

Some Closure on Foreclosures?

Since 2007, mortgage delinquencies and foreclosures increased significantly with the deterioration in the U.S. housing market. Among other factors, a high unemployment rate has contributed to this landscape by reducing borrowers' incomes, and a persistently high rate will continue to have negative effects. However, some recent developments, including a sharp decline in long-term delinquencies, suggest that there may be an end in sight for the foreclosure woes.

The chart shows data from the past decade: serious delinquencies (more than 90 days), foreclosure starts (when lenders have started foreclosure proceedings), and foreclosure inventory (completed foreclosures). During the 2001 recession, the delinquency rate and foreclosure inventory increased somewhat. In the most recent episode, from the start of the subprime mortgage crisis in 2007, delinquencies have increased fivefold, as both the number of households entering delinquency and the average duration of that delinquency have increased.¹ Yet, the number of foreclosure starts has become more volatile and has actually not kept pace with the number of seriously delinquent mortgages.

Ultimately, the national foreclosure rate doesn't depend solely on the borrower's ability to pay. Lenders' willingness to negotiate also affects the end result, as do their incentives and legal obligations.

When a borrower defaults on a loan, the lender has the choice to foreclose, but foreclosure is a complex process that varies by state: Borrowers must be notified of impending foreclosure, usually three to six months after the first missed payment. And, depending on the state, foreclosure actions may be judicial, which requires court approval, or non-judicial, which is an administrative matter independent of the courts.

In addition, lenders have found it difficult to handle the recent volume of foreclosures. Many mortgage lenders and servicers have placed moratoria on foreclosure proceedings after defective procedures were discovered; perhaps most visible was the "robo-signing" scandal in which bank employees processed thousands of foreclosure documents without evaluating their accuracy. For a limited number of borrowers, government programs have reduced foreclosures, although many analysts are skeptical these programs have had a significant effect.²

A final observation concerns the cost of foreclosure. Contrary to popular perception, the foreclosure process can be very costly for a lender. A number of states have anti-deficiency laws that prevent the lender from recovering the difference between the final (post-foreclosure) sale price and the outstanding balance of the mortgage. An alternative for the lender is to renegotiate the loan, a process that often is less costly than outright foreclosure—by some estimates, there is a sevenfold difference between modification write-offs and foreclosure losses.³ Therefore, it remains a puzzle as to why such large numbers of mortgages in default enter into foreclosure in the first place.

Although the recent data must be viewed with caution, fewer serious delinquencies and a slowing of foreclosures may indicate a more beneficial balance between the needs of borrowers and lenders.

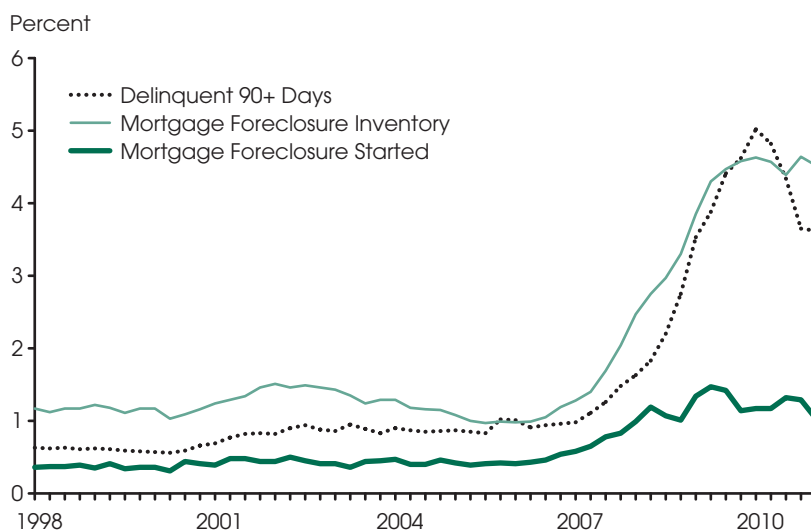
—Rajdeep Sengupta and Bryan J. Noeth

¹ According to Lender Processing Services, the average duration of seriously delinquent loans has jumped from 192 days in early 2008 to 374 days as of April 2011.

² See Gerardi, Kristopher and Li, Wenli. "Mortgage Foreclosure Prevention Efforts." Federal Reserve Bank of Atlanta *Economic Review*, 2010, 95(2), pp. 1-13 and references therein.

³ However, modifications are less frequent than might be expected from their cost savings. See White, Alan M. "Deleveraging the American Homeowner: The Failure of 2008 Voluntary Mortgage Contract Modifications." *Connecticut Law Review*, 2009, 41, p. 1107.

Mortgage Foreclosures and Delinquencies



SOURCE: Mortgage Bankers Association/Haver.

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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:

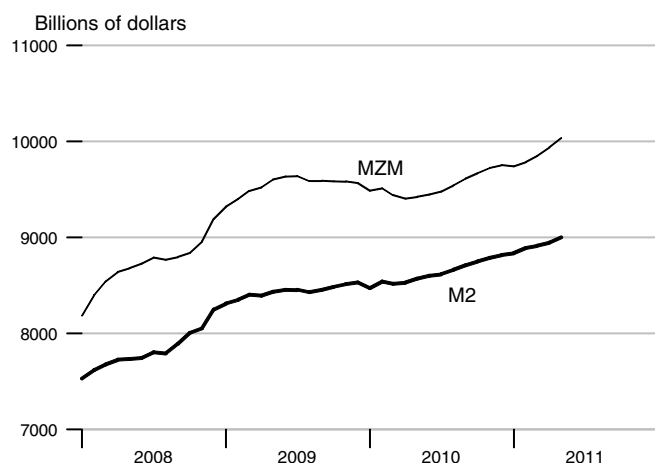
Editor, *Monetary Trends*
Research Division
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St. Louis, MO 63166-0442

or to:

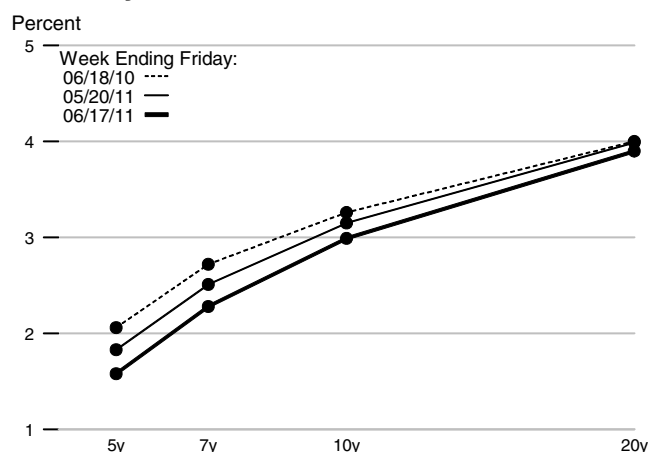
stlsFRED@stls.frb.org

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.

