Monetary *Trends*

July 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.

Contents

Page	
3	Monetary and Financial Indicators at a Glance
4	Monetary Aggregates and Their Components
6	Reserves Markets and Short-Term Credit Flows
7	Senior Loan Officer Opinion Survey on Bank Lending Practices
8	Measures of Expected Inflation
9	Interest Rates
10	Policy-Based Inflation Indicators
11	Implied Forward Rates, Futures Contracts, and Inflation-Indexed Securities
12	Velocity, Gross Domestic Product, and M2
14	Bank Credit
15	Stock Market Index and Foreign Inflation and Interest Rates
16	Reference Tables
18	Definitions, Notes, and Sources

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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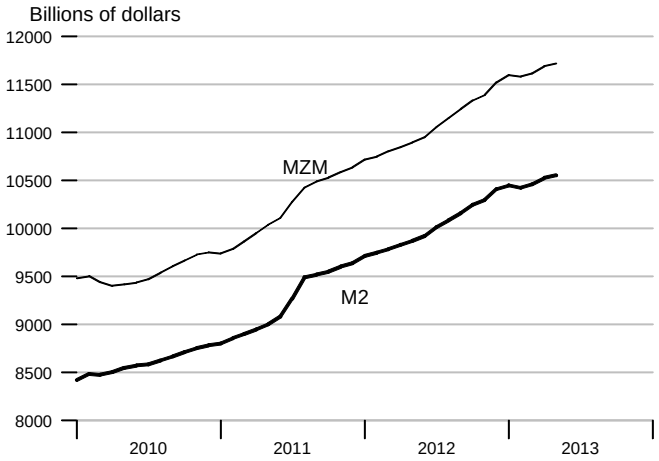
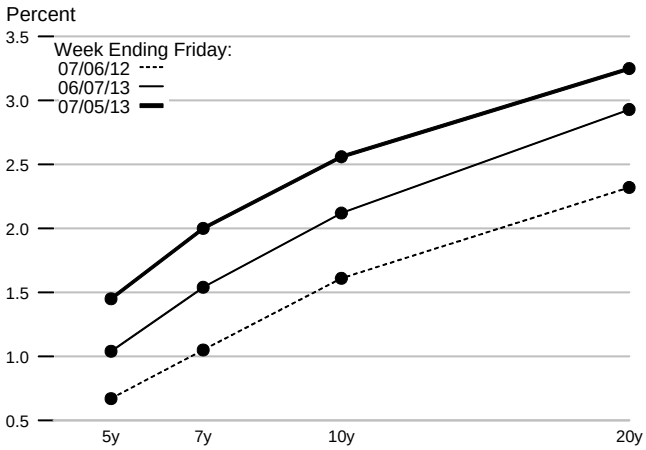
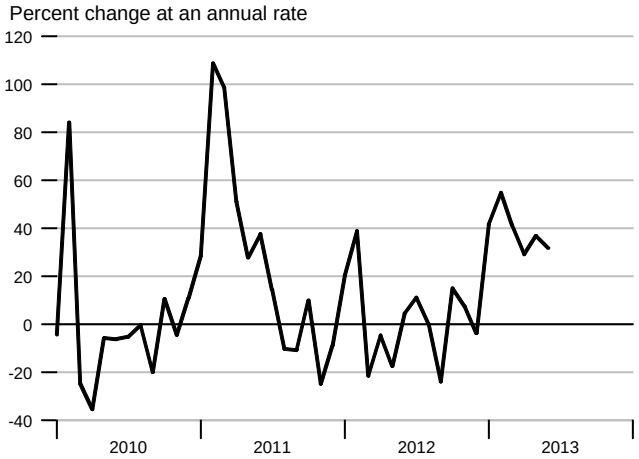
M2 and MZM



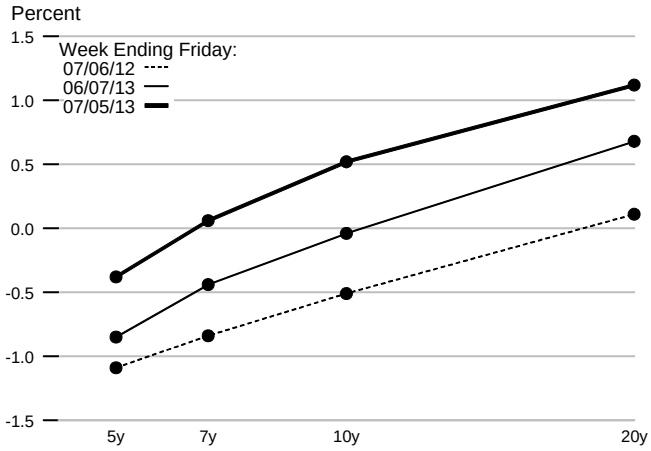
Treasury Yield Curve



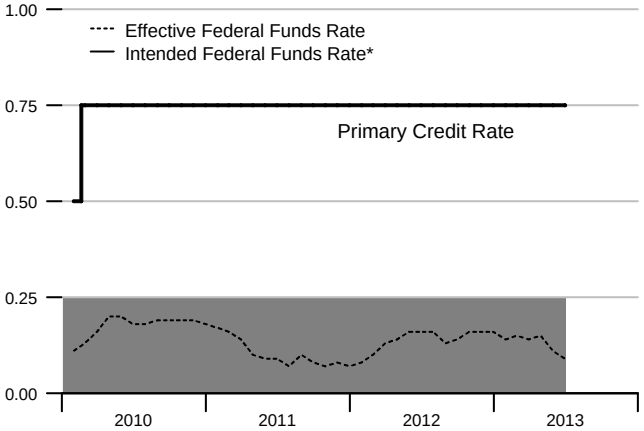
Adjusted Monetary Base



Real Treasury Yield Curve

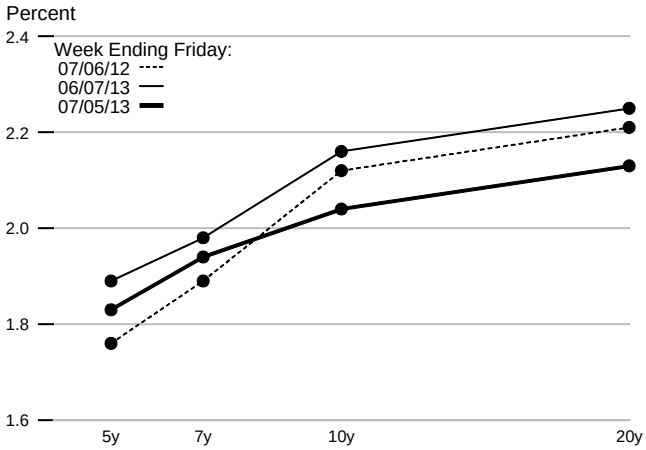


Reserve Market Rates



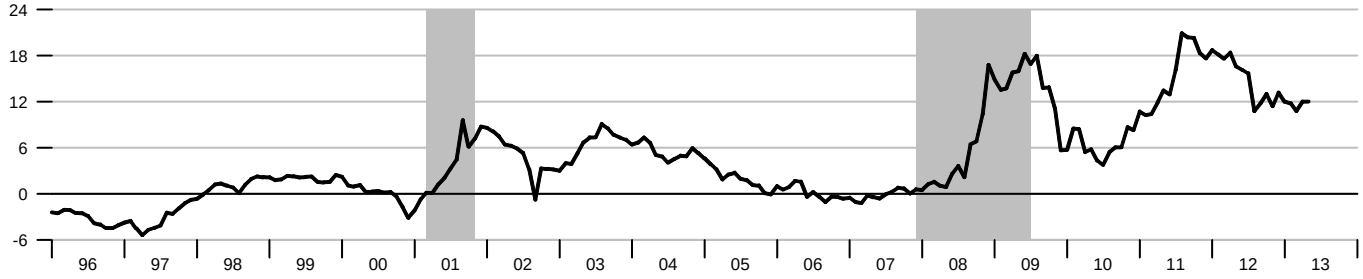
*Note: Effective December 16, 2008, FOMC reports the Intended Federal Funds Rate as a range. Currently, Intended Federal Funds Rate is not plotted on this chart due to the note above.

