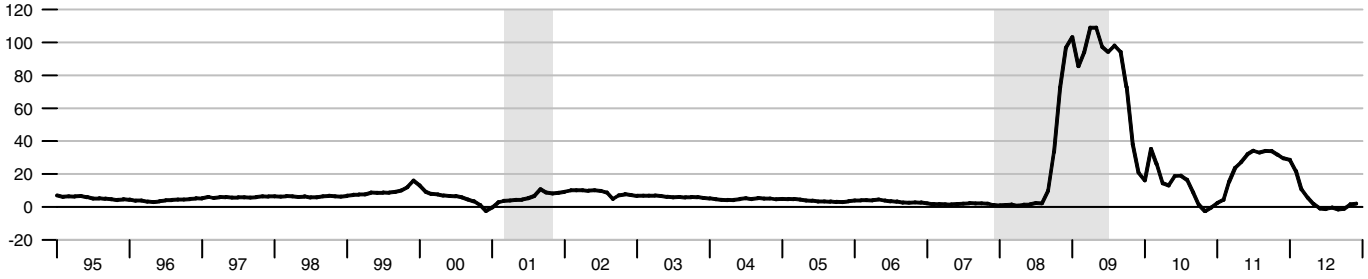
Monetary Services Index - M2

Percent change from year ago



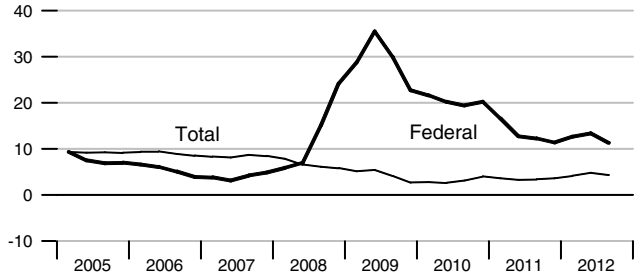
Adjusted Monetary Base

Percent change from year ago



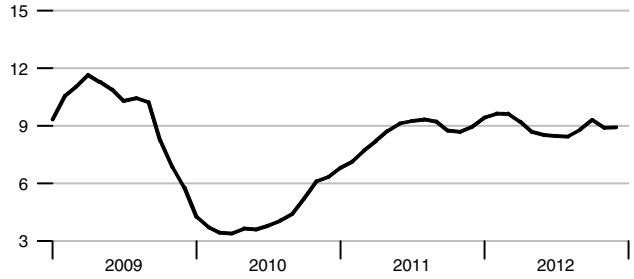
Domestic Nonfinancial Debt

Percent change from year ago



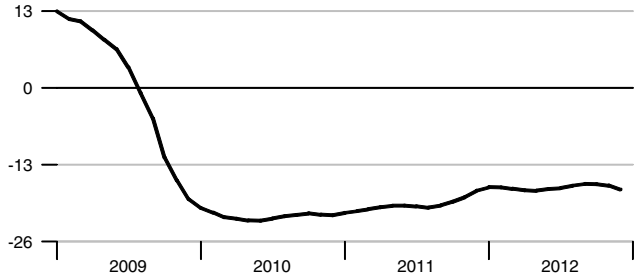
Currency Held by the Nonbank Public

Percent change from year ago



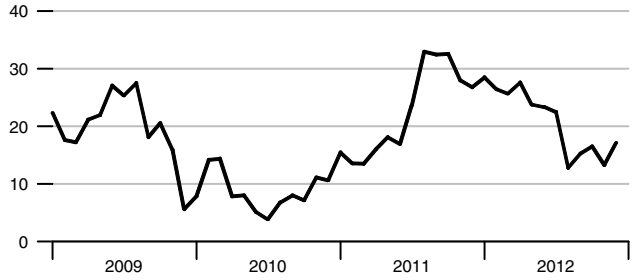
Small Denomination Time Deposits

Percent change from year ago



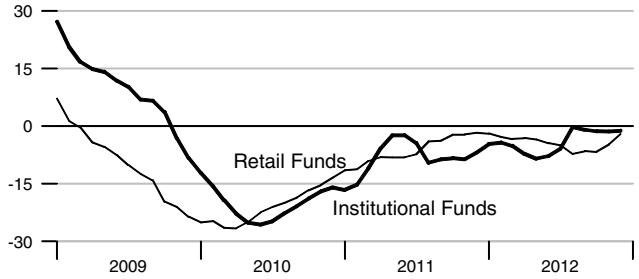
Checkable Deposits

Percent change from year ago



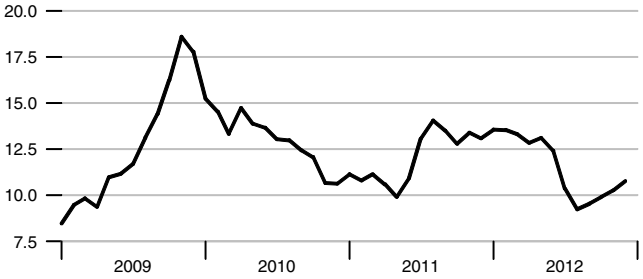
Money Market Mutual Fund Shares

Percent change from year ago



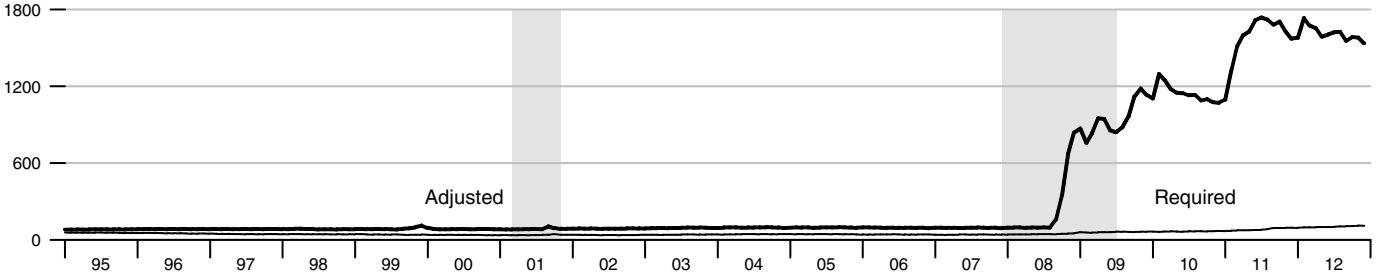
Savings Deposits

Percent change from year ago



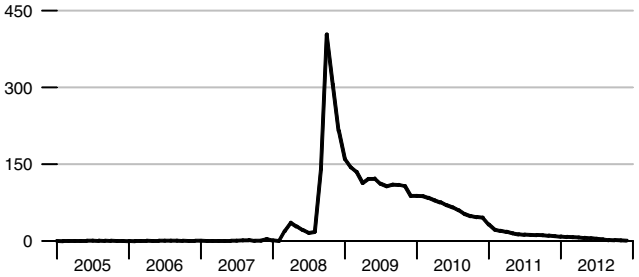
Adjusted and Required Reserves

Billions of dollars



Total Borrowings, nsa

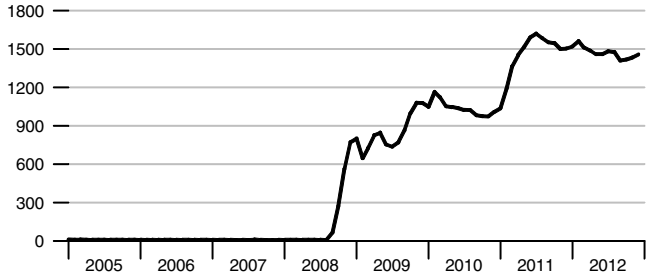