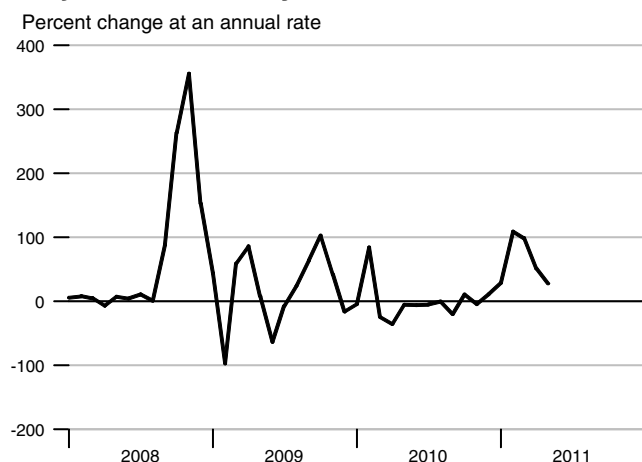
M2 and MZM



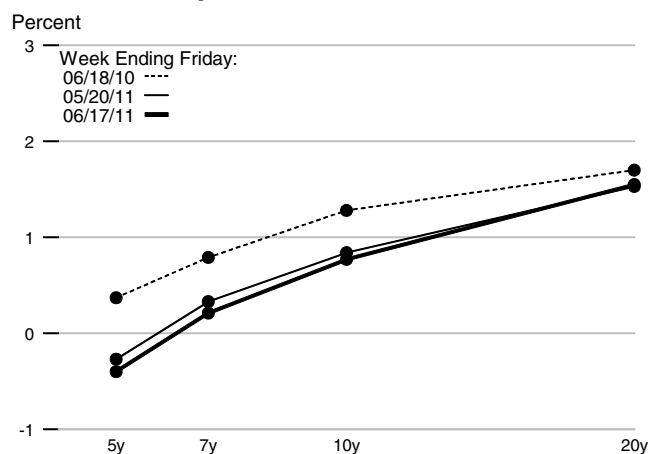
Treasury Yield Curve



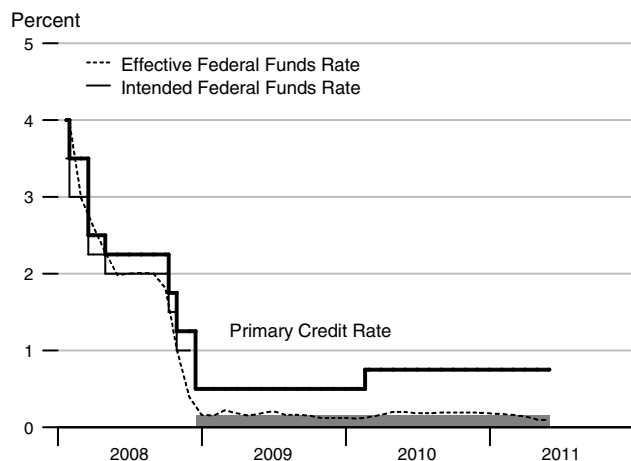
Adjusted Monetary Base



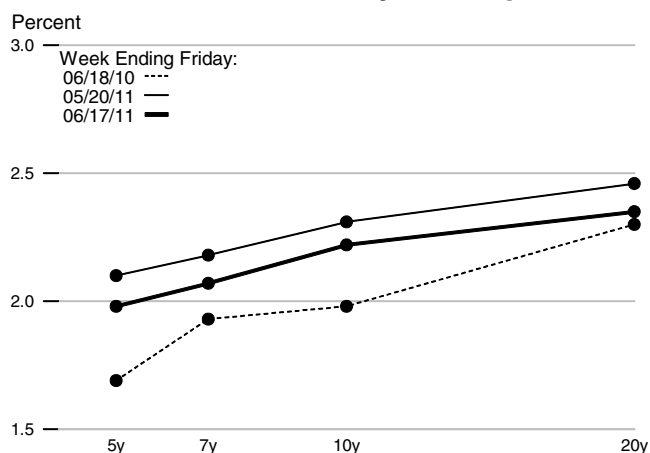
Real Treasury Yield Curve



Reserve Market Rates



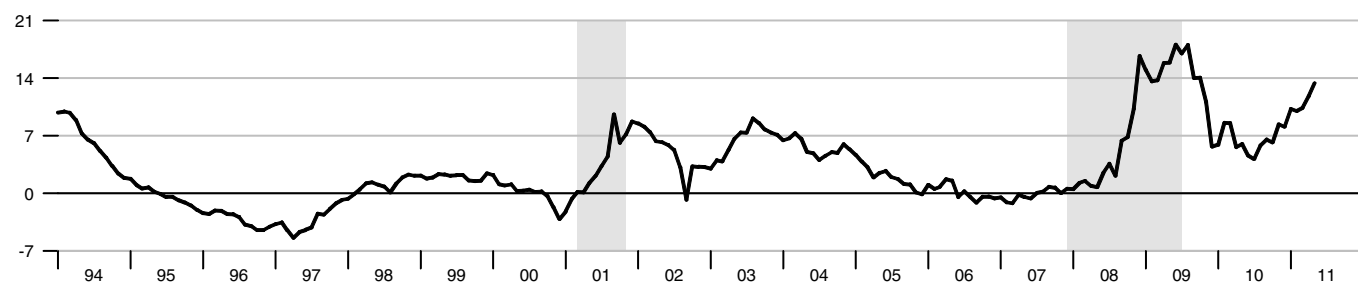
Inflation-Indexed Treasury Yield Spreads



Note: Effective December 16, 2008, FOMC reports the intended Federal Funds Rate as a range.