Inflation-Indexed Treasury Yield Spreads



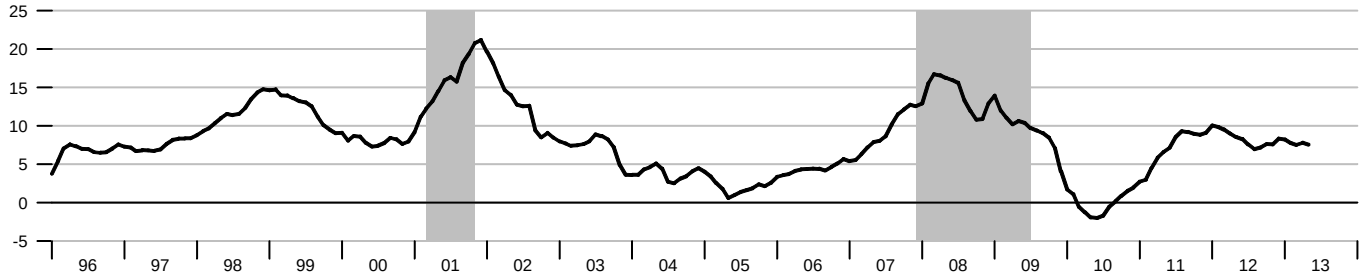
M1

Percent change from year ago



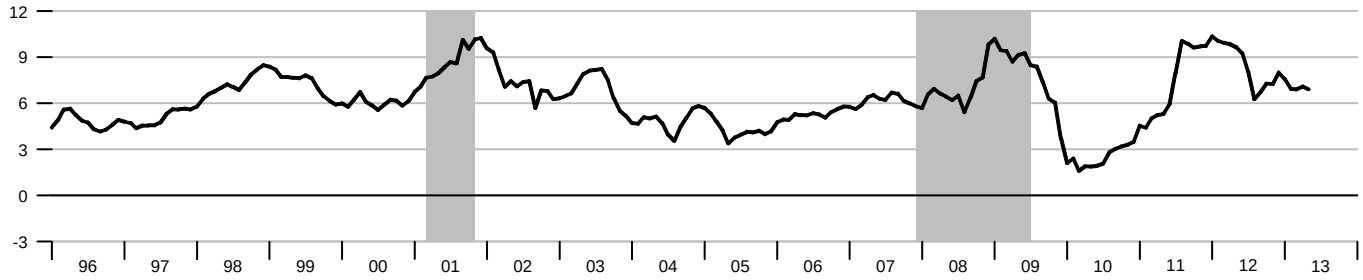
MZM

Percent change from year ago



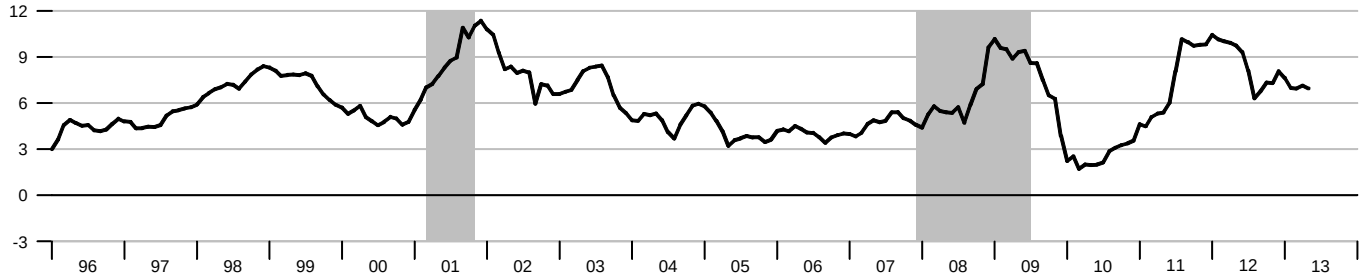
M2

Percent change from year ago



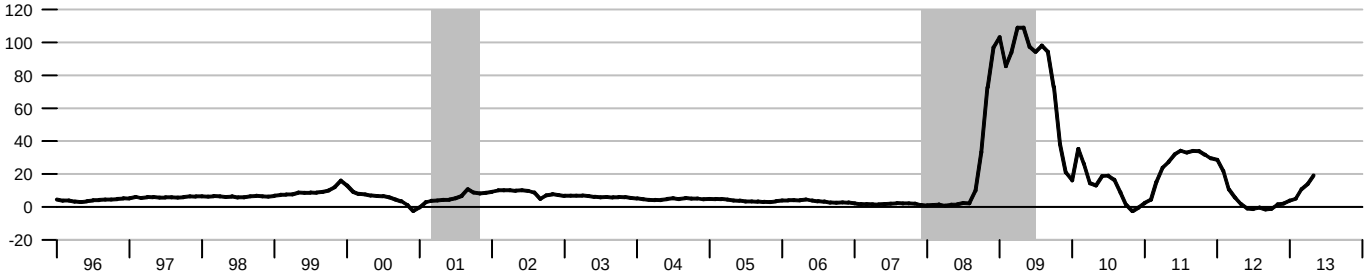
Monetary Services Index - M2

Percent change from year ago



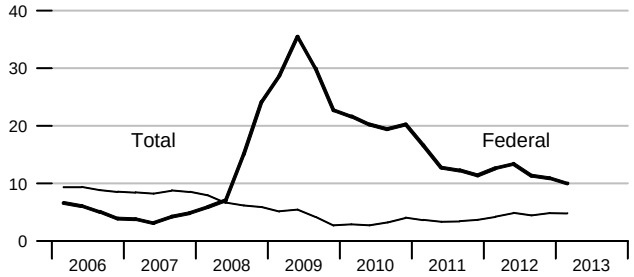
Adjusted Monetary Base

Percent change from year ago



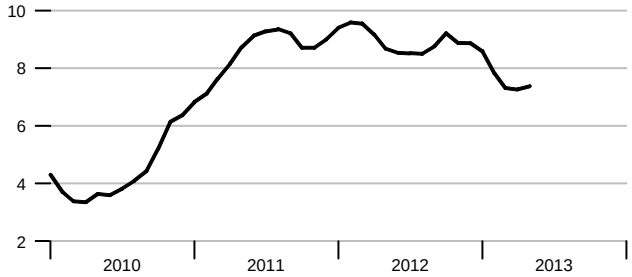
Domestic Nonfinancial Debt

Percent change from year ago



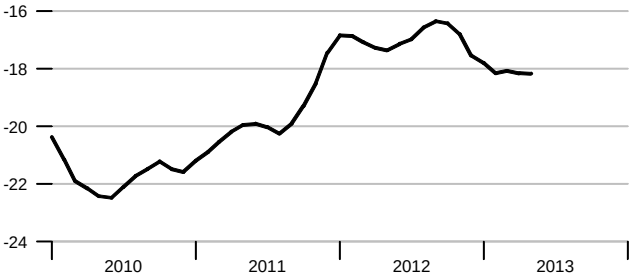
Currency Held by the Nonbank Public

Percent change from year ago



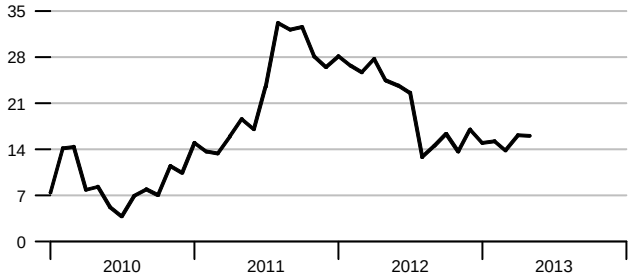
Small Denomination Time Deposits

Percent change from year ago



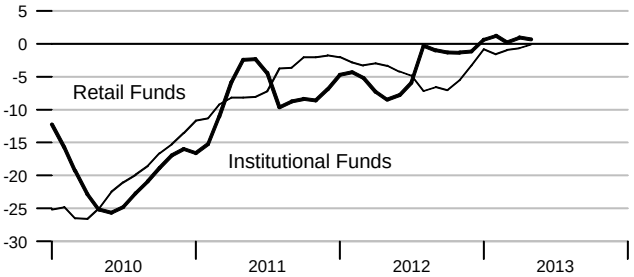
Checkable Deposits

Percent change from year ago



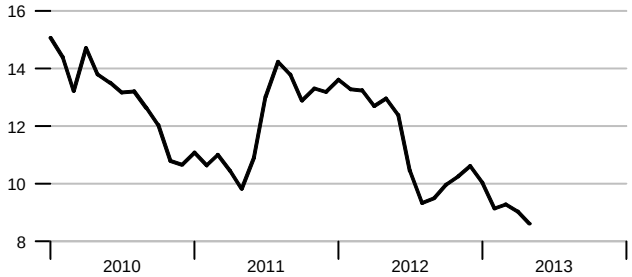
Money Market Mutual Fund Shares

Percent change from year ago



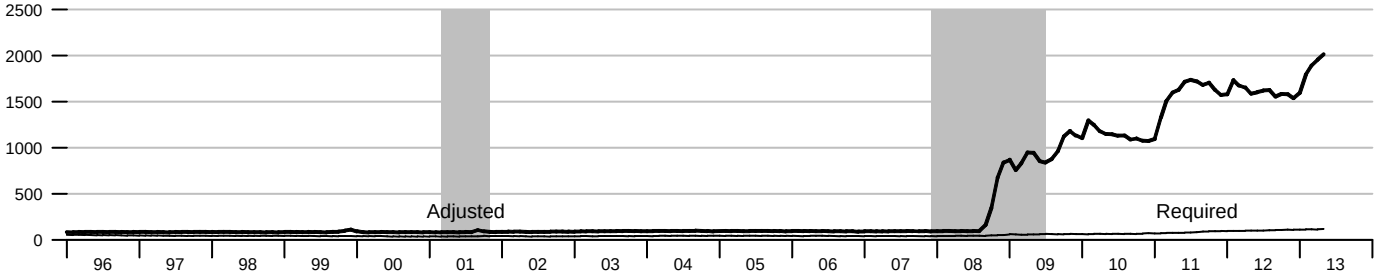
Savings Deposits

Percent change from year ago