Billions of dollars



* Data exclude term auction credit

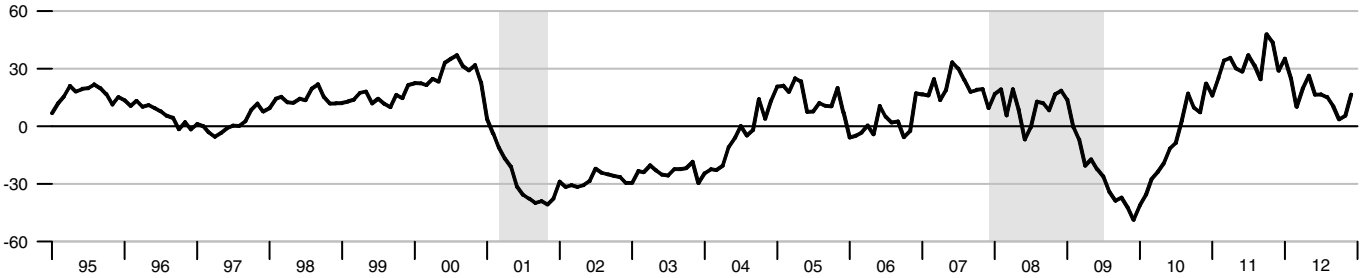
Excess Reserves plus RCB Contracts

Billions of dollars



Nonfinancial Commercial Paper

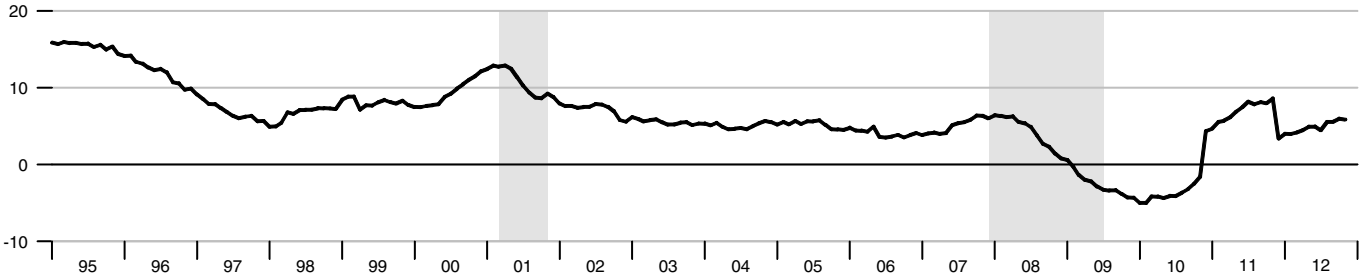
Percent change from year ago



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

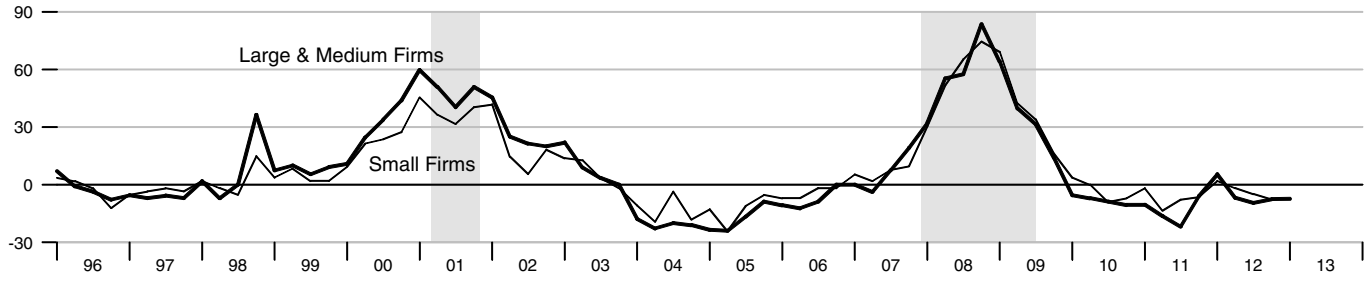
Consumer Credit

Percent change from year ago



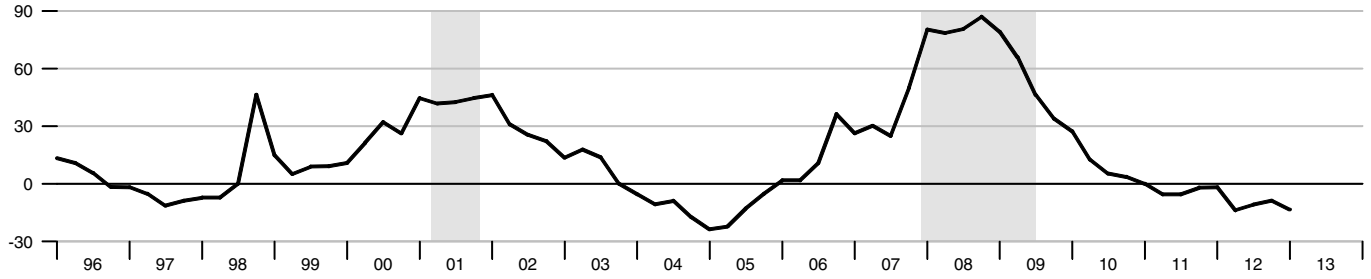
Net Percentage of Domestic Banks Tightening Standards for Commercial and Industrial Loans

Percentage



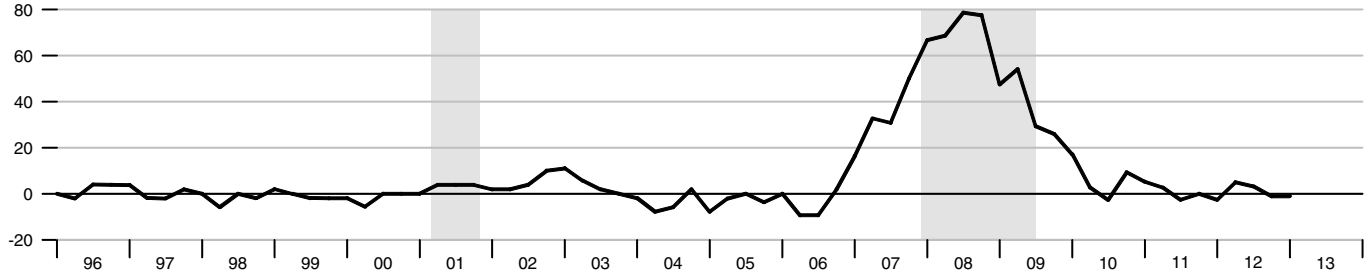
Net Percentage of Domestic Banks Tightening Standards for Commercial Real Estate Loans

Percentage



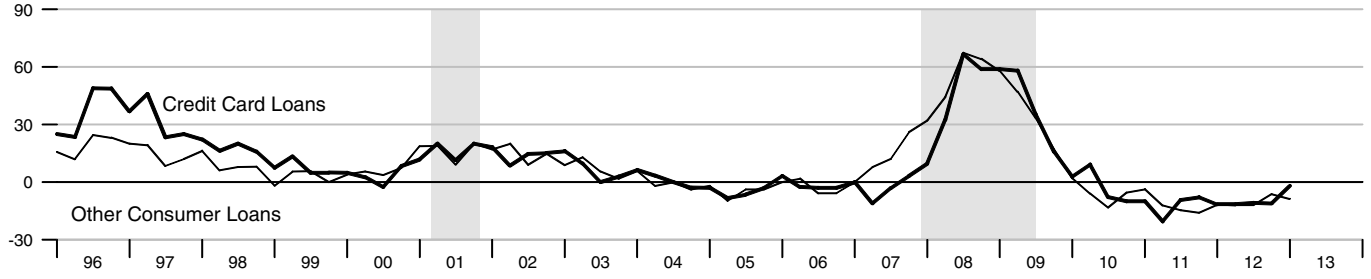
Net Percentage of Domestic Banks Tightening Standards for Residential Mortgage Loans

Percentage



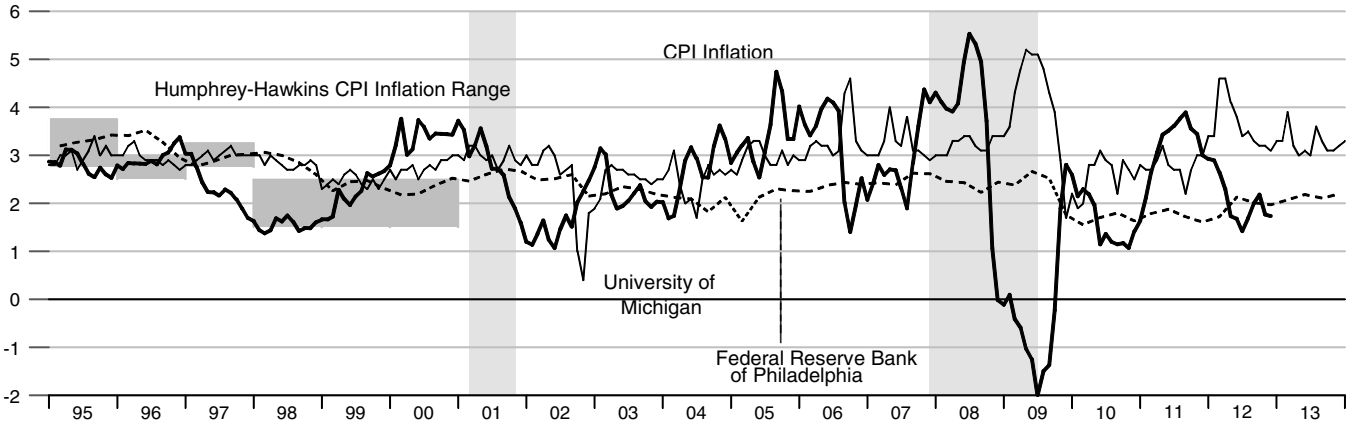
Net Percentage of Domestic Banks Tightening Standards for Consumer Loans

