

# Monetary *Trends*

January 2015

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:  $[(x_t/x_{t-1})-1] \times 1200$ . Note that this differs from *National Economic Trends*. In that publication, monthly percent changes are compounded and expressed as annual growth rates.
4. The *percent change from year ago* refers to the percent change from the same period in the previous year. For example, the percent change from year ago in  $x$  between month  $t-12$  and the current month  $t$  is:  $[(x_t/x_{t-12})-1] \times 100$ .

We welcome your comments addressed to:

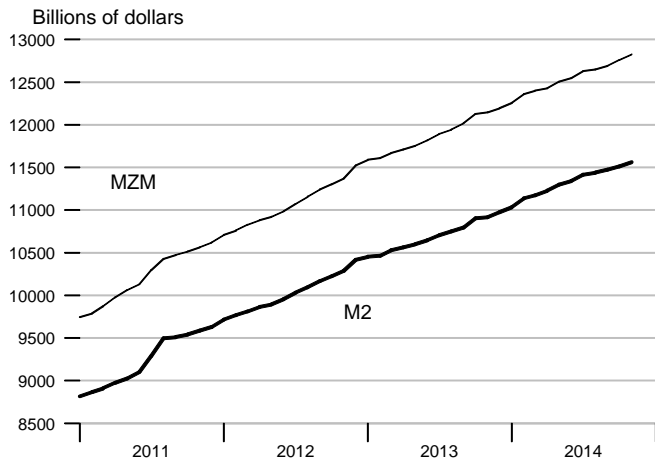
Editor, *Monetary Trends*  
Research Division  
Federal Reserve Bank of St. Louis  
P.O. Box 442  
St. Louis, MO 63166-0442

or to:

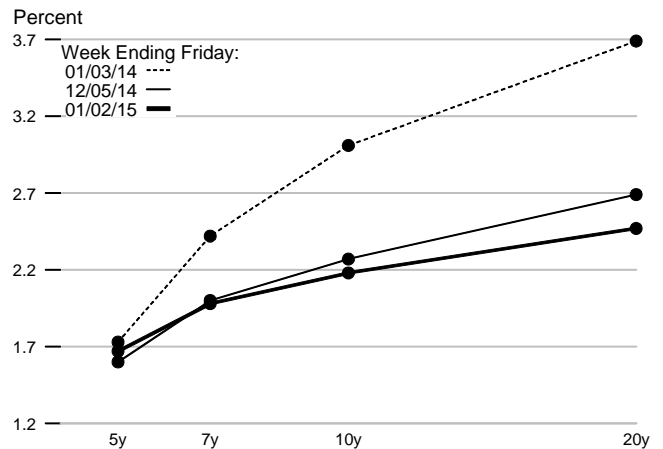
stlsFRED@stls.frb.org

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.

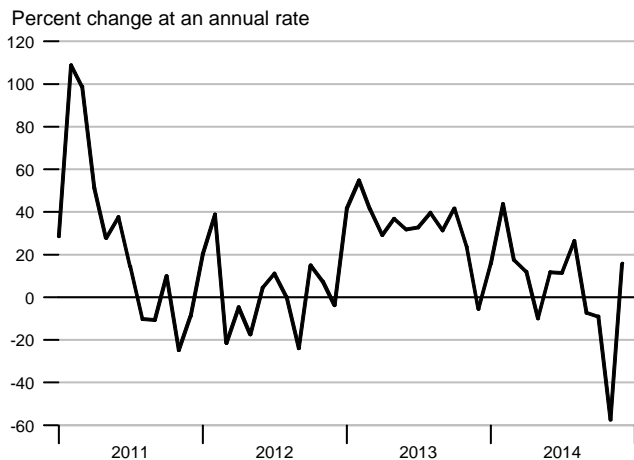
### M2 and MZM



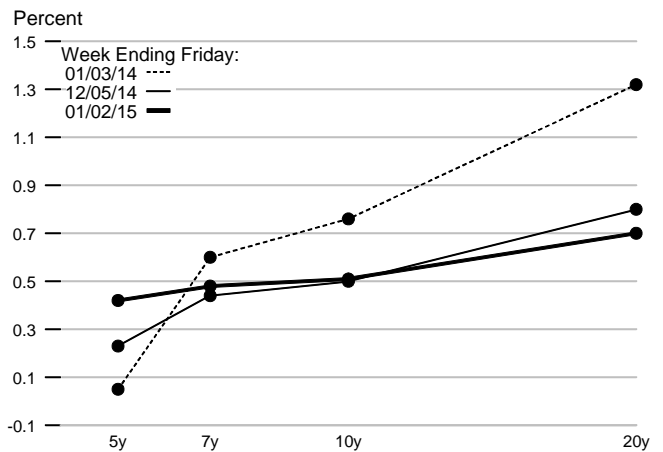
### Treasury Yield Curve



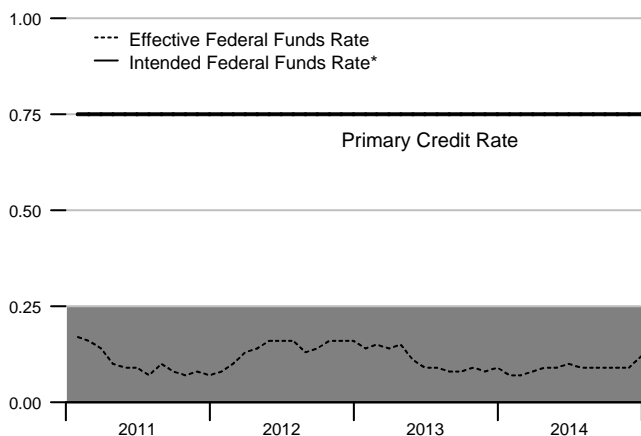
### Adjusted Monetary Base



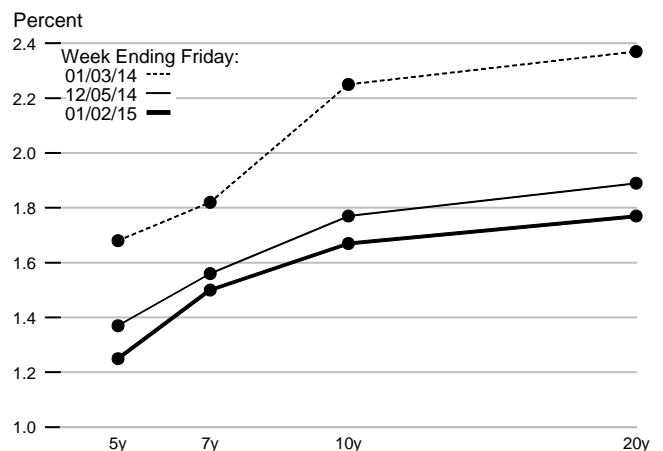
### Real Treasury Yield Curve



### Reserve Market Rates



### Inflation-Indexed Treasury Yield Spreads



\*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.