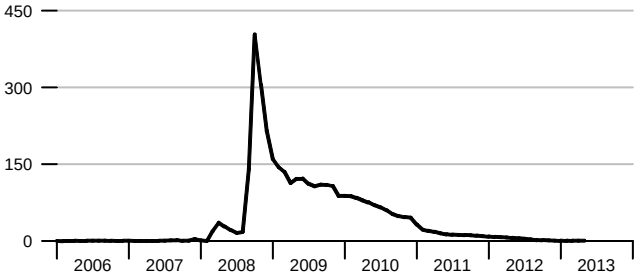
Adjusted and Required Reserves

Billions of dollars



Total Borrowings, nsa

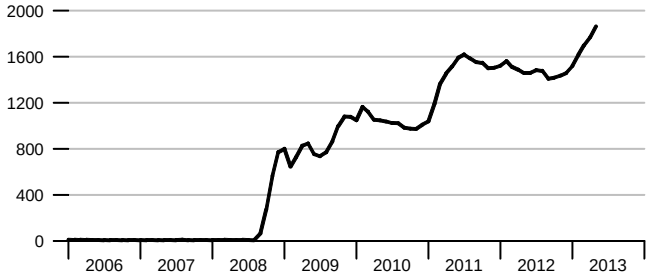
Billions of dollars



* Data exclude term auction credit

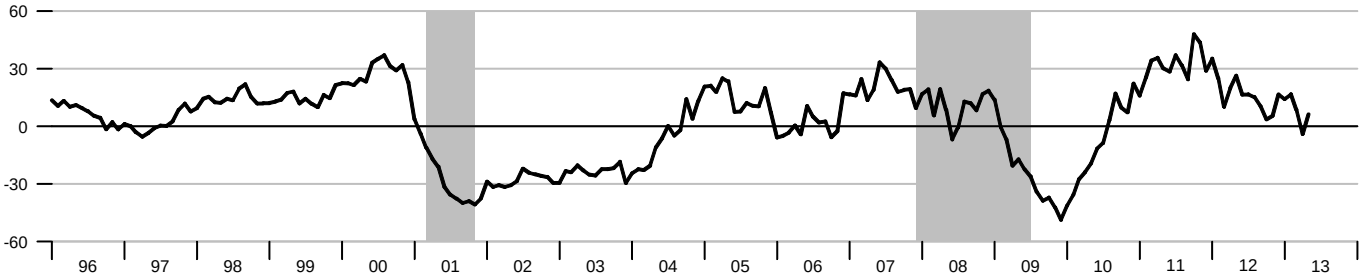
Excess Reserves plus RCB Contracts

Billions of dollars



Nonfinancial Commercial Paper

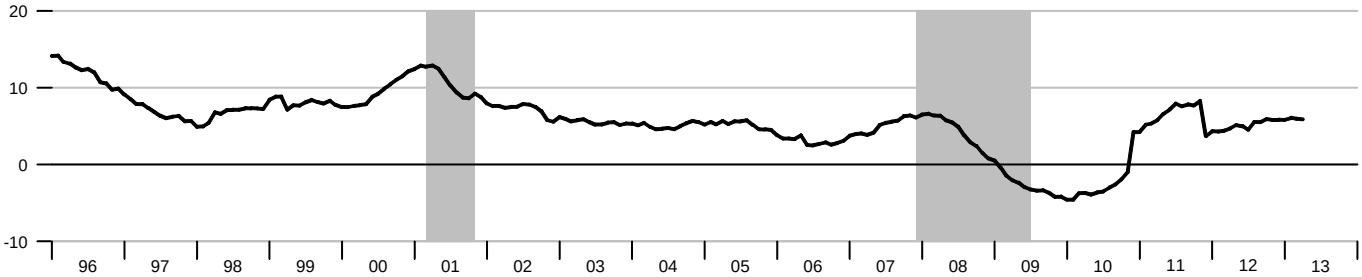
Percent change from year ago



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.

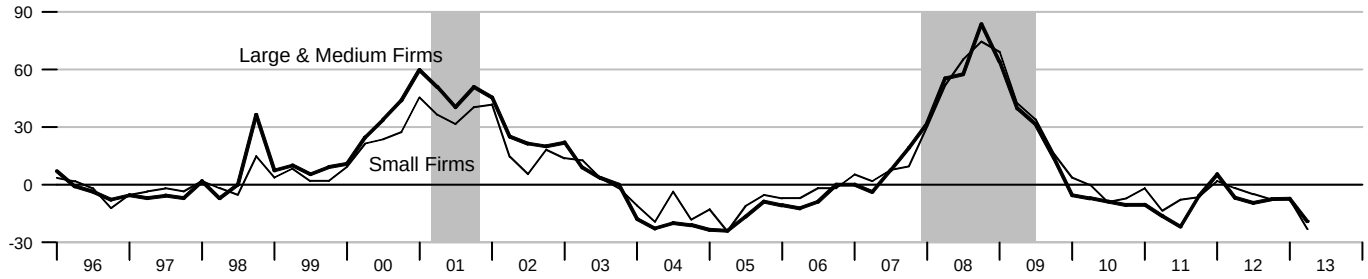
Consumer Credit

Percent change from year ago



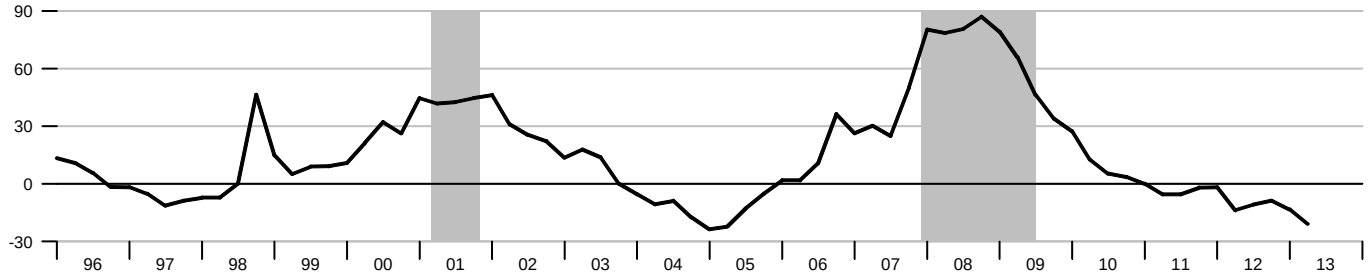
Net Percentage of Domestic Banks Tightening Standards for Commercial and Industrial Loans

Percentage



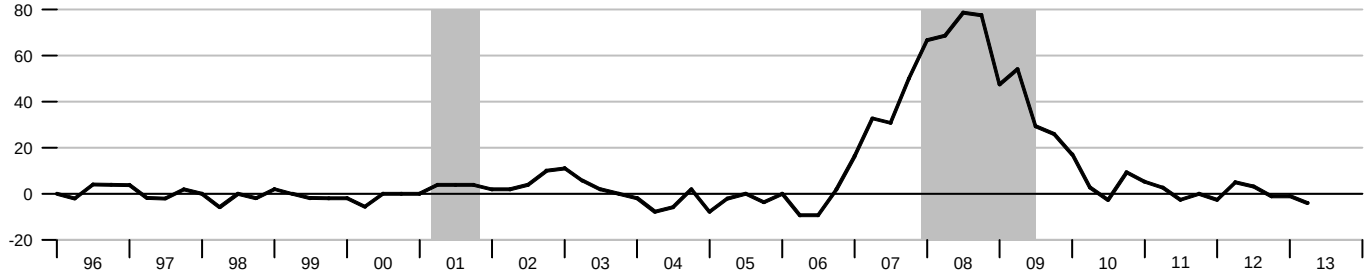
Net Percentage of Domestic Banks Tightening Standards for Commercial Real Estate Loans

Percentage



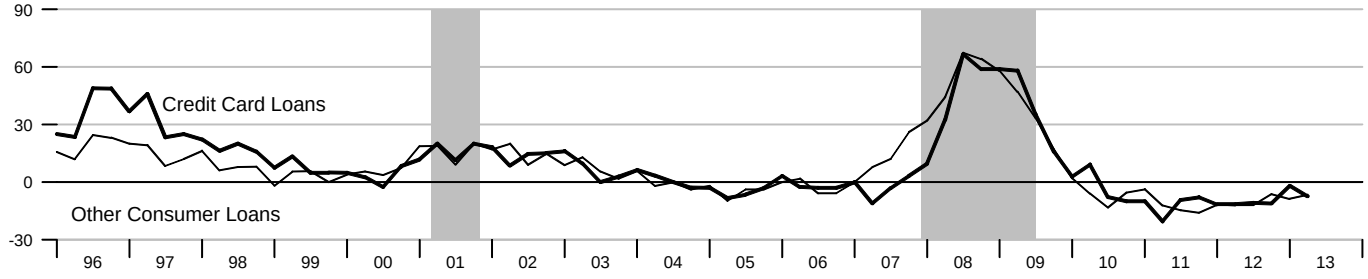
Net Percentage of Domestic Banks Tightening Standards for Residential Mortgage Loans

Percentage



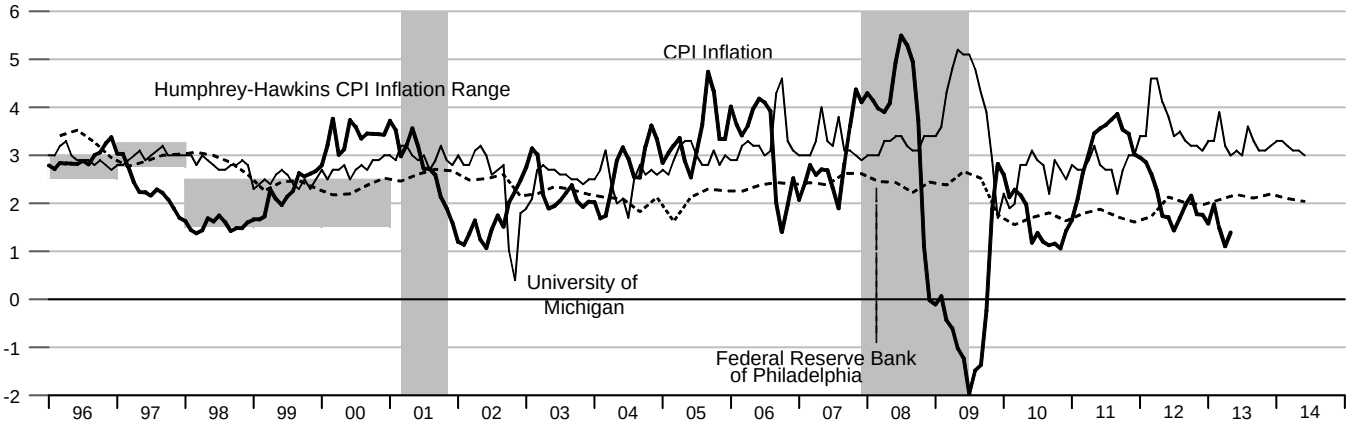
Net Percentage of Domestic Banks Tightening Standards for Consumer Loans