M1

Percent change from year ago



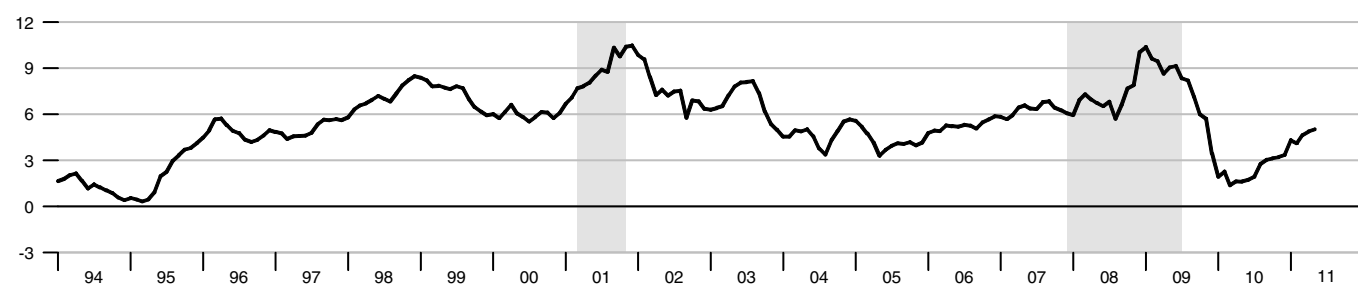
M2M

Percent change from year ago



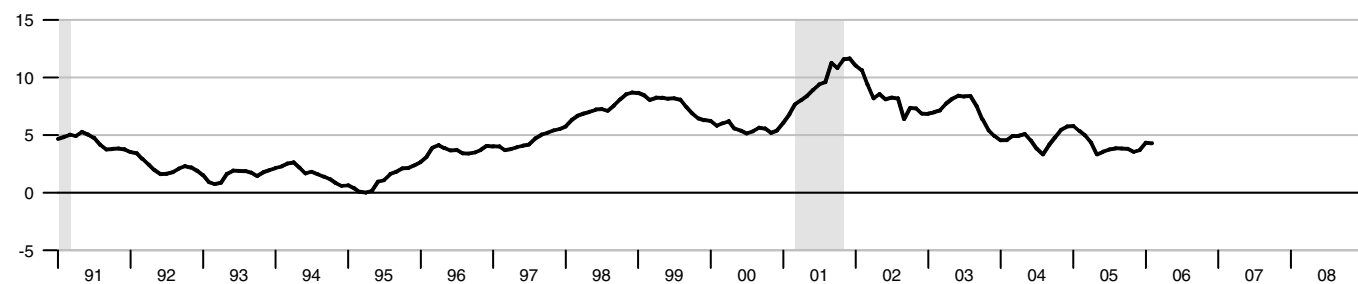
M2

Percent change from year ago



Monetary Services Index - M2**

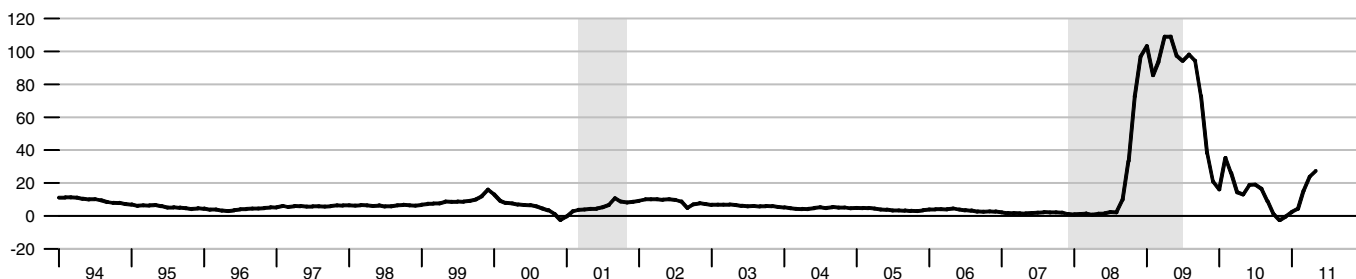
Percent change from year ago



**We will not update the MSI series until we revise the code to accomodate the discontinuation of M3.

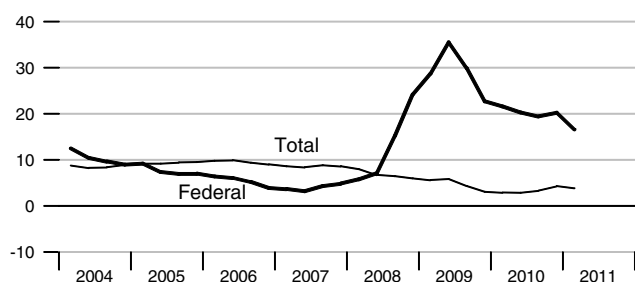
Adjusted Monetary Base

Percent change from year ago



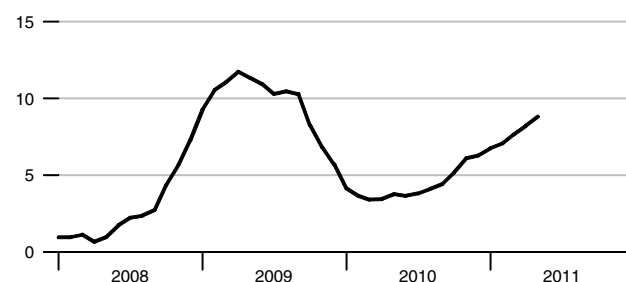
Domestic Nonfinancial Debt

Percent change from year ago



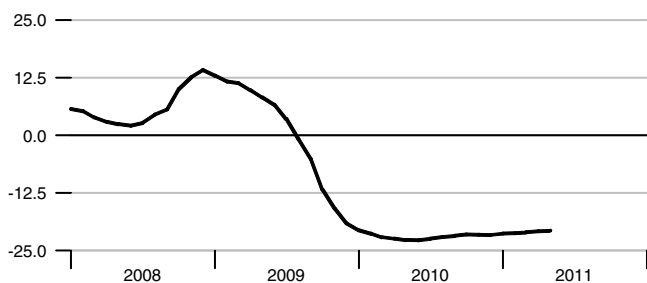
Currency Held by the Nonbank Public

Percent change from year ago



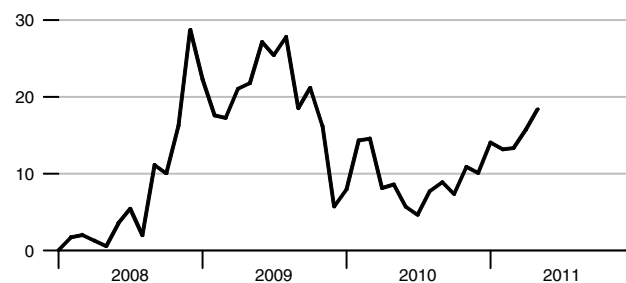
Small Denomination Time Deposits

Percent change from year ago



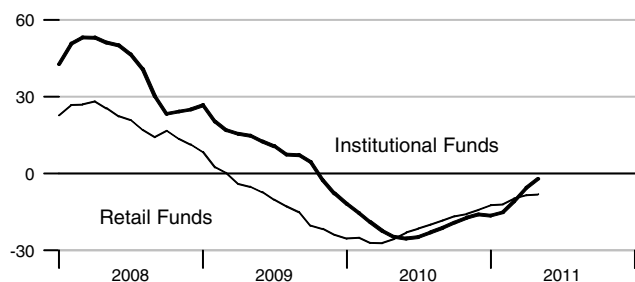
Checkable Deposits

Percent change from year ago



