

Monetary *Trends*

June 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.



CENTRAL TO AMERICA'S ECONOMY®

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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:

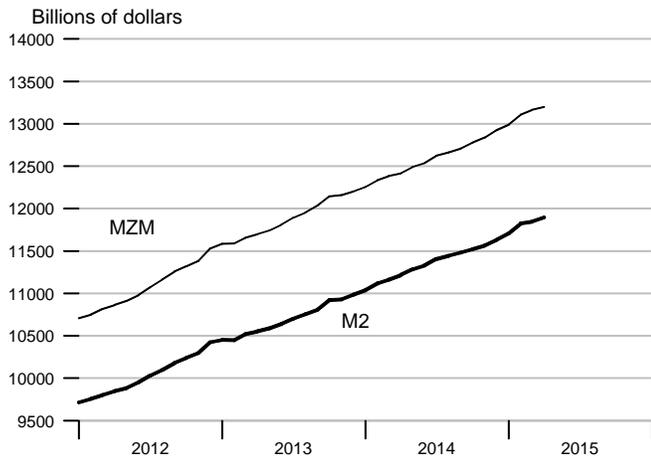
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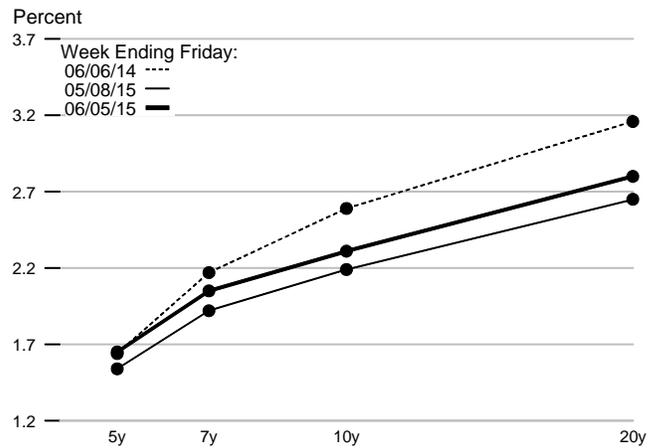
stlsFRED@stls.frb.org

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.

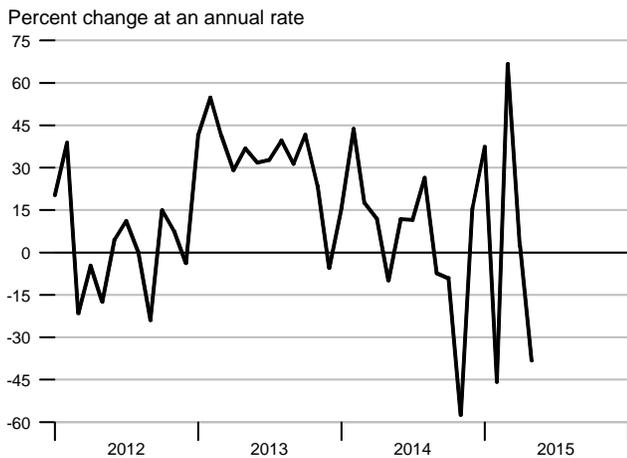
M2 and MZM



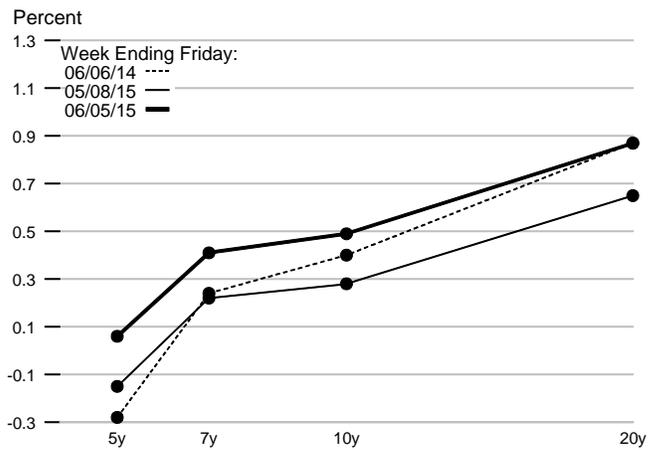
Treasury Yield Curve



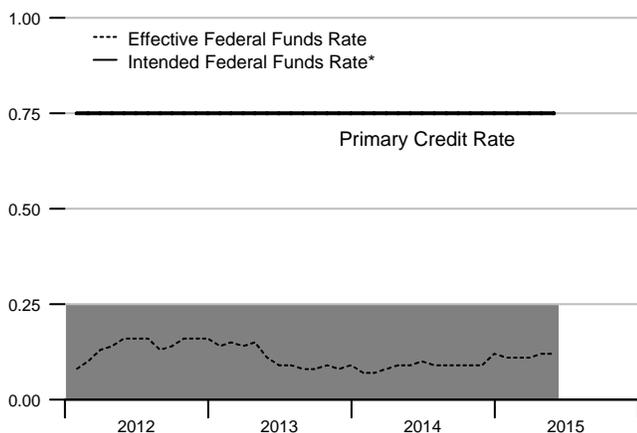
Adjusted Monetary Base



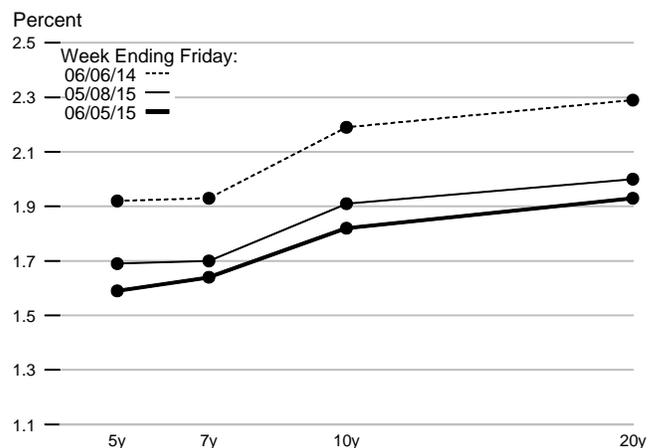
Real Treasury Yield Curve



Reserve Market Rates



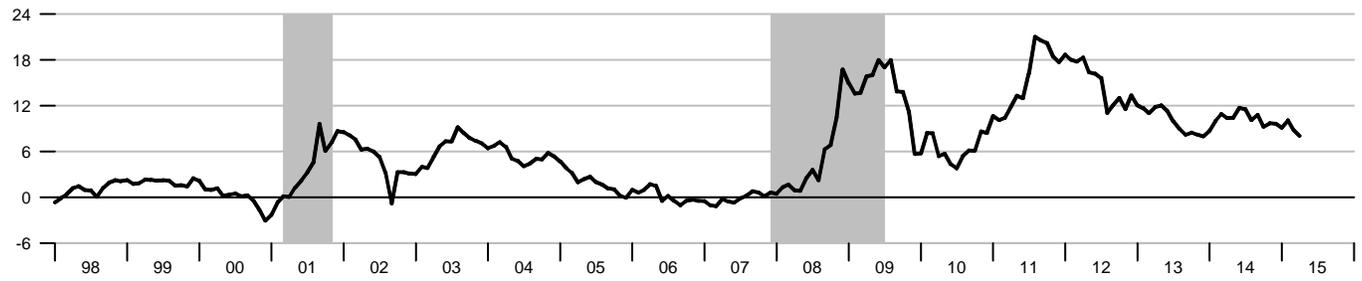
Inflation-Indexed Treasury Yield Spreads



*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.