Percentage



CPI Inflation and 1-Year-Ahead CPI Inflation Expectations

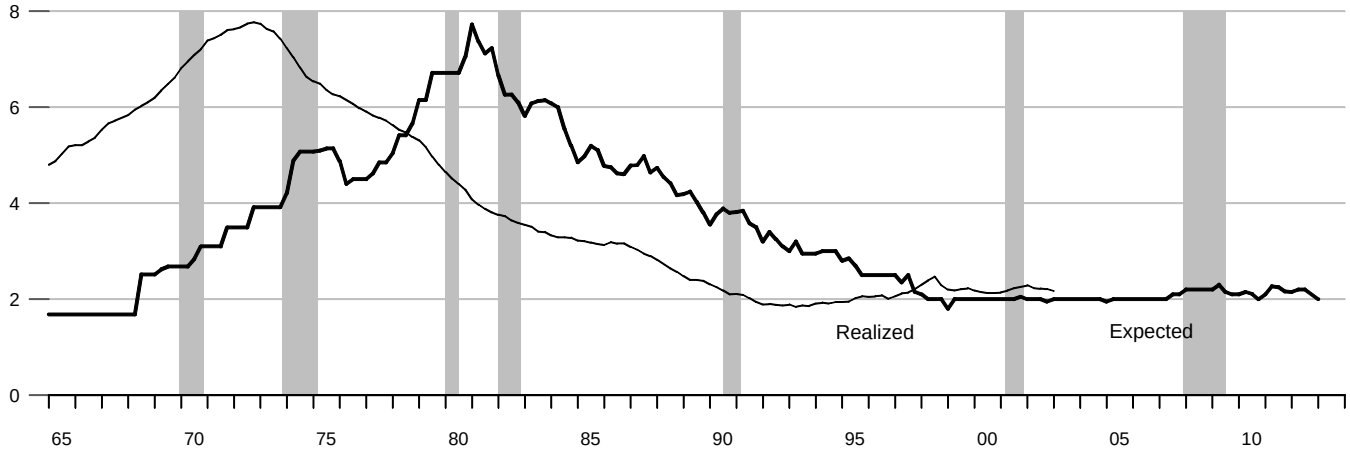
Percent



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

10-Year Ahead PCE Inflation Expectations and Realized Inflation

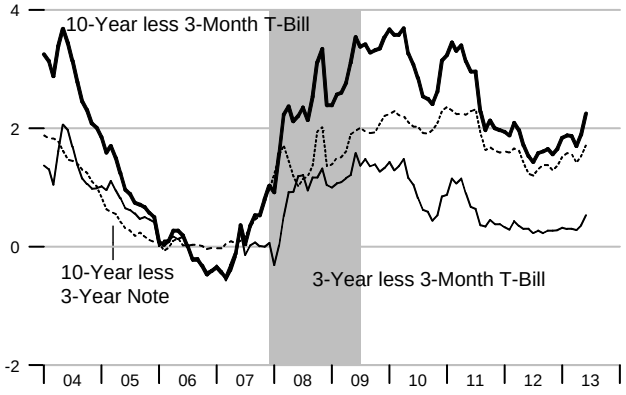
Percent



See the notes section for an explanation of the chart.

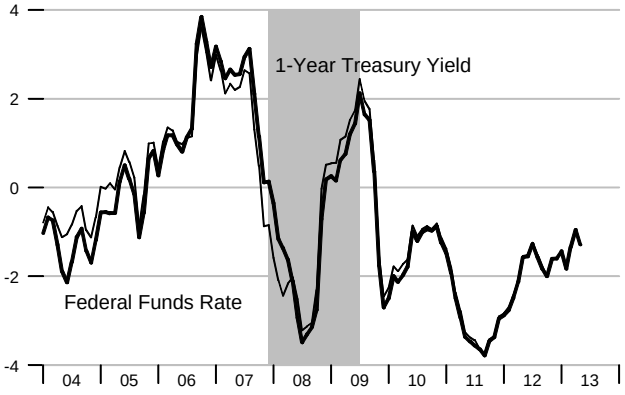
Treasury Security Yield Spreads

Yield to maturity

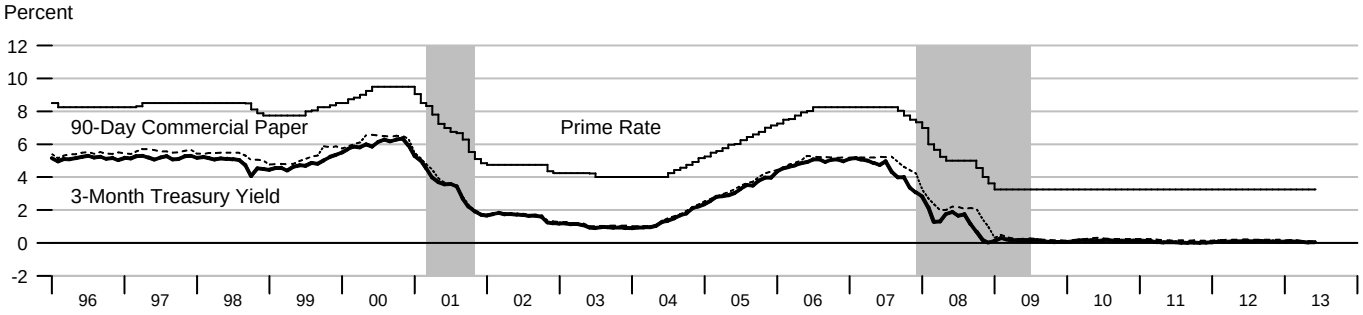


Real Interest Rates

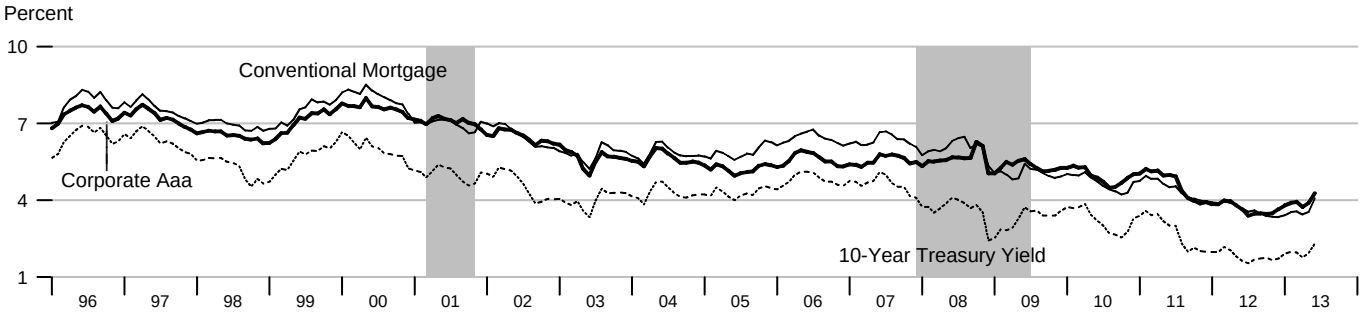
Percent, Real rate = Nominal rate less year-over-year CPI inflation