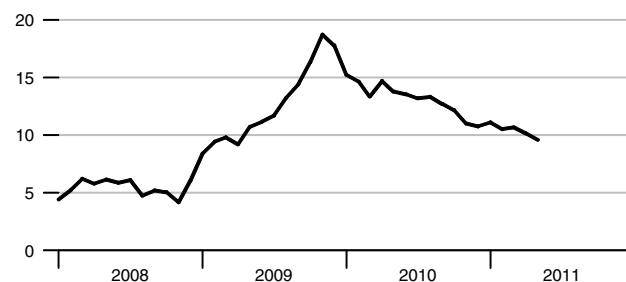
Money Market Mutual Fund Shares

Percent change from year ago



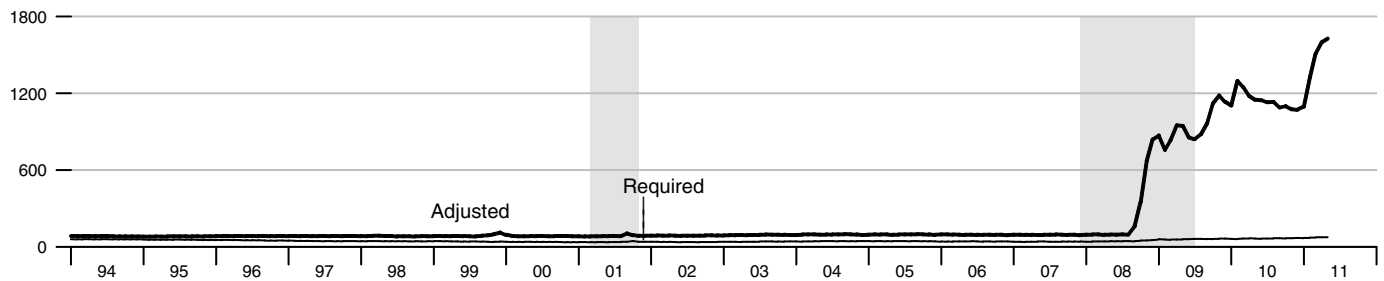
Savings Deposits

Percent change from year ago



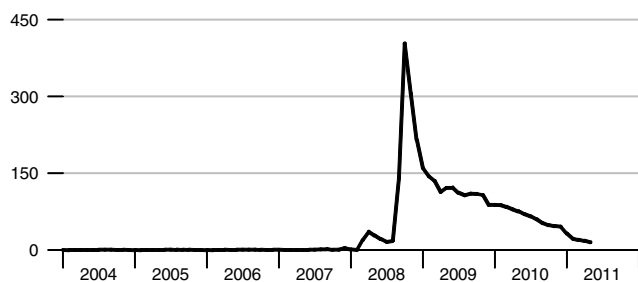
Adjusted and Required Reserves

Billions of dollars



Total Borrowings, nsa

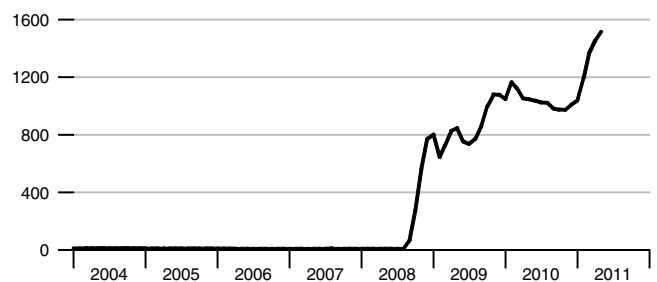
Billions of dollars



* Data exclude term auction credit

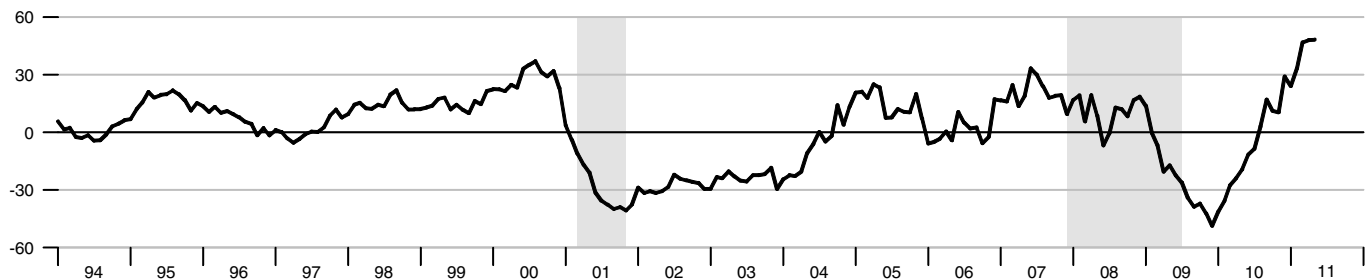
Excess Reserves plus RCB Contracts

Billions of dollars



Nonfinancial Commercial Paper

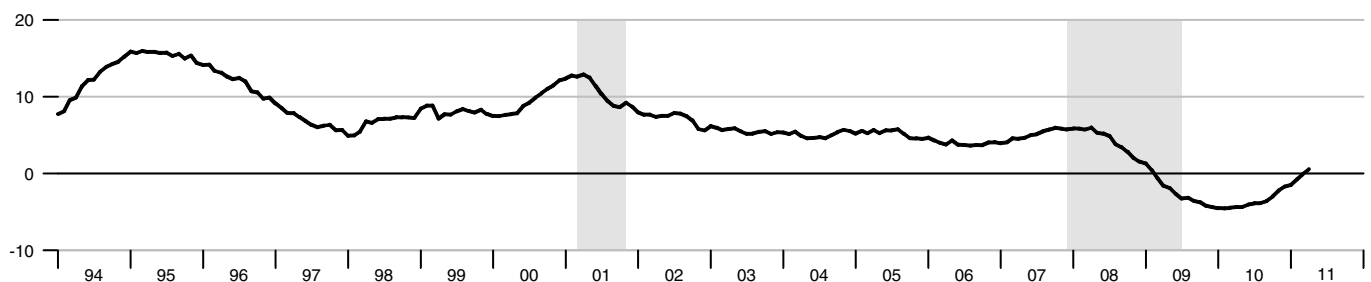
Percent change from year ago



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

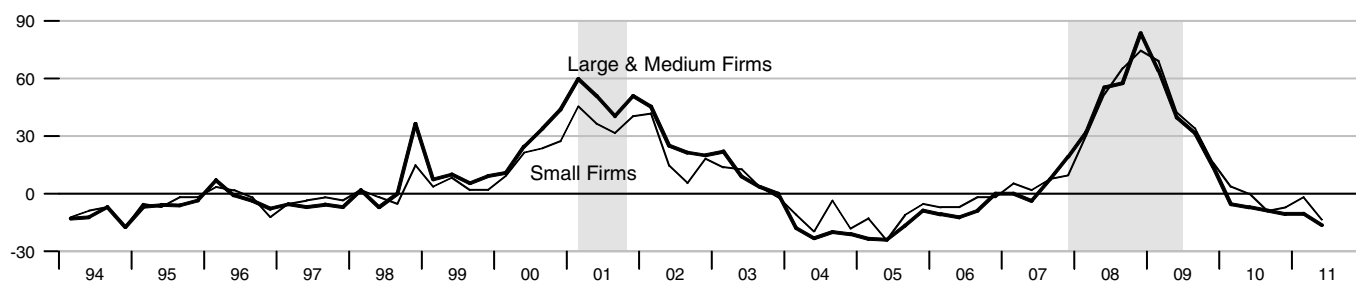
Consumer Credit

Percent change from year ago



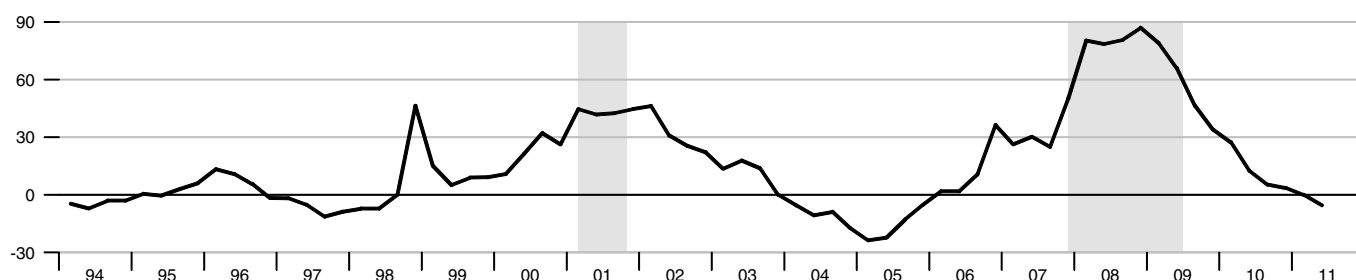
Net Percentage of Domestic Banks Tightening Standards for Commercial and Industrial Loans