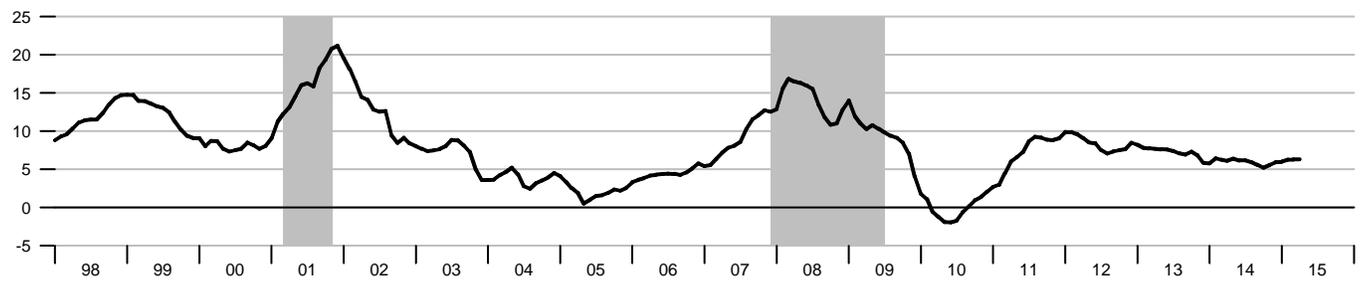
M1

Percent change from year ago



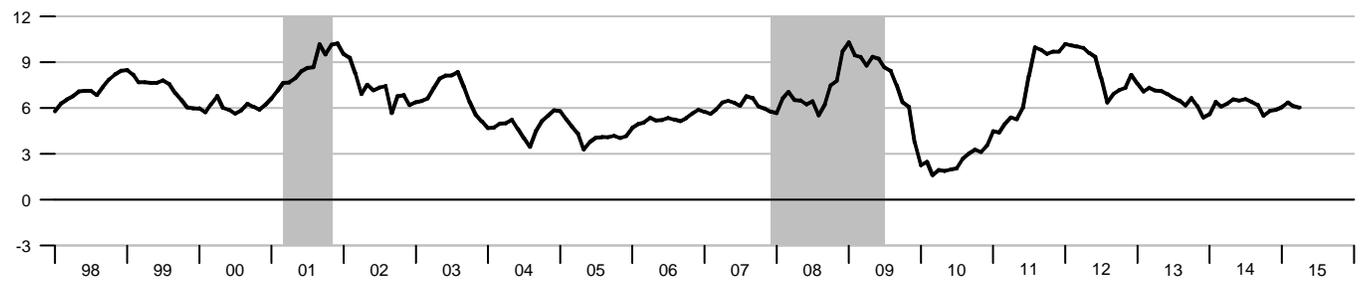
M2M

Percent change from year ago



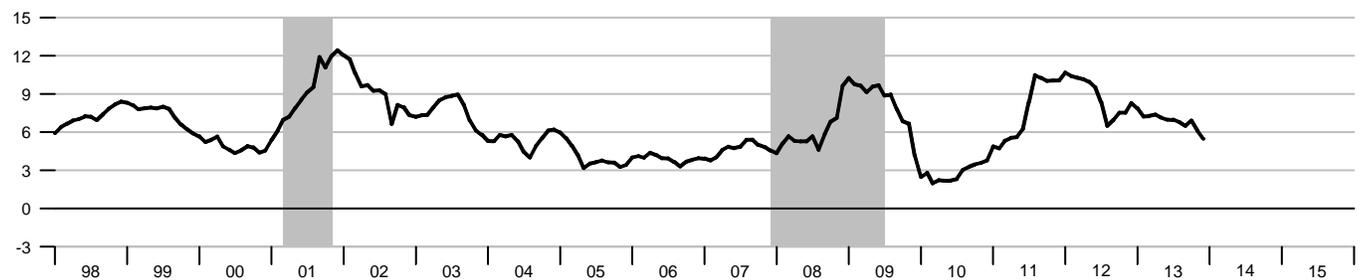
M2

Percent change from year ago



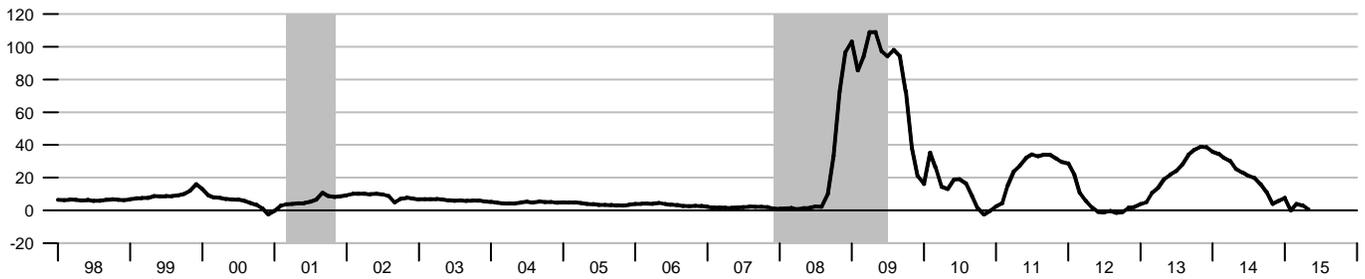
Monetary Services Index - M2

Percent change from year ago



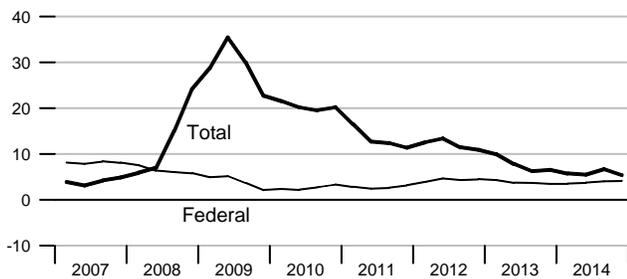
Adjusted Monetary Base

Percent change from year ago



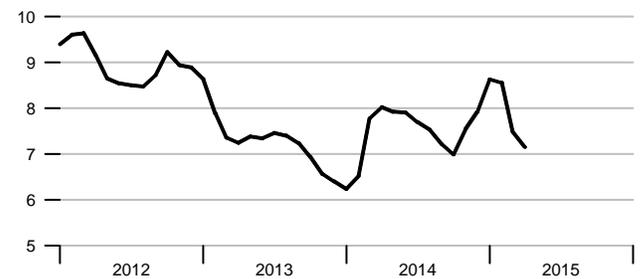
Domestic Nonfinancial Debt

Percent change from year ago



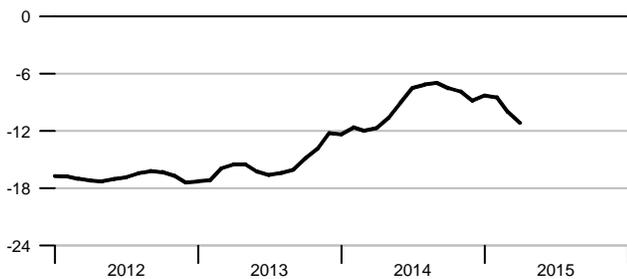
Currency Held by the Nonbank Public

Percent change from year ago



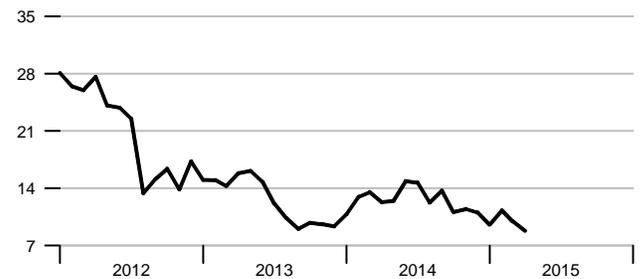
Small Denomination Time Deposits

Percent change from year ago



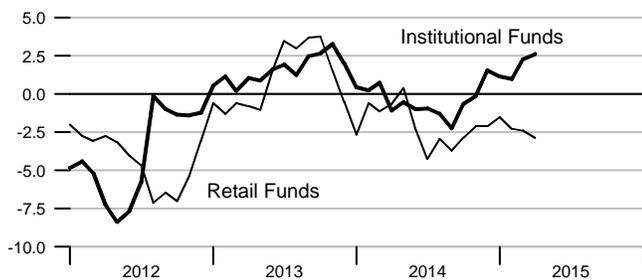
Checkable Deposits

Percent change from year ago



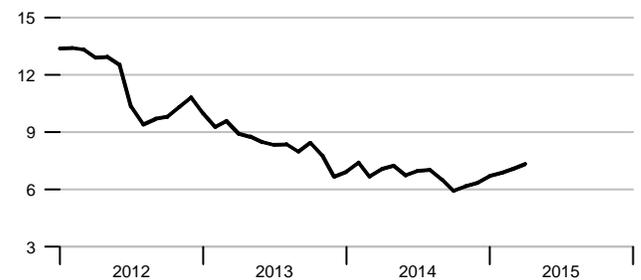
Money Market Mutual Fund Shares

Percent change from year ago

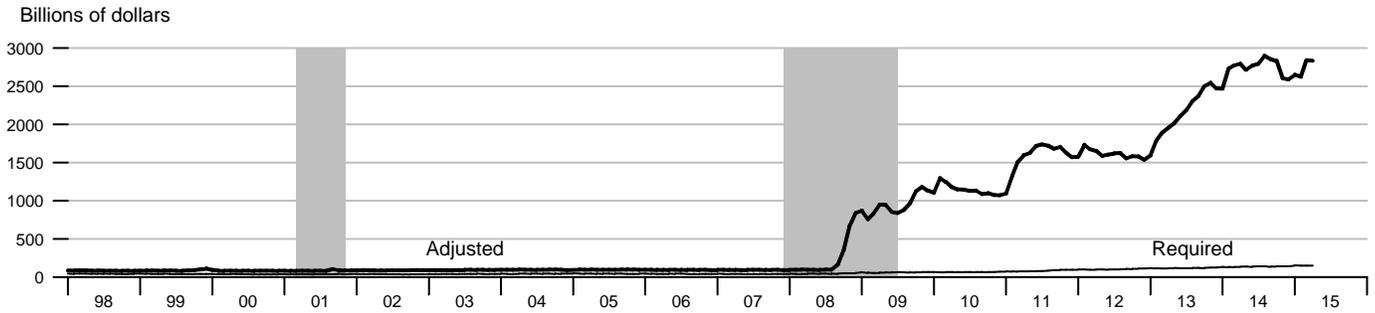