Percentage



CPI Inflation and 1-Year-Ahead CPI Inflation Expectations

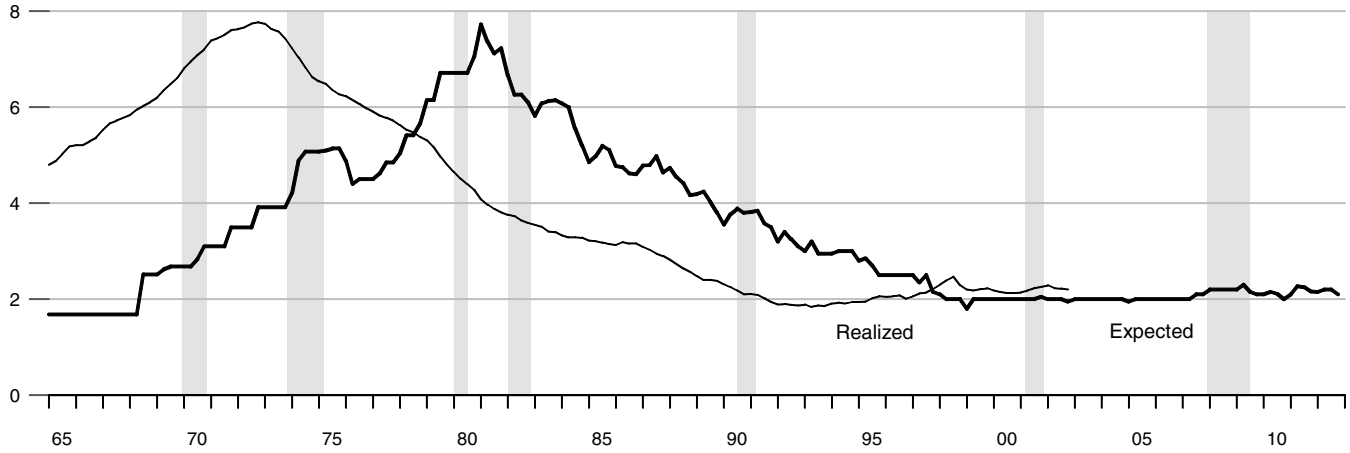
Percent



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

10-Year Ahead PCE Inflation Expectations and Realized Inflation

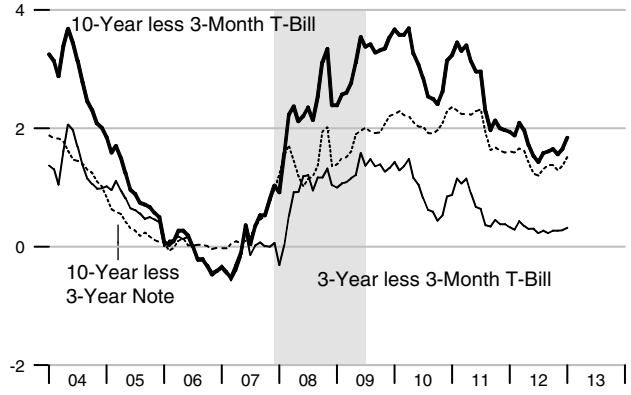
Percent



See the notes section for an explanation of the chart.

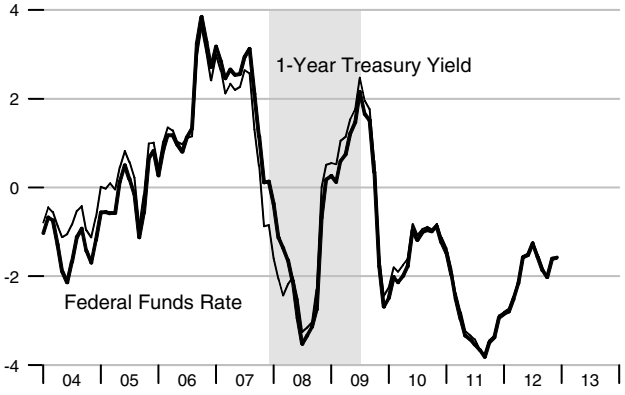
Treasury Security Yield Spreads

Yield to maturity

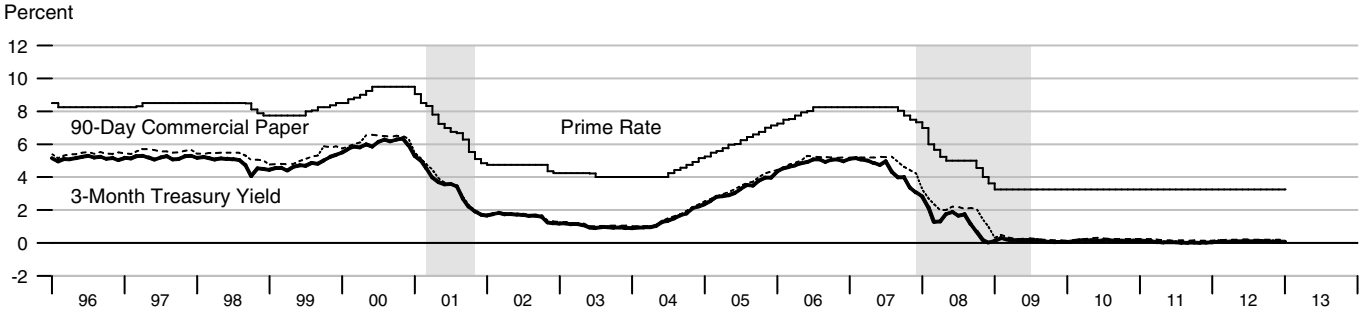


Real Interest Rates

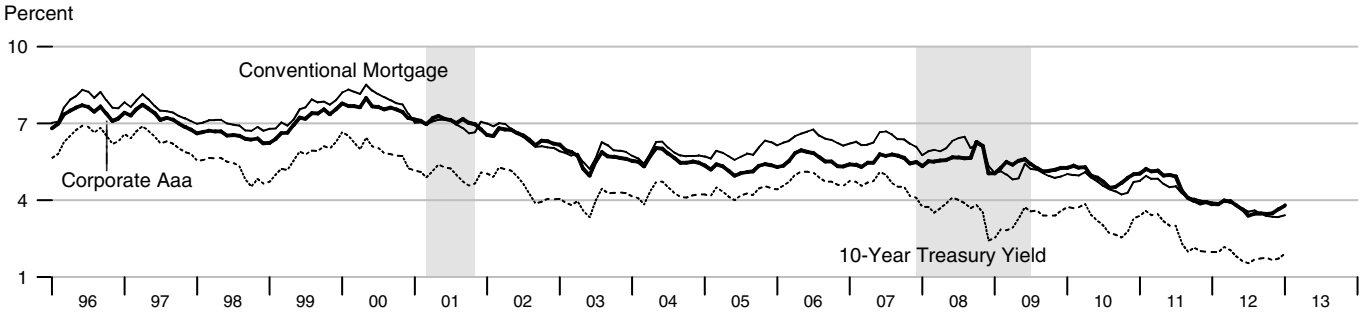
Percent, Real rate = Nominal rate less year-over-year CPI inflation



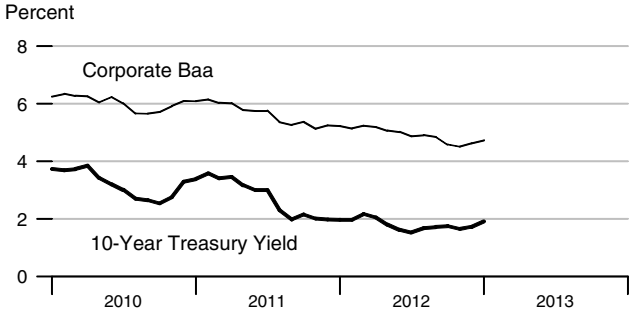
Short-Term Interest Rates



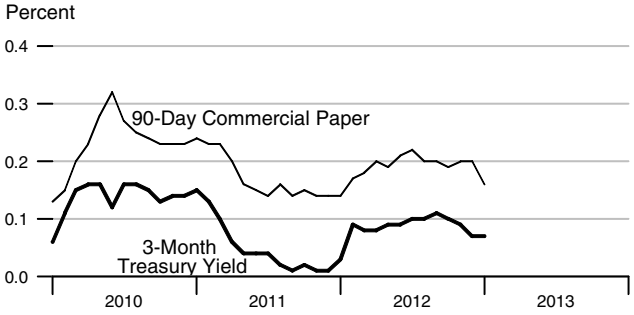
Long-Term Interest Rates



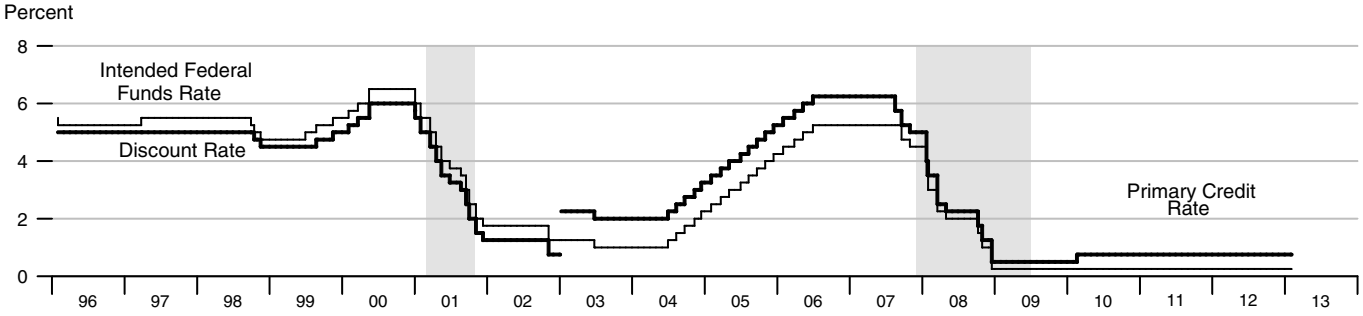
Long-Term Interest Rates



Short-Term Interest Rates

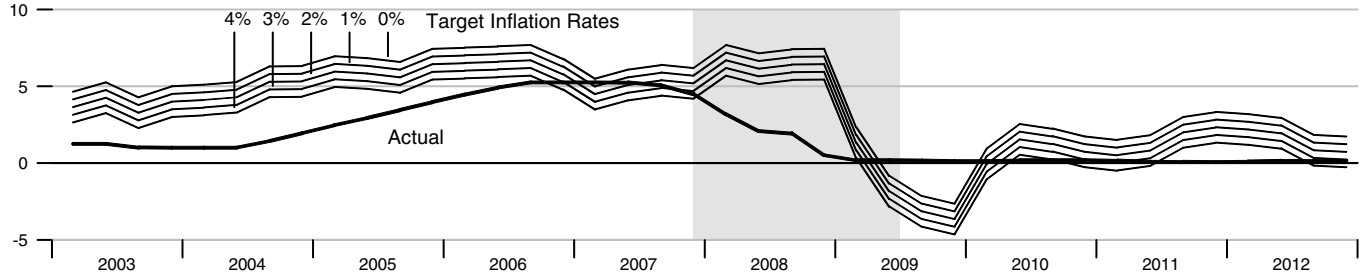


FOMC Intended Federal Funds Rate, Discount Rate, and Primary Credit Rate



Federal Funds Rate and Inflation Targets

Percent

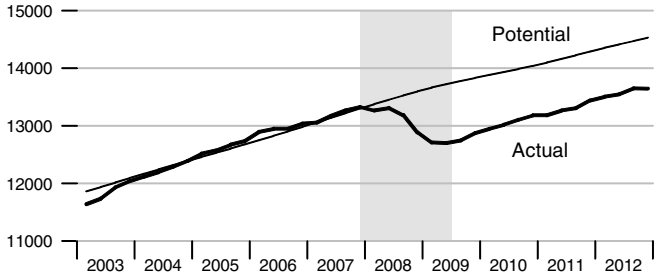


Calculated federal funds rate is based on Taylor's rule.