Percentage



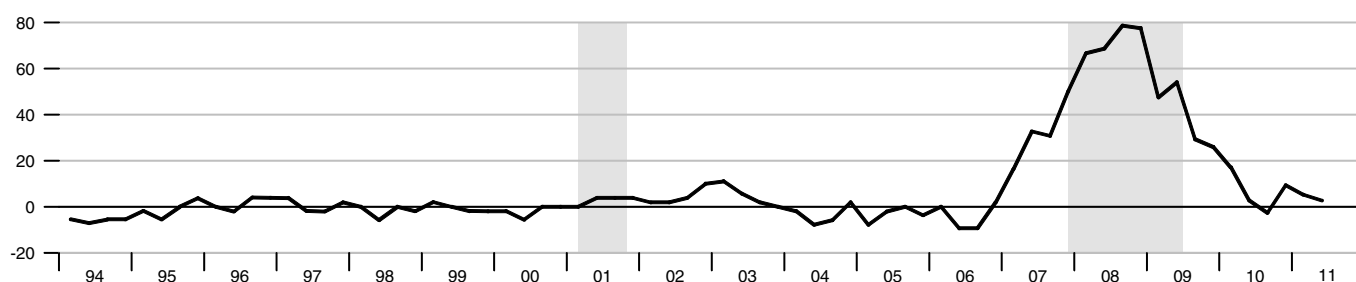
Net Percentage of Domestic Banks Tightening Standards for Commercial Real Estate Loans

Percentage



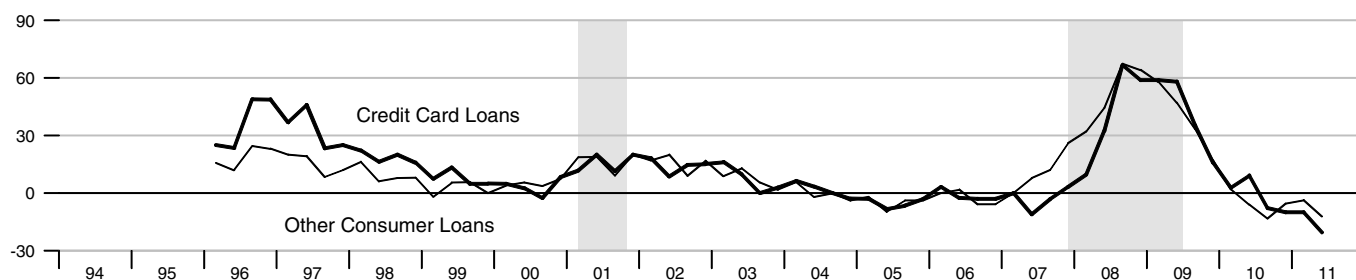
Net Percentage of Domestic Banks Tightening Standards for Residential Mortgage Loans