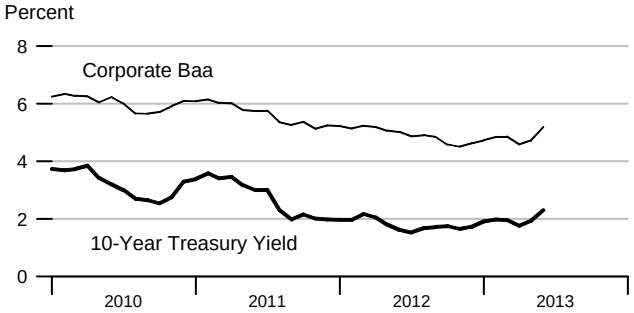
Short-Term Interest Rates



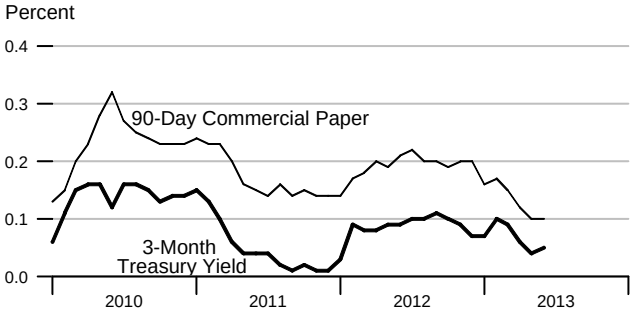
Long-Term Interest Rates



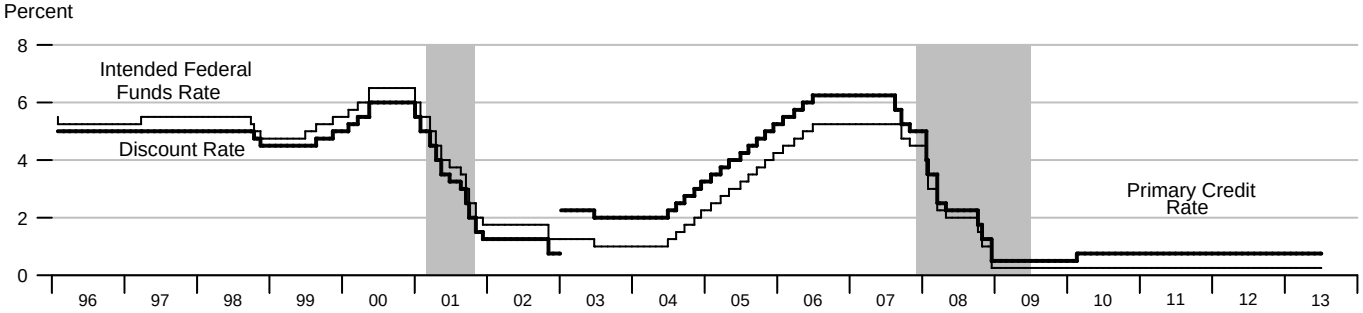
Long-Term Interest Rates



Short-Term Interest Rates

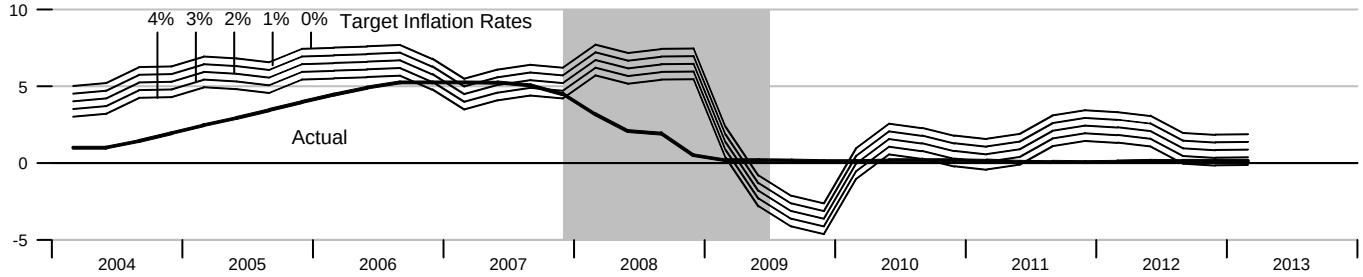


FOMC Intended Federal Funds Rate, Discount Rate, and Primary Credit Rate



Federal Funds Rate and Inflation Targets

Percent

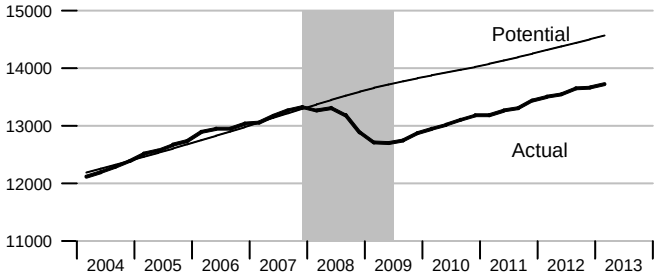


Calculated federal funds rate is based on Taylor's rule.

Components of Taylor's Rule

Actual and Potential Real GDP

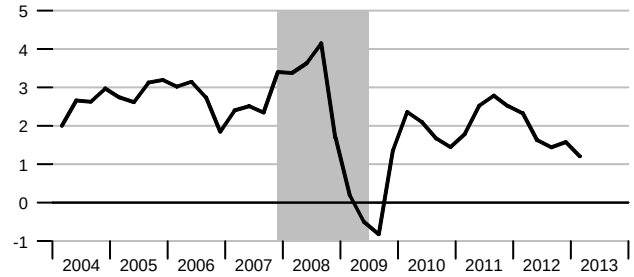
Billions of chain-weighted 2005 dollars



See notes section for further explanation.

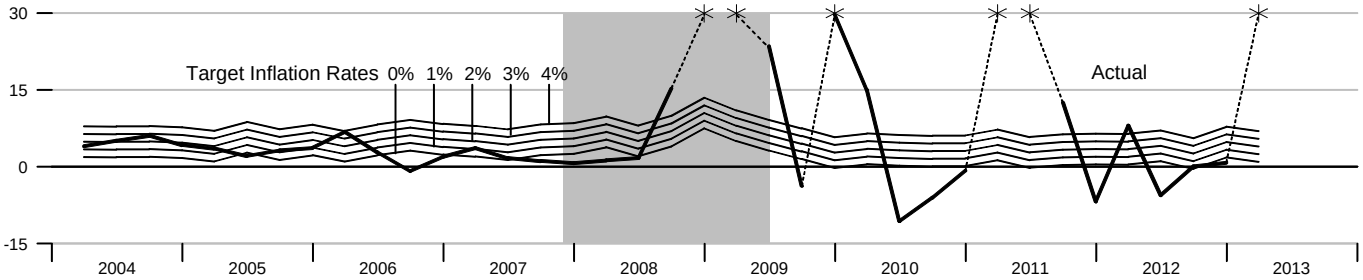
PCE Inflation

Percent change from year ago



Monetary Base Growth and Inflation Targets

Percent

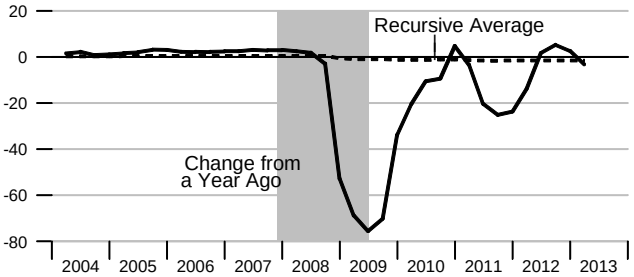


Calculated base growth is based on McCallum's rule. Actual base growth is percent change from the previous quarter. Stars represent actual values for 2008:Q4, 2009:Q1, 2009:Q4, 2011:Q1, 2011:Q2 and 2013:Q1 are 188.02%, 60.74%, 56.52%, 45.94%, 58.74%, and 30.24%, respectively.

Components of McCallum's Rule

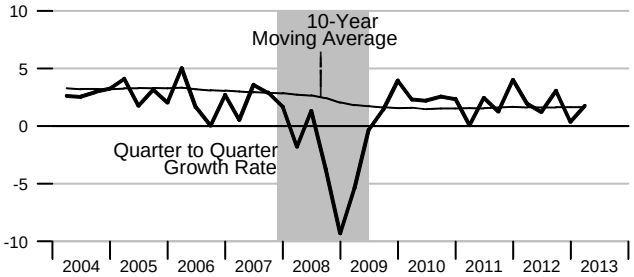
Monetary Base Velocity Growth

Percent



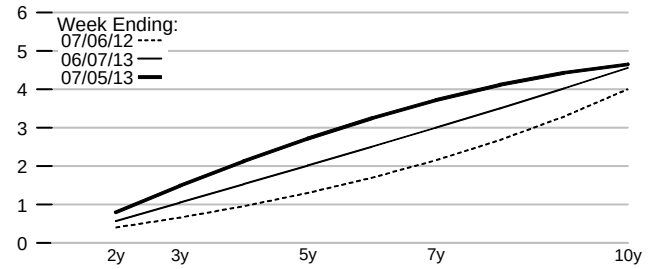
Real Output Growth

Percent



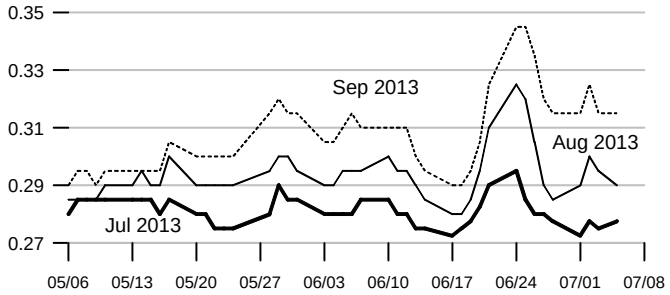
Implied One-Year Forward Rates

Percent



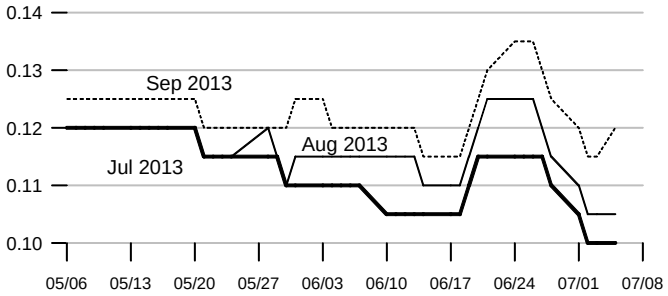
Rates on 3-Month Eurodollar Futures

Percent, daily data



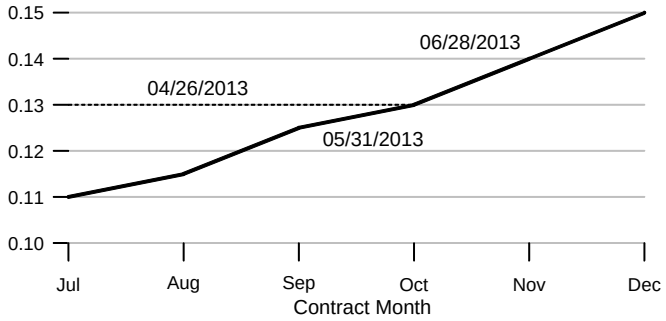
Rates on Selected Federal Funds Futures Contracts

Percent, daily data



Rates on Federal Funds Futures on Selected Dates

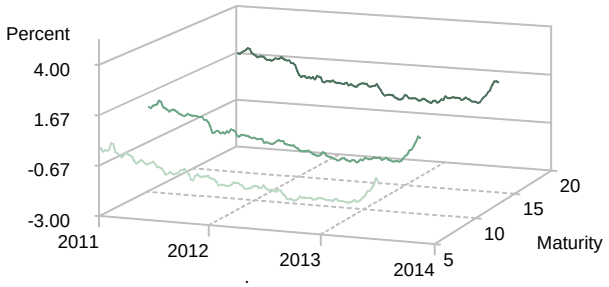
Percent



Federal Funds Rates for 5/31/13 are the same 6/28/2013.

