

# Monetary *Trends*

February 2014

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:  $[(x_t/x_{t-1})-1] \times 1200$ . 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:

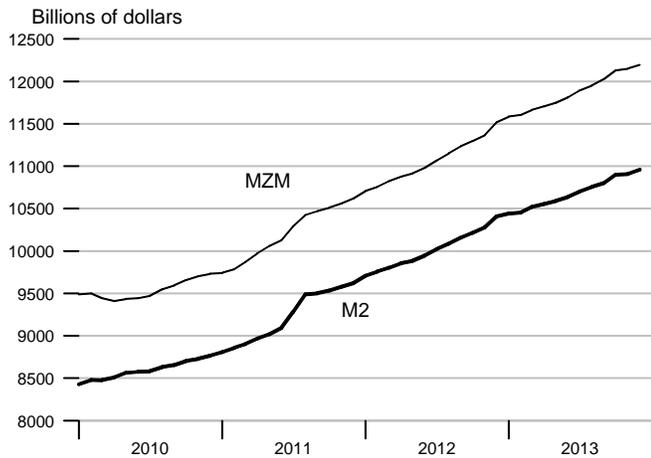
Editor, *Monetary Trends*  
Research Division  
Federal Reserve Bank of St. Louis  
P.O. Box 442  
St. Louis, MO 63166-0442

or to:

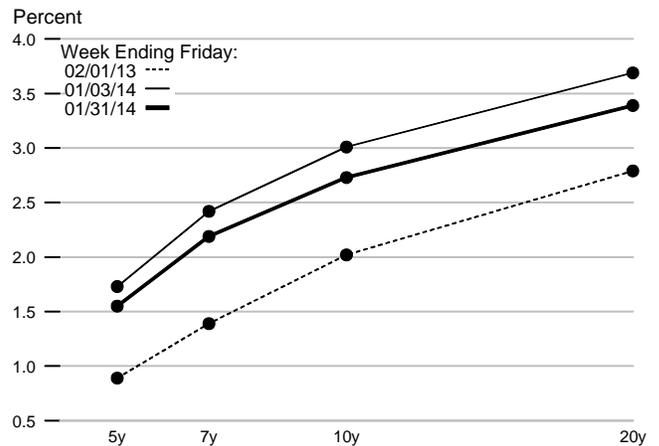
stlsFRED@stls.frb.org

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.

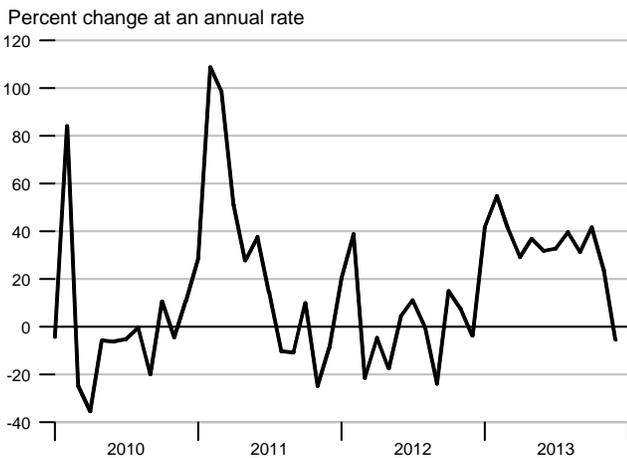
### M2 and MZM



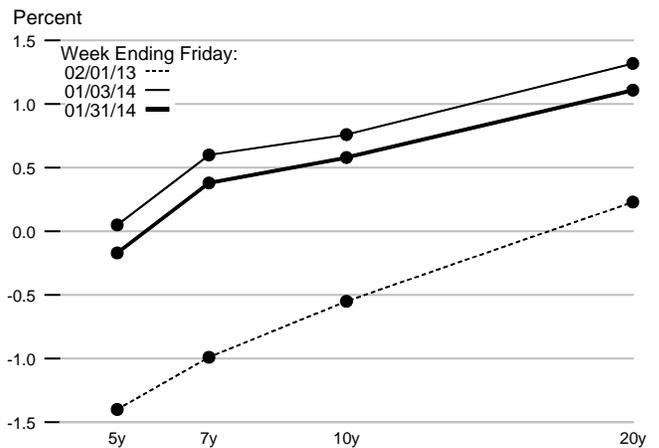
### Treasury Yield Curve



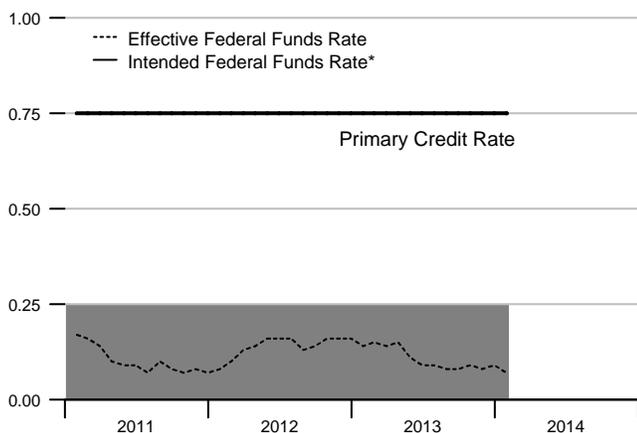
### Adjusted Monetary Base



### Real Treasury Yield Curve

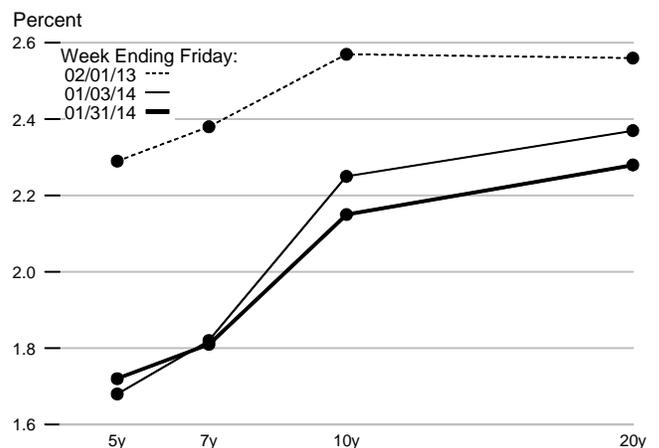


### Reserve Market Rates



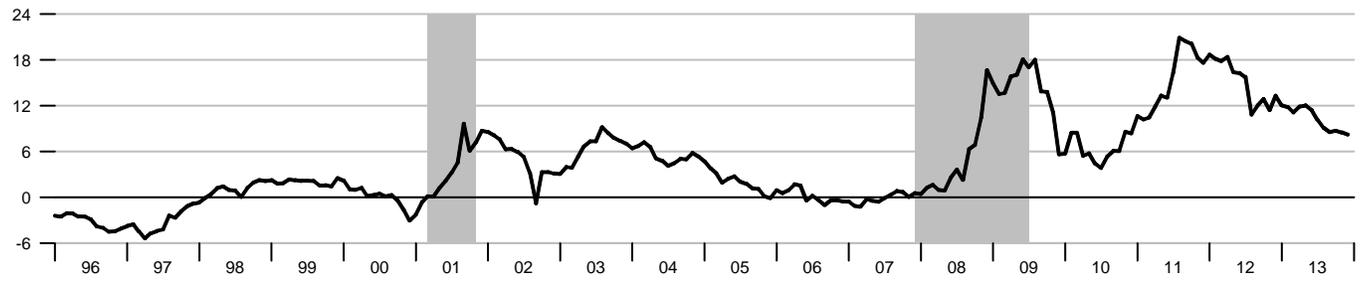
\*Note: Effective December 16, 2008, FOMC reports the Intended Federal Funds Rate as a range. Currently, Intended Federal Funds Rate is not plotted on this chart due to the note above.