Percentage

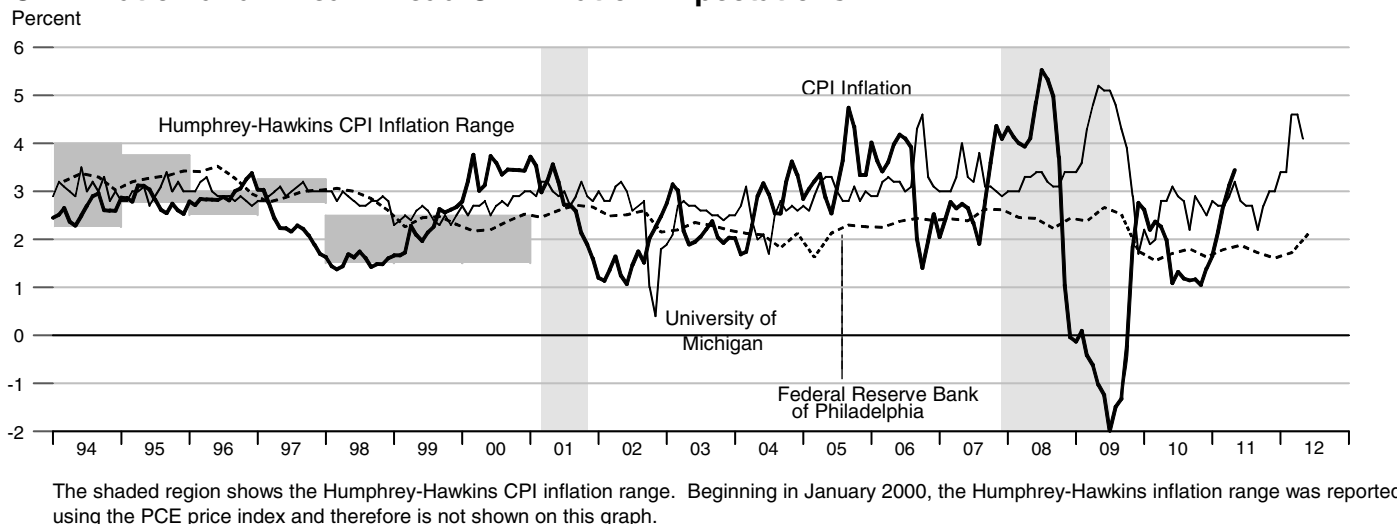


Net Percentage of Domestic Banks Tightening Standards for Consumer Loans

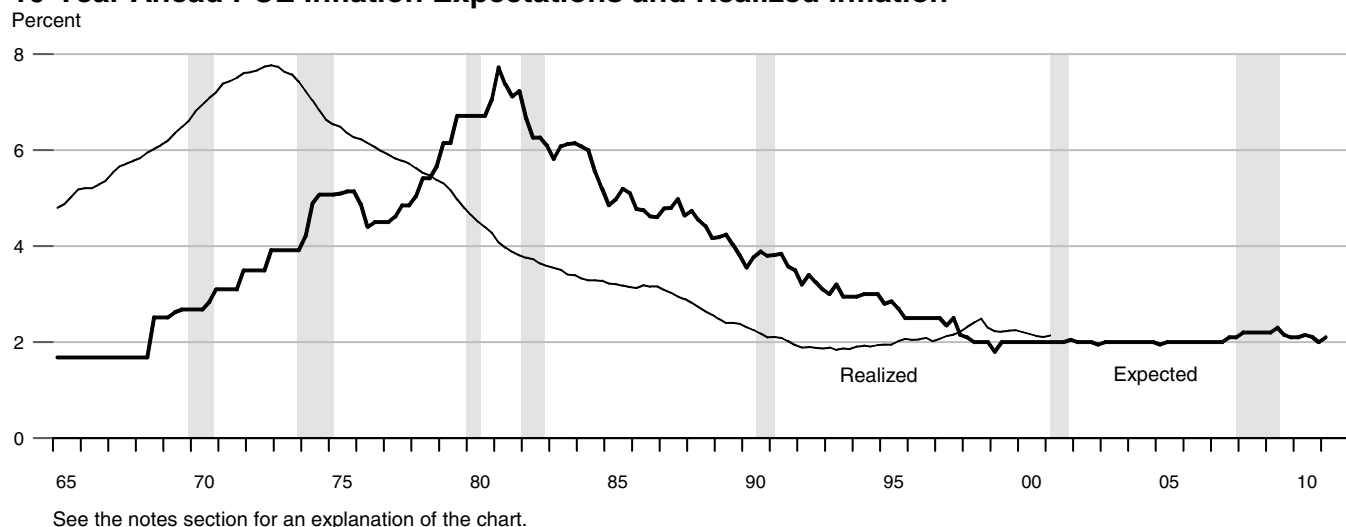
Percentage



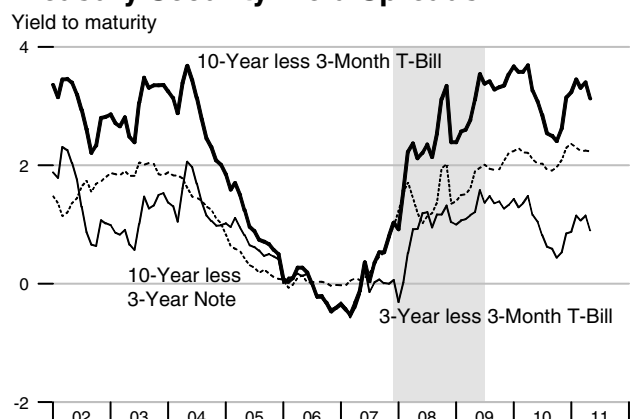
CPI Inflation and 1-Year-Ahead CPI Inflation Expectations



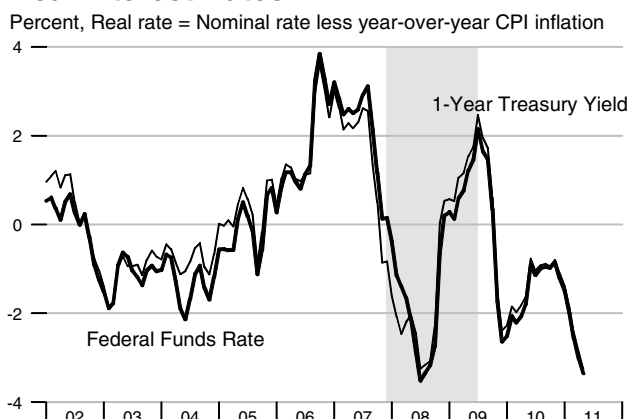
10-Year Ahead PCE Inflation Expectations and Realized Inflation