**M1**

Percent change from year ago



**M2M**

Percent change from year ago



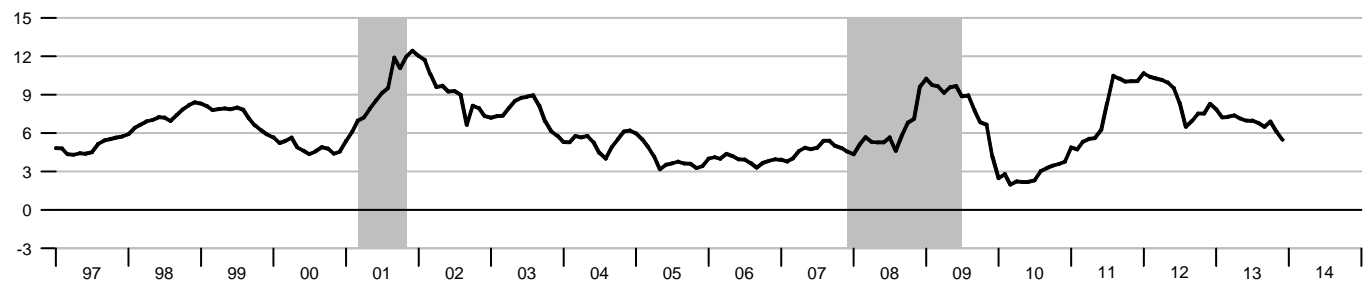
**M2**

Percent change from year ago



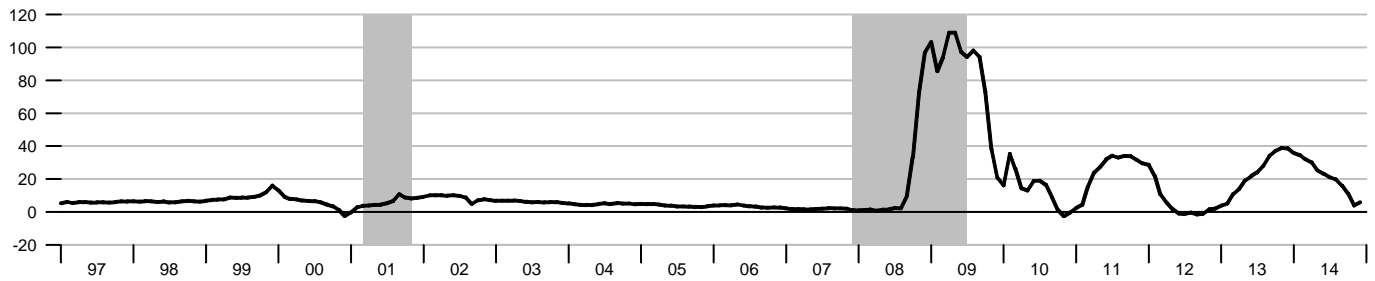
**Monetary Services Index - M2**

Percent change from year ago



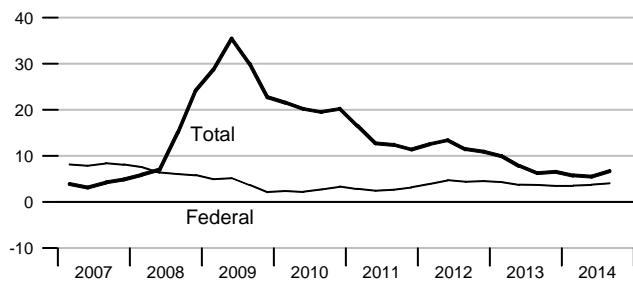
### Adjusted Monetary Base

Percent change from year ago



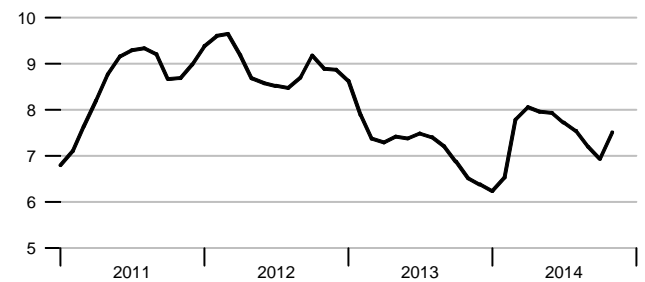
### Domestic Nonfinancial Debt

Percent change from year ago



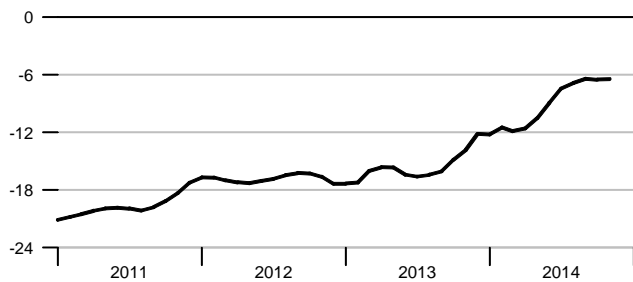
### Currency Held by the Nonbank Public

Percent change from year ago



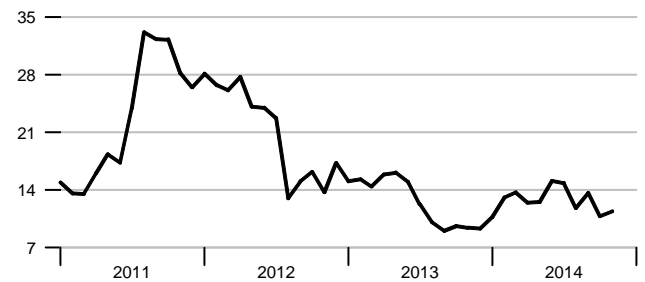
### Small Denomination Time Deposits

Percent change from year ago



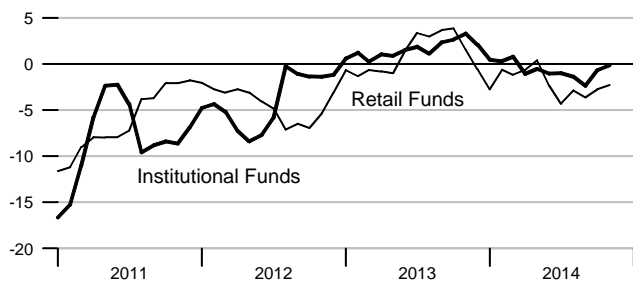
### Checkable Deposits

Percent change from year ago



### Money Market Mutual Fund Shares

Percent change from year ago



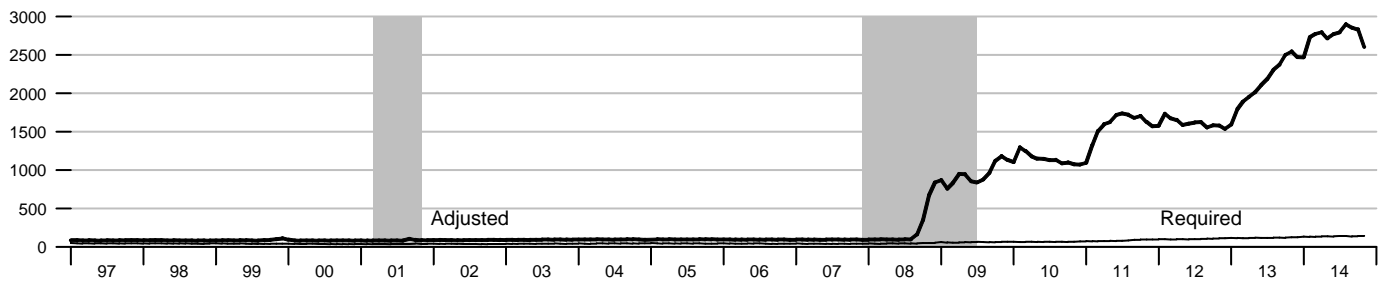
### Savings Deposits

Percent change from year ago



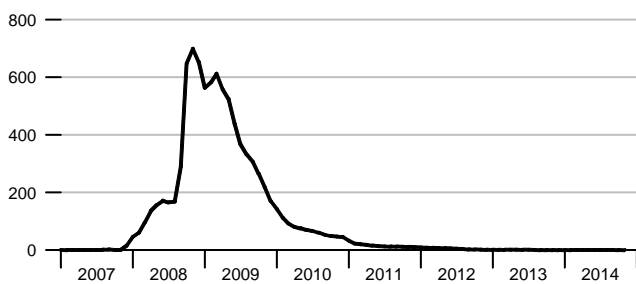
### Adjusted and Required Reserves

Billions of dollars



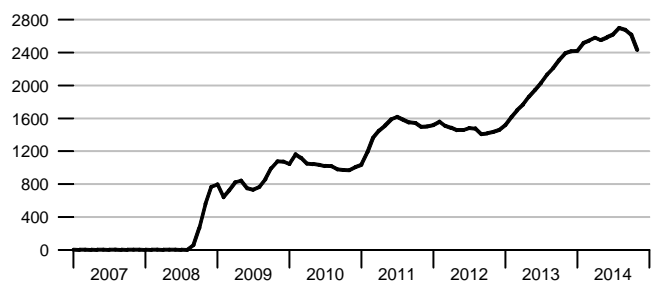
### Total Borrowings

Billions of dollars



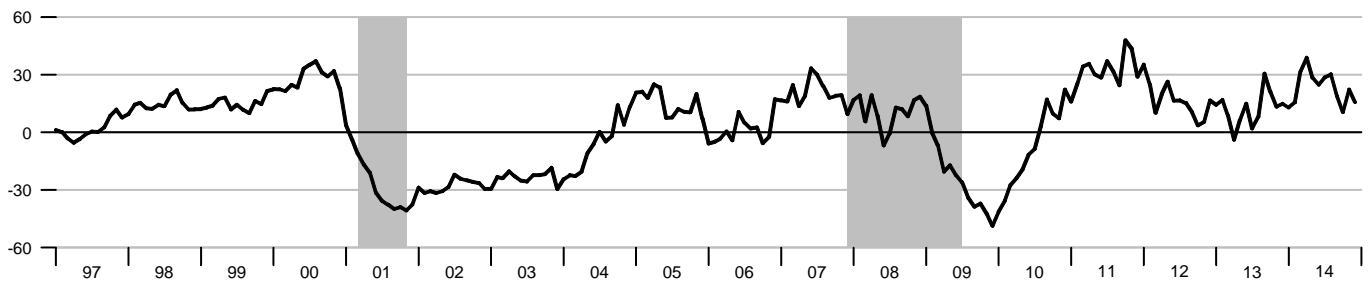
### Excess Reserve Balances

Billions of dollars



### Nonfinancial Commercial Paper

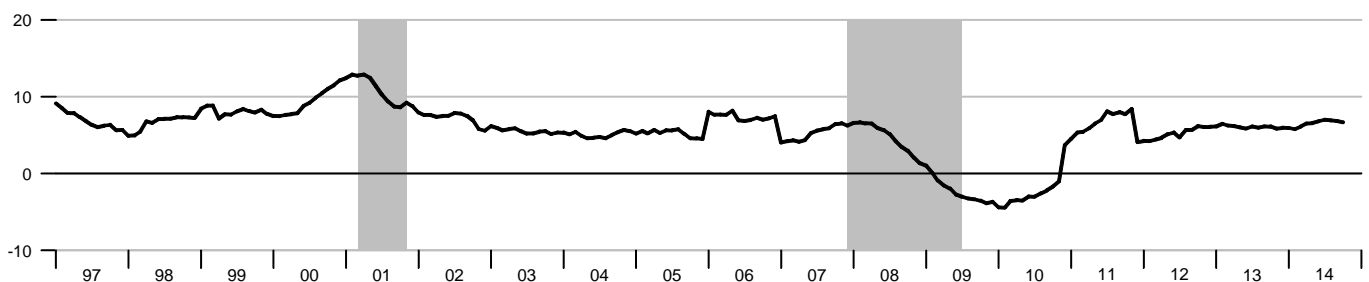
Percent change from year ago



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>.

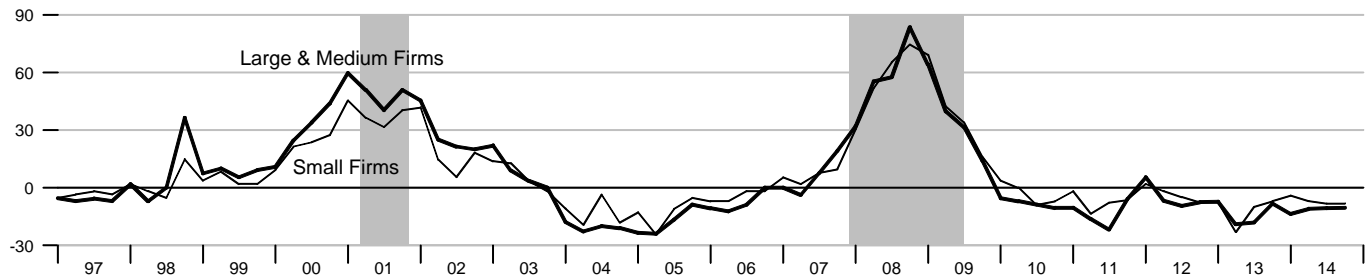
### Consumer Credit

Percent change from year ago



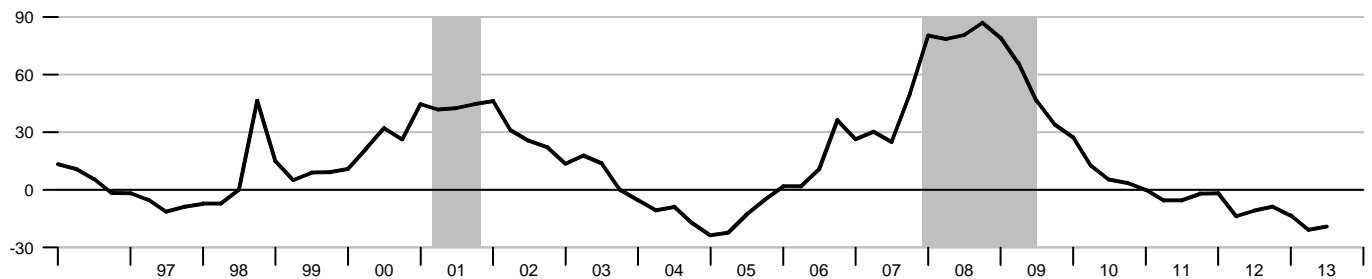
**Net Percentage of Domestic Banks Tightening Standards for Commercial and Industrial Loans**