### Inflation-Indexed Treasury Yield Spreads



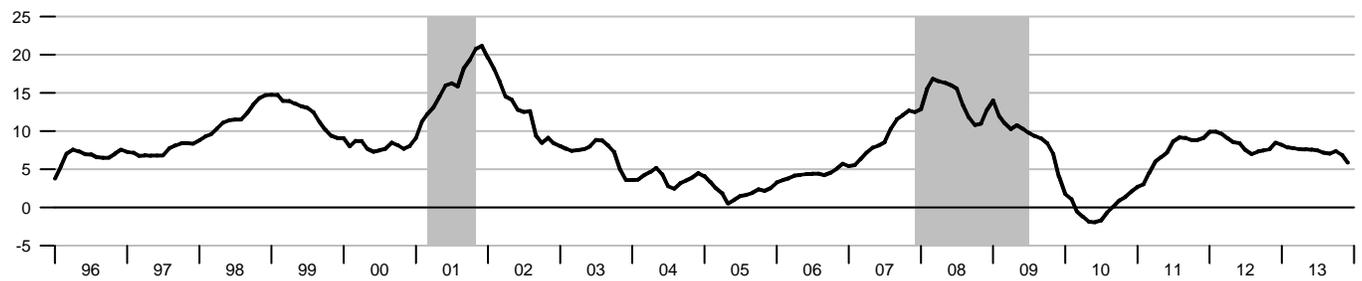
**M1**

Percent change from year ago



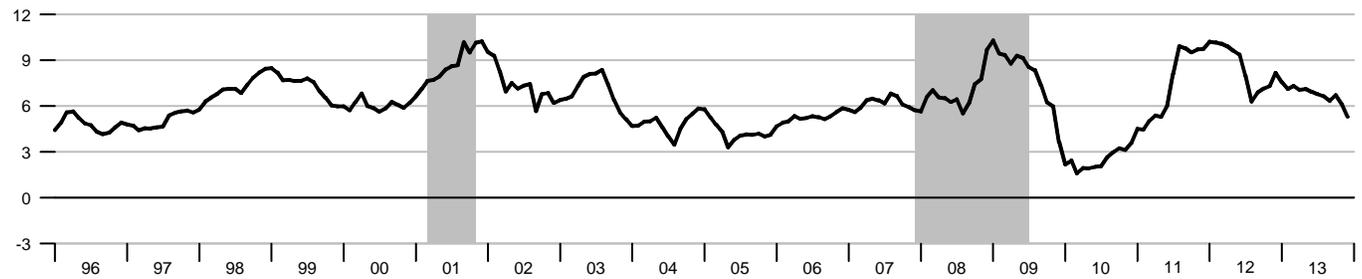
**M2M**

Percent change from year ago



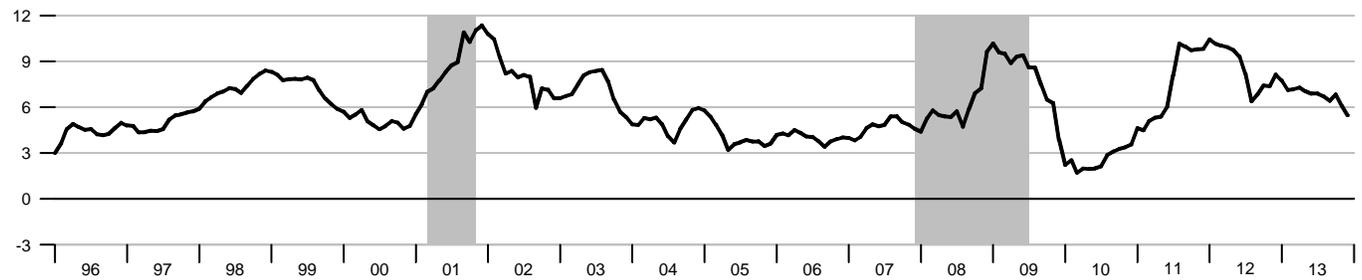
**M2**

Percent change from year ago



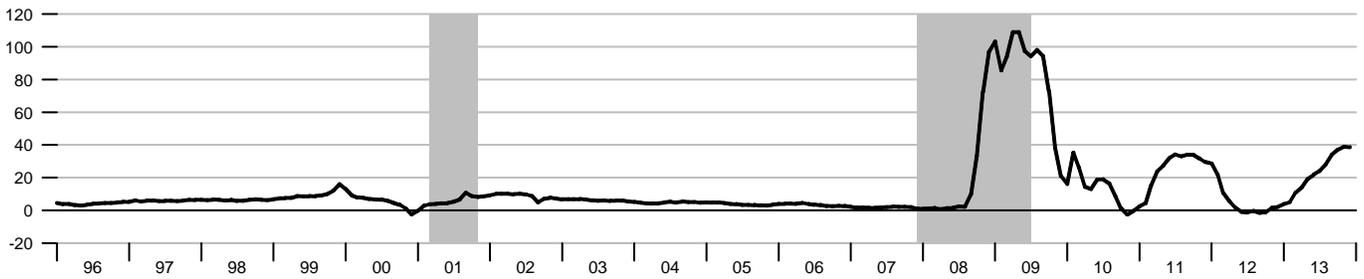
**Monetary Services Index - M2**

Percent change from year ago



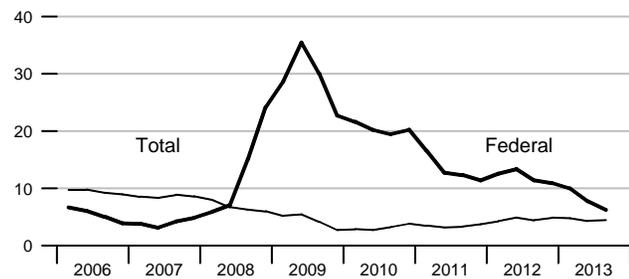
### Adjusted Monetary Base

Percent change from year ago



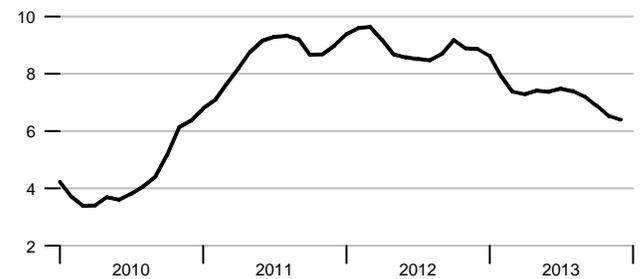
### Domestic Nonfinancial Debt

Percent change from year ago



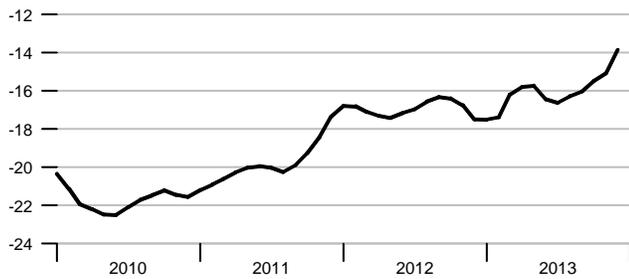
### Currency Held by the Nonbank Public

Percent change from year ago



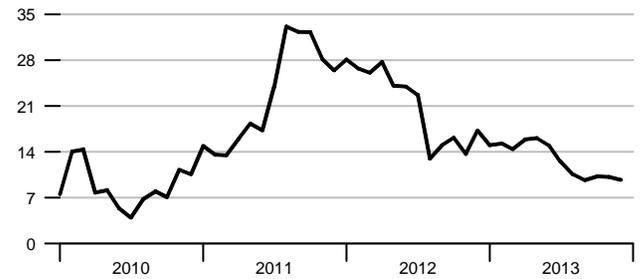
### Small Denomination Time Deposits

Percent change from year ago



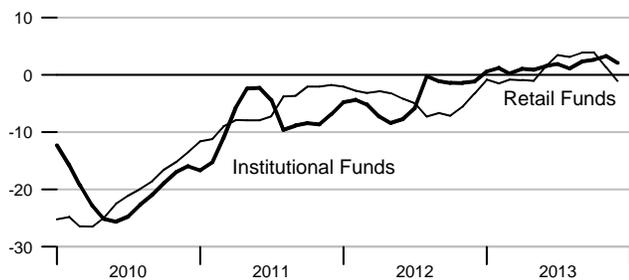
### Checkable Deposits

Percent change from year ago



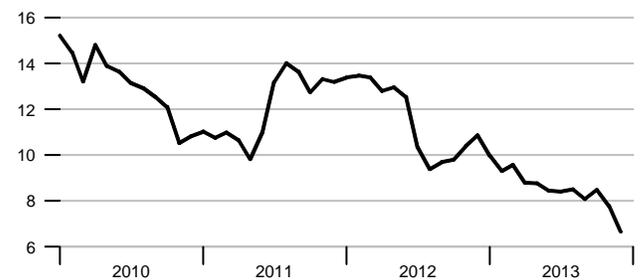
### Money Market Mutual Fund Shares

Percent change from year ago



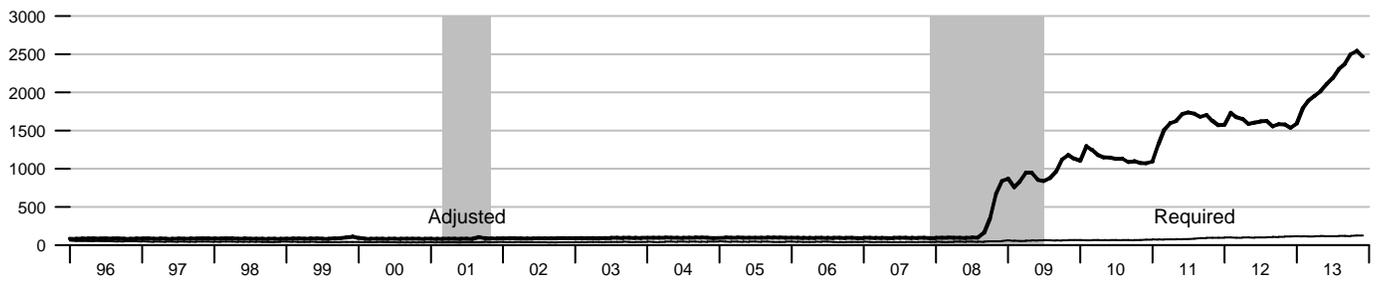
### Savings Deposits

Percent change from year ago



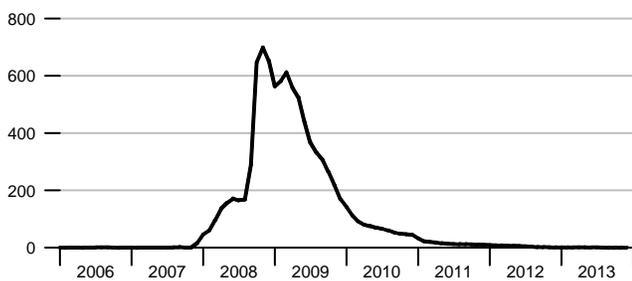
### Adjusted and Required Reserves

Billions of dollars



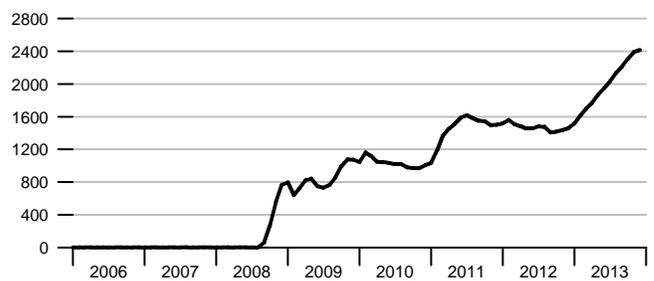
### Total Borrowings

Billions of dollars



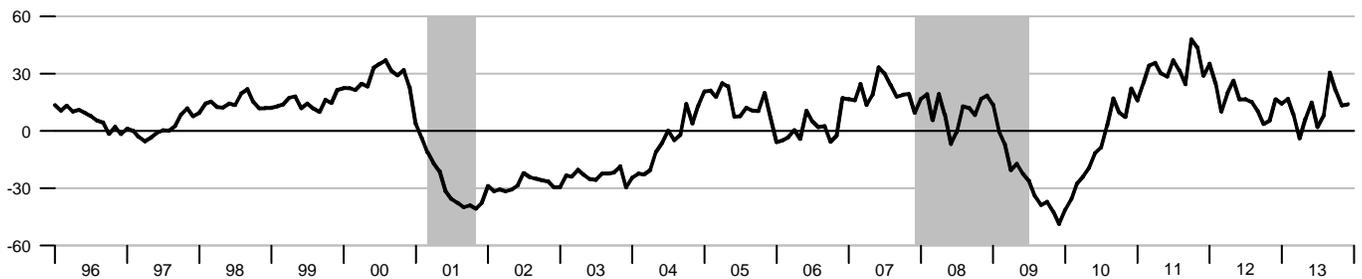
### Excess Reserve Balances

Billions of dollars



### Nonfinancial Commercial Paper

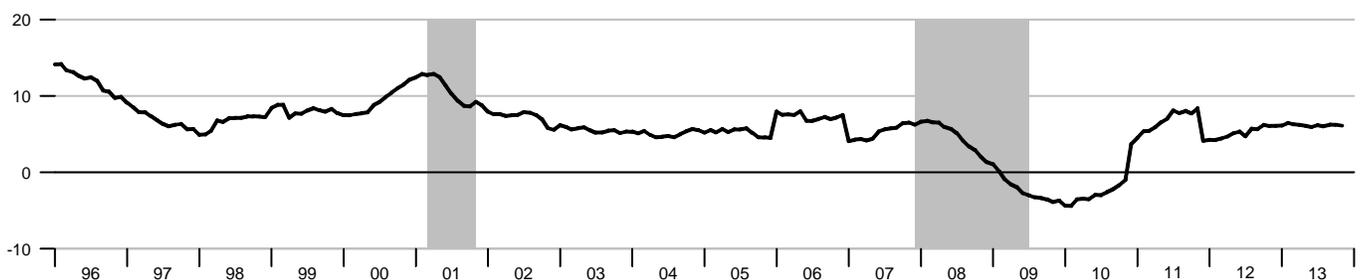
Percent change from year ago



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>.