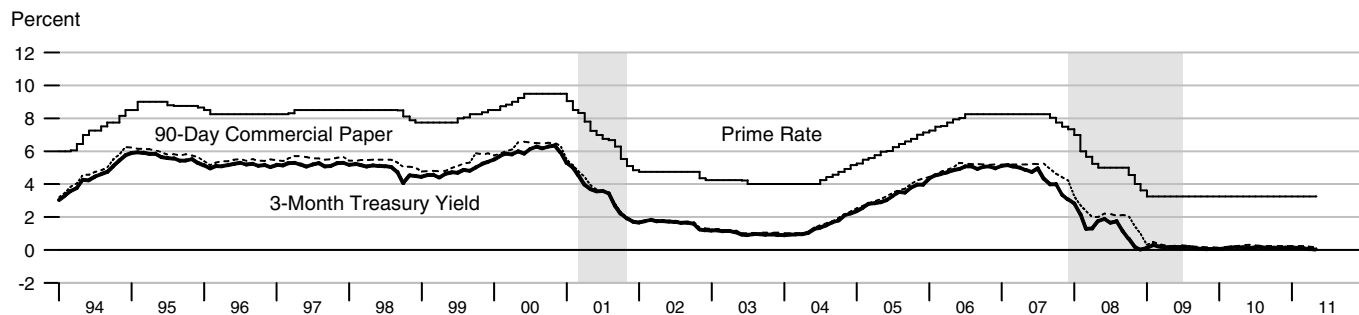
Treasury Security Yield Spreads



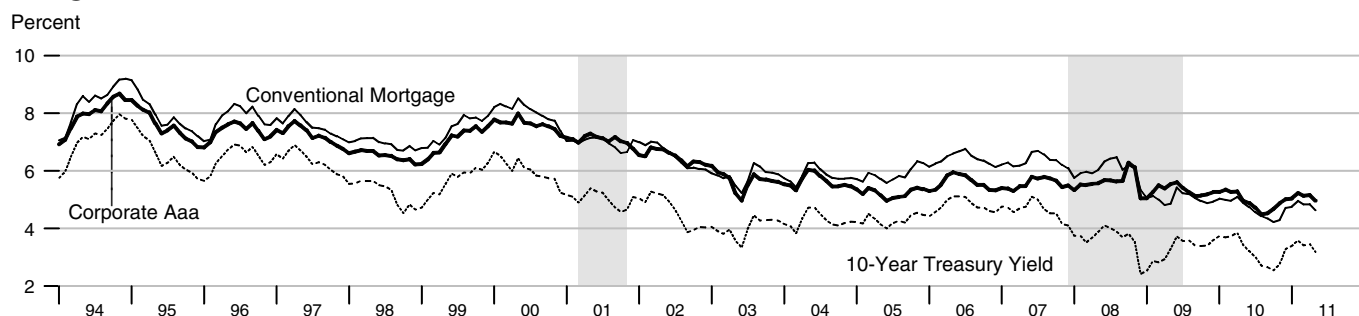
Real Interest Rates



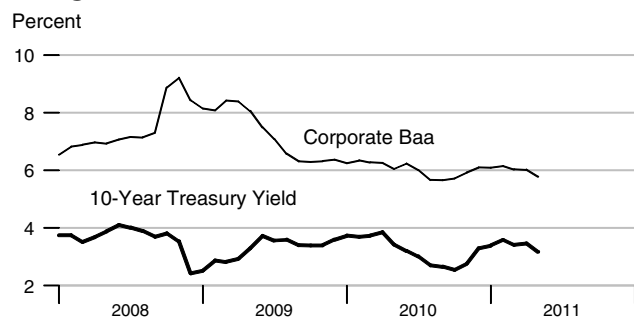
Short-Term Interest Rates



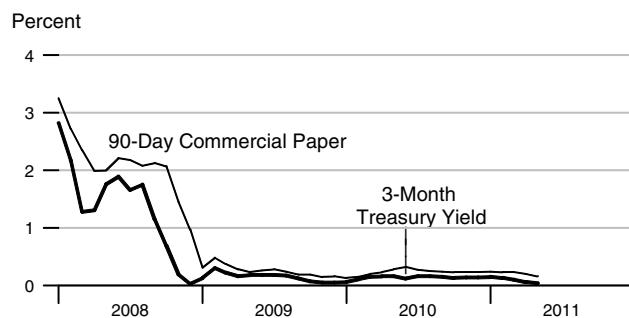
Long-Term Interest Rates



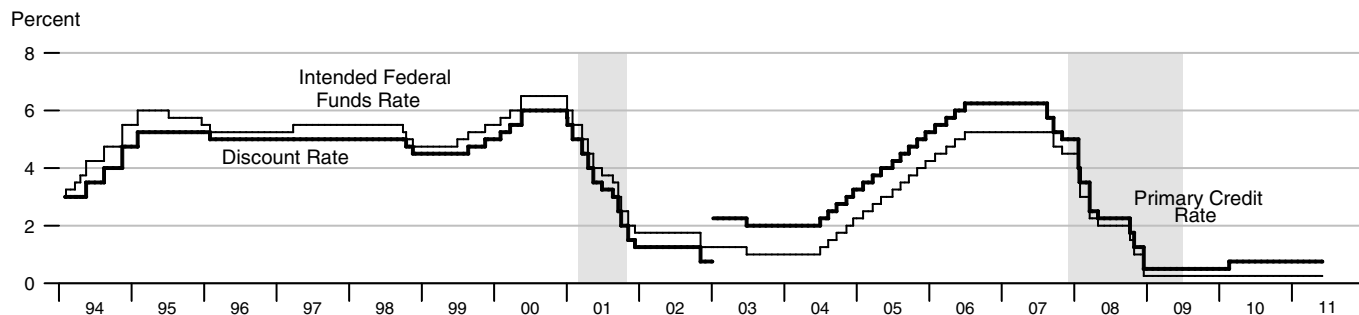
Long-Term Interest Rates



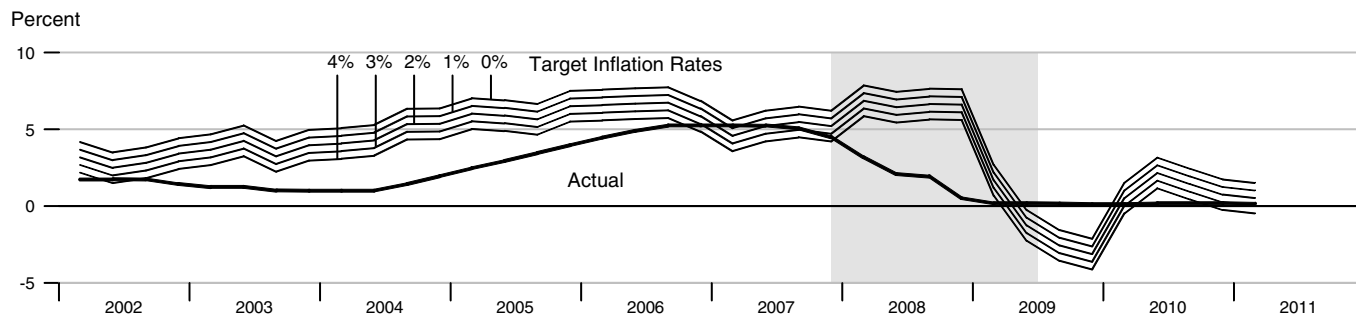
Short-Term Interest Rates



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



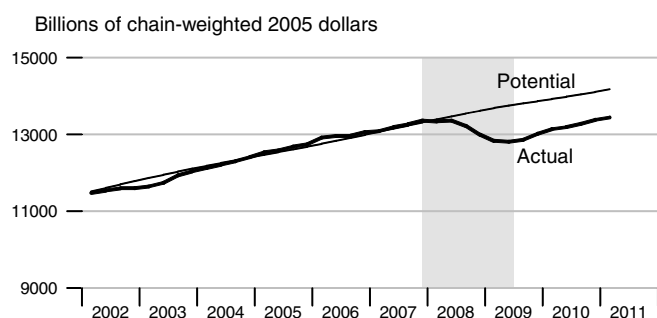
Federal Funds Rate and Inflation Targets



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

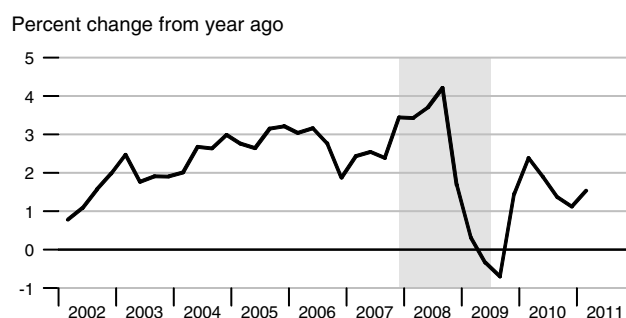
Components of Taylor's Rule

Actual and Potential Real GDP

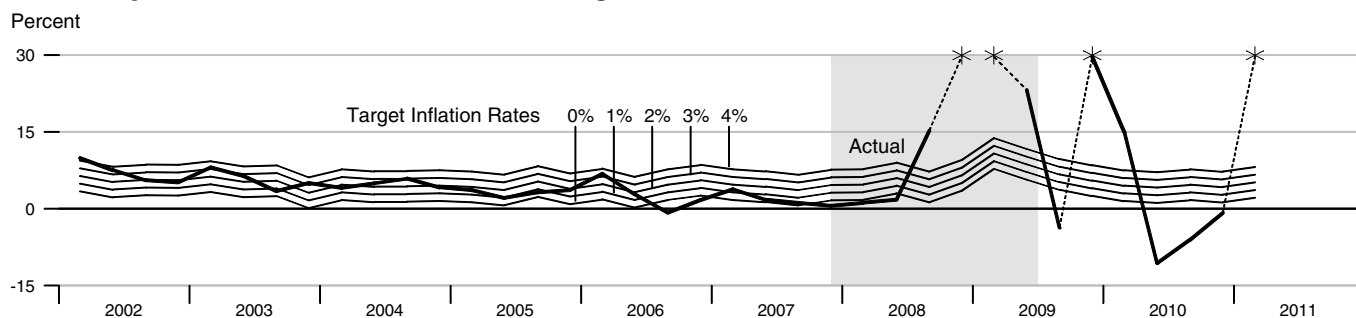


See notes section for further explanation.

PCE Inflation



Monetary Base Growth and Inflation Targets

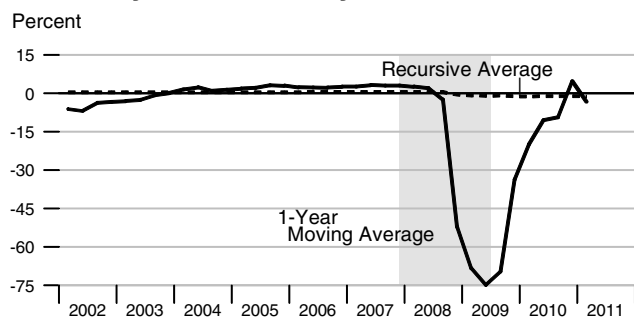


Calculated base growth is based on McCallum's rule. Actual base growth is percent change from the previous quarter.