Components of Taylor's Rule

Actual and Potential Real GDP

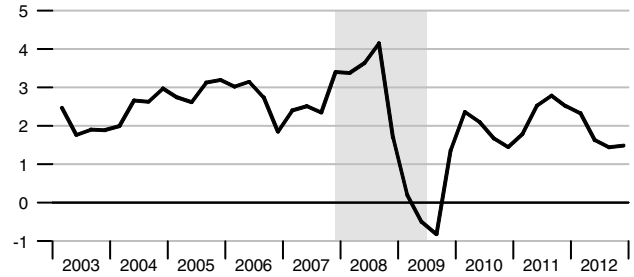
Billions of chain-weighted 2005 dollars



See notes section for further explanation.

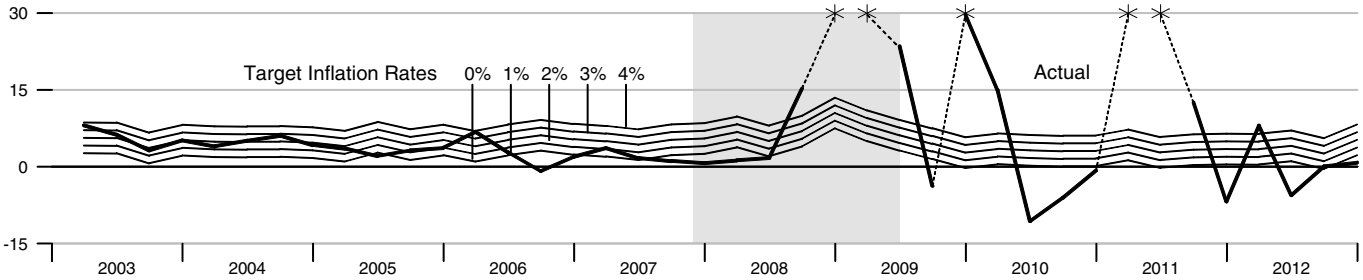
PCE Inflation

Percent change from year ago



Monetary Base Growth and Inflation Targets

Percent

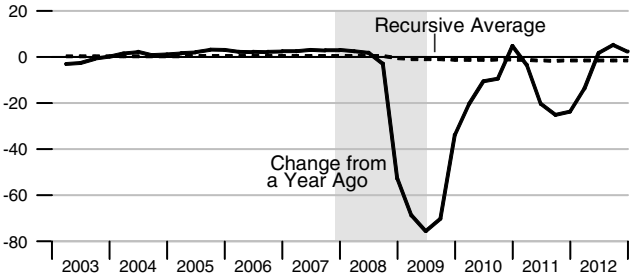


Calculated base growth is based on McCallum's rule. Actual base growth is percent change from the previous quarter. Stars represent actual values for 2008:Q4, 2009:Q1, 2009:Q4, 2011:Q1, 2011:Q2 and are 188.02 percent, 60.74 percent, 56.52 percent, 45.94 percent, and 58.74 percent, respectively.

Components of McCallum's Rule

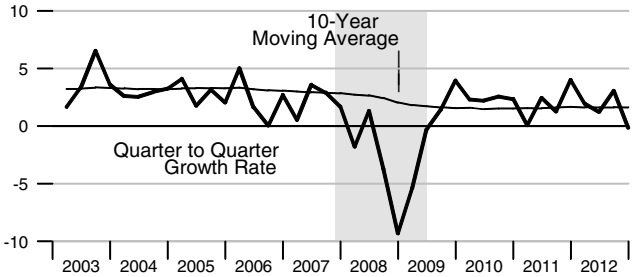
Monetary Base Velocity Growth

Percent



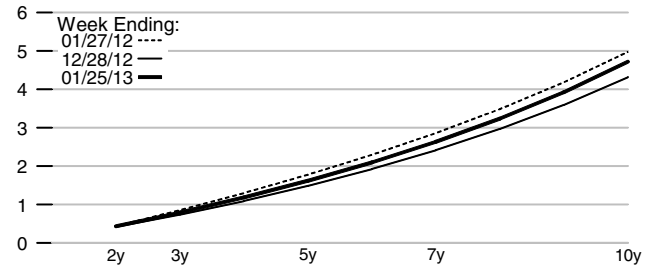
Real Output Growth

Percent



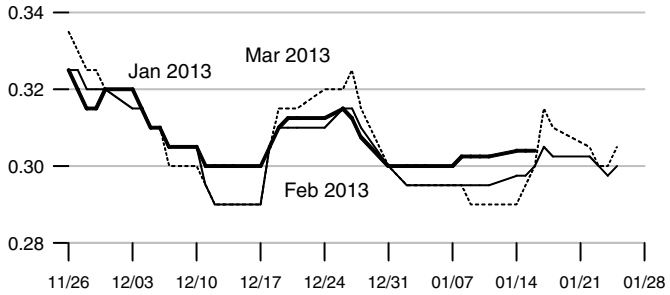
Implied One-Year Forward Rates

Percent



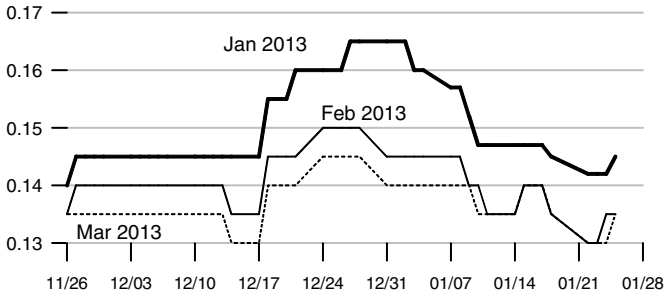
Rates on 3-Month Eurodollar Futures

Percent, daily data



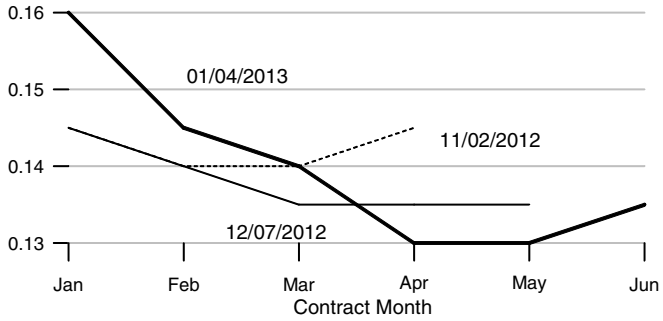
Rates on Selected Federal Funds Futures Contracts

Percent, daily data



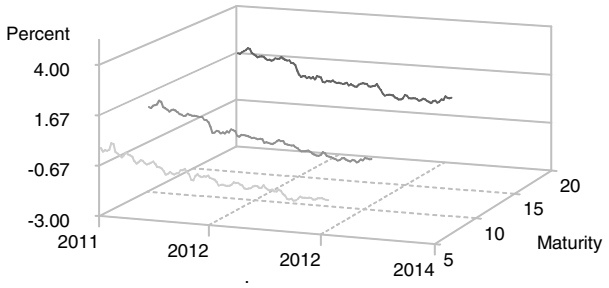
Rates on Federal Funds Futures on Selected Dates