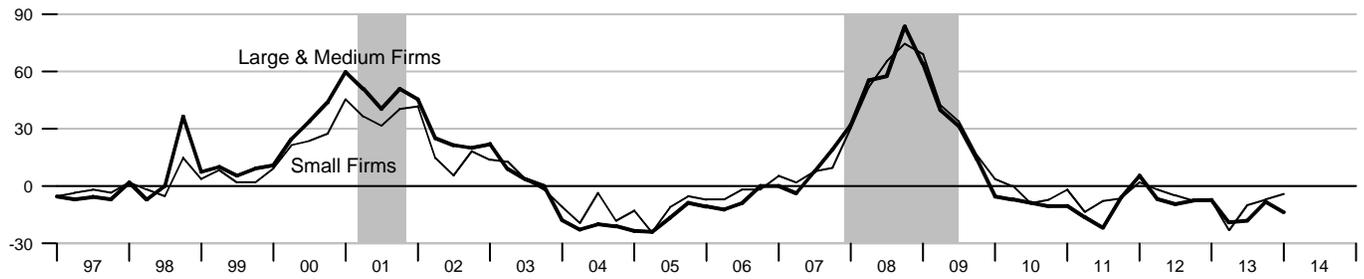
### Consumer Credit

Percent change from year ago



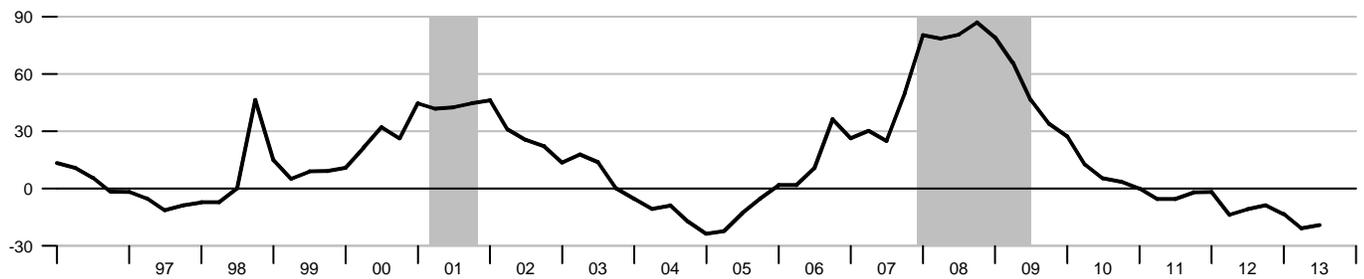
**Net Percentage of Domestic Banks Tightening Standards for Commercial and Industrial Loans**

Percentage



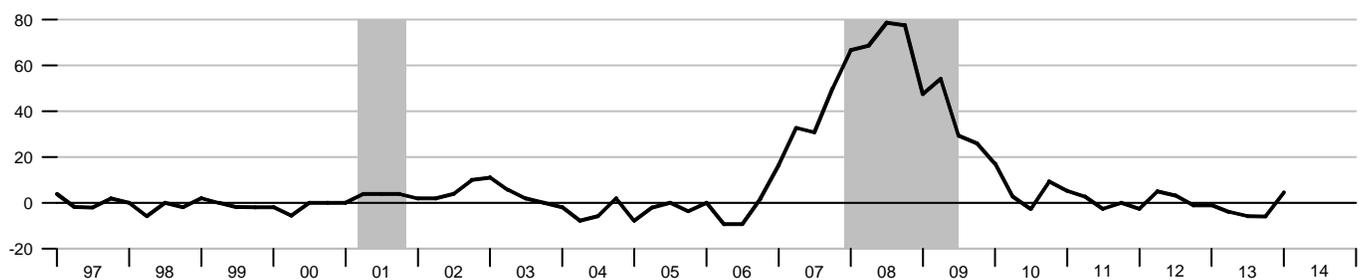
**Net Percentage of Domestic Banks Tightening Standards for Commercial Real Estate Loans**

Percentage



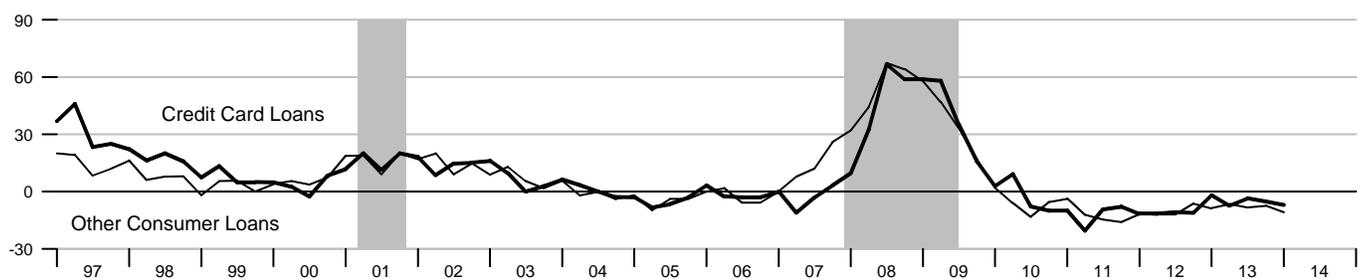
**Net Percentage of Domestic Banks Tightening Standards for Residential Mortgage Loans**