Inflation-Indexed Treasury Securities

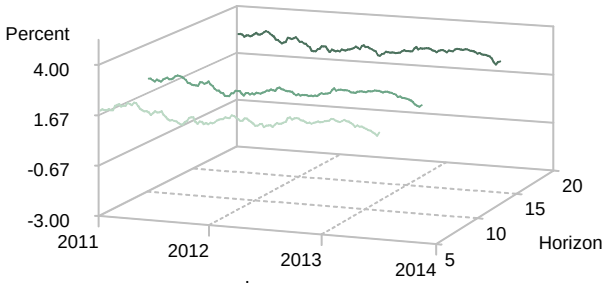
Weekly data



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

Inflation-Indexed Treasury Yield Spreads

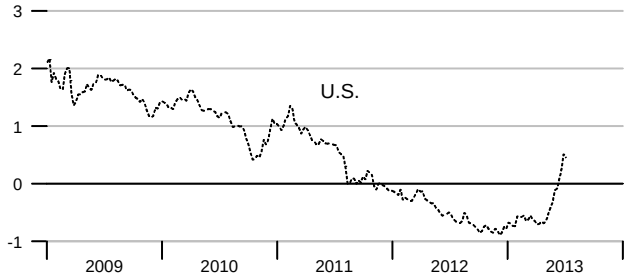
Weekly data



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

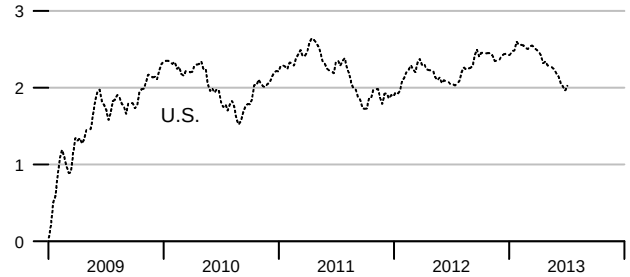
Inflation-Indexed 10-Year Government Notes