Percent



Inflation-Indexed Treasury Securities

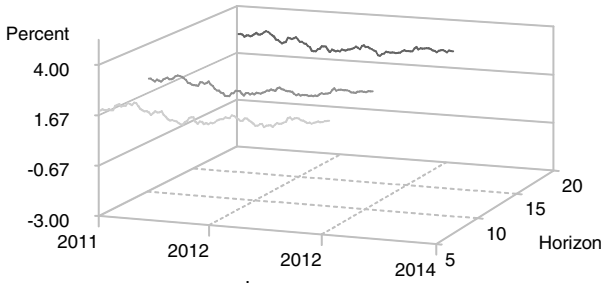
Weekly data



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

Inflation-Indexed Treasury Yield Spreads

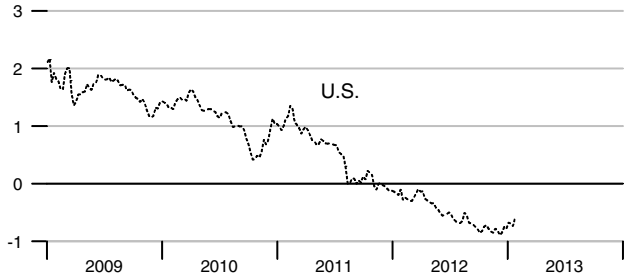
Weekly data



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

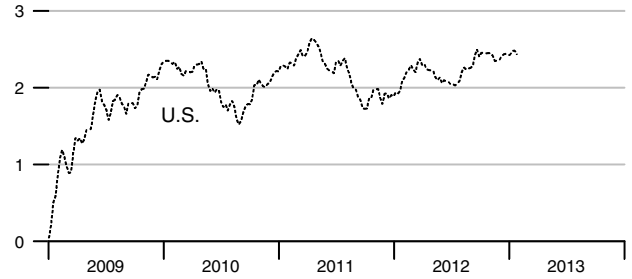
Inflation-Indexed 10-Year Government Notes

Percent, weekly data



Inflation-Indexed 10-Year Government Yield Spreads

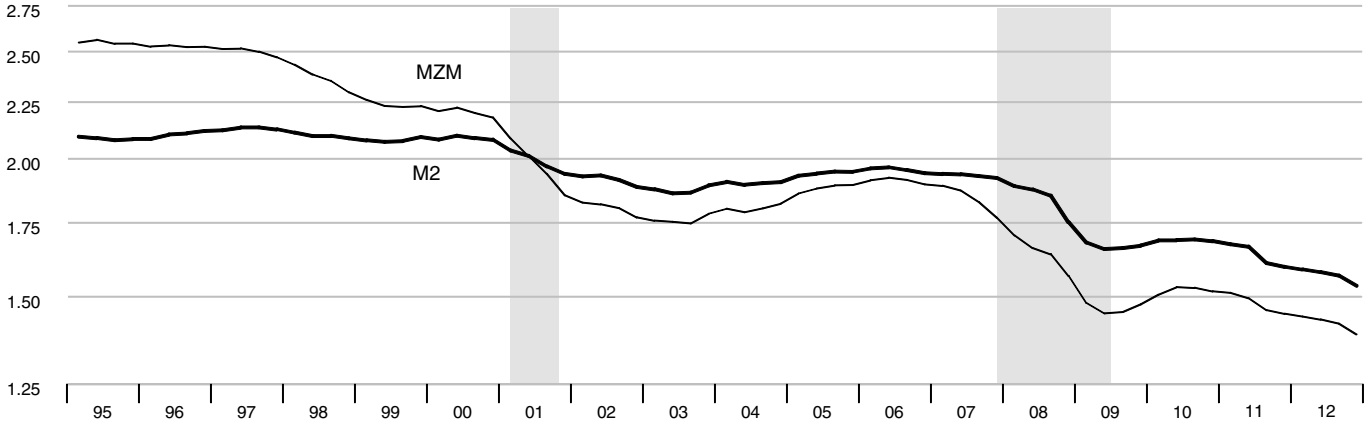
Percent, weekly data



Note: Data is temporarily unavailable for the French and U.K. 10-Year Notes and Government Yield Spreads.

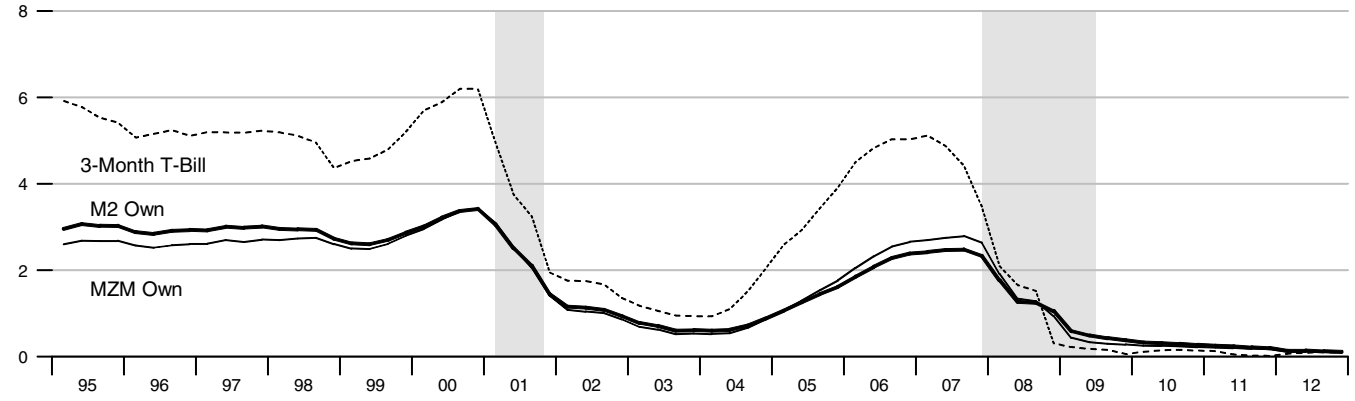
Velocity

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



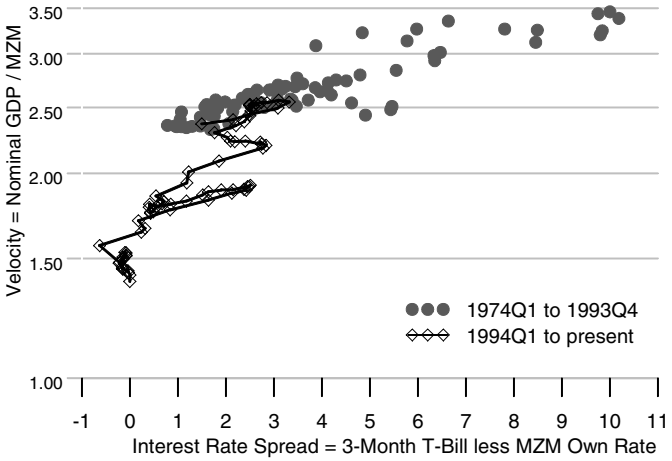
Interest Rates

Percent



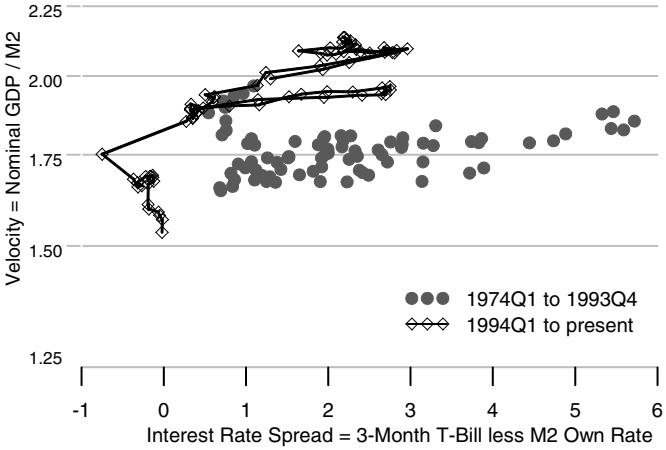
MZM Velocity and Interest Rate Spread

Ratio Scale



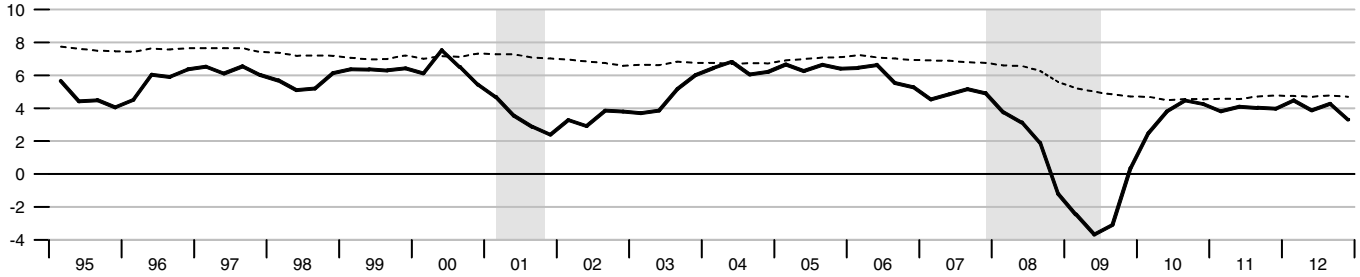
M2 Velocity and Interest Rate Spread

Ratio Scale



Gross Domestic Product

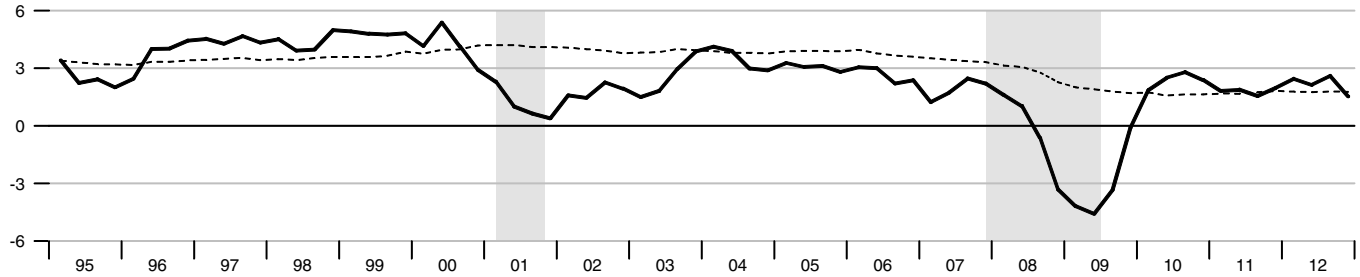
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Real Gross Domestic Product