Savings Deposits

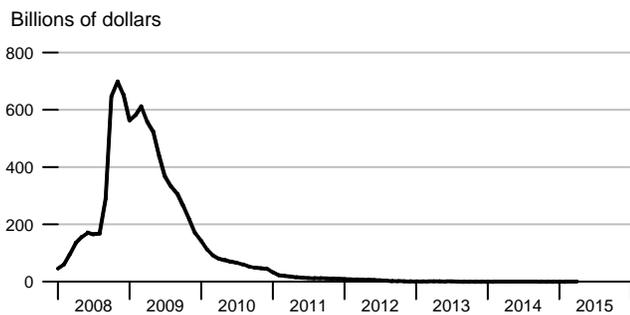
Percent change from year ago



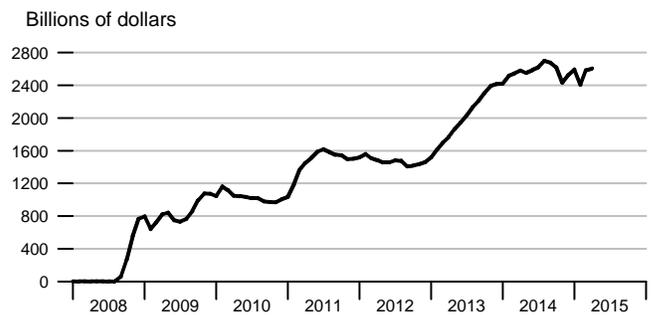
Adjusted and Required Reserves



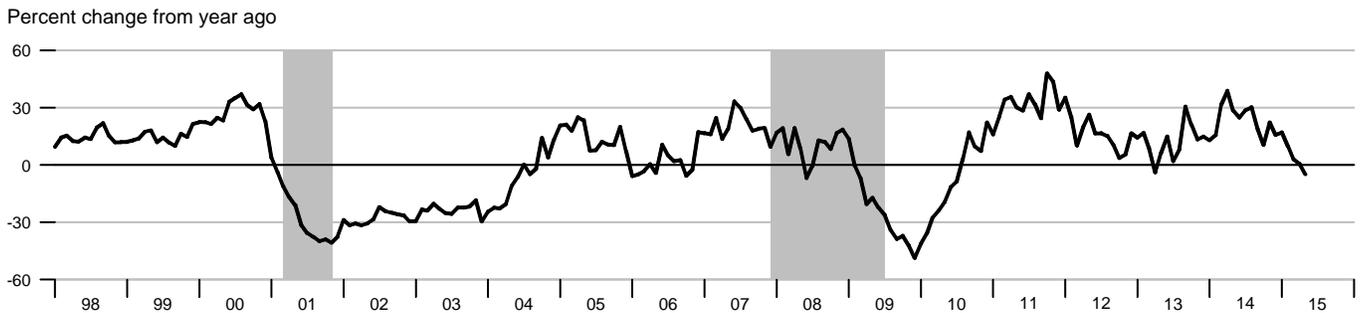
Total Borrowings



Excess Reserve Balances

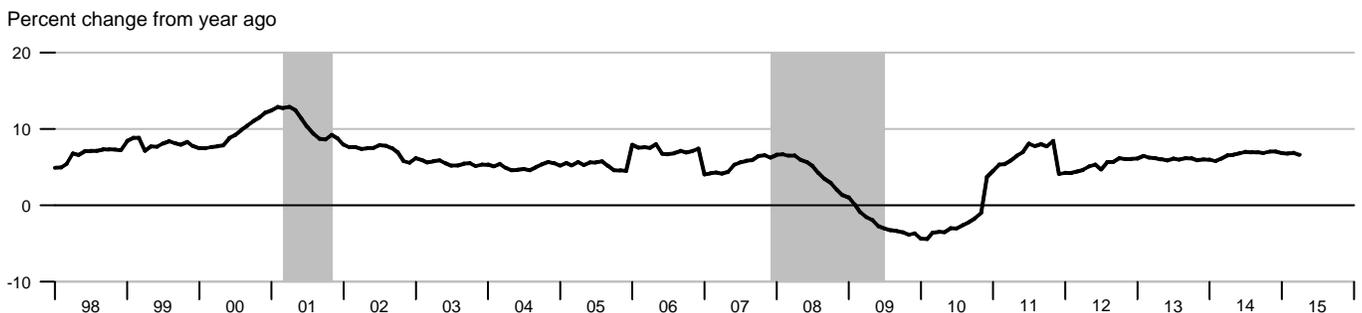


Nonfinancial Commercial Paper



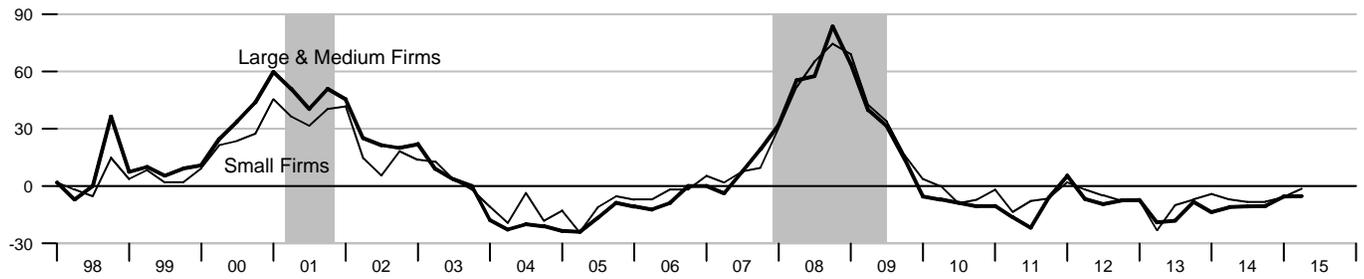
As of April 10, 2006, the Federal Reserve Board made major changes to its commercial paper calculations. For more information, please refer to <http://www.federalreserve.gov/releases/cp/about.htm>.

Consumer Credit



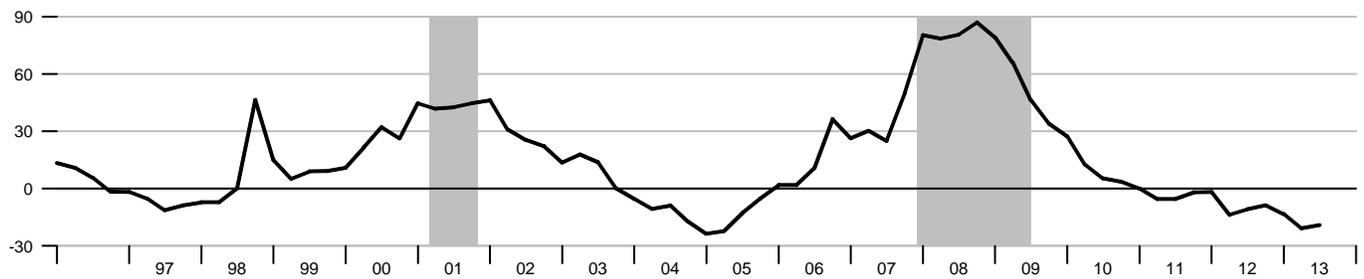
Net Percentage of Domestic Banks Tightening Standards for Commercial and Industrial Loans

Percentage



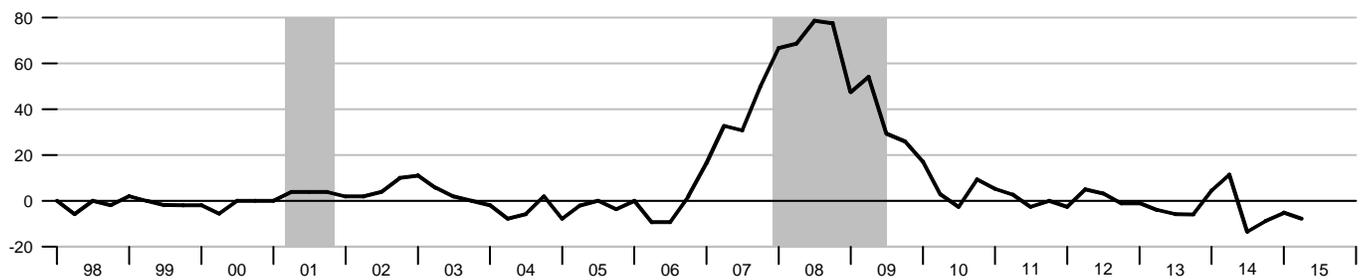
Net Percentage of Domestic Banks Tightening Standards for Commercial Real Estate Loans

Percentage



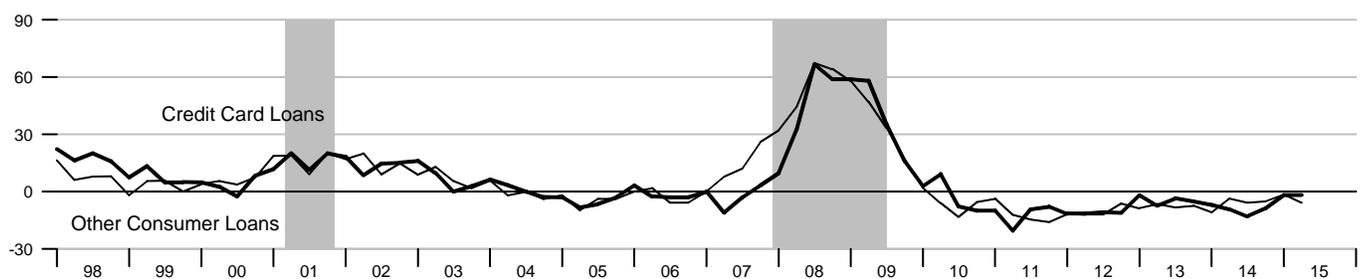
Net Percentage of Domestic Banks Tightening Standards for Residential Mortgage Loans