Percentage



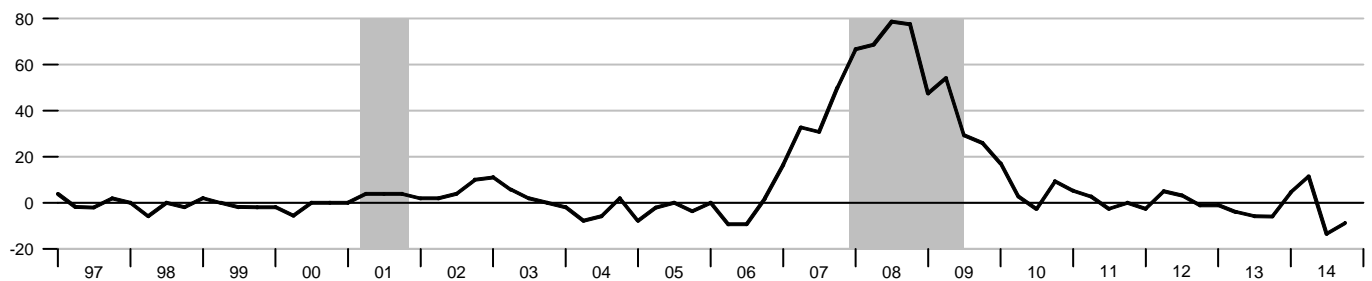
**Net Percentage of Domestic Banks Tightening Standards for Commercial Real Estate Loans**

Percentage



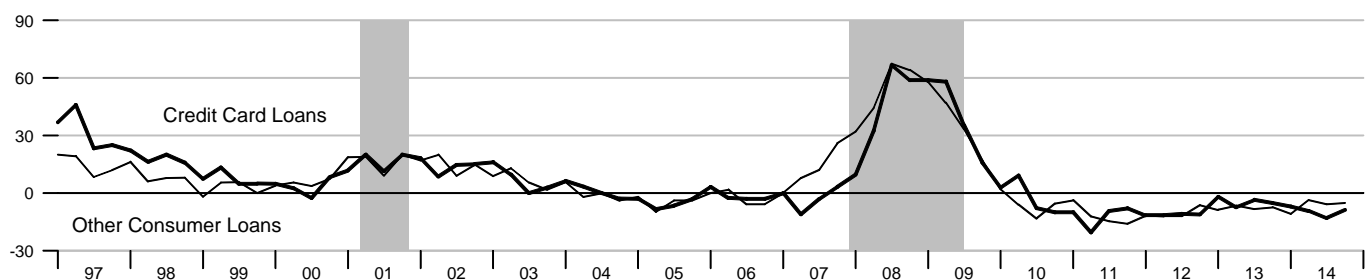
**Net Percentage of Domestic Banks Tightening Standards for Residential Mortgage Loans**

Percentage

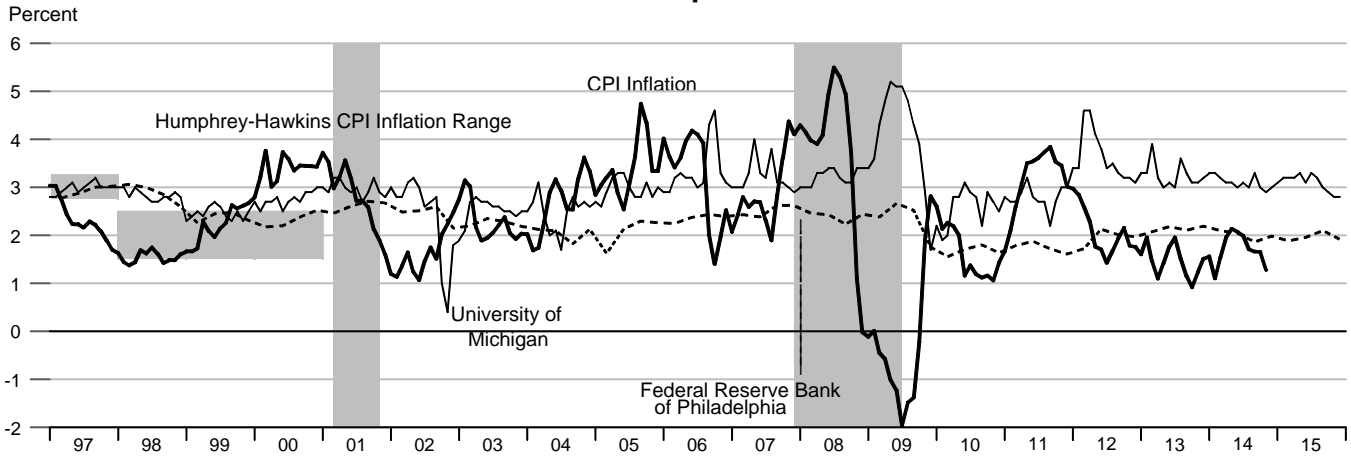


**Net Percentage of Domestic Banks Tightening Standards for Consumer Loans**

Percentage

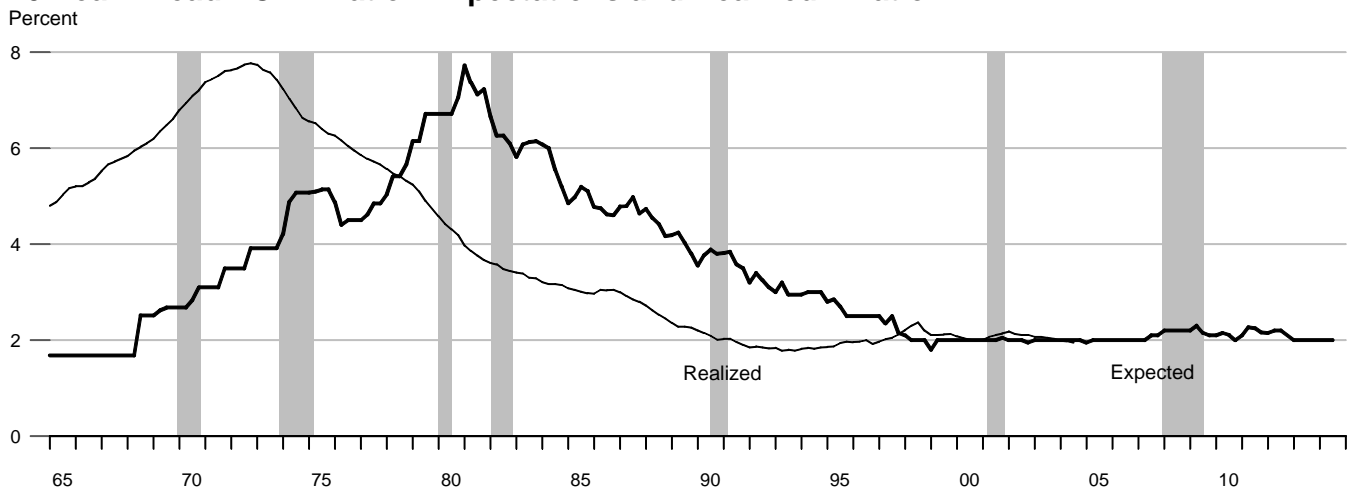


### CPI Inflation and 1-Year-Ahead CPI Inflation Expectations



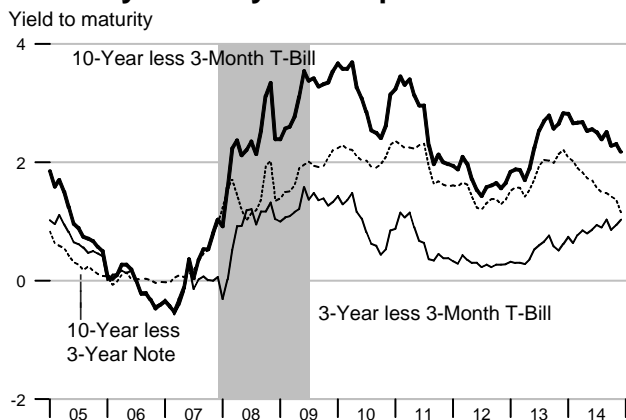
The shaded region shows the Humphrey-Hawkins CPI inflation range. Beginning in January 2000, the Humphrey-Hawkins inflation range was reported using the PCE price index and therefore is not shown on this graph.

### 10-Year Ahead PCE Inflation Expectations and Realized Inflation

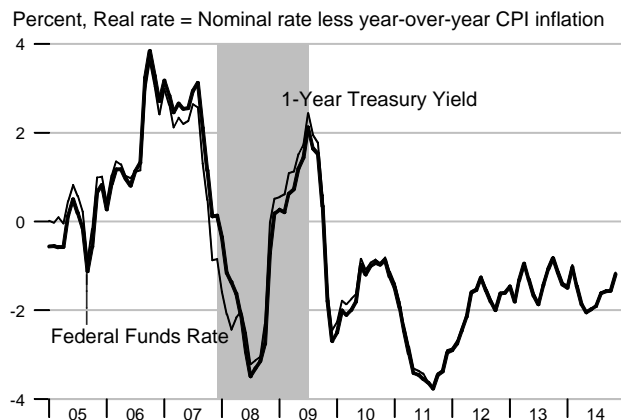


See the notes section for an explanation of the chart.