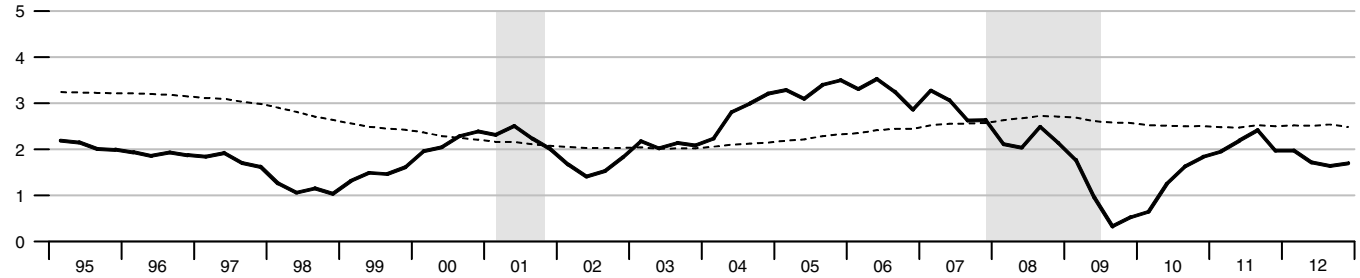
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Gross Domestic Product Price Index

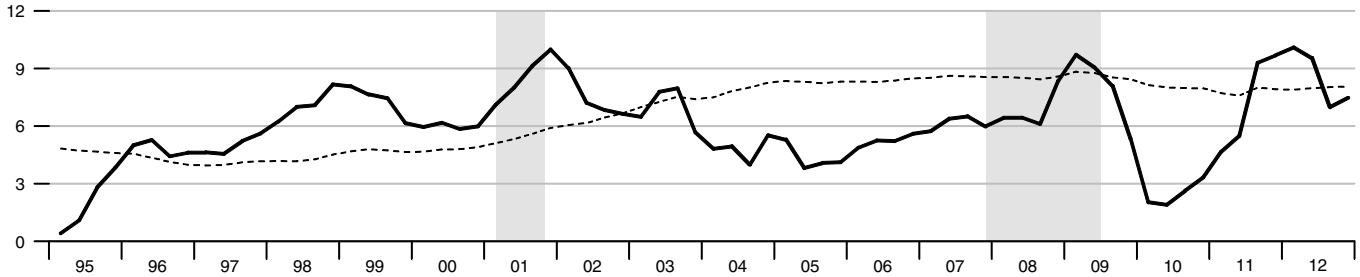
Percent change from year ago



Dashed lines indicate 10-year moving averages.

M2

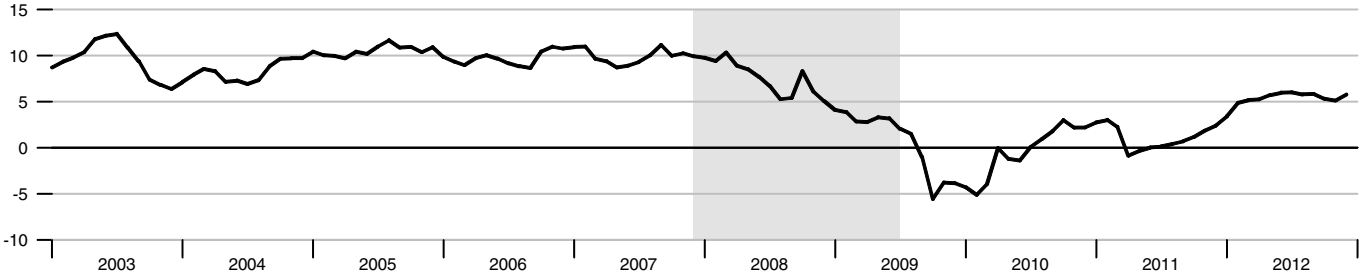
Percent change from year ago



Dashed lines indicate 10-year moving averages.

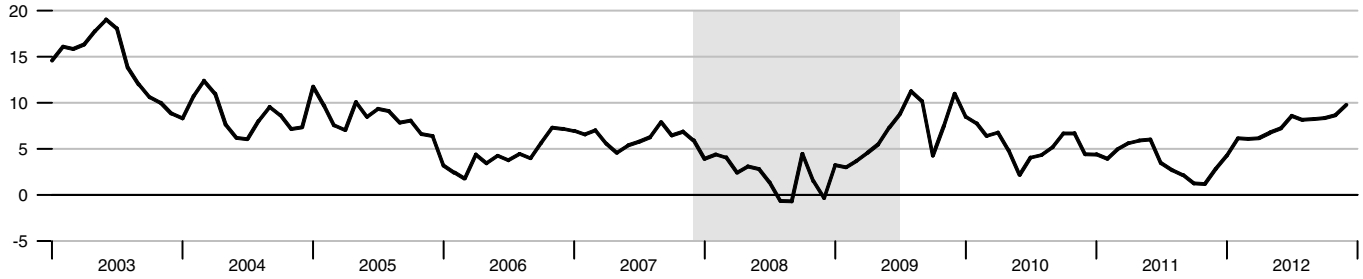
Bank Credit

Percent change from year ago



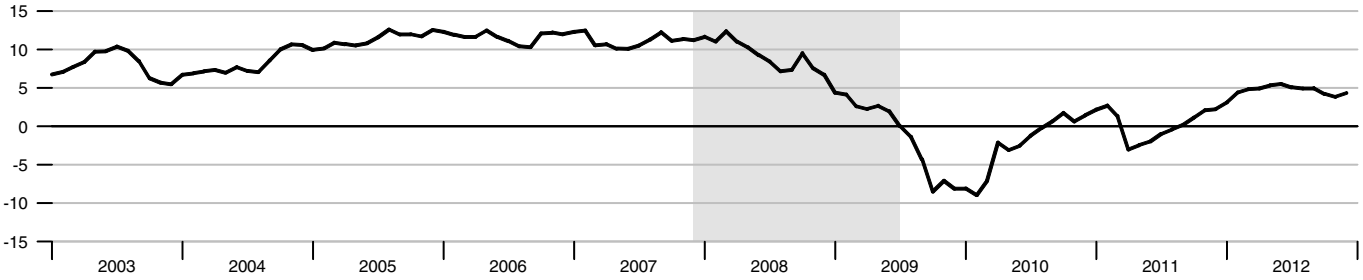
Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago



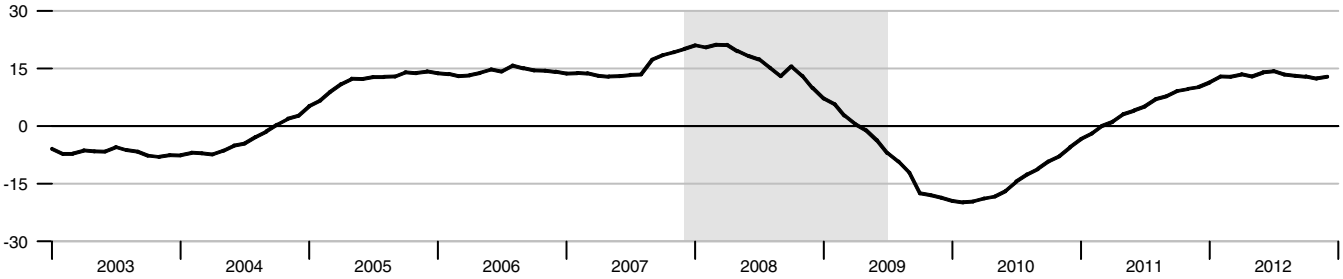
Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago

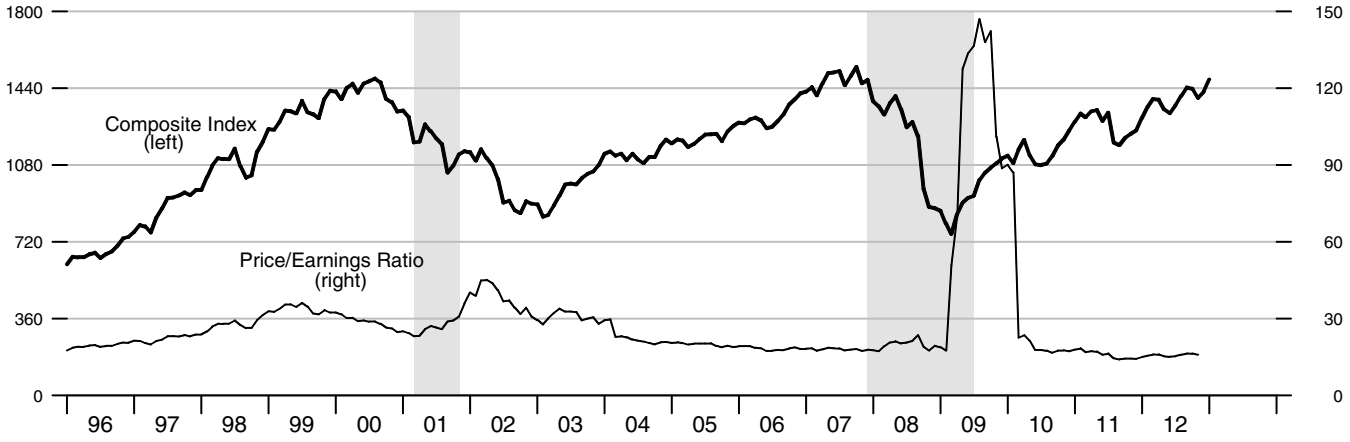


Commercial and Industrial Loans at Commercial Banks

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			
	2012Q1	2012Q2	2012Q3	2012Q4	Oct12	Nov12	Dec12	Jan13
United States	2.82	1.90	1.71	1.90	1.75	1.65	1.72	1.91
Canada	2.34	1.58	1.22	0.94	1.81	1.73	.	.
France	2.31	2.00	1.98	1.54	2.19	2.14	2.01	.
Germany	2.16	1.90	1.92	1.98	1.47	1.34	1.30	.
Italy	3.24	3.28	3.17	2.47	4.95	4.85	4.54	.
Japan	0.26	0.20	-0.34	.	0.76	0.71	.	.
United Kingdom	3.49	2.74	2.41	2.67	1.76	1.77	1.84	.