Percentage

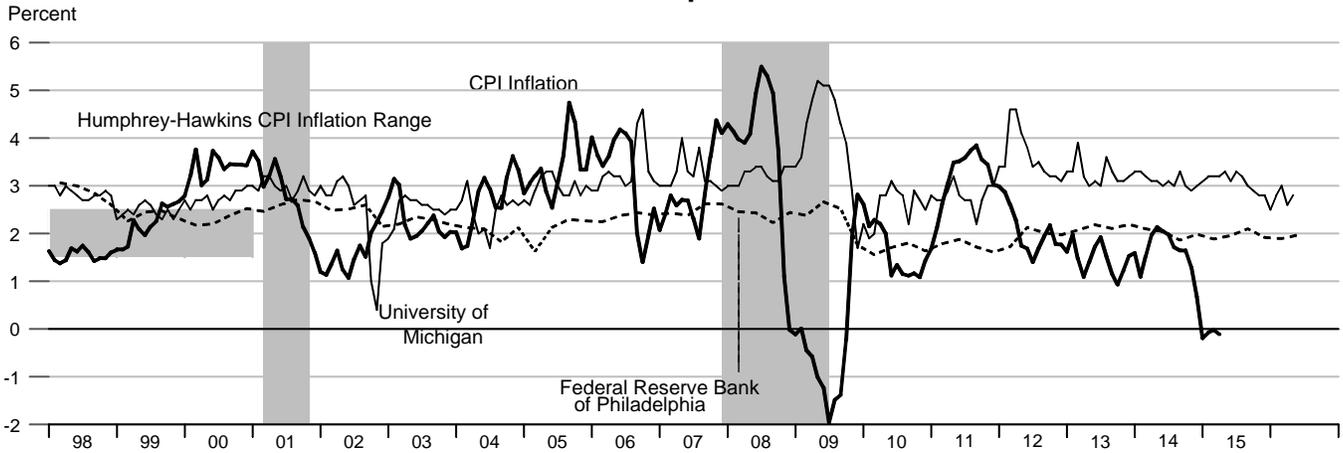


Net Percentage of Domestic Banks Tightening Standards for Consumer Loans

Percentage

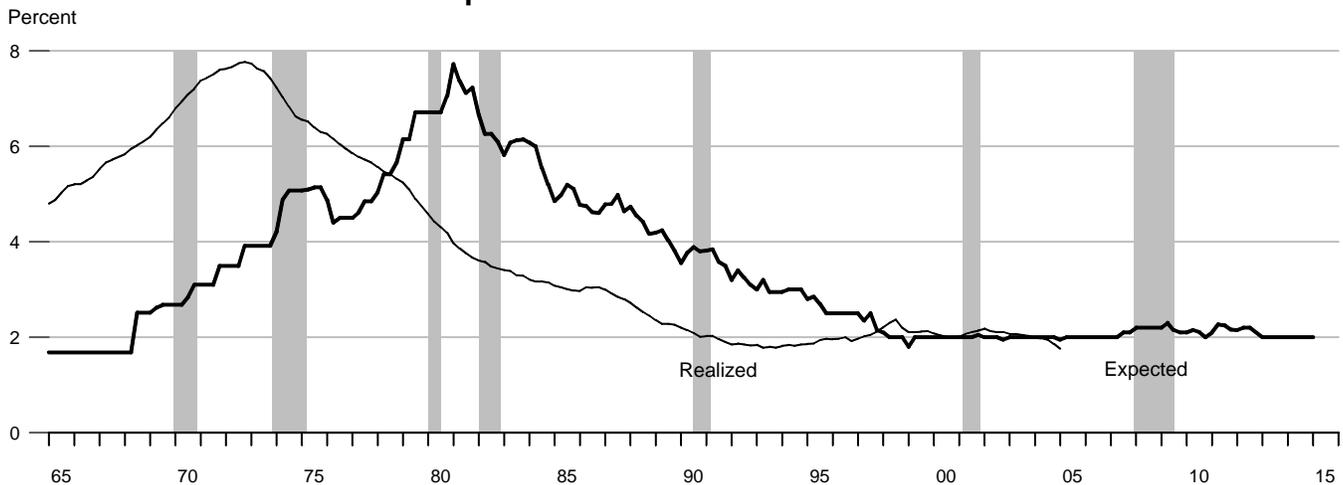


CPI Inflation and 1-Year-Ahead CPI Inflation Expectations



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

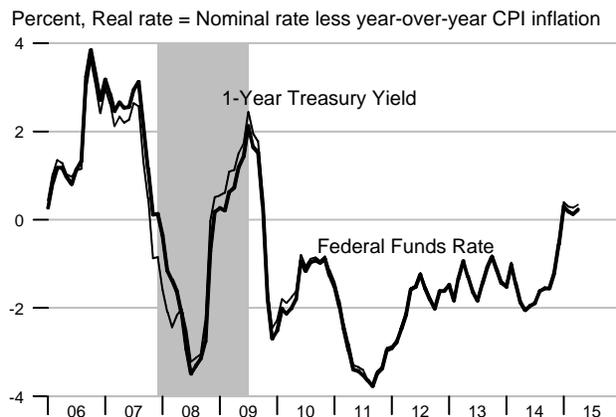


See the notes section for an explanation of the chart.