### Treasury Security Yield Spreads

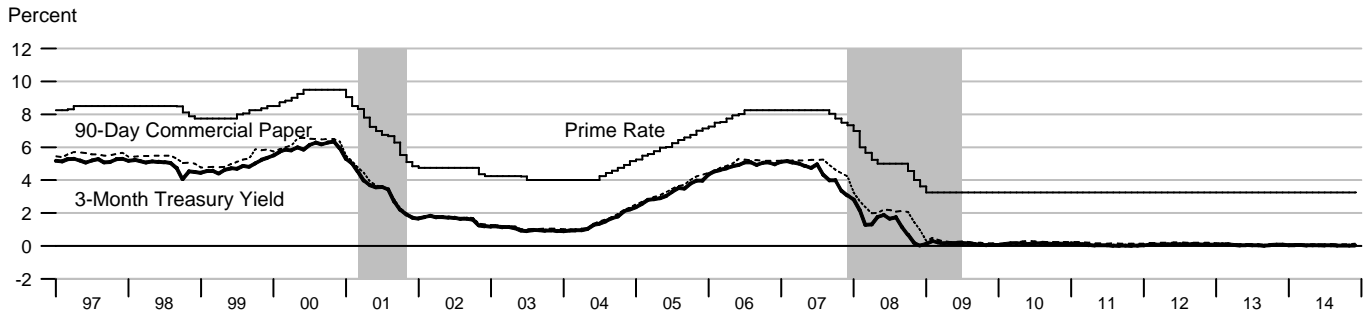


### Real Interest Rates

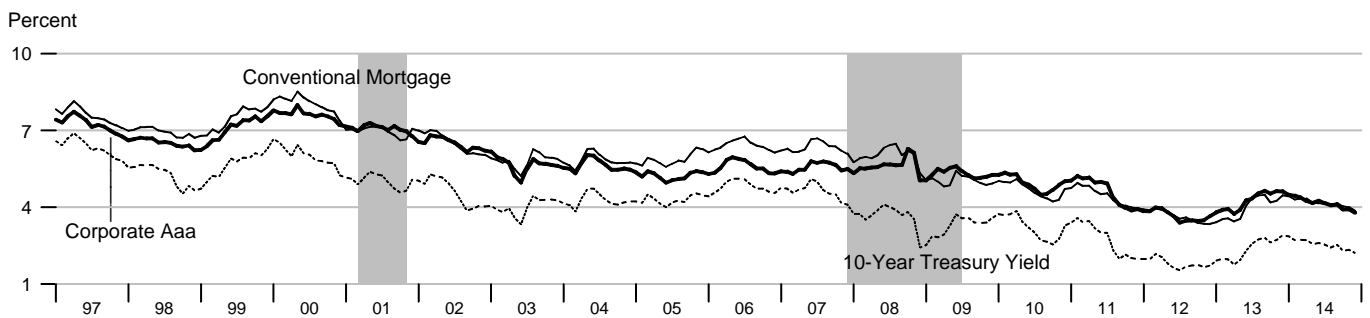




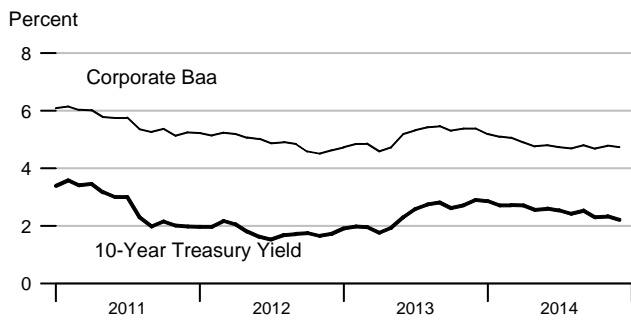
### Short-Term Interest Rates



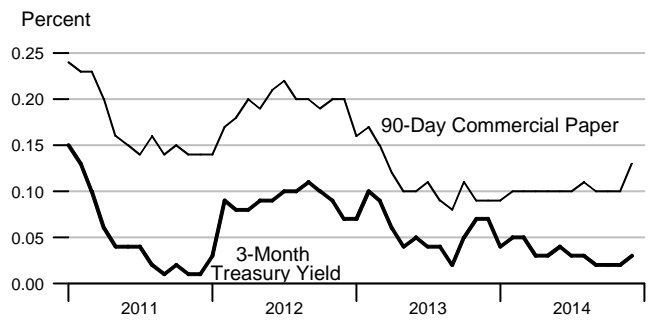
### Long-Term Interest Rates



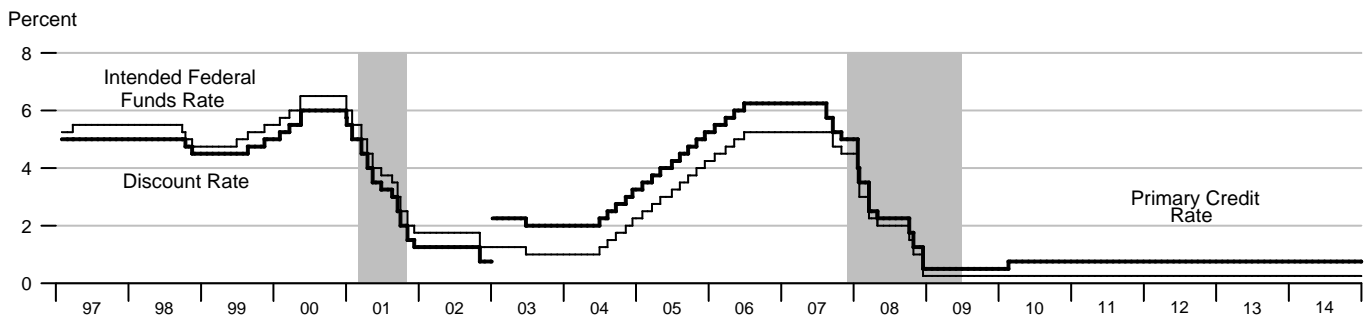
### Long-Term Interest Rates



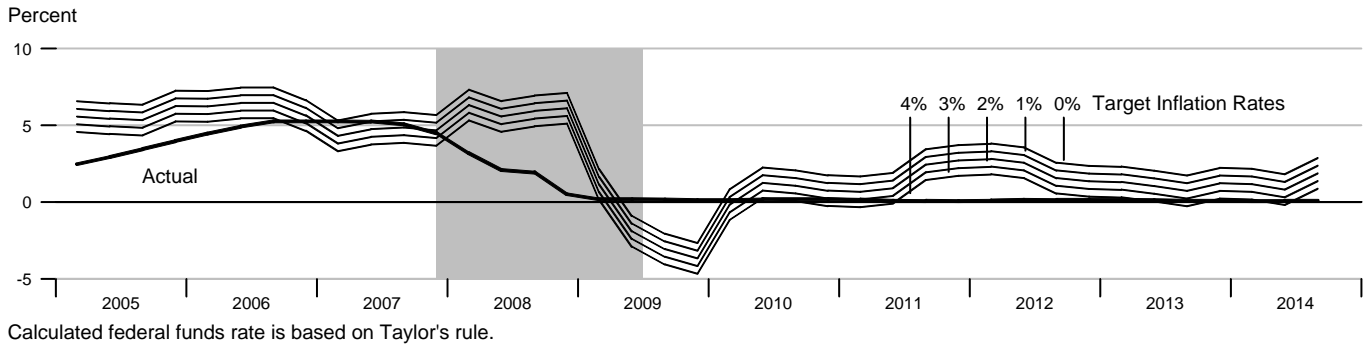
### Short-Term Interest Rates



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

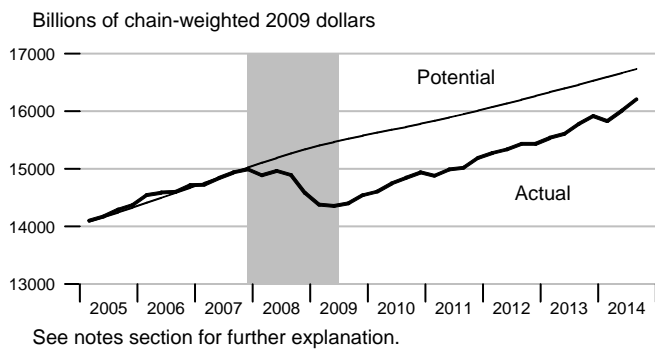


### Federal Funds Rate and Inflation Targets

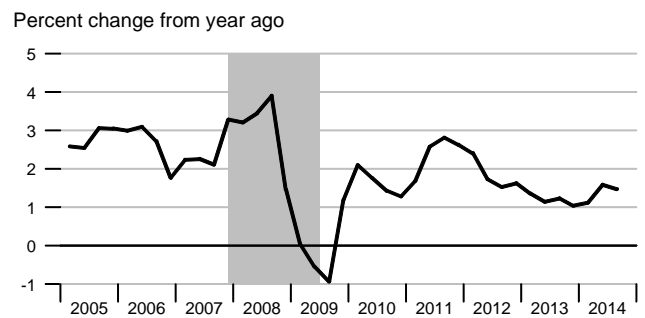


### Components of Taylor's Rule

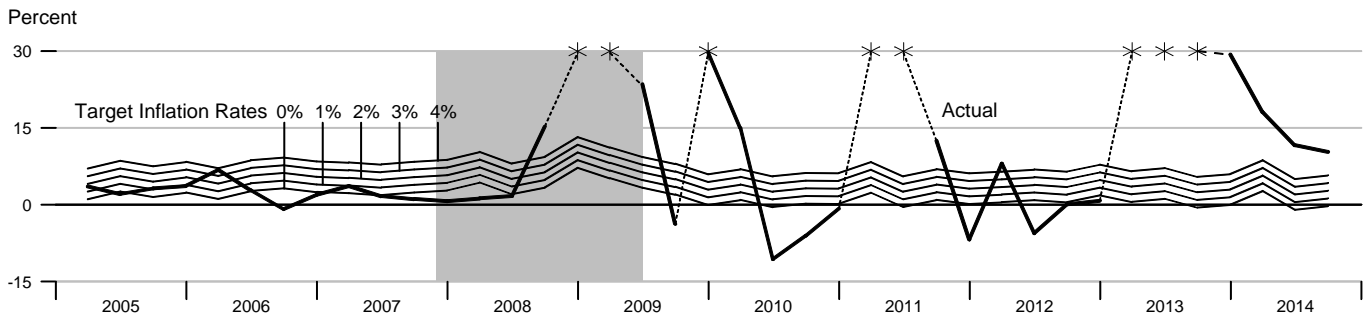
#### Actual and Potential Real GDP



#### PCE Inflation



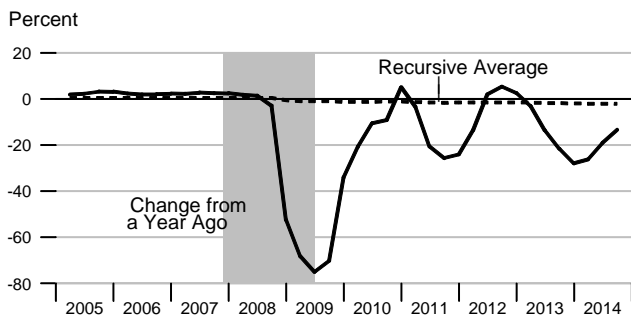
### Monetary Base Growth and Inflation Targets



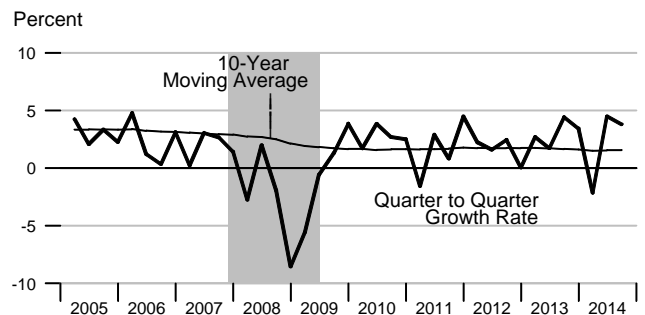
Calculated base growth is based on McCallum's rule. Actual base growth is percent change from the previous quarter. Stars represent actual values for 2008:Q4, 2009:Q1, 2009:Q4, 2011:Q1, 2011:Q2, 2013:Q1, 2013:Q2 and 2013:Q3 are 188.33%, 60.16%, 56.53%, 45.93%, 58.75%, 30.24%, 36.03% and 33.88%, respectively.