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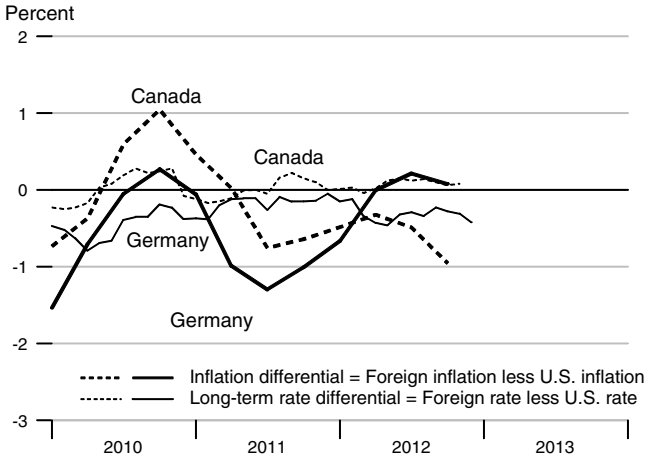
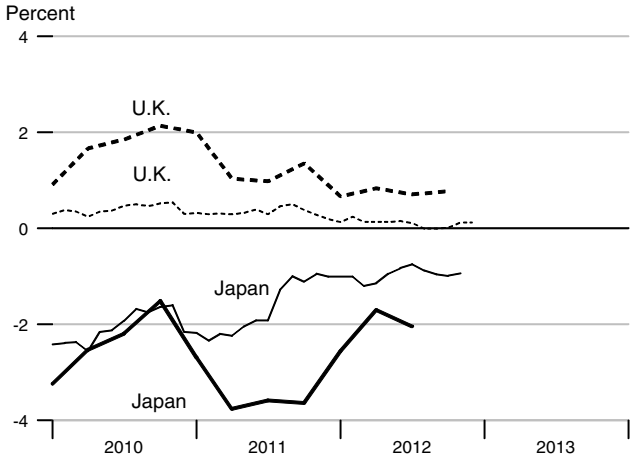
Inflation and Long-Term Interest Rate Differentials





		Money Stock				Bank	Adjusted		
		M1	MZM	M2	M3*	Credit	Monetary Base	Reserves	MSI M2**
2008		1434.280	8705.314	7761.861		9103.840	1010.160	232.562	7621.492
2009		1637.139	9539.557	8383.230		9170.403	1796.556	944.783	8242.475
2010		1741.446	9533.019	8590.497		9122.675	2031.689	1144.122	8453.550
2011		2008.964	10199.42	9218.360		9224.228	2538.959	1576.923	9078.800
2012		2309.592	11054.12	10006.98		9718.103	2661.952	1612.186	9861.992
2010	1	1699.940	9486.469	8471.527		8896.261	2089.170	1217.026	8333.967
	2	1709.377	9428.315	8553.025		9193.159	2034.258	1158.432	8415.500
	3	1743.325	9523.133	8609.239		9198.484	2003.669	1117.966	8472.700
	4	1813.143	9694.156	8728.196		9202.796	1999.659	1083.064	8592.033
2011	1	1879.454	9817.511	8874.689		9134.797	2242.975	1310.572	8737.467
	2	1926.003	10046.99	9026.168		9156.663	2597.817	1647.666	8887.700
	3	2077.195	10372.95	9400.685		9236.276	2680.091	1713.909	9259.867
	4	2153.205	10560.22	9571.898		9369.177	2634.953	1635.546	9430.167
2012	1	2221.848	10787.26	9779.035		9543.702	2688.250	1662.914	9635.800
	2	2249.908	10913.51	9891.751		9673.826	2651.079	1616.301	9747.400
	3	2343.372	11121.75	10057.77		9779.087	2651.566	1601.418	9912.200
	4	2423.240	11393.94	10299.35		9875.795	2656.913	1568.112	10152.57
2010	Dec	1840.155	9734.366	8765.825		9184.100	2009.295	1072.986	8629.800
2011	Jan	1868.385	9768.774	8829.710		9162.054	2057.137	1095.875	8693.100
	Feb	1878.822	9800.324	8873.224		9121.555	2243.572	1327.461	8736.000
	Mar	1891.154	9883.436	8921.134		9120.781	2428.216	1508.380	8783.300
	Apr	1903.677	9969.752	8968.075		9154.947	2531.668	1599.128	8830.100
	May	1930.417	10052.71	9017.075		9155.718	2590.336	1627.328	8878.600
	Jun	1943.915	10118.50	9093.355		9159.325	2671.446	1716.542	8954.400
	Jul	2003.311	10274.04	9266.617		9202.527	2703.445	1737.866	9126.300
	Aug	2105.149	10392.10	9457.025		9244.409	2680.325	1721.223	9315.800
	Sep	2123.126	10452.70	9478.412		9261.891	2656.502	1682.638	9337.500
	Oct	2137.718	10507.00	9525.155		9322.938	2678.391	1706.876	9383.900
	Nov	2154.064	10556.68	9572.867		9379.645	2622.981	1627.608	9431.100
	Dec	2167.833	10616.96	9617.671		9404.948	2603.487	1572.154	9475.500
2012	Jan	2223.246	10753.61	9747.819		9474.656	2647.502	1579.762	9604.600
	Feb	2217.549	10777.60	9777.469		9565.020	2733.060	1733.266	9634.400
	Mar	2224.749	10830.57	9811.817		9591.431	2684.187	1675.715	9668.400
	Apr	2253.053	10873.23	9856.561		9636.151	2673.652	1654.855	9712.900
	May	2243.211	10912.85	9888.167		9678.642	2634.871	1588.389	9743.700
	Jun	2253.459	10954.46	9930.524		9706.684	2644.714	1605.659	9785.600
	Jul	2316.523	11044.48	10004.70		9755.858	2669.125	1621.965	9859.500
	Aug	2331.026	11106.79	10041.83		9779.456	2669.356	1626.528	9896.300
	Sep	2382.566	11213.99	10126.77		9801.948	2616.218	1555.761	9980.800
	Oct	2418.532	11306.97	10220.88		9818.696	2648.742	1584.742	10073.90
	Nov	2395.681	11356.59	10269.14		9860.551	2665.094	1581.257	10123.10
	Dec	2455.507	11518.26	10408.04		9948.138	2656.902	1538.338	10260.70