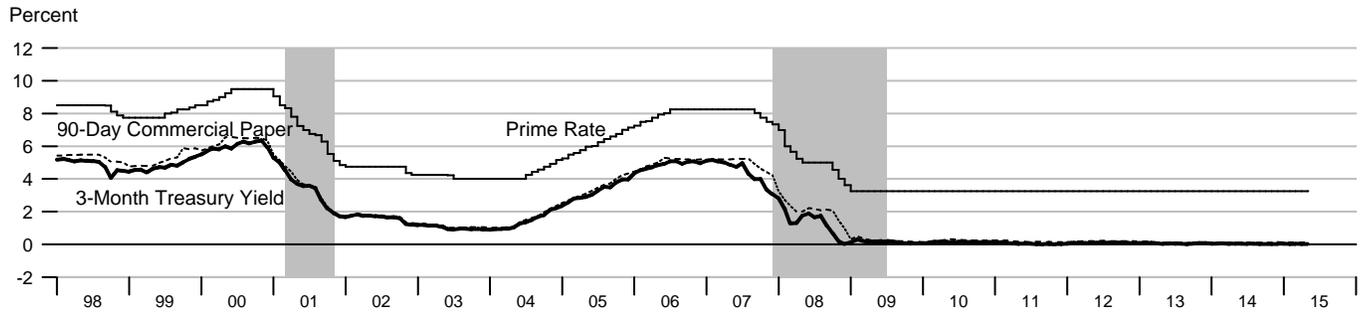
Treasury Security Yield Spreads



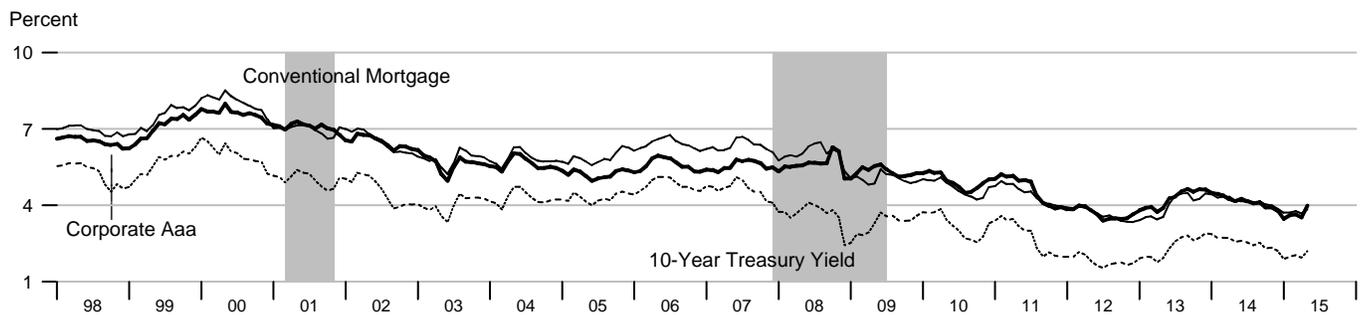
Real Interest Rates



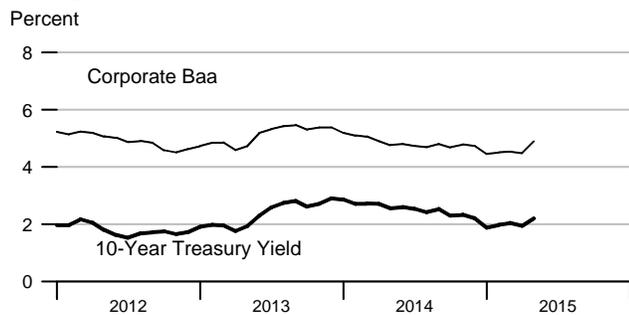
Short-Term Interest Rates



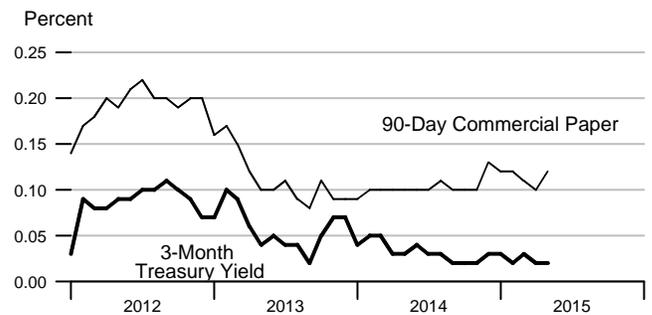
Long-Term Interest Rates



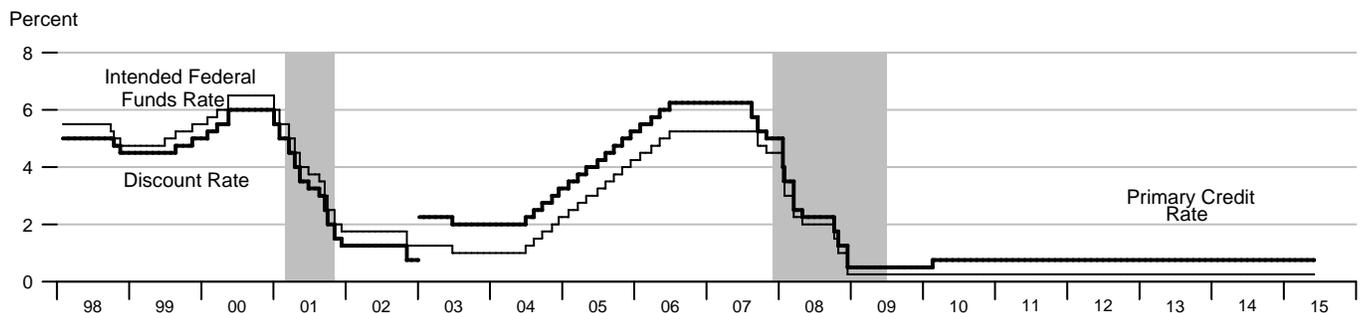
Long-Term Interest Rates



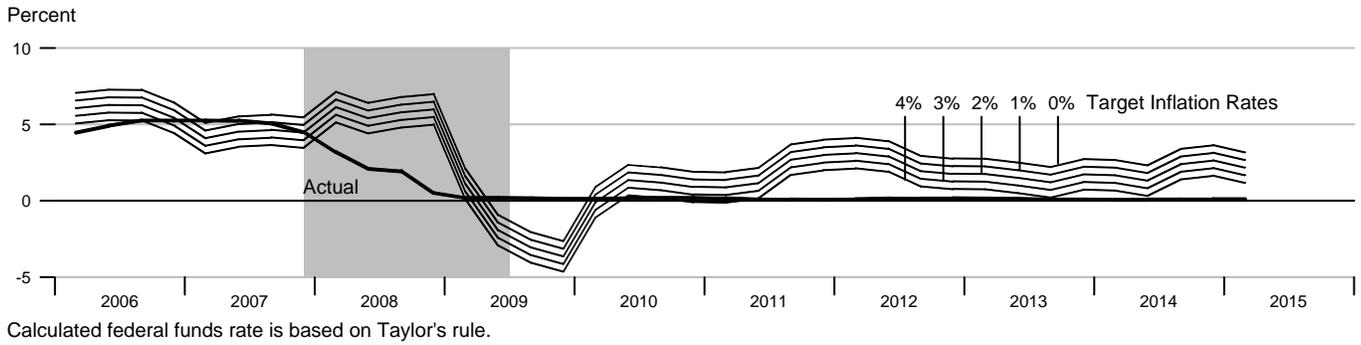
Short-Term Interest Rates



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

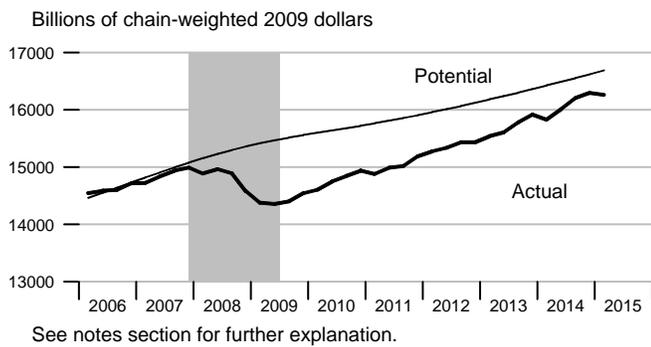


Federal Funds Rate and Inflation Targets

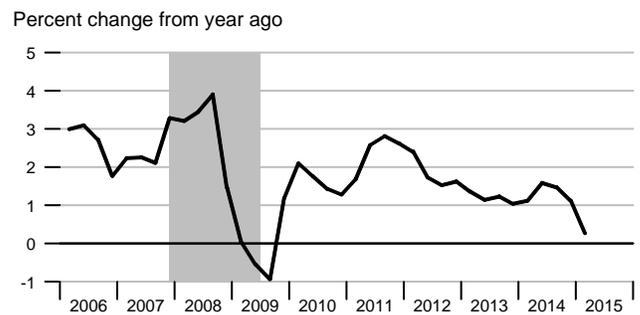


Components of Taylor's Rule

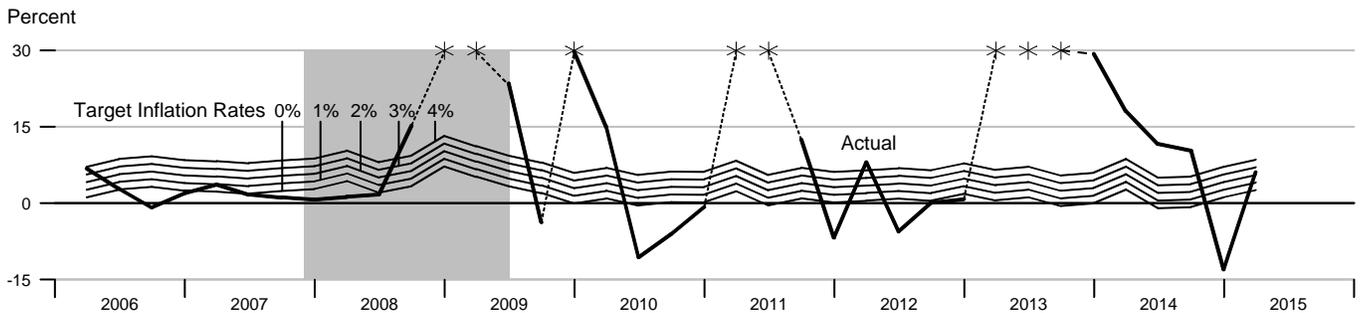
Actual and Potential Real GDP



PCE Inflation

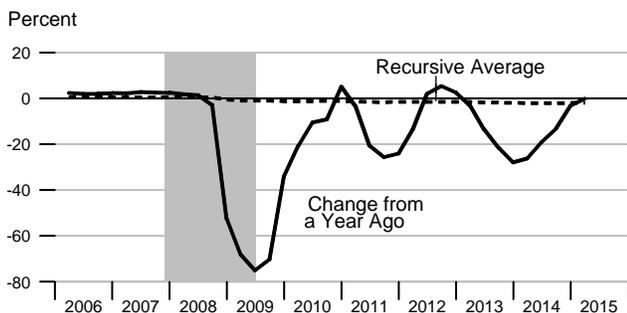


Monetary Base Growth and Inflation Targets

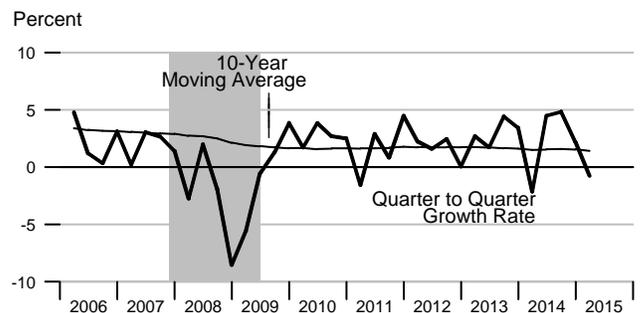


Components of McCallum's Rule

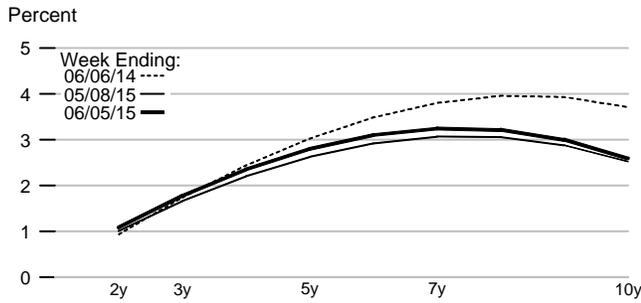
Monetary Base Velocity Growth



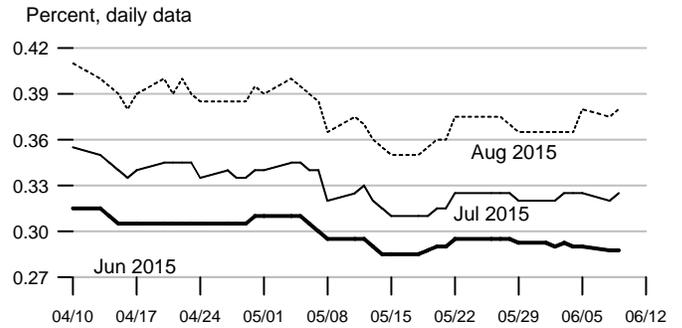
Real Output Growth



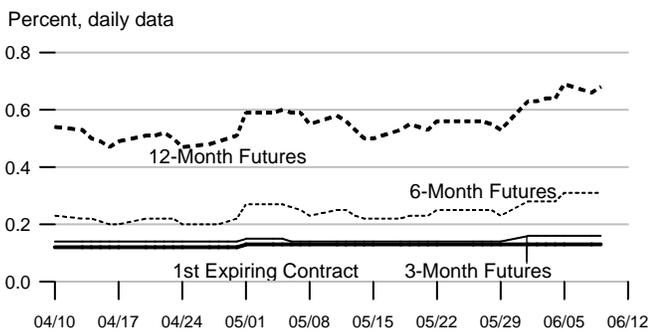
Implied One-Year Forward Rates



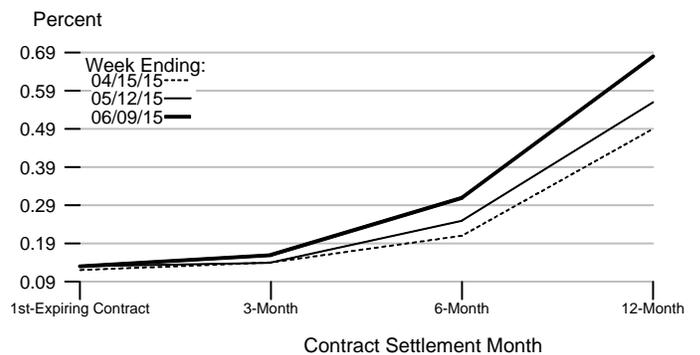
Rates on 3-Month Eurodollar Futures



Rates on Selected Federal Funds Futures Contracts



Rates on Federal Funds Futures on Selected Dates

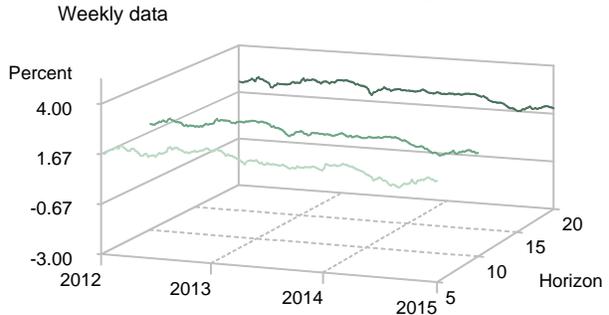


Inflation-Indexed Treasury Securities



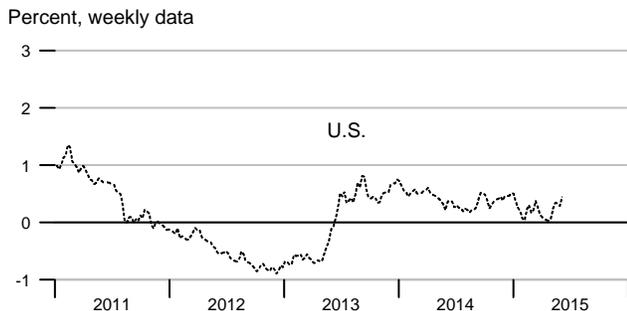
Note: Yields are inflation-indexed constant maturity U.S. Treasury securities

Inflation-Indexed Treasury Yield Spreads



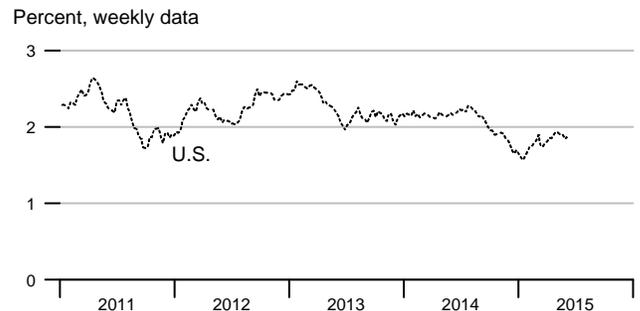
Note: Yield spread is between nominal and inflation-indexed constant maturity U.S. Treasury securities.