Percent, weekly data



Inflation-Indexed 10-Year Government Yield Spreads

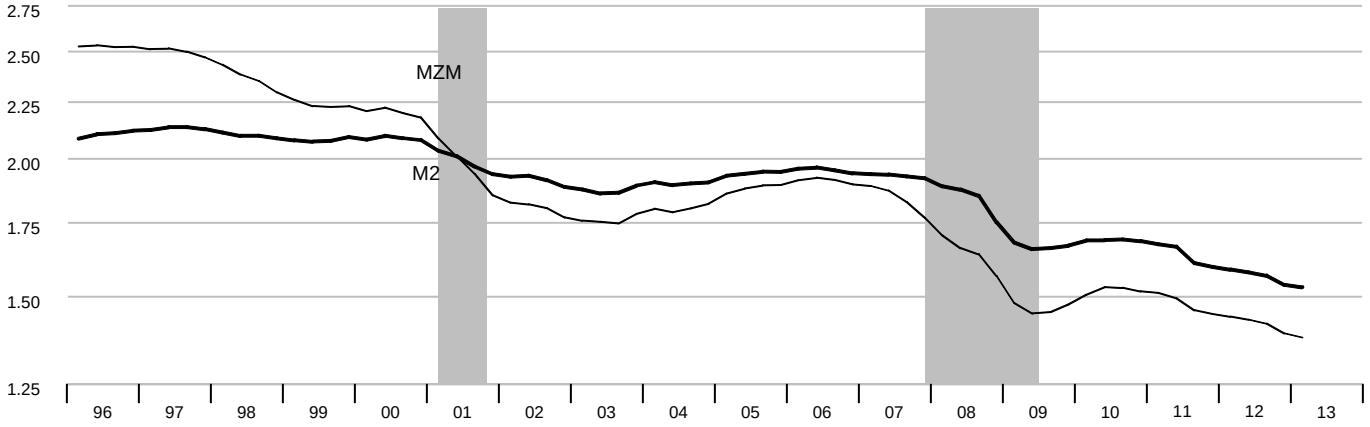
Percent, weekly data



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

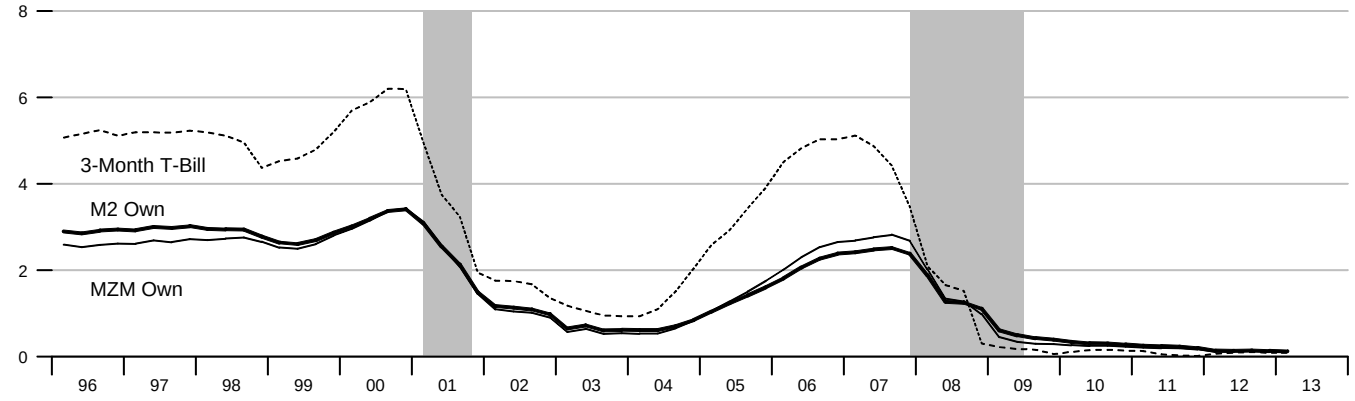
Velocity

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



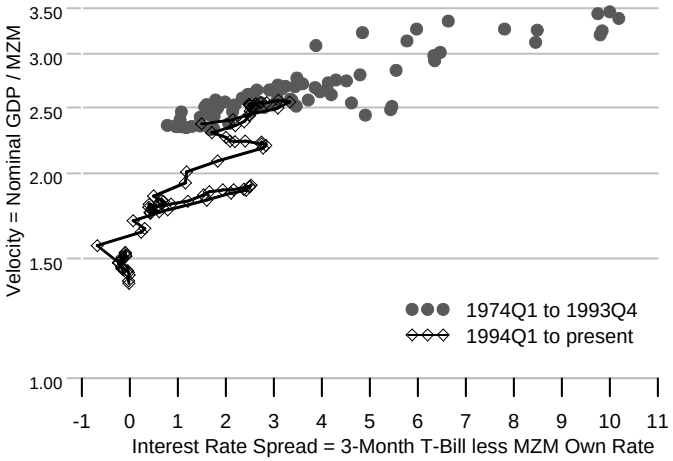
Interest Rates

Percent



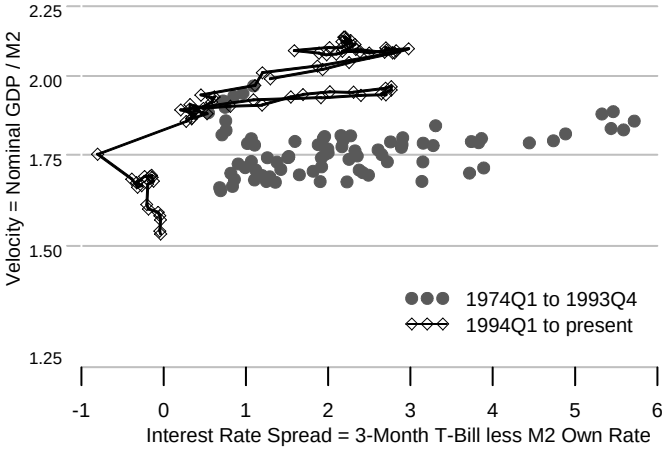
MZM Velocity and Interest Rate Spread

Ratio Scale



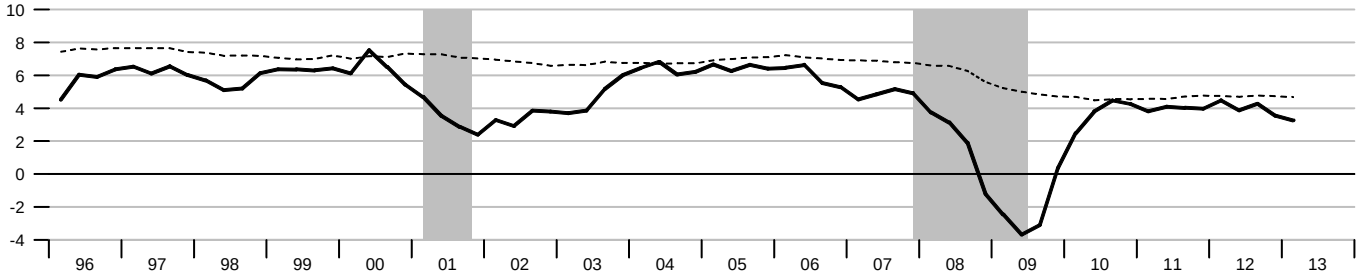
M2 Velocity and Interest Rate Spread

Ratio Scale



Gross Domestic Product

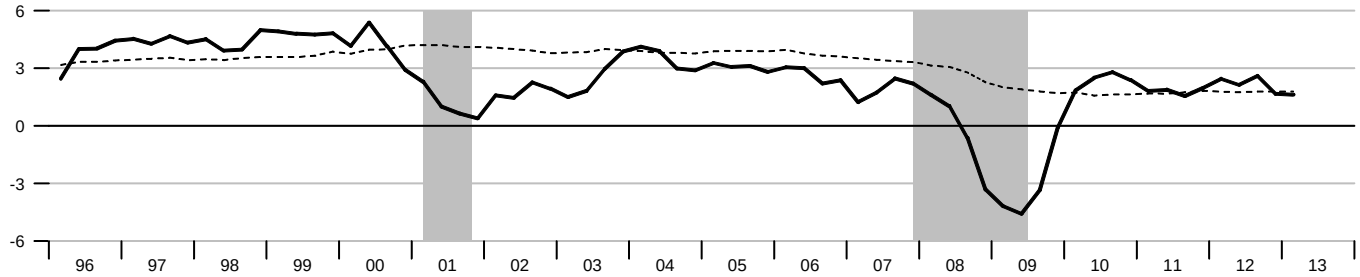
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Real Gross Domestic Product

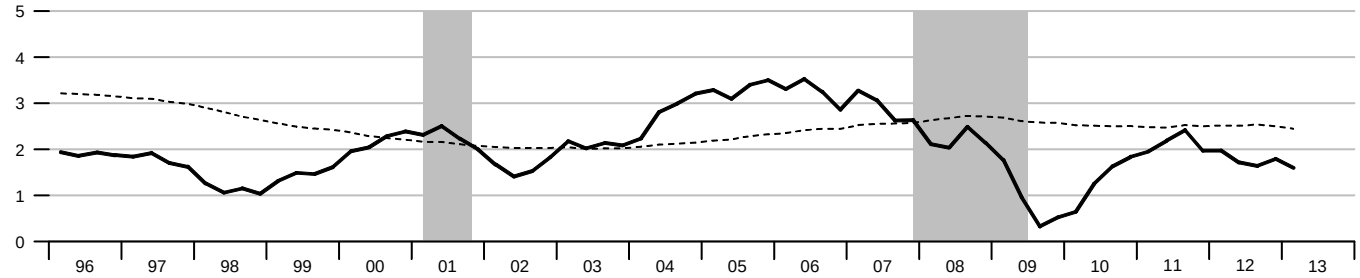
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Gross Domestic Product Price Index

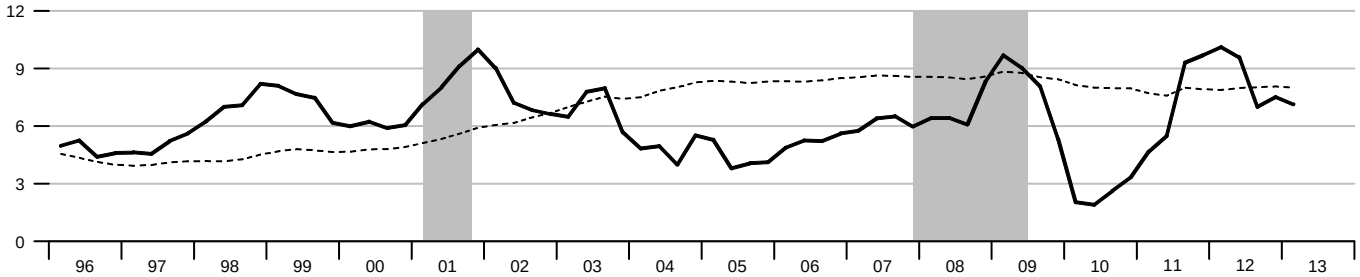
Percent change from year ago



Dashed lines indicate 10-year moving averages.

M2

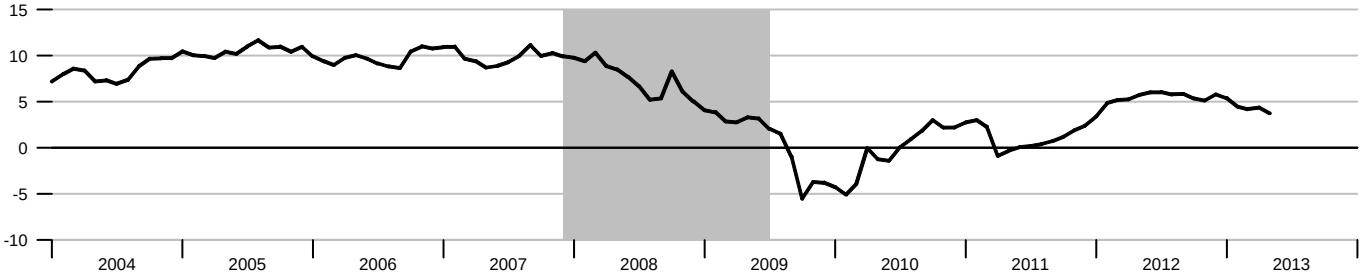
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Bank Credit

Percent change from year ago

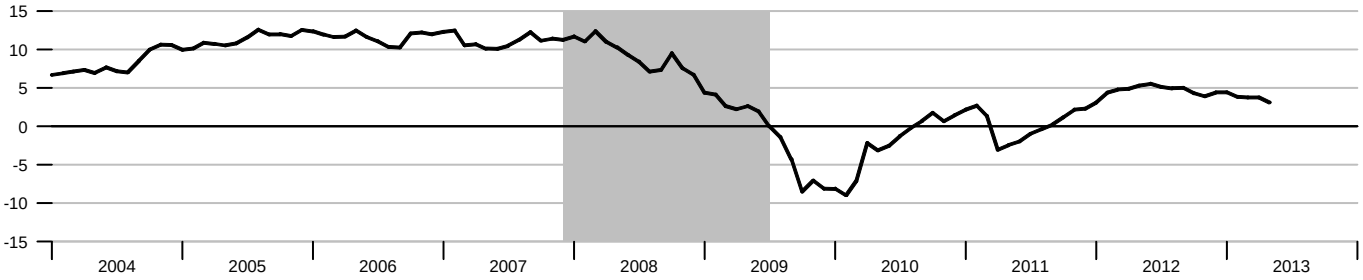


Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago

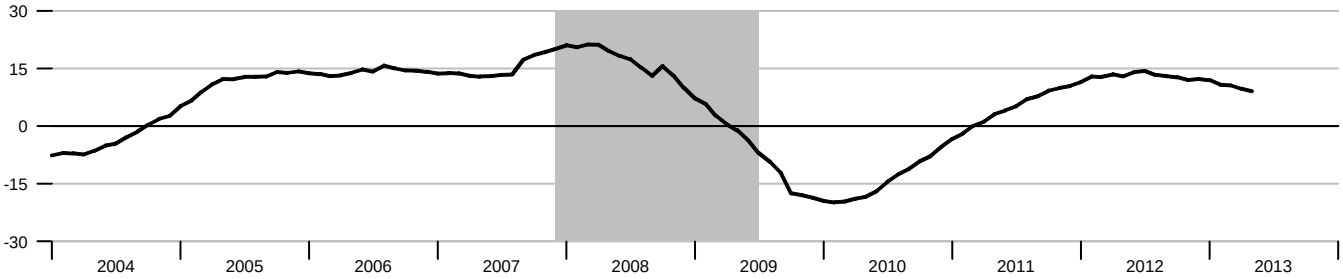
Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago

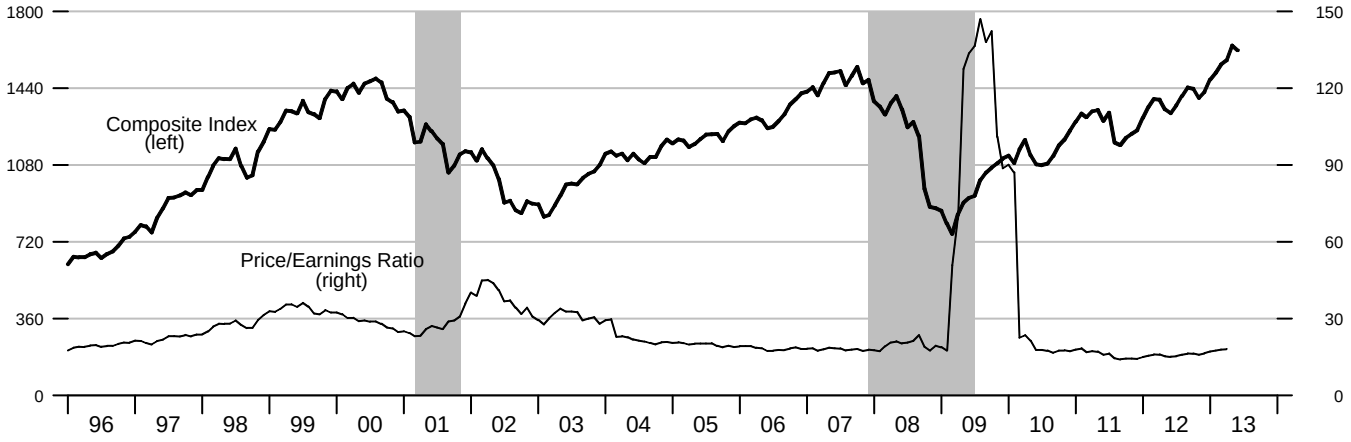


Commercial and Industrial Loans at Commercial Banks

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			
	2012Q2	2012Q3	2012Q4	2013Q1	Mar13	Apr13	May13	Jun13
United States	1.90	1.70	1.90	1.68	1.96	1.76	1.93	2.30
Canada	1.58	1.22	0.94	0.91	1.85	1.77	.	.
France	2.00	1.98	1.54	1.06	2.07	1.80	1.87	.
Germany	1.87	2.02	2.01	1.54	1.35	1.20	1.29	.
Italy	3.28	3.17	2.47	1.91	4.64	4.28	.	.
Japan	0.20	-0.34	-0.24	-0.63	0.49	0.59	.	.
United Kingdom	2.74	2.41	2.67	2.77	2.08	1.78	1.94	.