### Components of McCallum's Rule

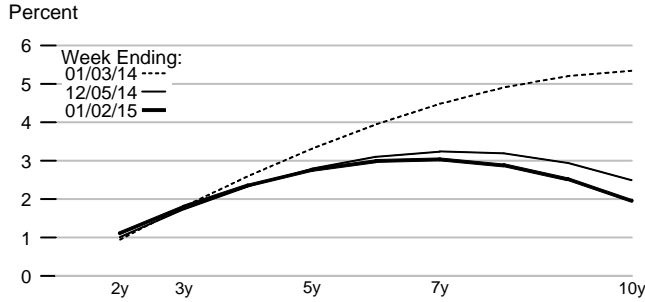
#### Monetary Base Velocity Growth



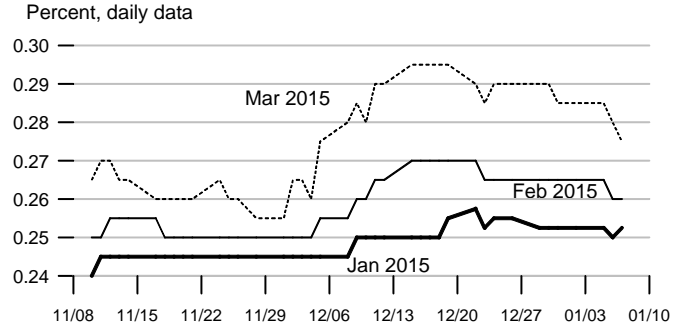
#### Real Output Growth



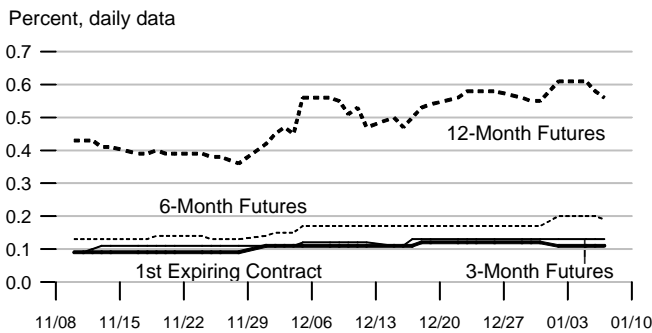
Implied One-Year Forward Rates



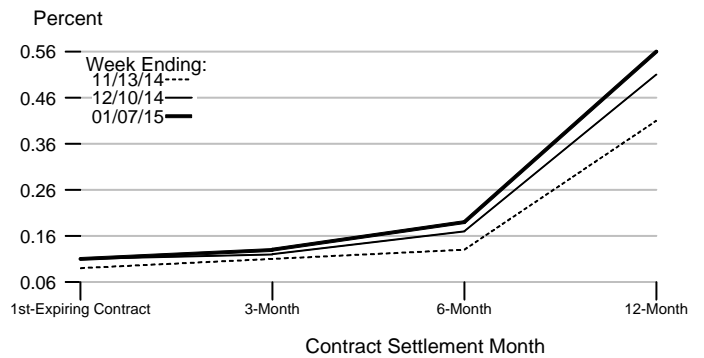
Rates on 3-Month Eurodollar Futures



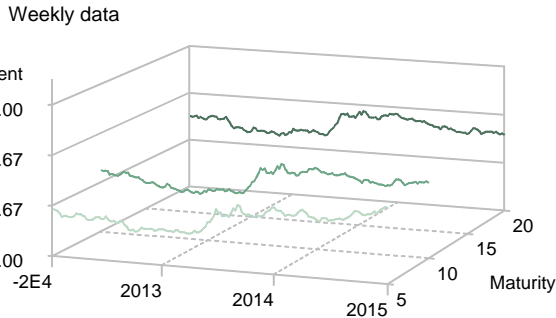
Rates on Selected Federal Funds Futures Contracts



Rates on Federal Funds Futures on Selected Dates

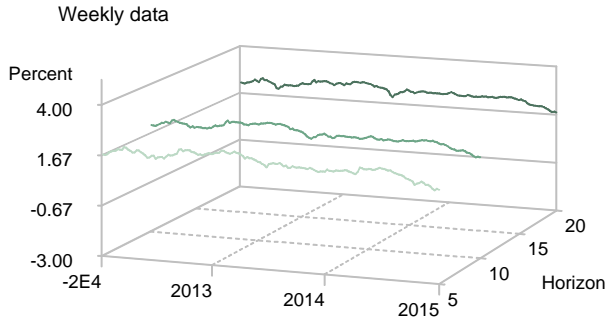


Inflation-Indexed Treasury Securities



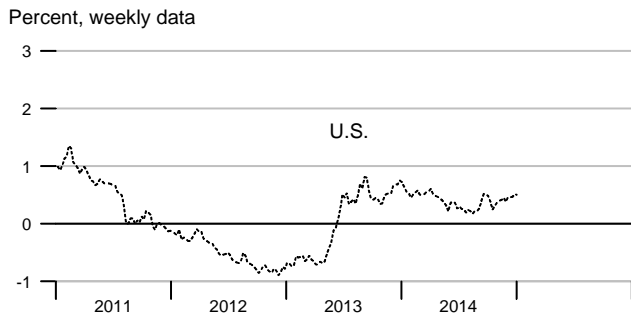
Note: Yields are inflation-indexed constant maturity U.S. Treasury securities

Inflation-Indexed Treasury Yield Spreads



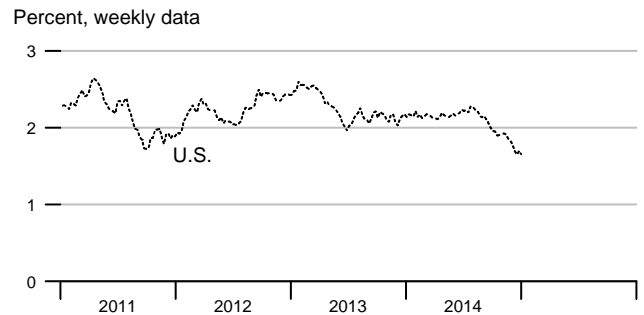
Note: Yield spread is between nominal and inflation-indexed constant maturity U.S. Treasury securities.

Inflation-Indexed 10-Year Government Notes



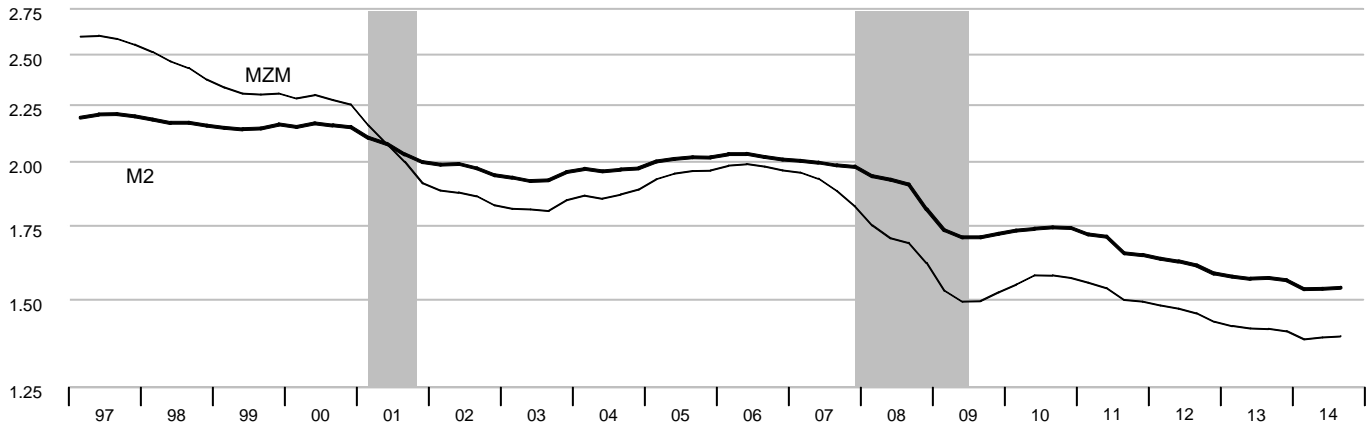
Note: Data is temporarily unavailable for the French and U.K. 10-Year Notes and Government Yield Spreads.