Inflation-Indexed 10-Year Government Notes



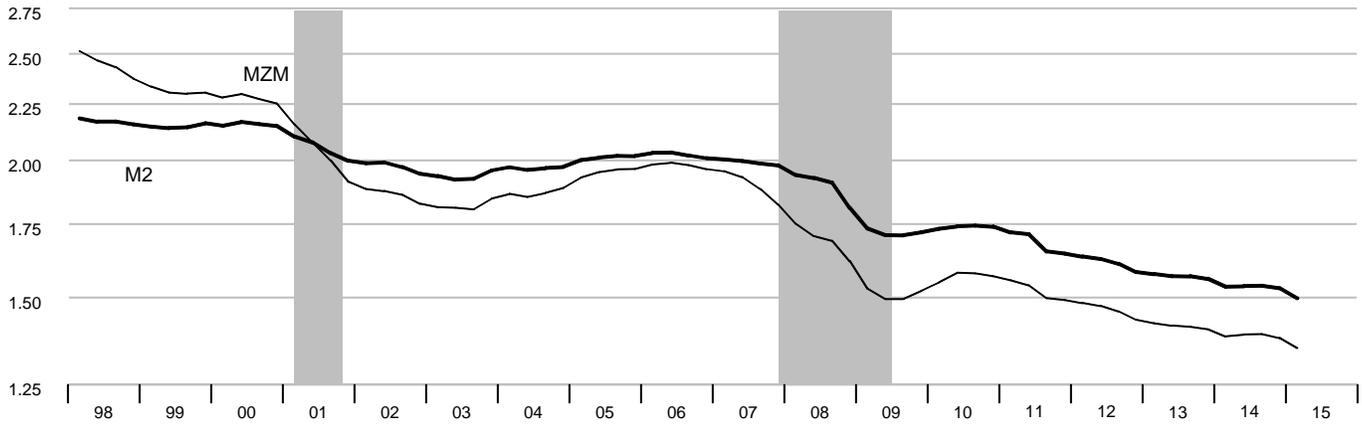
Note: Data is temporarily unavailable for the French and U.K. 10-Year Notes and Government Yield Spreads.

Inflation-Indexed 10-Year Government Yield Spreads



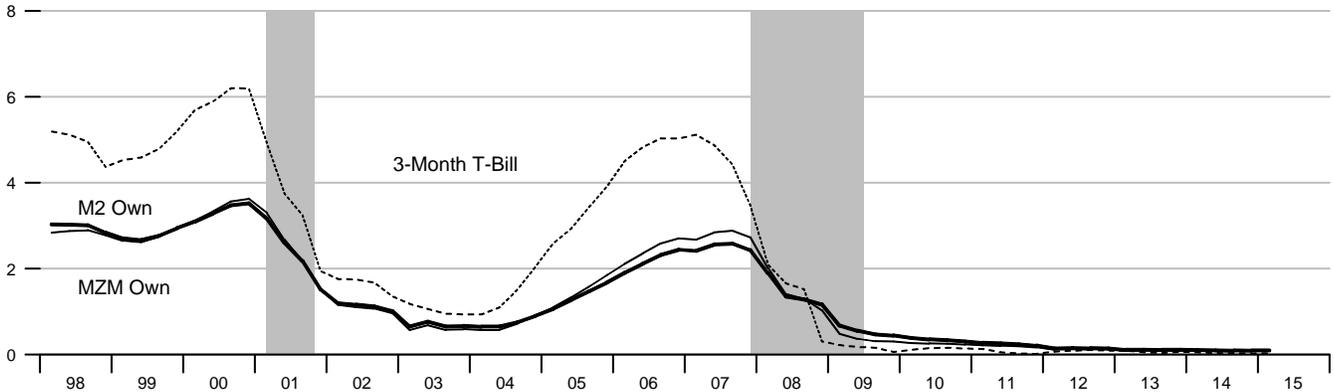
Velocity

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



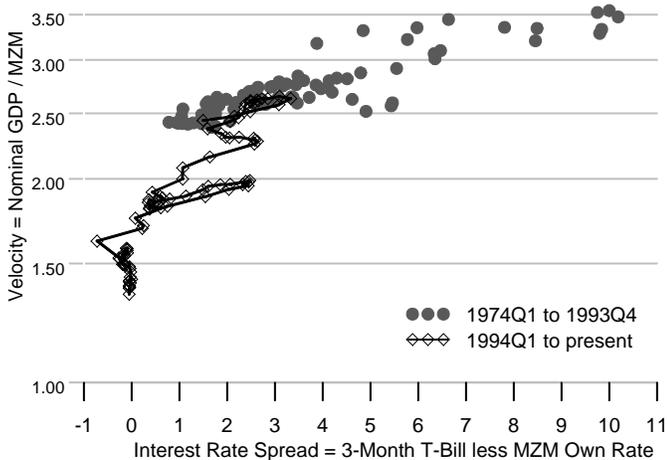
Interest Rates

Percent



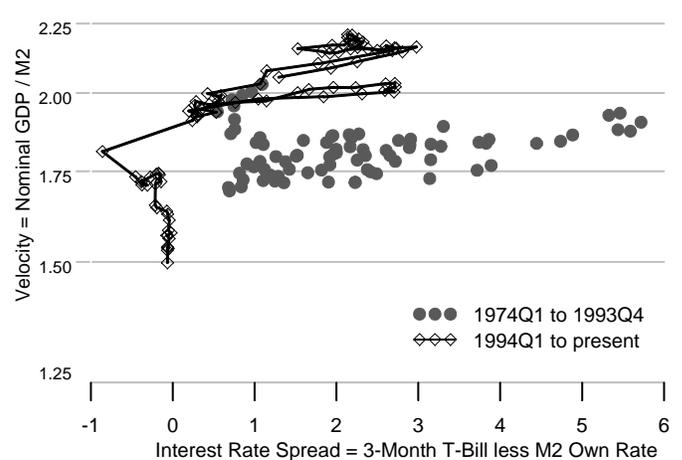
MZM Velocity and Interest Rate Spread

Ratio Scale



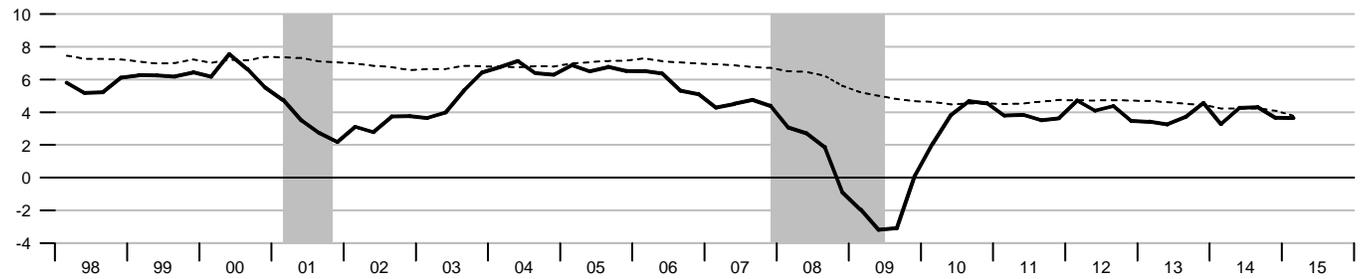
M2 Velocity and Interest Rate Spread

Ratio Scale



Gross Domestic Product

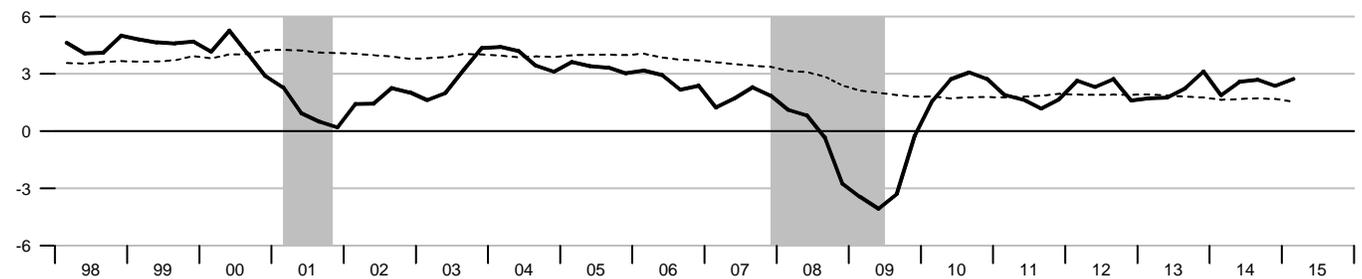
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Real Gross Domestic Product

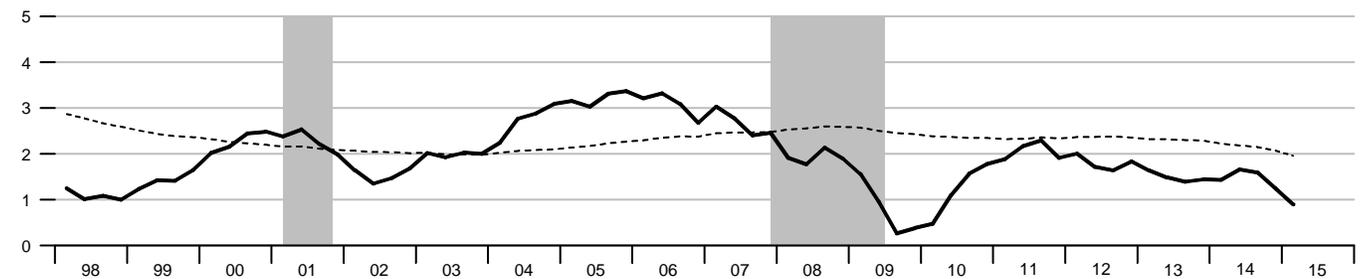
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Gross Domestic Product Price Index

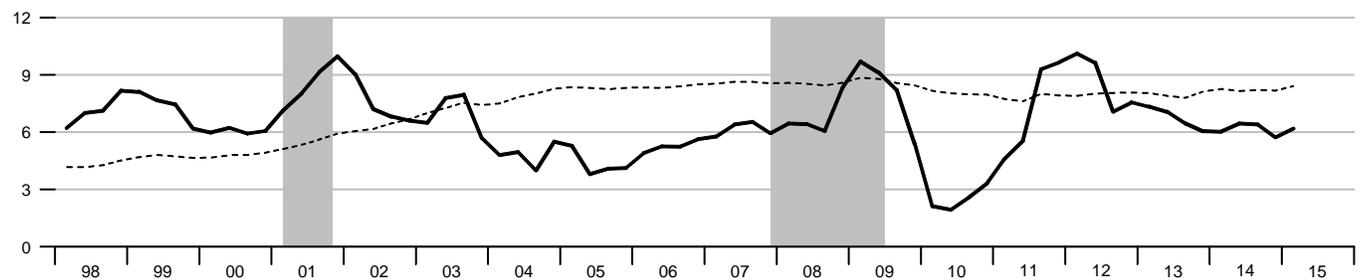
Percent change from year ago



Dashed lines indicate 10-year moving averages.