Percentage

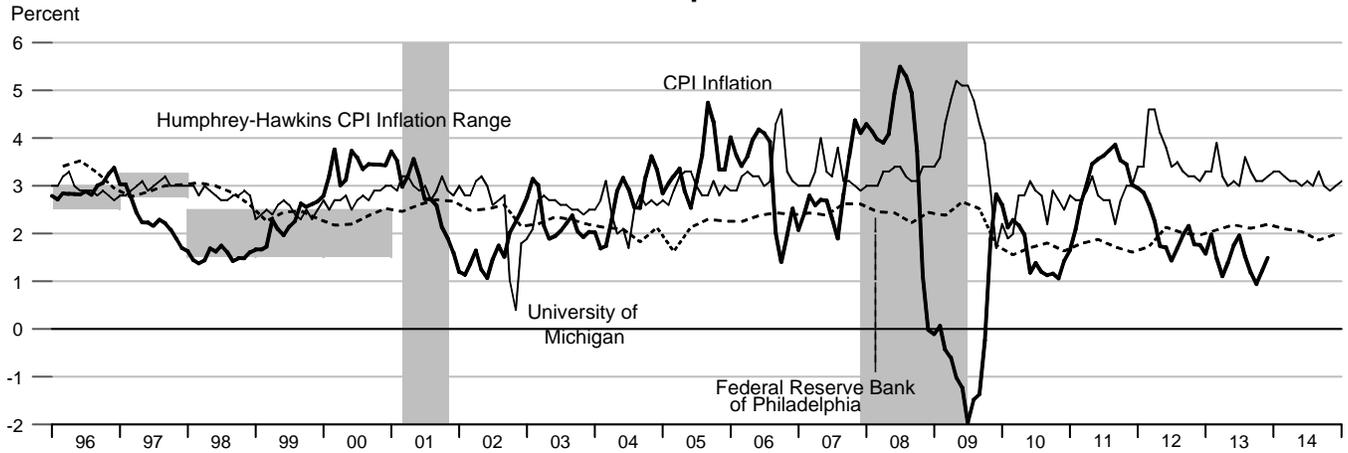


**Net Percentage of Domestic Banks Tightening Standards for Consumer Loans**

Percentage

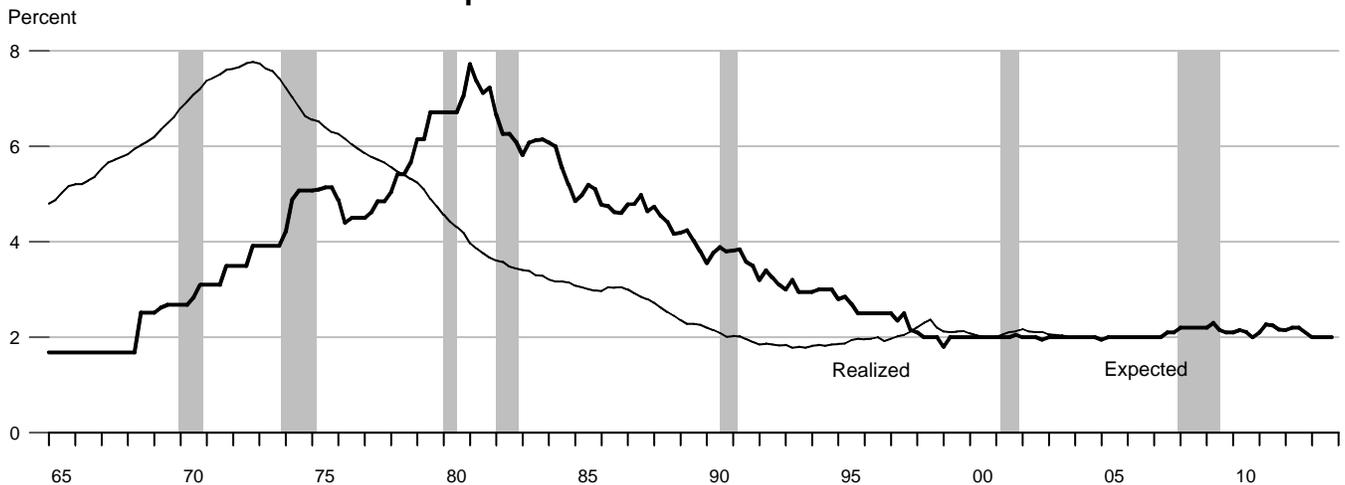


### CPI Inflation and 1-Year-Ahead CPI Inflation Expectations



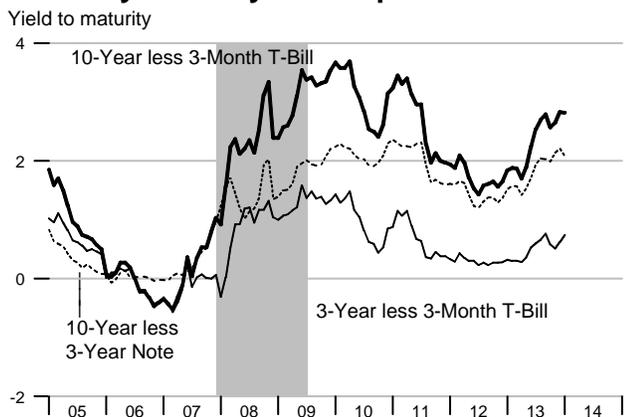
The shaded region shows the Humphrey-Hawkins CPI inflation range. Beginning in January 2000, the Humphrey-Hawkins inflation range was reported using the PCE price index and therefore is not shown on this graph.

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

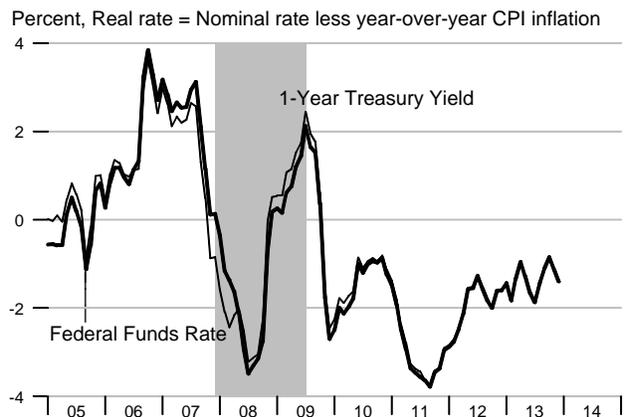


See the notes section for an explanation of the chart.