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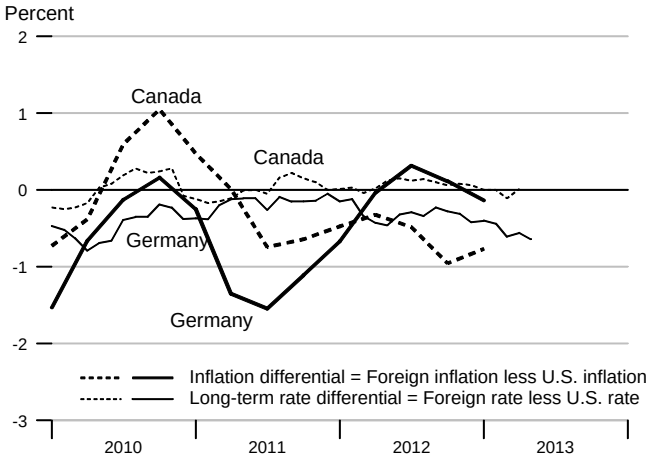
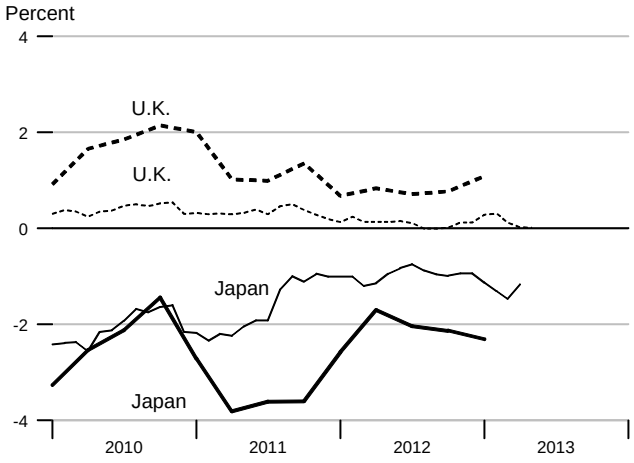
Inflation and Long-Term Interest Rate Differentials





		Money Stock				Bank	Adjusted		
		M1	MZM	M2	M3*	Credit	Monetary Base	Reserves	MSI M2**
2008		1434.484	8707.039	7764.531		9103.849	1010.160	232.392	7621.775
2009		1637.746	9542.589	8385.536		9170.387	1796.556	944.368	8242.425
2010		1742.079	9536.343	8593.096		9121.312	2031.689	1143.690	8453.575
2011		2009.572	10203.10	9221.519		9224.069	2538.959	1576.503	9079.317
2012		2310.401	11054.31	10006.37		9718.760	2661.969	1611.943	9858.642
2011	1	1873.875	9796.210	8852.835		9132.974	2242.975	1310.136	8713.433
	2	1931.825	10033.57	9010.039		9155.979	2597.817	1647.222	8869.433
	3	2078.262	10397.71	9426.258		9237.142	2680.091	1713.491	9282.300
	4	2154.327	10584.91	9596.946		9370.182	2634.952	1635.163	9452.100
2012	1	2214.065	10756.03	9748.146		9541.622	2688.263	1662.515	9602.667
	2	2260.856	10897.22	9873.356		9672.769	2651.102	1615.869	9726.800
	3	2342.316	11149.37	10086.31		9780.050	2651.597	1601.177	9937.400
	4	2424.368	11414.65	10317.66		9880.600	2656.914	1568.212	10167.70
2013	1	2469.109	11598.55	10444.38		9984.831	2865.577	1760.226	10293.33
2011	May	1940.612	10037.78	9000.712		9154.551	2590.336	1626.888	8860.200
	Jun	1952.371	10110.65	9081.168		9159.647	2671.446	1716.093	8940.000
	Jul	1998.765	10277.15	9267.421		9202.095	2703.445	1737.429	9124.400
	Aug	2112.455	10424.97	9490.829		9245.080	2680.325	1720.803	9346.400
	Sep	2123.566	10491.03	9520.523		9264.252	2656.502	1682.241	9376.100
	Oct	2142.167	10530.63	9550.176		9323.104	2678.391	1706.483	9405.900
	Nov	2159.892	10587.94	9602.369		9386.425	2622.980	1627.223	9457.500
	Dec	2160.921	10636.16	9638.293		9401.016	2603.486	1571.783	9492.900
2012	Jan	2201.941	10716.39	9712.317		9471.216	2647.505	1579.387	9566.700
	Feb	2216.784	10749.16	9747.838		9563.359	2733.081	1732.832	9602.700
	Mar	2223.470	10802.54	9784.282		9590.292	2684.203	1675.326	9638.600
	Apr	2252.593	10846.58	9828.699		9634.603	2673.666	1654.445	9682.800
	May	2262.601	10895.83	9870.331		9677.333	2634.893	1587.948	9723.800
	Jun	2267.375	10949.24	9921.038		9706.372	2644.747	1605.214	9773.800
	Jul	2312.603	11054.81	10012.78		9755.034	2669.164	1621.528	9864.600
	Aug	2340.020	11149.00	10085.28		9780.004	2669.390	1626.188	9936.300
	Sep	2374.326	11244.30	10160.88		9805.114	2616.238	1555.816	10011.30
	Oct	2420.931	11332.30	10245.82		9821.746	2648.761	1584.810	10095.60
	Nov	2406.532	11390.69	10298.24		9871.330	2665.101	1581.353	10149.00
	Dec	2445.640	11520.95	10408.93		9948.724	2656.879	1538.472	10258.50
2013	Jan	2466.165	11598.13	10448.60		9979.627	2748.980	1594.119	10297.60
	Feb	2477.903	11582.85	10424.57		9984.663	2874.405	1794.814	10274.00
	Mar	2463.259	11614.66	10459.97		9990.203	2973.347	1891.744	10308.40
	Apr	2523.205	11691.09	10525.63		10053.80	3045.673	1955.180	10373.90
	May	2534.670	11719.05	10552.64		10038.36	3139.122	2013.915	10400.60

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
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
2013	1	0.14	0.75	3.25	0.22	0.09	0.39	1.95	3.88	3.01	3.50
	2	0.12	0.75	3.25	0.20	0.05	0.44	2.00	3.97		3.68
2011	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	2.83	3.41
	Feb	0.15	0.75	3.25	0.22	0.10	0.40	1.98	3.90	3.08	3.53
	Mar	0.14	0.75	3.25	0.21	0.09	0.39	1.96	3.93	3.13	3.57
	Apr	0.15	0.75	3.25	0.20	0.06	0.34	1.76	3.73	3.11	3.45
	May	0.11	0.75	3.25	0.20	0.04	0.40	1.93	3.89		3.54
	Jun	0.09	0.75	3.25	0.19	0.05	0.58	2.30	4.27		4.07

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

		M1	MZM	M2	M3*
Percent change at an annual rate					
2008		4.50	14.06	6.82	
2009		14.17	9.60	8.00	
2010		6.37	-0.07	2.48	
2011		15.35	6.99	7.31	
2012		14.97	8.34	8.51	
2011	1	13.11	3.38	4.76	
	2	12.37	9.69	7.10	
	3	30.32	14.52	18.48	
	4	14.64	7.20	7.24	
2012	1	11.09	6.47	6.30	
	2	8.45	5.25	5.14	
	3	14.41	9.26	8.63	
	4	14.01	9.52	9.17	
2013	1	7.38	6.44	4.91	
2011	May	24.04	10.31	7.04	
	Jun	7.27	8.71	10.73	
	Jul	28.52	19.76	24.61	
	Aug	68.26	17.26	28.93	
	Sep	6.31	7.60	3.75	
	Oct	10.51	4.53	3.74	
	Nov	9.93	6.53	6.56	
	Dec	0.57	5.46	4.49	
2012	Jan	22.78	9.05	9.22	
	Feb	8.09	3.67	4.39	
	Mar	3.62	5.96	4.49	
	Apr	15.72	4.89	5.45	
	May	5.33	5.45	5.08	
	Jun	2.53	5.88	6.16	
	Jul	23.94	11.57	11.10	
	Aug	14.23	10.22	8.69	
	Sep	17.59	10.26	9.00	
	Oct	23.55	9.39	10.03	
	Nov	-7.14	6.18	6.14	
	Dec	19.50	13.72	12.90	
2013	Jan	10.07	8.04	4.57	
	Feb	5.71	-1.58	-2.76	
	Mar	-7.09	3.30	4.08	
	Apr	29.20	7.90	7.53	
	May	5.45	2.87	3.08	

*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^a 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/.