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

		Federal Funds	Primary Credit Rate	Prime Rate	3-mo CDs	Treasury Yields 3-mo	3-yr	10-yr	Corporate Aaa Bonds	Municipal Aaa Bonds	Conventional Mortgage
2008		1.93	2.39	5.09	2.97	1.39	2.24	3.67	5.63	4.58	6.04
2009		0.16	0.50	3.25	0.56	0.15	1.43	3.26	5.31	4.27	5.04
2010		0.17	0.72	3.25	0.31	0.14	1.11	3.21	4.94	3.90	4.69
2011		0.10	0.75	3.25	0.30	0.05	0.75	2.79	4.64	4.26	4.46
2012		0.14	0.75	3.25	0.28	0.09	0.38	1.80	3.67	3.12	3.66
2010	1	0.13	0.61	3.25	0.21	0.11	1.47	3.72	5.29	3.93	5.00
	2	0.19	0.75	3.25	0.42	0.15	1.38	3.49	5.04	3.83	4.91
	3	0.19	0.75	3.25	0.34	0.16	0.83	2.79	4.58	3.58	4.45
	4	0.19	0.75	3.25	0.28	0.14	0.74	2.86	4.86	4.24	4.41
2011	1	0.16	0.75	3.25	0.28	0.13	1.16	3.46	5.13	4.71	4.85
	2	0.09	0.75	3.25	0.22	0.05	0.95	3.21	5.04	4.50	4.66
	3	0.08	0.75	3.25	0.29	0.02	0.47	2.43	4.46	4.02	4.31
	4	0.07	0.75	3.25	0.42	0.01	0.42	2.05	3.93	3.82	4.01
2012	1	0.10	0.75	3.25	0.33	0.07	0.42	2.04	3.89	3.31	3.92
	2	0.15	0.75	3.25	0.30	0.09	0.40	1.82	3.80	3.32	3.79
	3	0.14	0.75	3.25	0.27	0.10	0.35	1.64	3.45	3.05	3.55
	4	0.16	0.75	3.25	0.23	0.09	0.36	1.71	3.54	2.81	3.36
2011	Jan	0.17	0.75	3.25	0.29	0.15	1.03	3.39	5.04	4.86	4.76
	Feb	0.16	0.75	3.25	0.28	0.13	1.28	3.58	5.22	4.79	4.95
	Mar	0.14	0.75	3.25	0.28	0.10	1.17	3.41	5.13	4.47	4.84
	Apr	0.10	0.75	3.25	0.23	0.06	1.21	3.46	5.16	4.93	4.84
	May	0.09	0.75	3.25	0.21	0.04	0.94	3.17	4.96	4.33	4.64
	Jun	0.09	0.75	3.25	0.22	0.04	0.71	3.00	4.99	4.23	4.51
	Jul	0.07	0.75	3.25	0.24	0.04	0.68	3.00	4.93	4.31	4.55
	Aug	0.10	0.75	3.25	0.29	0.02	0.38	2.30	4.37	3.90	4.27
	Sep	0.08	0.75	3.25	0.33	0.01	0.35	1.98	4.09	3.84	4.11
	Oct	0.07	0.75	3.25	0.37	0.02	0.47	2.15	3.98	3.93	4.07
	Nov	0.08	0.75	3.25	0.41	0.01	0.39	2.01	3.87	3.79	3.99
	Dec	0.07	0.75	3.25	0.49	0.01	0.39	1.98	3.93	3.75	3.96
2012	Jan	0.08	0.75	3.25	0.40	0.03	0.36	1.97	3.85	3.48	3.92
	Feb	0.10	0.75	3.25	0.30	0.09	0.38	1.97	3.85	3.09	3.89
	Mar	0.13	0.75	3.25	0.29	0.08	0.51	2.17	3.99	3.37	3.95
	Apr	0.14	0.75	3.25	0.29	0.08	0.43	2.05	3.96	3.43	3.91
	May	0.16	0.75	3.25	0.29	0.09	0.39	1.80	3.80	3.20	3.80
	Jun	0.16	0.75	3.25	0.32	0.09	0.39	1.62	3.64	3.32	3.68
	Jul	0.16	0.75	3.25	0.30	0.10	0.33	1.53	3.40	3.18	3.55
	Aug	0.13	0.75	3.25	0.26	0.10	0.37	1.68	3.48	3.01	3.60
	Sep	0.14	0.75	3.25	0.24	0.11	0.34	1.72	3.49	2.96	3.50
	Oct	0.16	0.75	3.25	0.23	0.10	0.37	1.75	3.47	2.86	3.38
	Nov	0.16	0.75	3.25	0.23	0.09	0.36	1.65	3.50	2.76	3.35
	Dec	0.16	0.75	3.25	0.24	0.07	0.35	1.72	3.65	2.81	3.35
2013	Jan	0.14	0.75	3.25	0.23	0.07	0.39	1.91	3.80		3.41

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

		M1	MZM	M2	M3*
Percent change at an annual rate					
	2008	4.51	14.06	6.84	
	2009	14.14	9.58	8.01	
	2010	6.37	-0.07	2.47	
	2011	15.36	6.99	7.31	
	2012	14.96	8.38	8.55	
2010	1	3.80	-3.03	0.99	
	2	2.22	-2.45	3.85	
	3	7.94	4.02	2.63	
	4	16.02	7.18	5.53	
2011	1	14.63	5.09	6.71	
	2	9.91	9.35	6.83	
	3	31.40	12.98	16.60	
	4	14.64	7.22	7.29	
2012	1	12.75	8.60	8.66	
	2	5.05	4.68	4.61	
	3	16.62	7.63	6.71	
	4	13.63	9.79	9.61	
2010	Dec	11.67	4.37	5.65	
2011	Jan	18.41	4.24	8.75	
	Feb	6.70	3.88	5.91	
	Mar	7.88	10.18	6.48	
	Apr	7.95	10.48	6.31	
	May	16.86	9.99	6.56	
	Jun	8.39	7.85	10.15	
	Jul	36.67	18.45	22.86	
	Aug	61.00	13.79	24.66	
	Sep	10.25	7.00	2.71	
	Oct	8.25	6.23	5.92	
	Nov	9.18	5.67	6.01	
	Dec	7.67	6.85	5.62	
2012	Jan	30.67	15.44	16.24	
	Feb	-3.07	2.68	3.65	
	Mar	3.90	5.90	4.22	
	Apr	15.27	4.73	5.47	
	May	-5.24	4.37	3.85	
	Jun	5.48	4.57	5.14	
	Jul	33.58	9.86	8.96	
	Aug	7.51	6.77	4.45	
	Sep	26.53	11.58	10.15	
	Oct	18.11	9.95	11.15	
	Nov	-11.34	5.27	5.67	
	Dec	29.97	17.08	16.23	

*See table of contents for changes to the series.

Definitions

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

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

M2: M1 plus savings deposits (including money market deposit accounts) and small-denomination (under $100,000) time deposits issued by financial institutions; and shares in retail money market mutual funds (funds with initial investments under $50,000), net of retirement accounts.

M3: M2 plus large-denomination ($100,000 or more) time deposits; repurchase agreements issued by depository institutions; Eurodollar deposits, specifically, dollar-denominated deposits due to nonbank U.S. addresses held at foreign offices of U.S. banks worldwide and all banking offices in Canada and the United Kingdom; and institutional money market mutual funds (funds with initial investments of $50,000 or more).

Bank Credit: All loans, leases, and securities held by commercial banks.

Domestic Nonfinancial Debt: Total credit market liabilities of the U.S. Treasury, federally sponsored agencies, state and local governments, households, and nonfinancial firms. End-of-period basis.

Adjusted Monetary Base: The sum of currency in circulation outside Federal Reserve Banks and the U.S. Treasury, deposits of depository financial institutions at Federal Reserve Banks, and an adjustment for the effects of changes in statutory reserve requirements on the quantity of base money held by depositories. This series is a spliced chain index; see Anderson and Rasche (1996a,b, 2001, 2003).

Adjusted Reserves: The sum of vault cash and Federal Reserve Bank deposits held by depository institutions and an adjustment for the effects of changes in statutory reserve requirements on the quantity of base money held by depositories. This spliced chain index is numerically larger than the Board of Governors' measure, which excludes vault cash not used to satisfy statutory reserve requirements and Federal Reserve Bank deposits used to satisfy required clearing balance contracts; see Anderson and Rasche (1996a, 2001, 2003).

Monetary Services Index: An index that measures the flow of monetary services received by households and firms from their holdings of liquid assets; see Anderson, Jones, and Nesmith (1997). Indexes are shown for the assets included in M2, with additional data at research.stlouisfed.org/msi/index.html.

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** and **Real Treasury Yield Curve** show constant maturity yields calculated by the U.S. Treasury for securities 5, 7, 10, and 20 years to maturity. **Inflation-Indexed Treasury Yield Spreads** are a measure of inflation compensation at those horizons, and it is simply the nominal constant maturity yield less the real constant maturity yield. Daily data and descriptions are available at research.stlouisfed.org/fred2/. 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. **Retail Money Market Mutual Funds** are included in M2. **Institutional** money market funds are not included in M2.

Page 6: **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 7: Data are reported in the Senior Loan Officer Opinion Survey on Bank Lending Practices.

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

From 1991 to the present the source of the long-term PCE inflation expectations data is the Federal Reserve Bank of Philadelphia's *Survey of Professional Forecasters*. Prior to 1991, the data were obtained from the Board of Governors of the Federal Reserve System. Realized (actual) inflation is the annualized rate of change for the 40-quarter period that corresponds to the forecast horizon (the expectations measure). For example, in 1965:Q1, annualized PCE inflation over the next 40 quarters was expected to average 1.7 percent. In actuality, the average annualized rate of change measured 4.8 percent from 1965:Q1 to 1975:Q1. Thus, the vertical distance between the two lines in the chart at any point is the forecast error.

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 estimated by the Congressional Budget Office (CBO).

Monetary Base Growth and Inflation Targets shows the quarterly growth of the adjusted monetary base implied by applying McCallum's (2000, p. 52) equation

$$\Delta b_t = \Delta x_t^* - \Delta v_t^a + \lambda\,(\Delta x_t^* - \Delta x_{t-1}),$$
$$\Delta x_t^* = \pi^* + \Delta y_t^*$$

to five alternative target inflation rates, $\pi^* = 0, 1, 2, 3, 4$ percent, where Δb_t is the implied growth rate of the adjusted monetary base, Δy_t^* is the 10-year

moving average growth in real GDP, Δv_t^{α} is the average base velocity growth (calculated recursively), Δx_{t-1} is the lag growth rate of nominal GDP, and $\lambda = 0.5$.

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 Federal Funds Futures Contracts** trace through time the yield on three specific contracts. **Rates on Federal Funds Futures on Selected Dates** displays a single day's snapshot of yields for contracts expiring in the months shown on the horizontal axis. **Inflation-Indexed Treasury Securities and Yield Spreads** are those plotted on page 3. **Inflation-Indexed 10-Year Government Notes** shows the yield of an inflation-indexed note that is scheduled to mature in approximately (but not greater than) 10 years. The current French note has a maturity date of 7/25/2015, the current U.K. note has a maturity date of 4/16/2020, and the current U.S. note has a maturity date of 11/15/2020. **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 2005 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. Senior Loan Officer Opinion Survey on Bank Lending Practices.

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/.