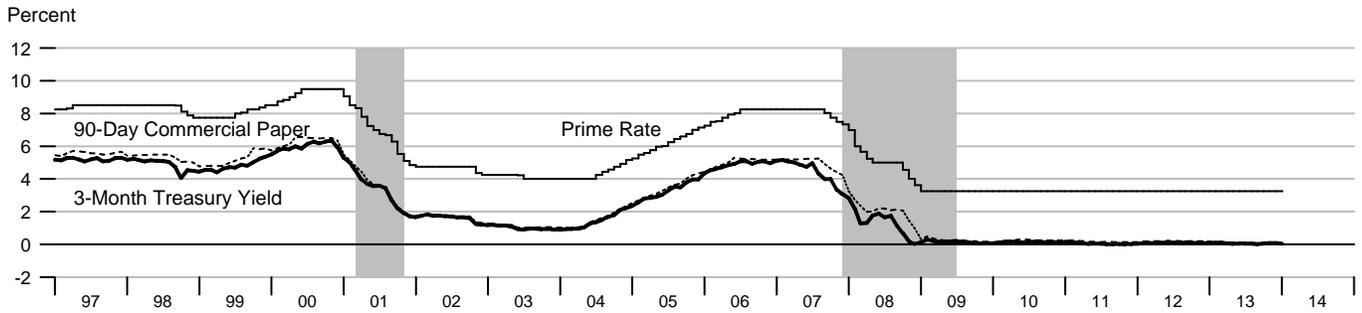
### Treasury Security Yield Spreads



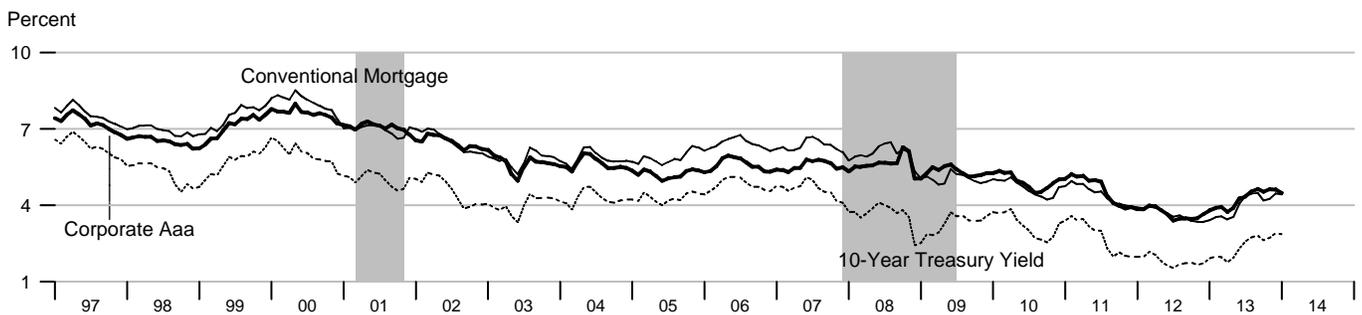
### Real Interest Rates



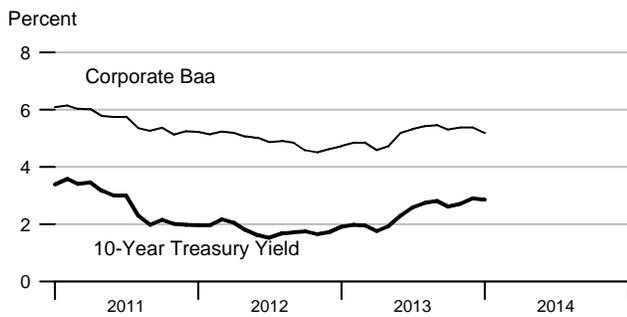
### Short-Term Interest Rates



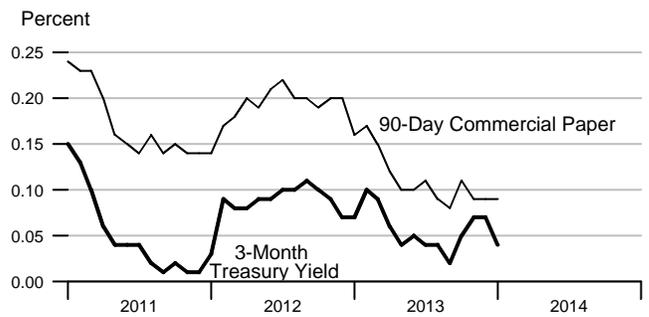
### Long-Term Interest Rates



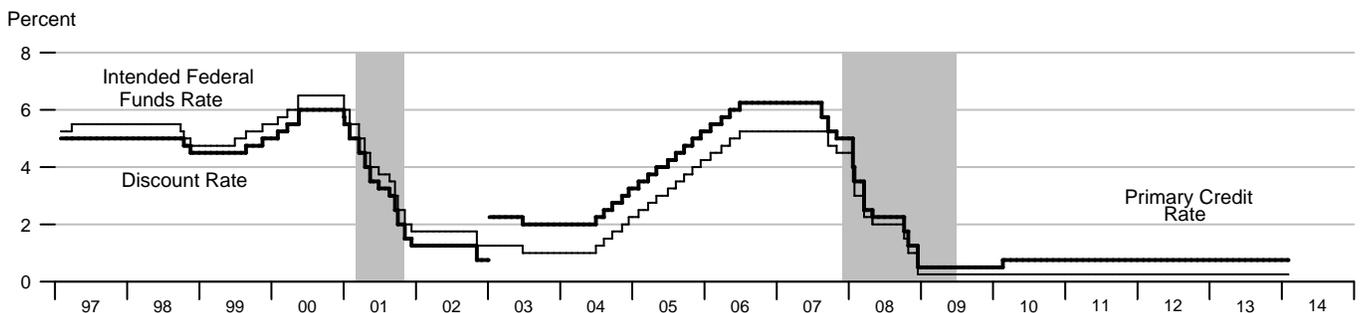
### Long-Term Interest Rates



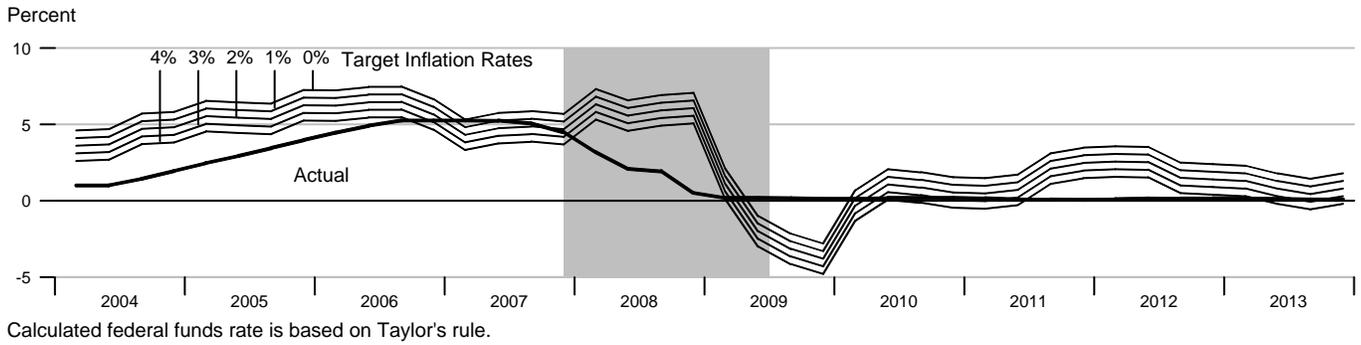
### Short-Term Interest Rates



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

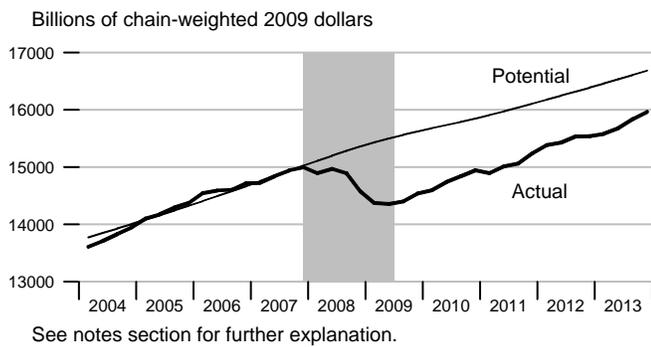


### Federal Funds Rate and Inflation Targets

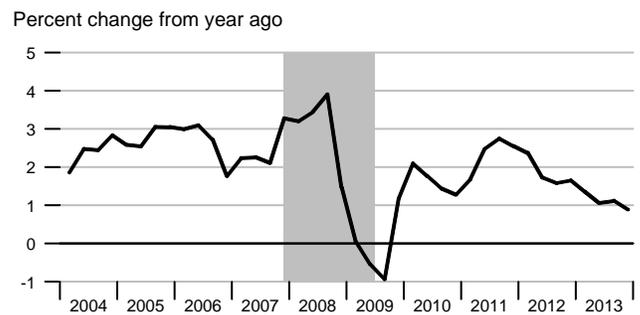


### Components of Taylor's Rule

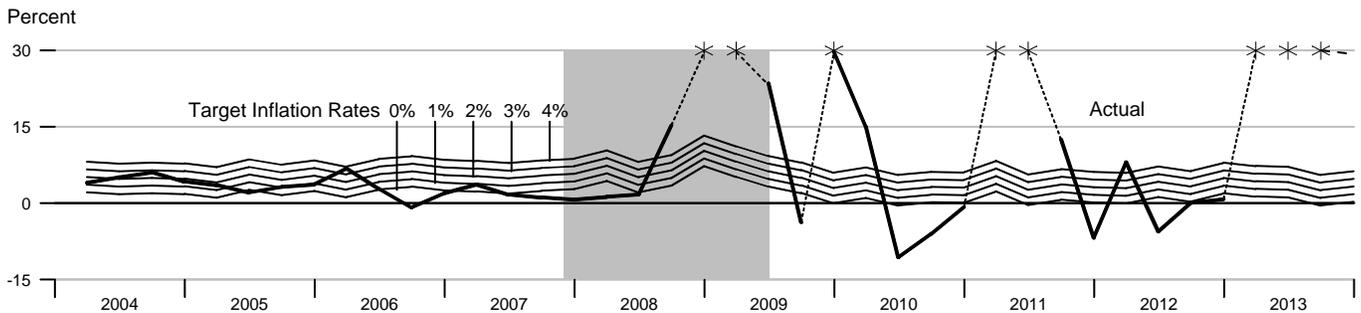
#### Actual and Potential Real GDP



#### PCE Inflation



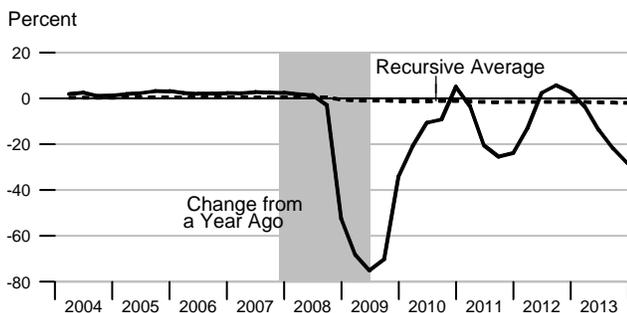
### Monetary Base Growth and Inflation Targets



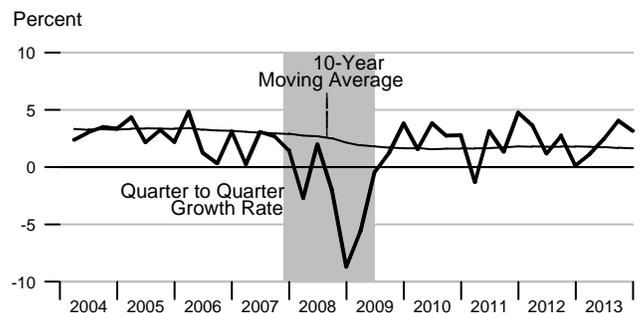
Calculated base growth is based on McCallum's rule. Actual base growth is percent change from the previous quarter. Stars represent actual values for 2008:Q4, 2009:Q1, 2009:Q4, 2011:Q1, 2011:Q2, 2013:Q1, 2013:Q2 and 2013:Q3 are 188.33%, 60.16%, 56.53%, 45.93%, 58.75%, 30.24%, 36.03% and 33.88%, respectively.

### Components of McCallum's Rule

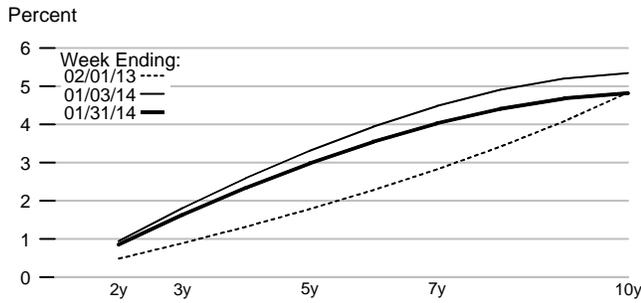
#### Monetary Base Velocity Growth



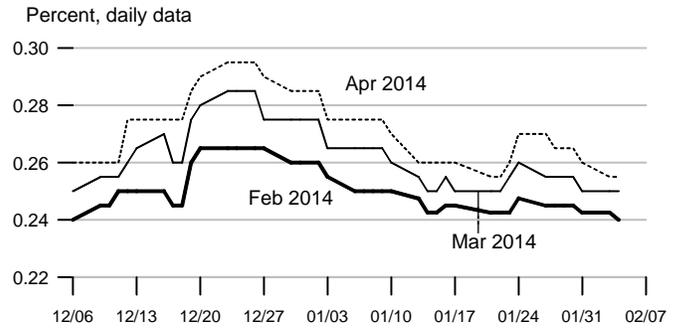
#### Real Output Growth



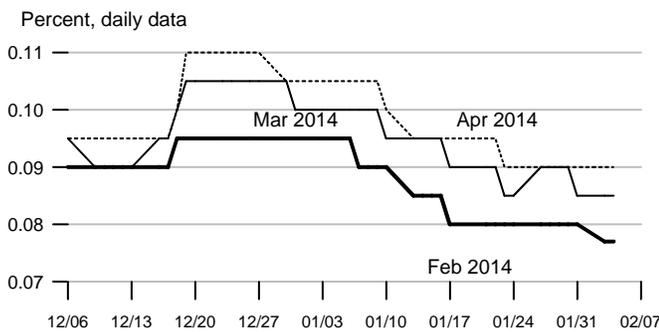
### Implied One-Year Forward Rates



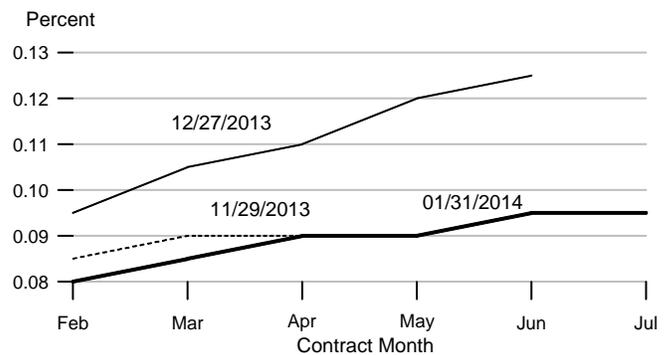
### Rates on 3-Month Eurodollar Futures



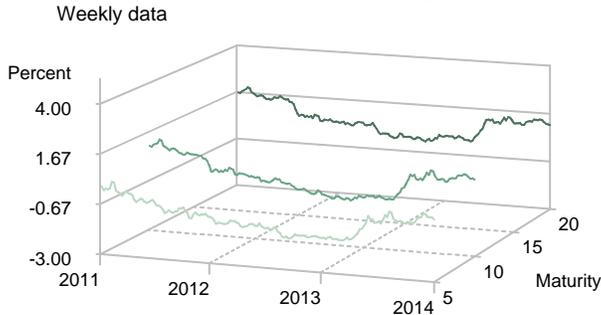
### Rates on Selected Federal Funds Futures Contracts



### Rates on Federal Funds Futures on Selected Dates

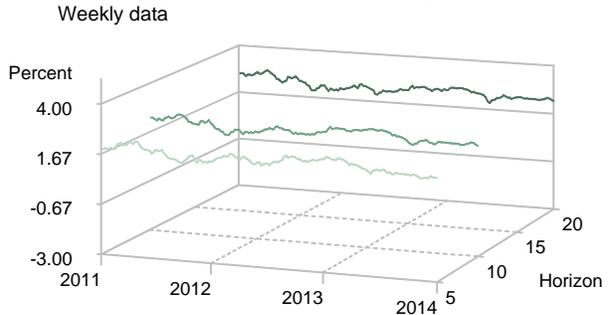


### Inflation-Indexed Treasury Securities



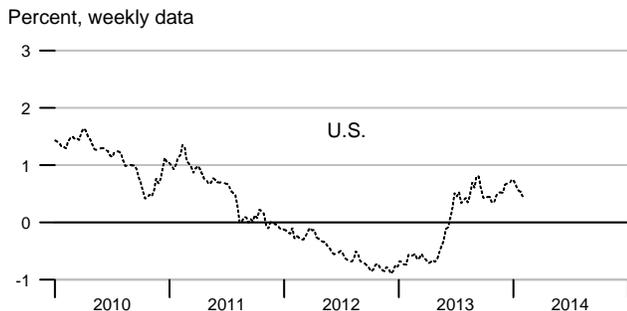
Note: Yields are inflation-indexed constant maturity U.S. Treasury securities

### Inflation-Indexed Treasury Yield Spreads



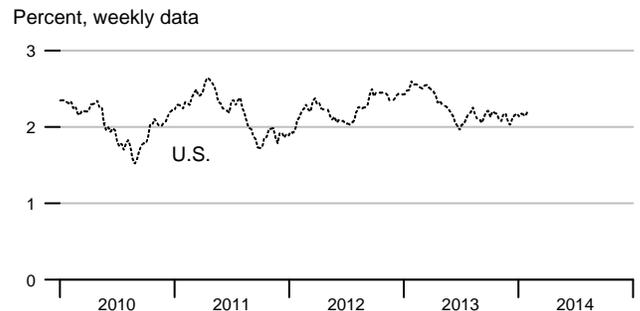
Note: Yield spread is between nominal and inflation-indexed constant maturity U.S. Treasury securities.