M2

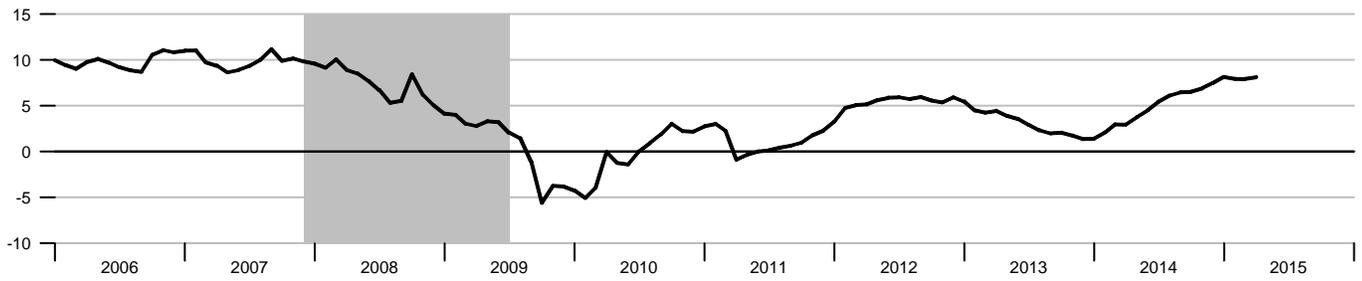
Percent change from year ago



Dashed lines indicate 10-year moving averages.

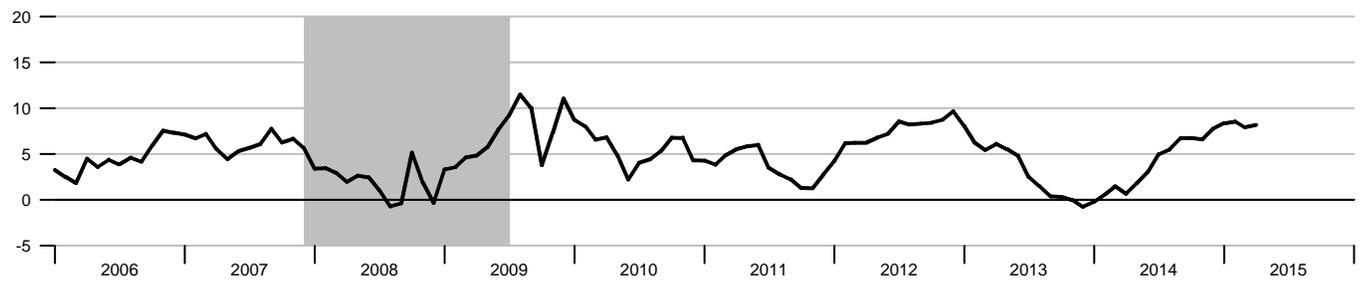
Bank Credit

Percent change from year ago



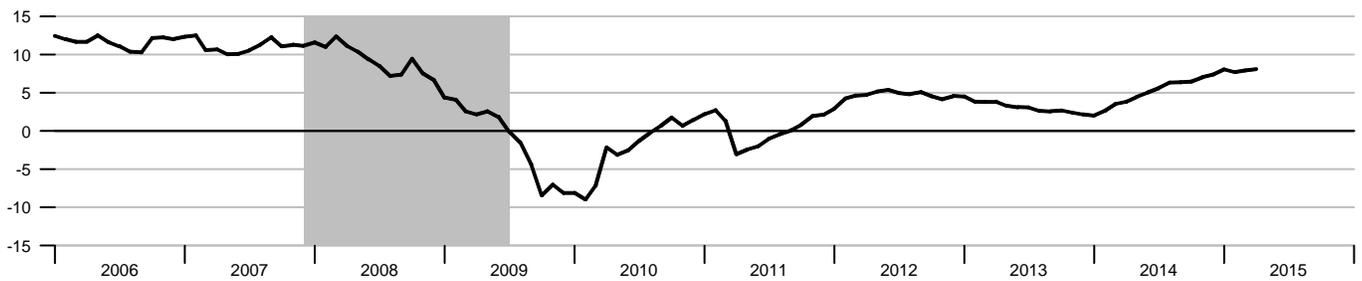
Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago



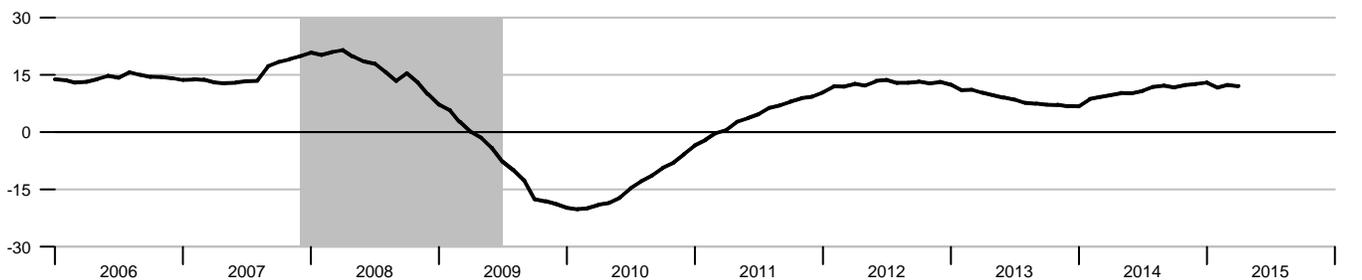
Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago

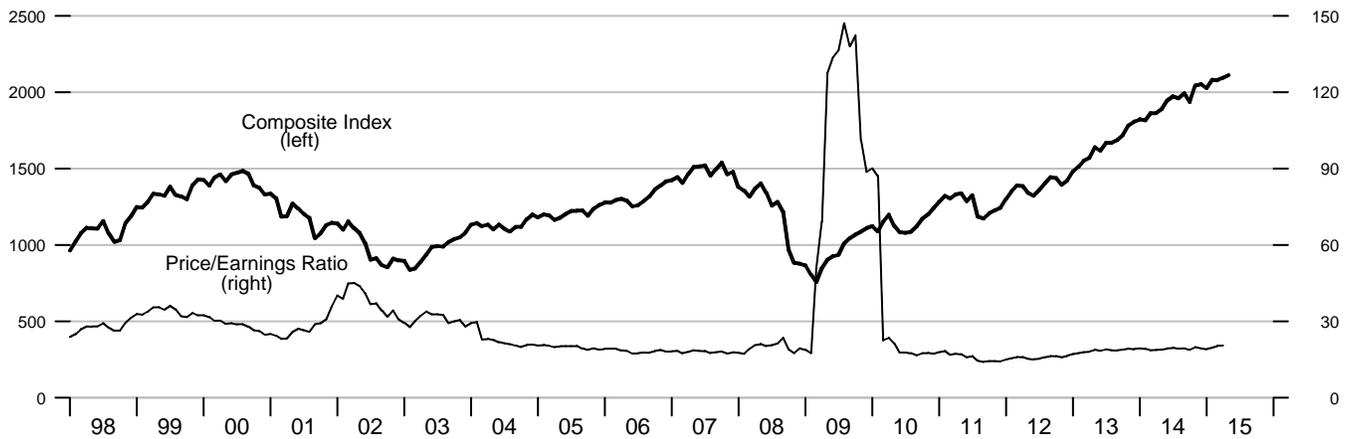


Commercial and Industrial Loans at Commercial Banks

Percent change from year ago



Standard & Poor's 500



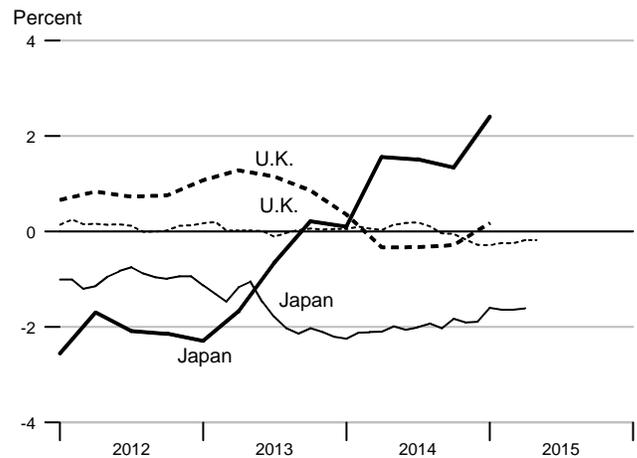
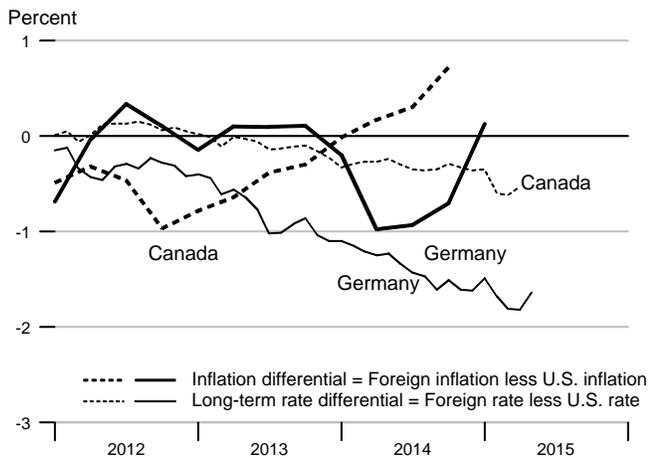
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Recent Inflation and Long-Term Interest Rates