Inflation-Indexed 10-Year Government Yield Spreads



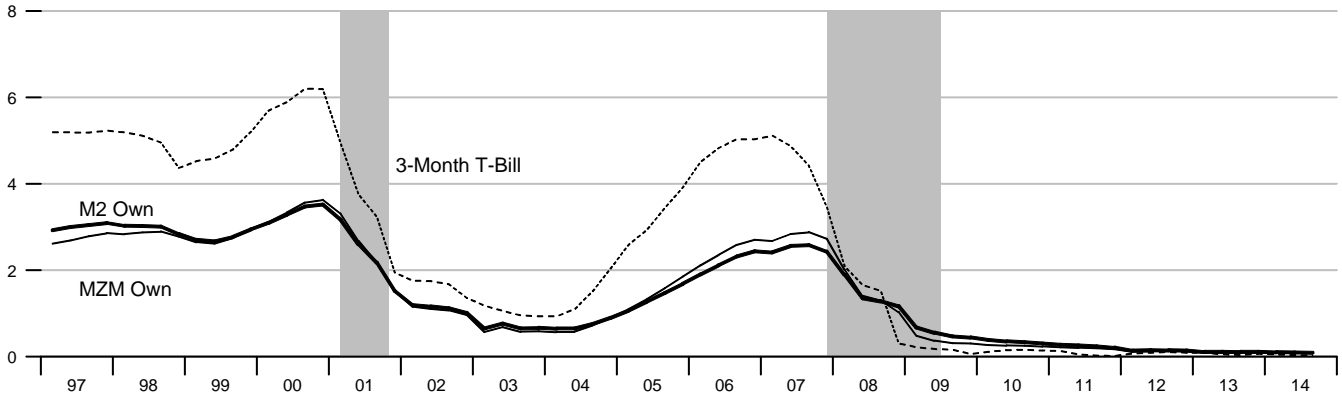
Velocity

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



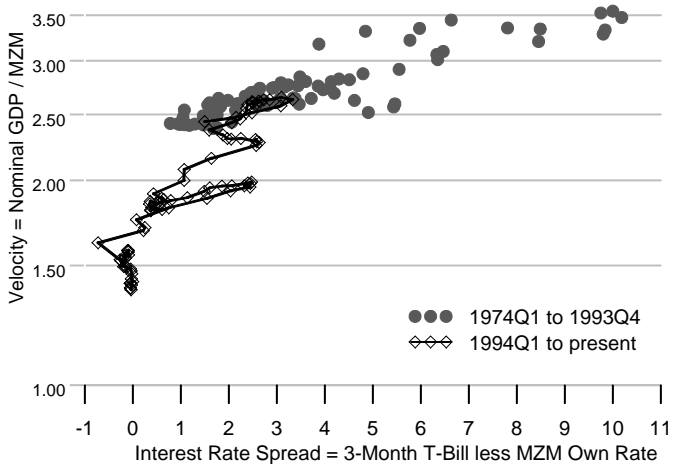
Interest Rates

Percent



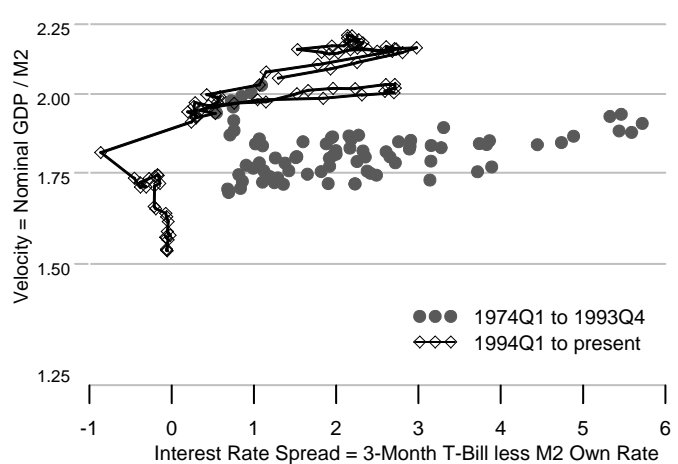
MZM Velocity and Interest Rate Spread

Ratio Scale



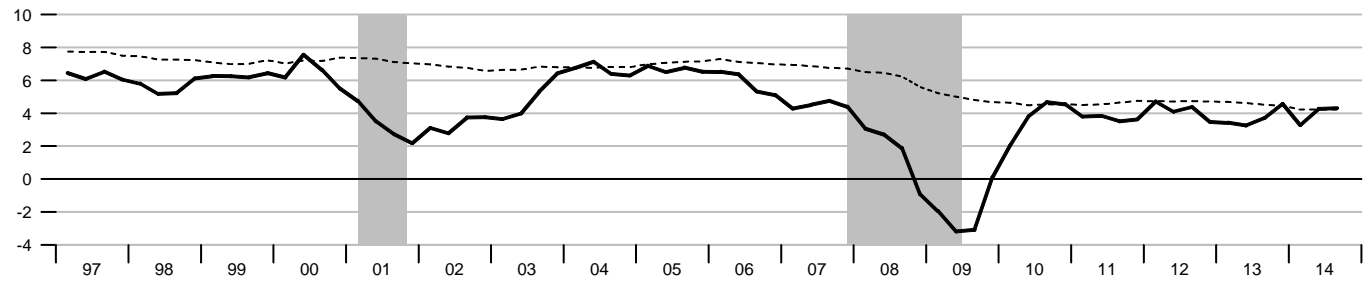
M2 Velocity and Interest Rate Spread

Ratio Scale



### Gross Domestic Product

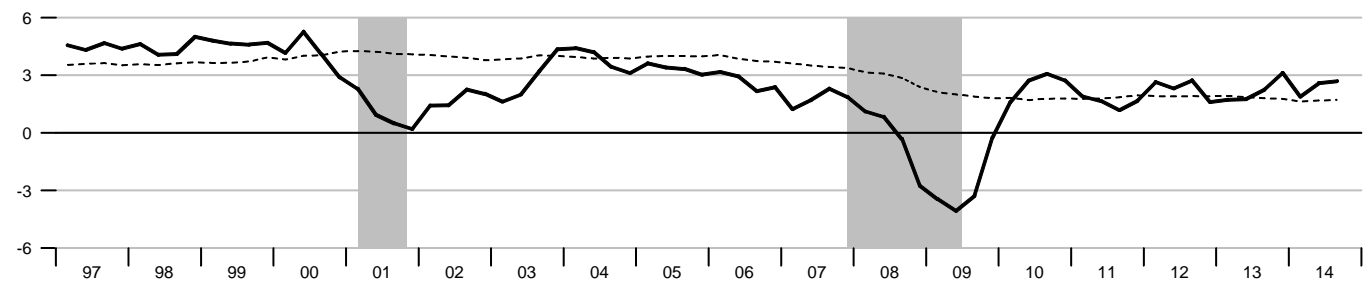
Percent change from year ago



Dashed lines indicate 10-year moving averages.

### Real Gross Domestic Product

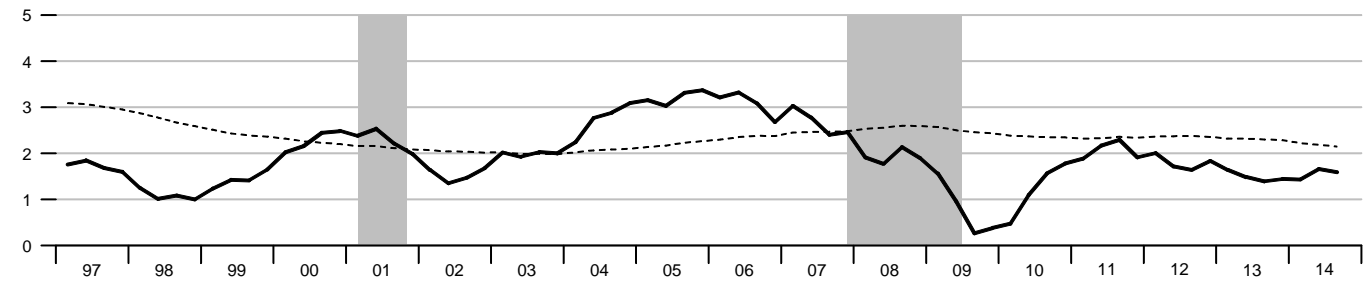
Percent change from year ago



Dashed lines indicate 10-year moving averages.

### Gross Domestic Product Price Index

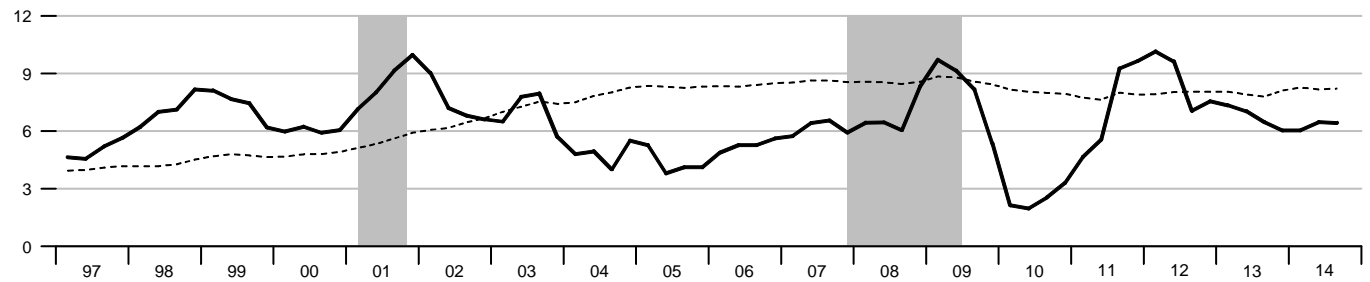
Percent change from year ago



Dashed lines indicate 10-year moving averages.

### M2

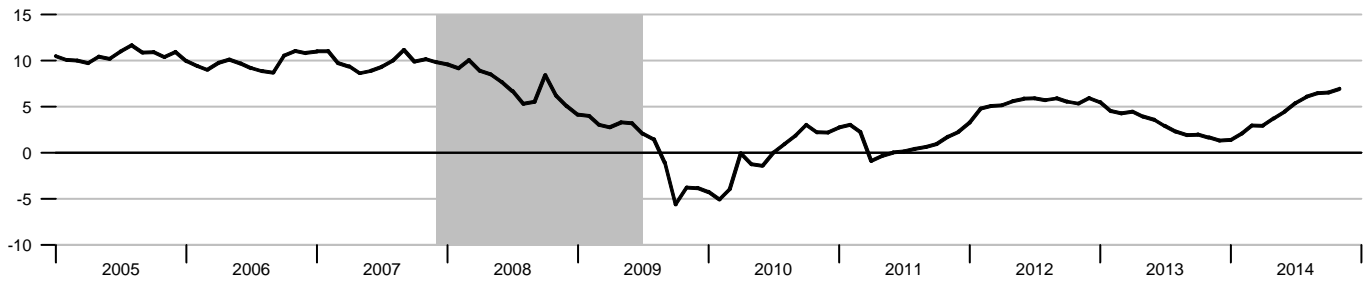
Percent change from year ago



Dashed lines indicate 10-year moving averages.