### Inflation-Indexed 10-Year Government Notes



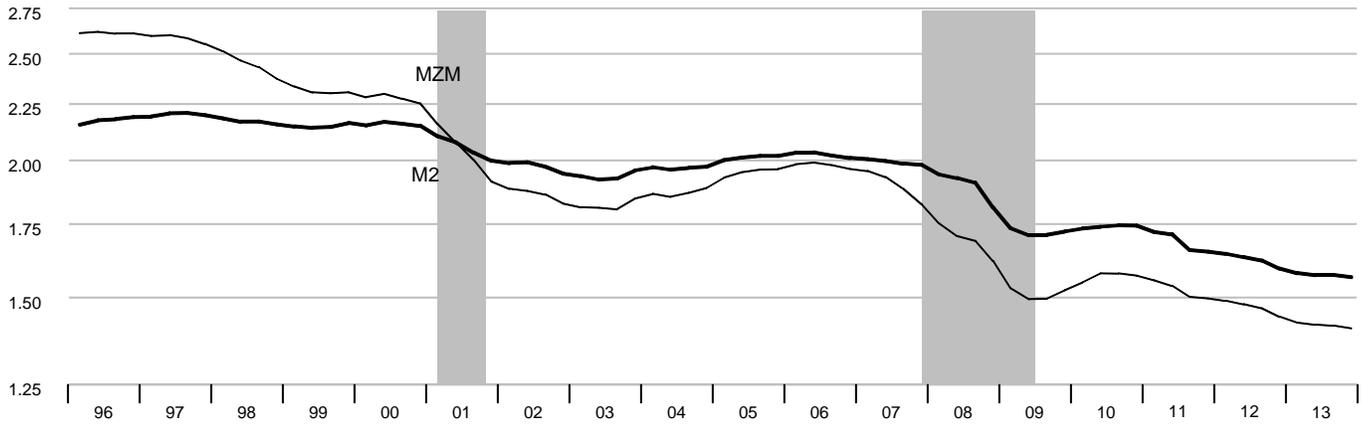
Note: Data is temporarily unavailable for the French and U.K. 10-Year Notes and Government Yield Spreads.

### Inflation-Indexed 10-Year Government Yield Spreads



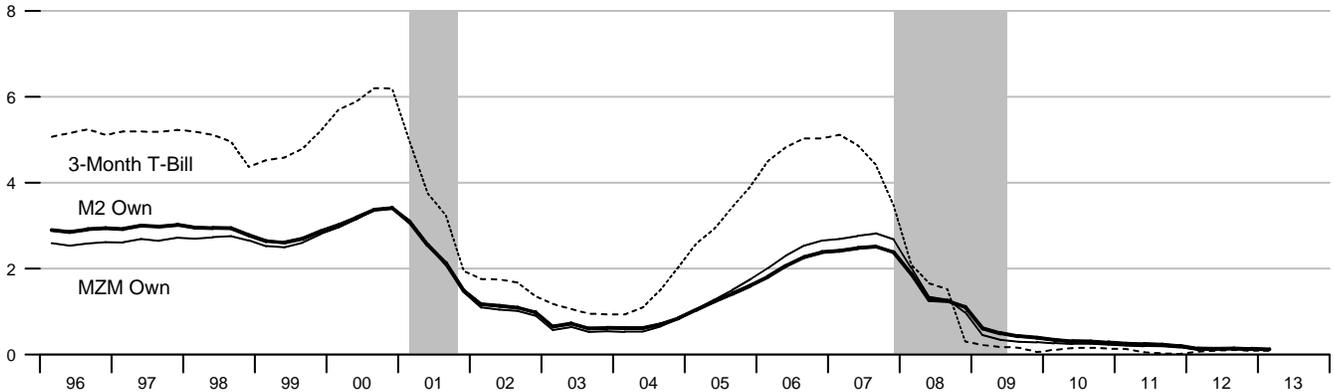
Velocity

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



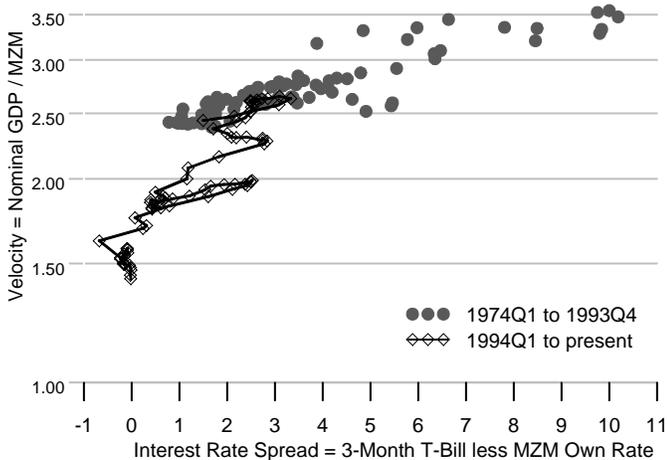
Interest Rates

Percent



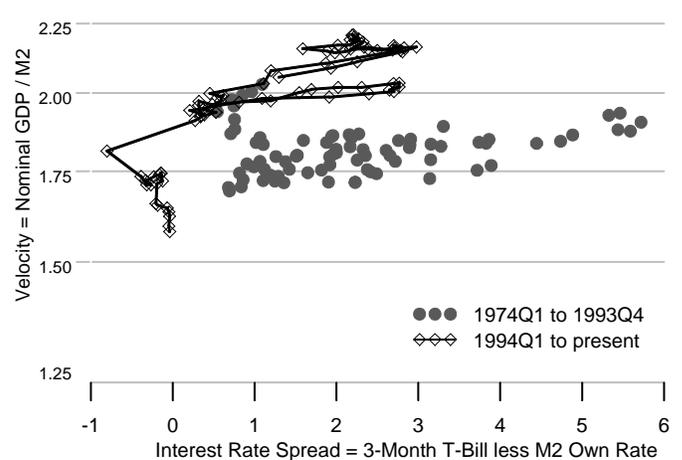
MZM Velocity and Interest Rate Spread

Ratio Scale



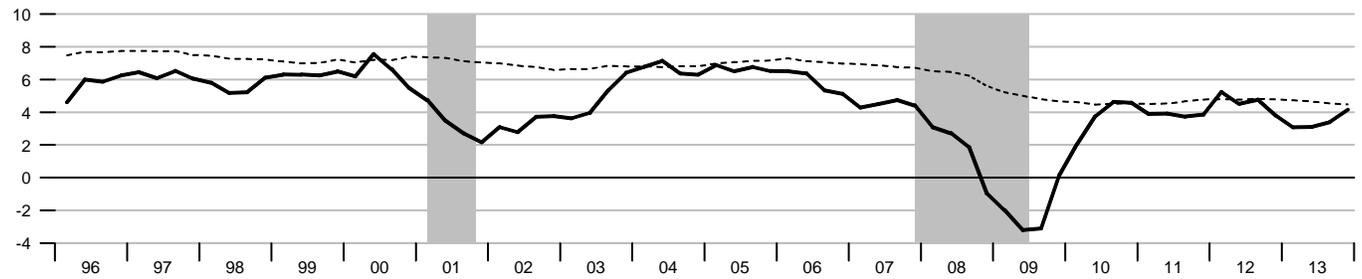
M2 Velocity and Interest Rate Spread

Ratio Scale



### Gross Domestic Product

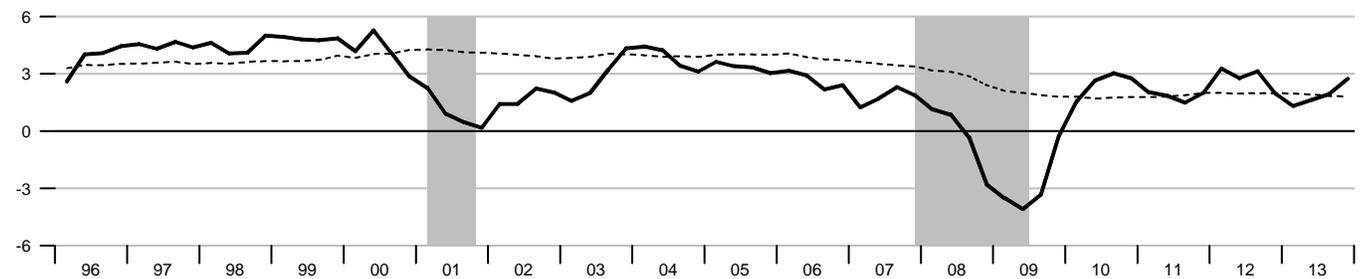
Percent change from year ago



Dashed lines indicate 10-year moving averages.

### Real Gross Domestic Product

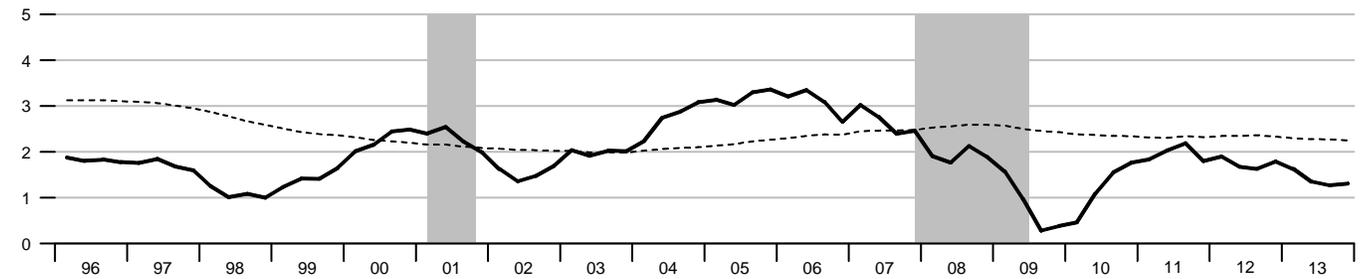
Percent change from year ago



Dashed lines indicate 10-year moving averages.