	Consumer Price Inflation Rates				Long-Term Government Bond Rates			
	Percent change from year ago				Percent			
	2014Q2	2014Q3	2014Q4	2015Q1	Feb15	Mar15	Apr15	May15
United States	2.05	1.78	1.20	-0.10	1.98	2.04	1.94	2.20
Canada	2.22	2.08	1.93	1.08	1.38	1.42	1.41	.
France	0.63	0.40	0.28	-0.24	0.60	0.51	0.42	0.89
Germany	1.08	0.85	0.50	0.03	0.30	0.23	0.12	0.56
Italy	0.44	-0.06	0.09	-0.25	1.56	1.29	1.36	1.81
Japan	3.61	3.29	2.55	2.31	0.34	0.40	0.33	.
United Kingdom	1.72	1.45	0.92	0.08	1.74	1.79	1.76	2.02

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Inflation and Long-Term Interest Rate Differentials



		Money Stock			Bank	Adjusted		MSI M2**	
		M1	MZM	M2	M3*	Credit	Monetary Base		Reserves
2010		1742.161	9539.737	8601.013		9123.327	2031.754	1143.754	9033.800
2011		2009.953	10206.58	9229.236		9220.678	2539.071	1576.615	9725.950
2012		2311.913	11062.60	10018.99		9713.910	2662.210	1612.146	10581.97
2013		2545.189	11872.71	10691.82		10023.39	3271.779	2145.031	11309.34
2014		2806.453	12579.21	11349.65		10496.81	3946.875	2737.250	
2013	1	2470.947	11610.14	10473.94		9983.047	2865.781	1760.260	11067.70
	2	2516.971	11750.78	10593.49		10038.54	3135.740	2025.880	11183.03
	3	2560.546	11961.08	10754.83		10009.69	3412.932	2287.476	11391.10
	4	2632.294	12168.86	10945.01		10062.27	3672.663	2506.508	11595.53
2014	1	2715.584	12324.95	11105.74		10198.29	3842.884	2658.886	
	2	2789.676	12481.71	11276.94		10413.80	3956.063	2761.865	
	3	2837.453	12664.39	11443.62		10610.46	4059.351	2851.071	
	4	2883.097	12845.77	11572.29		10764.68	3929.202	2677.178	
2015	1	2969.280	13086.86	11792.83		11014.37	3989.204	2705.718	
2013	Apr	2511.032	11699.36	10553.38		10044.21	3045.787	1955.094	11154.40
	May	2521.987	11740.87	10587.24		10036.97	3139.137	2013.784	11176.80
	Jun	2517.894	11812.11	10639.86		10034.45	3222.296	2108.761	11217.90
	Jul	2545.554	11891.04	10700.67		10020.55	3310.263	2184.810	11330.70
	Aug	2557.281	11954.48	10754.46		10000.94	3419.562	2303.441	11393.80
	Sep	2578.804	12037.73	10809.36		10007.57	3508.971	2374.177	11448.80
	Oct	2620.191	12144.45	10920.35		10035.86	3630.634	2500.936	11591.10
	Nov	2622.226	12160.28	10929.77		10063.11	3702.078	2545.483	11569.10
	Dec	2654.464	12201.84	10984.91		10087.84	3685.277	2473.105	11626.40
2014	Jan	2683.208	12254.78	11037.47		10119.85	3733.485	2471.886	
	Feb	2718.553	12336.11	11118.48		10193.13	3869.463	2731.186	
	Mar	2744.992	12383.97	11161.28		10281.90	3925.705	2773.585	
	Apr	2771.390	12415.94	11217.44		10341.72	3965.026	2796.051	
	May	2784.609	12490.77	11282.63		10413.10	3932.365	2716.719	
	Jun	2813.029	12538.42	11330.75		10486.57	3970.798	2772.826	
	Jul	2839.471	12622.72	11405.82		10564.69	4008.908	2797.168	
	Aug	2815.989	12661.53	11443.63		10611.10	4097.118	2899.810	
	Sep	2856.899	12708.90	11481.41		10655.58	4072.028	2856.236	
	Oct	2862.434	12776.49	11521.69		10692.07	4041.286	2834.126	
	Nov	2876.523	12836.81	11564.73		10759.52	3847.952	2605.190	
	Dec	2910.333	12924.02	11630.46		10842.44	3898.369	2592.218	
2015	Jan	2927.858	12989.71	11706.50		10943.66	4019.760	2650.337	
	Feb	2992.278	13107.79	11826.31		11002.11	3866.553	2625.978	
	Mar	2987.703	13163.09	11845.70		11097.34	4081.299	2840.838	
	Apr	2994.544	13199.50	11895.10		11181.86	4088.850	2834.376	

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
2013 1		0.14	0.75	3.25		0.09	0.39	1.95	3.88	3.01	3.50
2		0.12	0.75	3.25		0.05	0.44	2.00	3.97	3.31	3.68
3		0.08	0.75	3.25		0.03	0.71	2.71	4.51	3.86	4.44
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
2		0.09	0.75	3.25		0.03	0.87	2.62	4.22	3.47	4.23
3		0.09	0.75	3.25		0.03	0.98	2.50	4.12	3.28	4.14
4		0.10	0.75	3.25		0.02	0.97	2.28	3.88	3.06	3.97
2015 1		0.11	0.75	3.25		0.03	0.97	1.97	3.57		3.73
2013 May		0.11	0.75	3.25		0.04	0.40	1.93	3.89	3.13	3.54
Jun		0.09	0.75	3.25		0.05	0.58	2.30	4.27	3.70	4.07
Jul		0.09	0.75	3.25		0.04	0.64	2.58	4.34	3.73	4.37
Aug		0.08	0.75	3.25		0.04	0.70	2.74	4.54	3.91	4.46
Sep		0.08	0.75	3.25		0.02	0.78	2.81	4.64	3.94	4.49
Oct		0.09	0.75	3.25		0.05	0.63	2.62	4.53	3.60	4.19
Nov		0.08	0.75	3.25		0.07	0.58	2.72	4.63	3.56	4.26
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
Feb		0.07	0.75	3.25		0.05	0.69	2.71	4.45	3.77	4.30
Mar		0.08	0.75	3.25		0.05	0.82	2.72	4.38	3.72	4.34
Apr		0.09	0.75	3.25		0.03	0.88	2.71	4.24	3.57	4.34
May		0.09	0.75	3.25		0.03	0.83	2.56	4.16	3.43	4.19
Jun		0.10	0.75	3.25		0.04	0.90	2.60	4.25	3.41	4.16
Jul		0.09	0.75	3.25		0.03	0.97	2.54	4.16	3.38	4.13
Aug		0.09	0.75	3.25		0.03	0.93	2.42	4.08	3.25	4.12
Sep		0.09	0.75	3.25		0.02	1.05	2.53	4.11	3.21	4.16
Oct		0.09	0.75	3.25		0.02	0.88	2.30	3.92	3.04	4.04
Nov		0.09	0.75	3.25		0.02	0.96	2.33	3.92	3.12	4.00
Dec		0.12	0.75	3.25		0.03	1.06	2.21	3.79	3.02	3.86
2015 Jan		0.11	0.75	3.25		0.03	0.90	1.88	3.46		3.71
Feb		0.11	0.75	3.25		0.02	0.99	1.98	3.61	3.08	3.71
Mar		0.11	0.75	3.25		0.03	1.02	2.04	3.64	3.15	3.77
Apr		0.12	0.75	3.25		0.02	0.87	1.94	3.52	3.20	3.67
May		0.12	0.75	3.25		0.02	0.98	2.20	3.98	3.28	3.84

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

		M1	MZM	M2	M3*
Percent change at an annual rate					
2010		6.38	-0.07	2.49	
2011		15.37	6.99	7.30	
2012		15.02	8.39	8.56	
2013		10.09	7.32	6.72	
2014		10.26	5.95	6.15	
<hr/>					
2013	1	6.38	7.03	5.94	
	2	7.45	4.85	4.57	
	3	6.93	7.16	6.09	
	4	11.21	6.95	7.07	
2014	1	12.66	5.13	5.87	
	2	10.91	5.09	6.17	
	3	6.85	5.85	5.91	
	4	6.43	5.73	4.50	
2015	1	11.96	7.51	7.62	
<hr/>					
2013	Apr	17.56	4.52	3.83	
	May	5.24	4.26	3.85	
	Jun	-1.95	7.28	5.96	
	Jul	13.18	8.02	6.86	
	Aug	5.53	6.40	6.03	
	Sep	10.10	8.36	6.13	
	Oct	19.26	10.64	12.32	
	Nov	0.93	1.56	1.03	
	Dec	14.75	4.10	6.05	
2014	Jan	12.99	5.21	5.74	
	Feb	15.81	7.96	8.81	
	Mar	11.67	4.66	4.62	
	Apr	11.54	3.10	6.04	
	May	5.72	7.23	6.97	
	Jun	12.25	4.58	5.12	
	Jul	11.28	8.07	7.95	
	Aug	-9.92	3.69	3.98	
	Sep	17.43	4.49	3.96	
	Oct	2.32	6.38	4.21	
	Nov	5.91	5.66	4.48	
	Dec	14.10	8.15	6.82	
2015	Jan	7.23	6.10	7.85	
	Feb	26.40	10.91	12.28	
	Mar	-1.83	5.06	1.97	
	Apr	2.75	3.32	5.00	

*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/agggreg/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 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, 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 $m = 1, \dots, 10$ 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.

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Note: *Available on the Internet at research.stlouisfed.org/publications/review/.