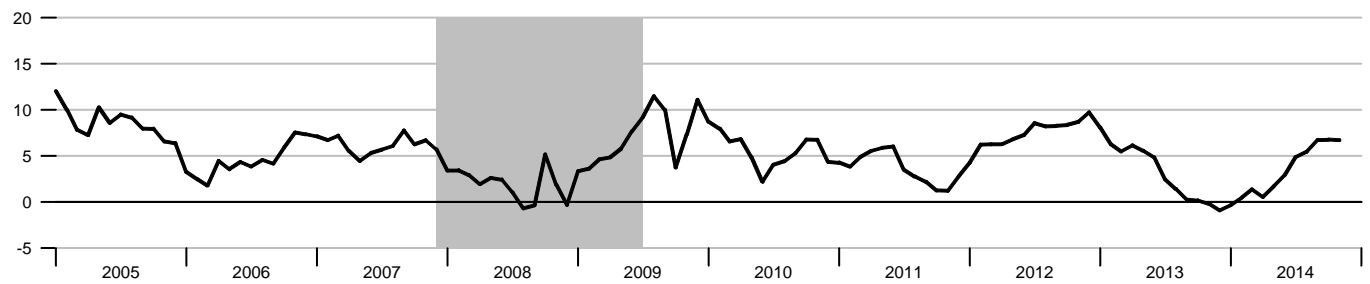
**Bank Credit**

Percent change from year ago



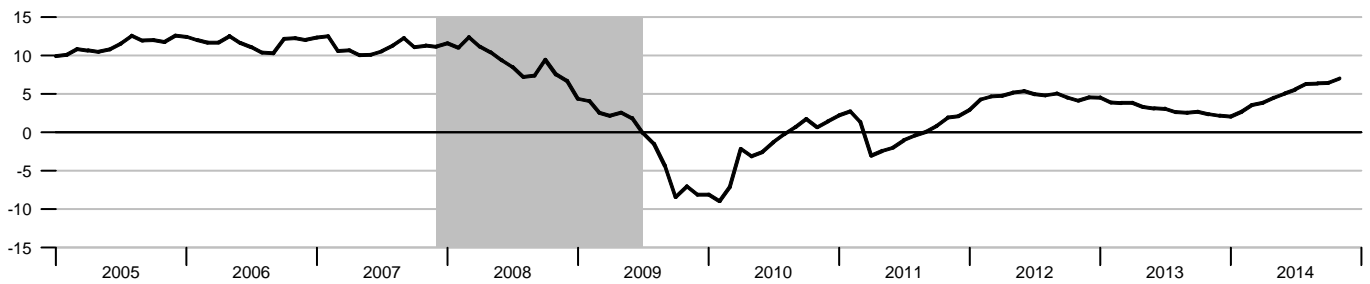
**Investment Securities in Bank Credit at Commercial Banks**

Percent change from year ago



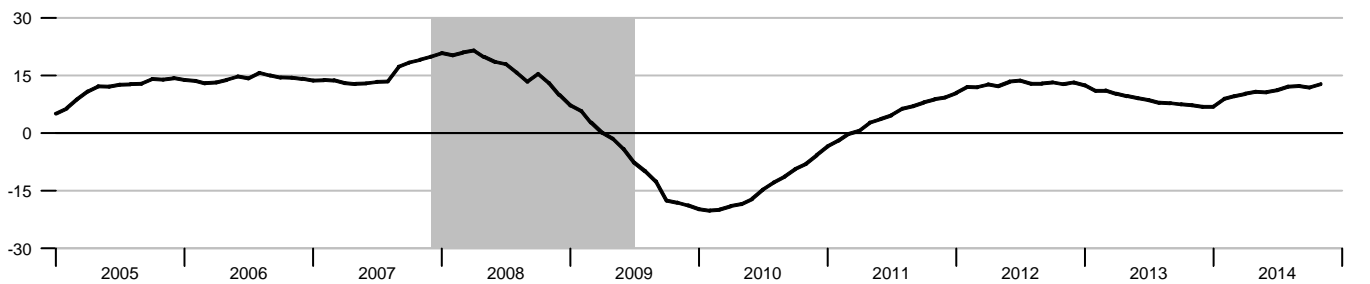
**Total Loans and Leases in Bank Credit at Commercial Banks**

Percent change from year ago

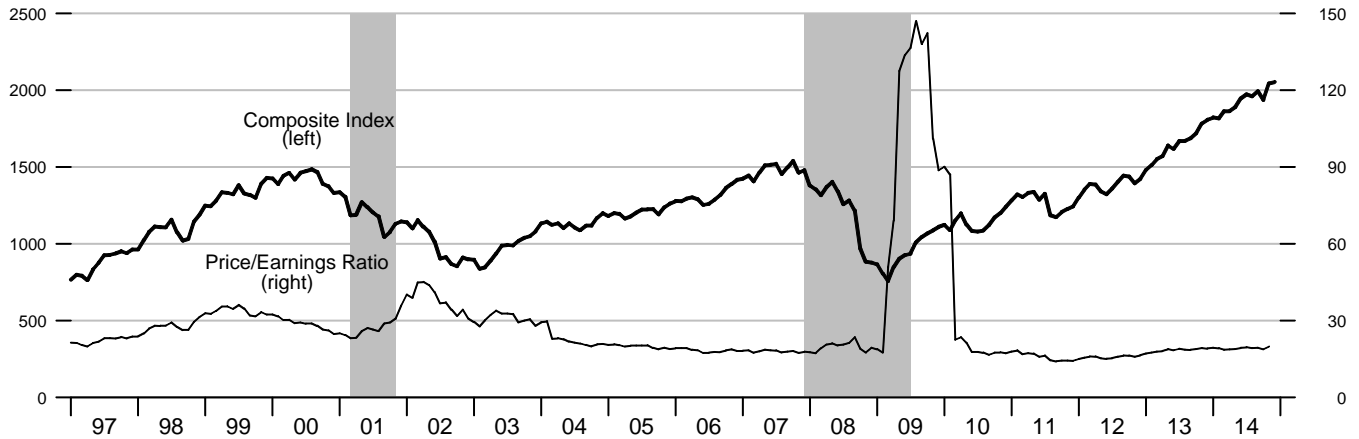


**Commercial and Industrial Loans at Commercial Banks**

Percent change from year ago



### Standard & Poor's 500



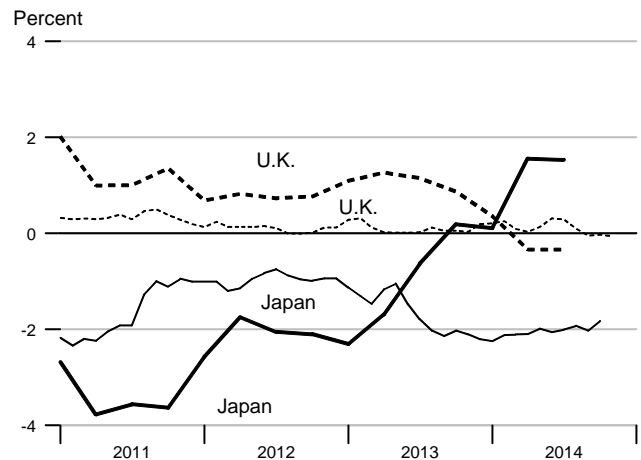
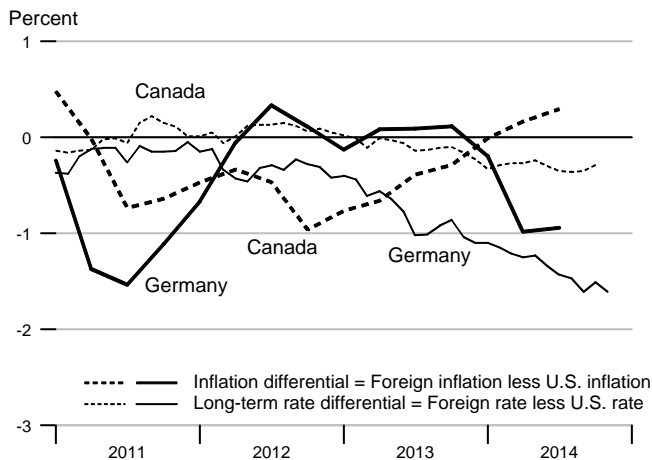
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### Recent Inflation and Long-Term Interest Rates

	Consumer Price Inflation Rates				Long-Term Government Bond Rates			
	Percent change from year ago				Percent			
	2013Q4	2014Q1	2014Q2	2014Q3	Sep14	Oct14	Nov14	Dec14
United States	1.22	1.40	2.06	1.79	2.53	2.30	2.33	2.21
Canada	0.93	1.39	2.22	2.08	2.18	2.01	.	.
France	0.65	0.72	0.63	0.40	1.35	1.26	1.15	.
Germany	1.34	1.21	1.08	0.85	0.92	0.79	0.72	.
Italy	0.69	0.50	0.44	-0.06	2.40	2.42	.	.
Japan	1.41	1.51	3.61	3.32	0.50	0.47	.	.
United Kingdom	2.09	1.76	1.72	1.45	2.48	2.27	2.27	.

\* Copyright © , 2011, Organisation for Economic Cooperation and Development, OECD Main Economic Indicators (www.oecd.org).

### Inflation and Long-Term Interest Rate Differentials



	Money Stock				Bank Credit	Adjusted		MSI M2**
	M1	MZM	M2	M3*		Monetary Base	Reserves	
2009	1637.621	9546.199	8392.347		9170.510	1796.556	944.368	8789.633
2010	1741.916	9539.869	8601.172		9123.214	2031.689	1143.690	9033.800
2011	2009.578	10206.58	9229.341		9220.373	2538.959	1576.503	9725.950
2012	2311.410	11062.71	10019.23		9713.446	2661.969	1611.904	10581.97
2013	2544.714	11872.98	10691.82		10021.67	3271.717	2144.969	11309.34
2012	1	2213.283	10766.48	9764.609	9535.489	2688.263	1662.512	10299.80
	2	2258.090	10929.48	9905.657	9657.218	2651.102	1615.814	10434.77
	3	2350.855	11156.38	10097.47	9772.681	2651.597	1601.127	10670.30
	4	2423.410	11398.50	10309.20	9888.393	2656.914	1568.164	10923.00
2013	1	2471.467	11622.42	10481.89	9988.634	2865.577	1760.057	11067.70
	2	2524.174	11760.86	10603.30	10041.81	3135.692	2025.831	11183.03
	3	2562.851	11952.27	10750.34	10004.46	3412.927	2287.471	11391.10
	4	2620.365	12156.37	10931.74	10051.79	3672.670	2506.515	11595.53
2014	1	2717.272	12338.72	11114.98	10202.31	3842.868	2658.868	
	2	2800.129	12493.77	11289.51	10414.48	3956.037	2761.831	
	3	2838.344	12655.88	11442.33	10602.16	4059.285	2850.938	
2012	Nov	2407.669	11371.89	10288.79	9880.580	2665.101	1581.304	10904.00
	Dec	2447.135	11521.79	10415.81	9956.098	2656.879	1538.430	11021.90
2013	Jan	2464.560	11589.07	10451.99	9982.362	2748.980	1594.015	11066.80
	Feb	2473.572	11609.33	10464.20	9990.800	2874.405	1794.639	11045.60
	Mar	2476.268	11668.87	10529.49	9992.741	2973.347	1891.517	11090.70
	Apr	2517.689	11711.73	10563.28	10049.23	3045.674	1954.979	11154.40
	May	2525.705	11753.08	10599.63	10040.29	3139.116	2013.763	11176.80
	Jun	2529.128	11817.76	10647.00	10035.92	3222.287	2108.752	11217.90
	Jul	2555.963	11892.68	10704.68	10019.35	3310.260	2184.808	11330.70
	Aug	2554.113	11944.64	10750.36	9996.113	3419.555	2303.434	11393.80
	Sep	2578.476	12019.48	10795.97	9997.922	3508.965	2374.171	11448.80
	Oct	2617.137	12126.47	10903.26	10023.88	3630.629	2500.930	11591.10
	Nov	2601.866	12147.05	10916.74	10044.62	3702.083	2545.488	11569.10
	Dec	2642.093	12195.60	10975.23	10086.87	3685.298	2473.126	11626.40
2014	Jan	2678.493	12256.92	11034.54	10120.65	3733.498	2471.897	
	Feb	2724.204	12359.93	11137.77	10198.69	3869.437	2731.159	
	Mar	2749.118	12399.32	11172.63	10287.60	3925.669	2773.547	
	Apr	2781.212	12428.34	11227.98	10345.34	3965.001	2796.017	
	May	2789.958	12505.46	11298.03	10413.79	3932.332	2716.678	
	Jun	2829.218	12547.53	11342.53	10484.31	3970.779	2772.798	
	Jul	2853.790	12627.88	11414.38	10559.09	4008.880	2797.085	
	Aug	2806.131	12648.52	11439.18	10603.49	4096.954	2899.585	
	Sep	2855.111	12691.24	11473.44	10643.91	4072.022	2856.145	
	Oct	2854.406	12759.11	11511.41	10678.81	4041.273	2834.054	
	Nov	2852.573	12826.04	11562.08	10741.47	3847.937	2605.136	