### Gross Domestic Product Price Index

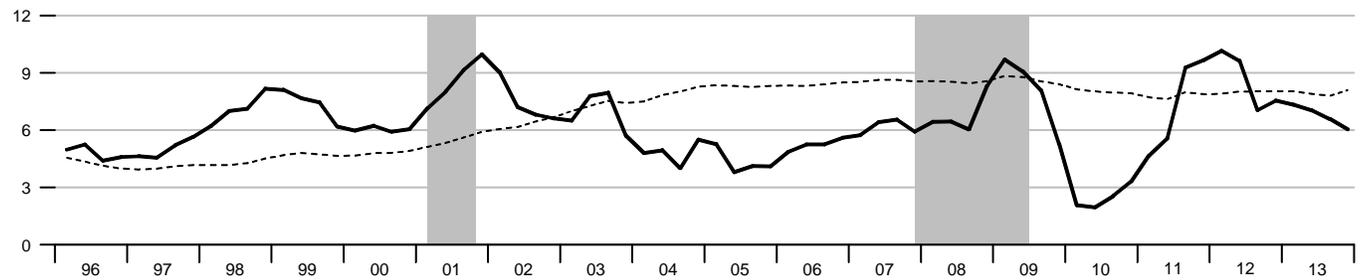
Percent change from year ago



Dashed lines indicate 10-year moving averages.

### M2

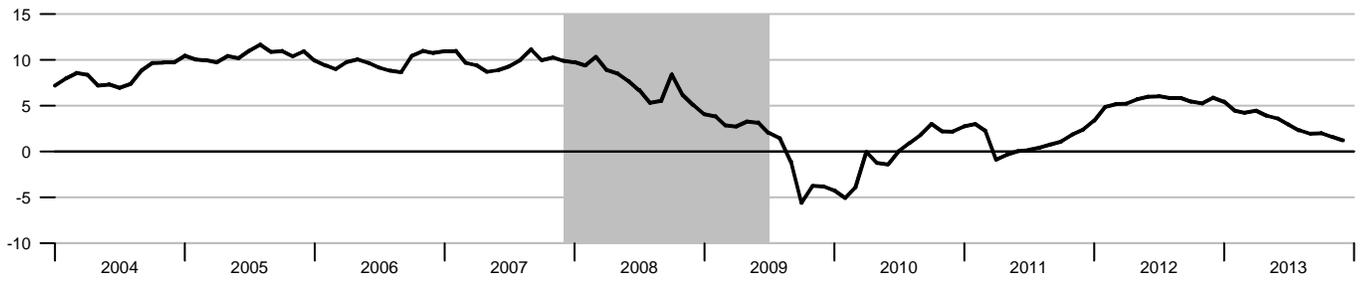
Percent change from year ago



Dashed lines indicate 10-year moving averages.

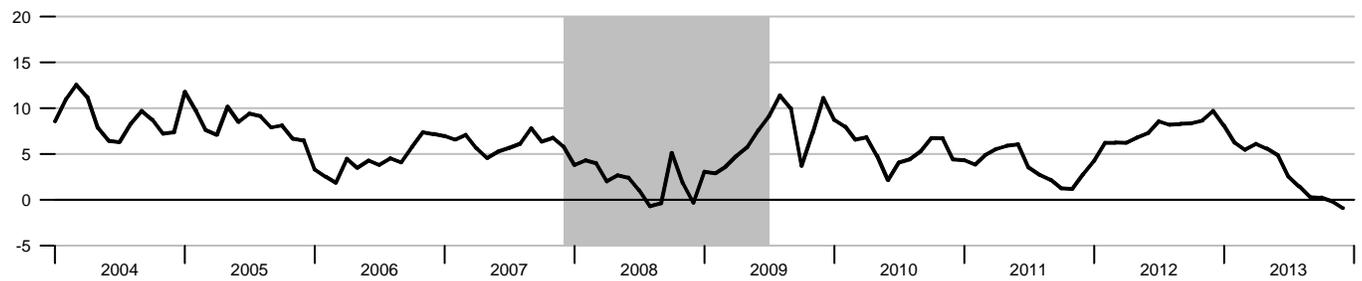
**Bank Credit**

Percent change from year ago



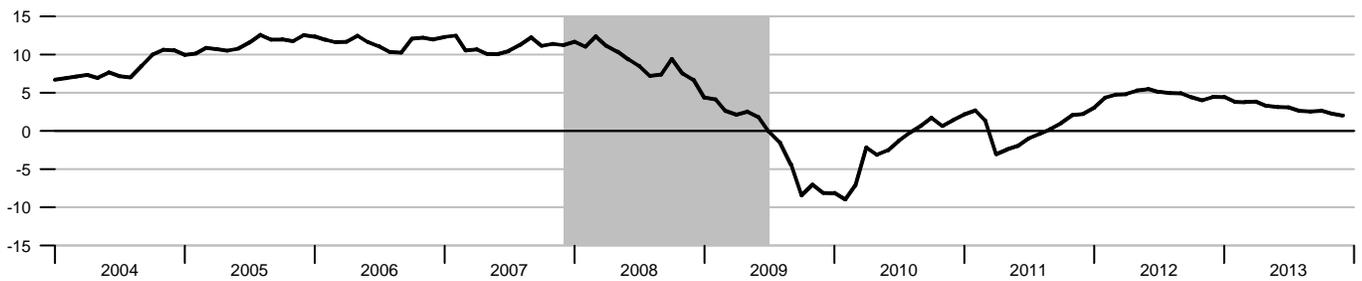
**Investment Securities in Bank Credit at Commercial Banks**

Percent change from year ago



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

Percent change from year ago

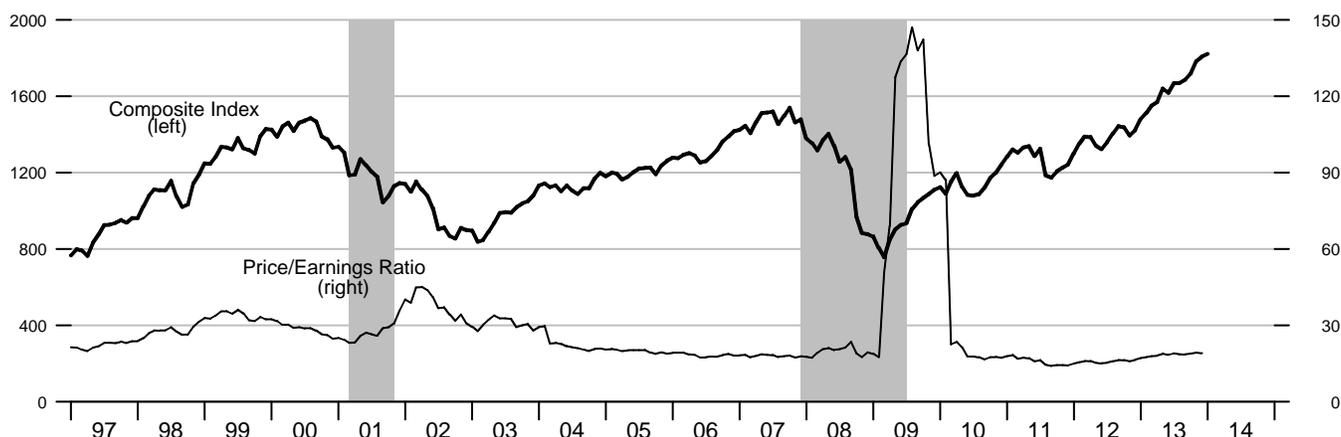


**Commercial and Industrial Loans at Commercial Banks**

Percent change from year ago



### Standard & Poor's 500

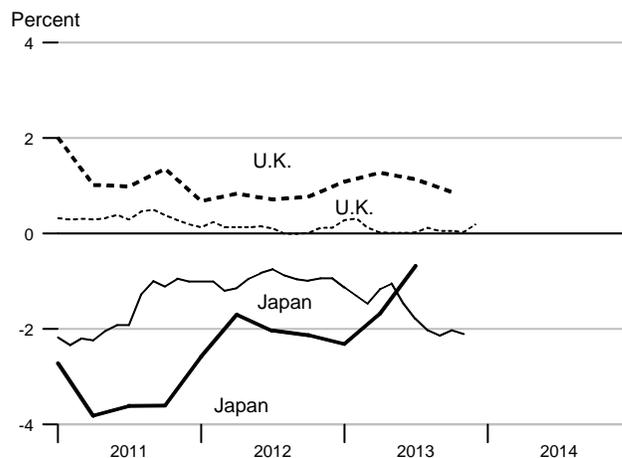
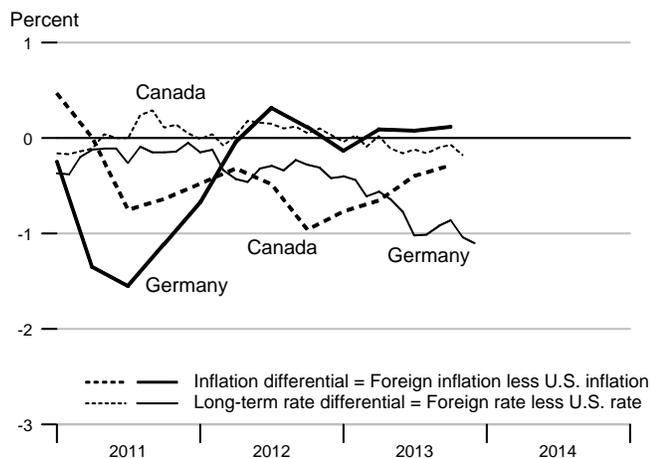


### Recent Inflation and Long-Term Interest Rates

	Consumer Price Inflation Rates				Long-Term Government Bond Rates			
	Percent change from year ago				Percent			
	2013Q1	2013Q2	2013Q3	2013Q4	Oct13	Nov13	Dec13	Jan14
United States	1.68	1.42	1.55	1.22	2.62	2.72	2.90	2.86
Canada	0.91	0.76	1.15	0.93	2.55	2.54	.	.
France	1.07	0.81	0.95	0.65	2.39	2.27	2.33	.
Germany	1.55	1.51	1.63	1.34	1.76	1.68	1.80	.
Italy	1.91	1.16	1.13	0.69	4.25	4.10	4.11	.
Japan	-0.63	-0.27	0.87	.	0.59	0.61	.	.
United Kingdom	2.77	2.69	2.69	2.09	2.67	2.75	3.09	.

\* 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	Adjusted		
		M1	MZM	M2	Credit	Monetary Base	Reserves	MSI M2**
2009		1637.796	9541.723	8385.021	9169.958	1796.556	944.368	8242.650
2010		1742.112	9535.780	8592.737	9122.993	2031.689	1143.690	8453.833
2011		2009.729	10202.78	9221.300	9224.567	2538.959	1576.503	9079.992
2012		2311.406	11058.34	10010.64	9721.109	2661.969	1611.903	9863.150
2013		2548.262	11872.57	10685.75	10028.20	3271.719	2144.946	10533.53
2011	1	1872.256	9799.119	8856.789	9133.247	2242.975	1310.136	8713.933
	2	1929.773	10053.56	9027.023	9152.113	2597.817	1647.222	8870.033
	3	2083.381	10395.58	9424.080	9240.154	2680.091	1713.491	9283.033
	4	2153.503	10562.88	9577.309	9372.753	2634.952	1635.163	9452.967
2012	1	2213.387	10762.64	9756.548	9540.382	2688.263	1662.512	9603.533
	2	2258.062	10925.13	9897.144	9667.938	2651.102	1615.813	9727.567
	3	2350.745	11151.76	10088.62	9785.452	2651.597	1601.126	9945.433
	4	2423.430	11393.84	10300.26	9890.665	2656.914	1568.164	10176.07
2013	1	2471.451	11617.39	10472.36	9989.703	2865.577	1760.054	10309.43
	2	2524.228	11755.97	10594.47	10053.51	3135.692	2025.832	10415.77
	3	2568.537	11958.44	10753.53	10020.34	3412.927	2287.538	10609.53
	4	2628.830	12158.46	10922.63	10049.26	3672.678	2506.357	10799.40
2011	Dec	2159.923	10616.88	9620.243	9405.801	2603.486	1571.783	9493.800
2012	Jan	2199.647	10706.33	9707.523	9468.292	2647.505	1579.387	9567.500
	Feb	2212.059	10758.66	9760.028	9563.983	2733.081	1732.832	9603.600
	Mar	2228.456	10822.91	9802.093	9588.871	2684.203	1675.316	9639.500
	Apr	2250.376	10877.46	9856.676	9628.917	2673.666	1654.388	9683.700
	May	2254.184	10916.49	9886.047	9672.632	2634.893	1587.890	9724.500
	Jun	2269.626	10981.44	9948.709	9702.266	2644.747	1605.160	9774.500
	Jul	2322.051	11066.61	10022.11	9754.540	2669.164	1621.475	9872.500
	Aug	2346.729	11152.44	10086.04	9787.373	2669.390	1626.134	9944.500
	Sep	2383.456	11236.24	10157.72	9814.444	2616.238	1555.768	10019.30
	Oct	2415.437	11297.18	10214.14	9833.324	2648.761	1584.757	10104.40
	Nov	2407.686	11367.23	10279.88	9880.774	2665.101	1581.304	10157.40
	Dec	2447.166	11517.10	10406.75	9957.898	2656.879	1538.430	10266.40
2013	Jan	2464.496	11584.13	10442.57	9983.428	2748.980	1594.013	10308.30
	Feb	2473.505	11604.29	10454.68	9990.113	2874.405	1794.637	10288.40
	Mar	2476.353	11663.76	10519.84	9995.569	2973.347	1891.513	10331.60
	Apr	2517.815	11706.60	10553.68	10057.42	3045.674	1954.983	10389.10
	May	2525.755	11748.16	10590.77	10051.13	3139.116	2013.762	10409.80
	Jun	2529.115	11813.16	10638.94	10051.97	3222.287	2108.752	10448.40
	Jul	2558.311	11893.62	10702.21	10042.04	3310.260	2184.846	10553.20
	Aug	2560.311	11952.90	10756.21	10014.10	3419.555	2303.530	10612.40
	Sep	2586.990	12028.81	10802.17	10004.89	3508.965	2374.239	10663.00
	Oct	2625.815	12130.85	10900.09	10030.23	3630.629	2500.854	10794.60
	Nov	2612.266	12150.78	10908.93	10037.79	3702.083	2545.324	10775.60
	Dec	2648.410	12193.75	10958.88	10079.75	3685.322	2472.894	10828.00

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			
2009		0.16	0.50	3.25		0.15	1.43	3.26	5.31	4.27	5.04
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
2011 1		0.16	0.75	3.25		0.13	1.16	3.46	5.13	4.71	4.85
2011 2		0.09	0.75	3.25		0.05	0.95	3.21	5.04	4.50	4.66
2011 3		0.08	0.75	3.25		0.02	0.47	2.43	4.46	4.02	4.31
2011 4		0.07	0.75	3.25		0.01	0.42	2.05	3.93	3.82	4.01
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
2012 Jan		0.08	0.75	3.25		0.03	0.36	1.97	3.85	3.48	3.92
2012 Feb		0.10	0.75	3.25		0.09	0.38	1.97	3.85	3.09	3.89
2012 Mar		0.13	0.75	3.25		0.08	0.51	2.17	3.99	3.37	3.95
2012 Apr		0.14	0.75	3.25		0.08	0.43	2.05	3.96	3.43	3.91
2012 May		0.16	0.75	3.25		0.09	0.39	1.80	3.80	3.20	3.80
2012 Jun		0.16	0.75	3.25		0.09	0.39	1.62	3.64	3.32	3.68
2012 Jul		0.16	0.75	3.25		0.10	0.33	1.53	3.40	3.18	3.55
2012 Aug		0.13	0.75	3.25		0.10	0.37	1.68	3.48	3.01	3.60
2012 Sep		0.14	0.75	3.25		0.11	0.34	1.72	3.49	2.96	3.50
2012 Oct		0.16	0.75	3.25		0.10	0.37	1.75	3.47	2.86	3.38
2012 Nov		0.16	0.75	3.25		0.09	0.36	1.65	3.50	2.76	3.35
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		4.43

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	14.18	9.60	8.00	
	2010	6.37	-0.06	2.48	
	2011	15.36	6.99	7.32	
	2012	15.01	8.39	8.56	
	2013	10.25	7.36	6.74	
<hr/>					
2011	1	12.73	4.17	5.64	
	2	12.29	10.39	7.69	
	3	31.84	13.61	17.59	
	4	13.46	6.44	6.50	
2012	1	11.12	7.56	7.49	
	2	8.07	6.04	5.76	
	3	16.42	8.30	7.74	
	4	12.37	8.68	8.39	
2013	1	7.93	7.85	6.68	
	2	8.54	4.77	4.66	
	3	7.02	6.89	6.01	
	4	9.39	6.69	6.29	
<hr/>					
2011	Dec	-0.48	6.41	5.21	
<hr/>					
2012	Jan	22.07	10.11	10.89	
	Feb	6.77	5.87	6.49	
	Mar	8.90	7.17	5.17	
	Apr	11.80	6.05	6.68	
	May	2.03	4.31	3.58	
	Jun	8.22	7.14	7.61	
	Jul	27.72	9.31	8.85	
	Aug	12.75	9.31	7.65	
	Sep	18.78	9.02	8.53	
	Oct	16.10	6.51	6.67	
	Nov	-3.85	7.44	7.72	
	Dec	19.68	15.82	14.81	
<hr/>					
2013	Jan	8.50	6.98	4.13	
	Feb	4.39	2.09	1.39	
	Mar	1.38	6.15	7.48	
	Apr	20.09	4.41	3.86	
	May	3.78	4.26	4.22	
	Jun	1.60	6.64	5.46	
	Jul	13.85	8.17	7.14	
	Aug	0.94	5.98	6.05	
	Sep	12.50	7.62	5.13	
	Oct	18.01	10.18	10.88	
	Nov	-6.19	1.97	0.97	
	Dec	16.60	4.24	5.49	

\*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

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

$$\Delta x_t^* = \pi^* + \Delta y_t^*$$

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.

*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.

## References

- Anderson, Richard G. and Robert H. Rasche (1996a). "A Revised Measure of the St. Louis Adjusted Monetary Base," *Federal Reserve Bank of St. Louis Review*, March/April, 78(2), pp. 3-13.\*
- \_\_\_\_ and \_\_\_\_ (1996b). "Measuring the Adjusted Monetary Base in an Era of Financial Change," *Federal Reserve Bank of St. Louis Review*, November/December, 78(6), pp. 3-37.\*
- \_\_\_\_ and \_\_\_\_ (2001). "Retail Sweep Programs and Bank Reserves, 1994-1999," *Federal Reserve Bank of St. Louis Review*, January/February, 83(1), pp. 51-72.\*
- \_\_\_\_ and \_\_\_\_ , with Jeffrey Loesel (2003). "A Reconstruction of the Federal Reserve Bank of St. Louis Adjusted Monetary Base and Reserves," *Federal Reserve Bank of St. Louis Review*, September/October, 85(5), pp. 39-70.\*
- \_\_\_\_ , Barry E. Jones and Travis D. Nesmith (1997). "Special Report: The Monetary Services Indexes Project of the Federal Reserve Bank of St. Louis," *Federal Reserve Bank of St. Louis Review*, January/February, 79(1), pp. 31-82.\*
- McCallum, Bennett T. (2000). "Alternative Monetary Policy Rules: A Comparison with Historical Settings for the United States, the United Kingdom, and Japan," *Federal Reserve Bank of Richmond Economic Quarterly*, vol. 86/1, Winter.
- Motley, Brian (1988). "Should M2 Be Redefined?" *Federal Reserve Bank of San Francisco Economic Review*, Winter, pp. 33-51.
- Nelson, Charles R. and Andrew F. Siegel (1987). "Parsimonious Modeling of Yield Curves," *Journal of Business*, October, pp. 473-89.
- Poole, William (1991). Statement before the Subcommittee on Domestic Monetary Policy of the Committee on Banking, Finance and Urban Affairs, U.S. House of Representatives, November 6, 1991. Government Printing Office, Serial No. 102-82.
- Sharpe, William F. (1997). *Macro-Investment Analysis*, on-line textbook available at [www.stanford.edu/~wfsarpe/mia/mia.htm](http://www.stanford.edu/~wfsarpe/mia/mia.htm).
- Shiller, Robert (1990). "The Term Structure of Interest Rates," *Handbook of Monetary Economics*, vol. 1, B. Friedman and F. Hahn, eds., pp. 627-722.
- Taylor, John B. (1993). "Discretion versus Policy Rules in Practice," *Carnegie-Rochester Conference Series on Public Policy*, vol. 39, pp. 195-214.
- Note:** \*Available on the Internet at [research.stlouisfed.org/publications/review/](http://research.stlouisfed.org/publications/review/).