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			Corporate Aaa Bonds	Municipal Aaa Bonds	Conventional Mortgage
						3-mo	3-yr	10-yr			
2010		0.17	0.72	3.25		0.14	1.11	3.21	4.94	3.90	4.69
2011		0.10	0.75	3.25		0.05	0.75	2.79	4.64	4.26	4.46
2012		0.14	0.75	3.25		0.09	0.38	1.80	3.67	3.12	3.66
2013		0.11	0.75	3.25		0.06	0.54	2.35	4.24	3.49	3.98
2014		0.09	0.75	3.25		0.03	0.90	2.54	4.16	3.40	4.17
2012 1		0.10	0.75	3.25		0.07	0.42	2.04	3.89	3.31	3.92
2012 2		0.15	0.75	3.25		0.09	0.40	1.82	3.80	3.32	3.79
2012 3		0.14	0.75	3.25		0.10	0.35	1.64	3.45	3.05	3.55
2012 4		0.16	0.75	3.25		0.09	0.36	1.71	3.54	2.81	3.36
2013 1		0.14	0.75	3.25		0.09	0.39	1.95	3.88	3.01	3.50
2013 2		0.12	0.75	3.25		0.05	0.44	2.00	3.97	3.31	3.68
2013 3		0.08	0.75	3.25		0.03	0.71	2.71	4.51	3.86	4.44
2013 4		0.09	0.75	3.25		0.06	0.63	2.75	4.59	3.77	4.30
2014 1		0.07	0.75	3.25		0.05	0.76	2.76	4.44	3.81	4.36
2014 2		0.09	0.75	3.25		0.03	0.87	2.62	4.22	3.47	4.23
2014 3		0.09	0.75	3.25		0.03	0.98	2.50	4.12	3.28	4.14
2014 4		0.10	0.75	3.25		0.02	0.97	2.28	3.88	3.06	3.97
2012 Dec		0.16	0.75	3.25		0.07	0.35	1.72	3.65	2.81	3.35
2013 Jan		0.14	0.75	3.25		0.07	0.39	1.91	3.80	2.83	3.41
2013 Feb		0.15	0.75	3.25		0.10	0.40	1.98	3.90	3.08	3.53
2013 Mar		0.14	0.75	3.25		0.09	0.39	1.96	3.93	3.13	3.57
2013 Apr		0.15	0.75	3.25		0.06	0.34	1.76	3.73	3.11	3.45
2013 May		0.11	0.75	3.25		0.04	0.40	1.93	3.89	3.13	3.54
2013 Jun		0.09	0.75	3.25		0.05	0.58	2.30	4.27	3.70	4.07
2013 Jul		0.09	0.75	3.25		0.04	0.64	2.58	4.34	3.73	4.37
2013 Aug		0.08	0.75	3.25		0.04	0.70	2.74	4.54	3.91	4.46
2013 Sep		0.08	0.75	3.25		0.02	0.78	2.81	4.64	3.94	4.49
2013 Oct		0.09	0.75	3.25		0.05	0.63	2.62	4.53	3.60	4.19
2013 Nov		0.08	0.75	3.25		0.07	0.58	2.72	4.63	3.56	4.26
2013 Dec		0.09	0.75	3.25		0.07	0.69	2.90	4.62	4.15	4.46
2014 Jan		0.07	0.75	3.25		0.04	0.78	2.86	4.49	3.94	4.43
2014 Feb		0.07	0.75	3.25		0.05	0.69	2.71	4.45	3.77	4.30
2014 Mar		0.08	0.75	3.25		0.05	0.82	2.72	4.38	3.72	4.34
2014 Apr		0.09	0.75	3.25		0.03	0.88	2.71	4.24	3.57	4.34
2014 May		0.09	0.75	3.25		0.03	0.83	2.56	4.16	3.43	4.19
2014 Jun		0.10	0.75	3.25		0.04	0.90	2.60	4.25	3.41	4.16
2014 Jul		0.09	0.75	3.25		0.03	0.97	2.54	4.16	3.38	4.13
2014 Aug		0.09	0.75	3.25		0.03	0.93	2.42	4.08	3.25	4.12
2014 Sep		0.09	0.75	3.25		0.02	1.05	2.53	4.11	3.21	4.16
2014 Oct		0.09	0.75	3.25		0.02	0.88	2.30	3.92	3.04	4.04
2014 Nov		0.09	0.75	3.25		0.02	0.96	2.33	3.92	3.12	4.00
2014 Dec		0.12	0.75	3.25		0.03	1.06	2.21	3.79	3.02	3.86

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

		M1	MZM	M2	M3*
<b>Percent change at an annual rate</b>					
	2009	14.17	9.62	8.06	
	2010	6.37	-0.07	2.49	
	2011	15.37	6.99	7.30	
	2012	15.02	8.39	8.56	
	2013	10.09	7.32	6.71	
<hr/>					
2012	1	11.16	7.57	7.49	
	2	8.10	6.06	5.78	
	3	16.43	8.30	7.75	
	4	12.35	8.68	8.39	
2013	1	7.93	7.86	6.70	
	2	8.53	4.76	4.63	
	3	6.13	6.51	5.55	
	4	8.98	6.83	6.75	
2014	1	14.79	6.00	6.70	
	2	12.20	5.03	6.28	
	3	5.46	5.19	5.41	
<hr/>					
2012	Nov	-3.85	7.44	7.72	
	Dec	19.67	15.82	14.81	
<hr/>					
2013	Jan	8.54	7.01	4.17	
	Feb	4.39	2.10	1.40	
	Mar	1.31	6.15	7.49	
	Apr	20.07	4.41	3.85	
	May	3.82	4.24	4.13	
	Jun	1.63	6.60	5.36	
	Jul	12.73	7.61	6.50	
	Aug	-0.87	5.24	5.12	
	Sep	11.45	7.52	5.09	
	Oct	17.99	10.68	11.92	
	Nov	-7.00	2.04	1.48	
	Dec	18.55	4.80	6.43	
<hr/>					
2014	Jan	16.53	6.03	6.48	
	Feb	20.48	10.08	11.23	
	Mar	10.97	3.82	3.76	
	Apr	14.01	2.81	5.95	
	May	3.77	7.45	7.49	
	Jun	16.89	4.04	4.73	
	Jul	10.42	7.68	7.60	
	Aug	-20.04	1.96	2.61	
	Sep	20.95	4.05	3.59	
	Oct	-0.30	6.42	3.97	
	Nov	-0.77	6.30	5.28	

\*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](http://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](http://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/](http://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 Reserve Balances** equals the amount of reserve balances maintained at depository institutions (DIs) less reserve balance requirements at DIs. **Total Borrowings** from the Federal Reserve is the sum of credit extended under the primary, second, and seasonal programs, as well as credit extended under the Term Asset-Backed Securities Loan Facility, and other credit extensions. [NOTE: Excess reserves and total borrowings are not seasonally adjusted.] The excess reserves calculation was changed with the introduction of the new H.3 statistical release, "Aggregate Reserves of Depository Institutions and the Monetary Base" on July 11, 2013. See <http://www.federalreserve.gov/releases/h3/current/>.

**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,  $\pi_{t-1}$  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  $\Delta b_t$  is the implied growth rate of the adjusted monetary base,  $\Delta y_t^*$  is the 10-year moving average growth in real GDP,  $\Delta v_t^a$  is the average base velocity growth (calculated recursively),  $\Delta x_{t-1}$  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  $m = 1, \dots, 10$  years to maturity are obtained by linear interpolation between reported yields. These yields are smoothed by fitting the regression suggested by Nelson and Siegel (1987),

$$R(m) = a_0 + (a_1 + a_2)(1 - e^{-m/50})/(m/50) - a_2 \times e^{-m/50},$$

and forward rates are calculated from these smoothed yields using equation (a) in table 13.1 of Shiller (1990),

$$f(m) = [D(m)R(m) - D(m-1)] / [D(m) - D(m-1)],$$

where duration is approximated as  $D(m) = (1 - e^{-R(m) \times m})/R(m)$ . These rates are linear approximations to the true instantaneous forward rates; see Shiller (1990). For a discussion of the use of forward rates as indicators of inflation expectations, see Sharpe (1997). **Rates on 3-Month Eurodollar Futures** and **Rates on Selected Federal Funds Futures Contracts** trace through time the yield on three specific contracts. **Rates on Federal Funds Futures on Selected Dates** displays a single day's snapshot of yields for contracts expiring in the months shown on the horizontal axis. **Inflation-Indexed Treasury Securities 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 2009 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 2009 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.

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*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/](http://research.stlouisfed.org/publications/review/).