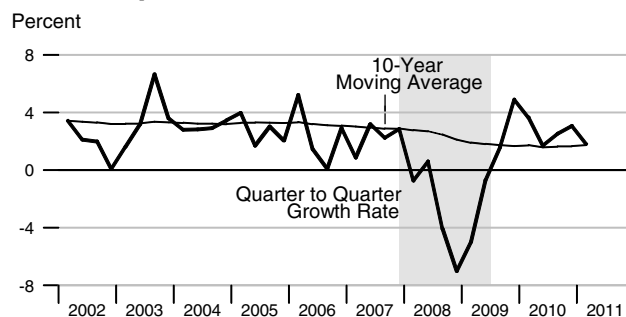
*Actual values for 2008:Q4, 2009:Q1, 2009:Q4, and 2011:Q1 are 188.02 percent, 60.74 percent, 56.52 percent, and 45.94 percent, respectively.

Components of McCallum's Rule

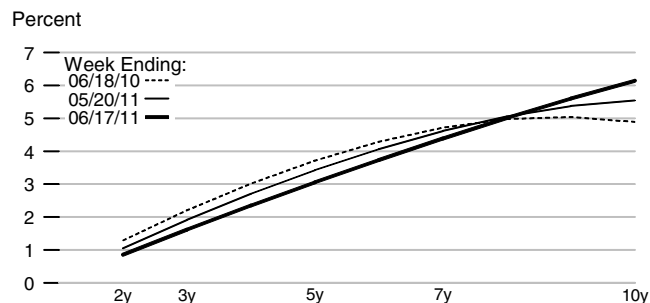
Monetary Base Velocity Growth



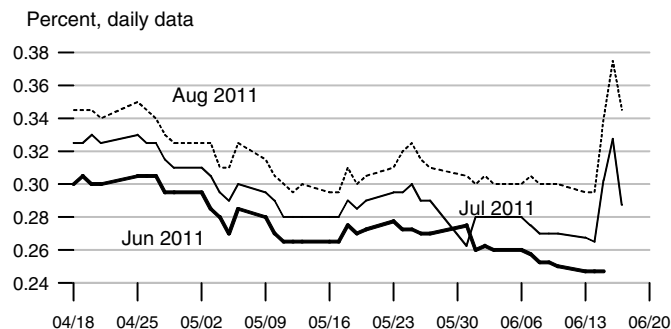
Real Output Growth



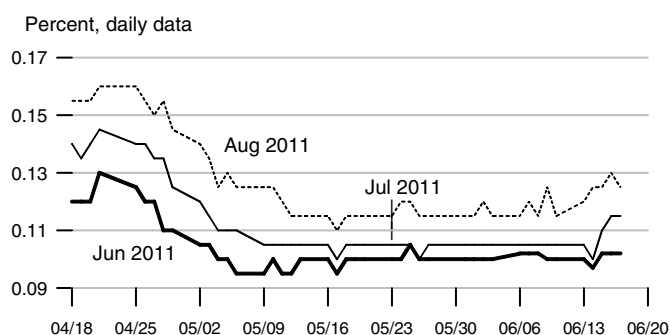
Implied One-Year Forward Rates



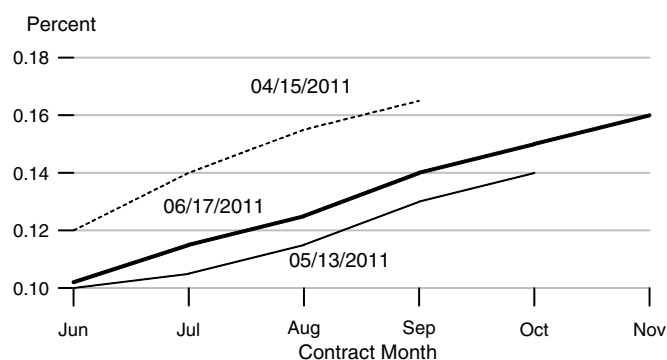
Rates on 3-Month Eurodollar Futures



Rates on Selected Federal Funds Futures Contracts

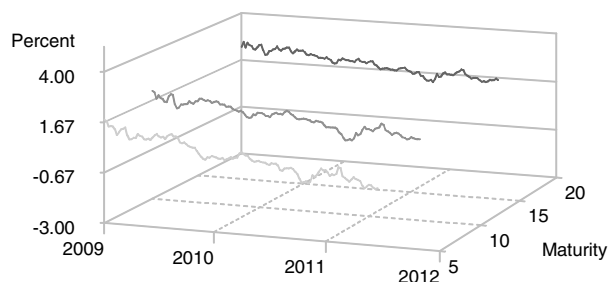


Rates on Federal Funds Futures on Selected Dates



Inflation-Indexed Treasury Securities

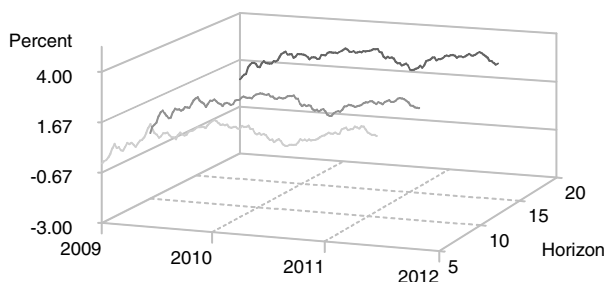
Weekly data



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

Inflation-Indexed Treasury Yield Spreads

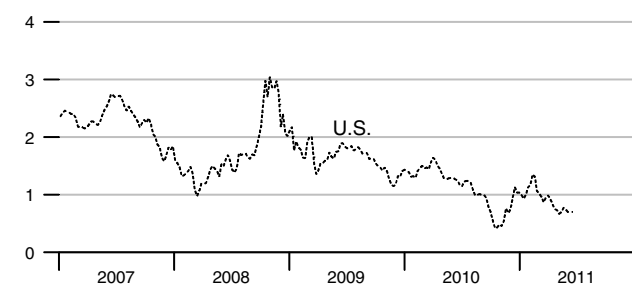
Weekly data



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

Inflation-Indexed 10-Year Government Notes

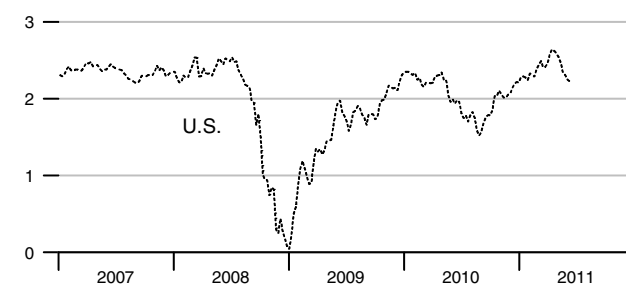
Percent, weekly data



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

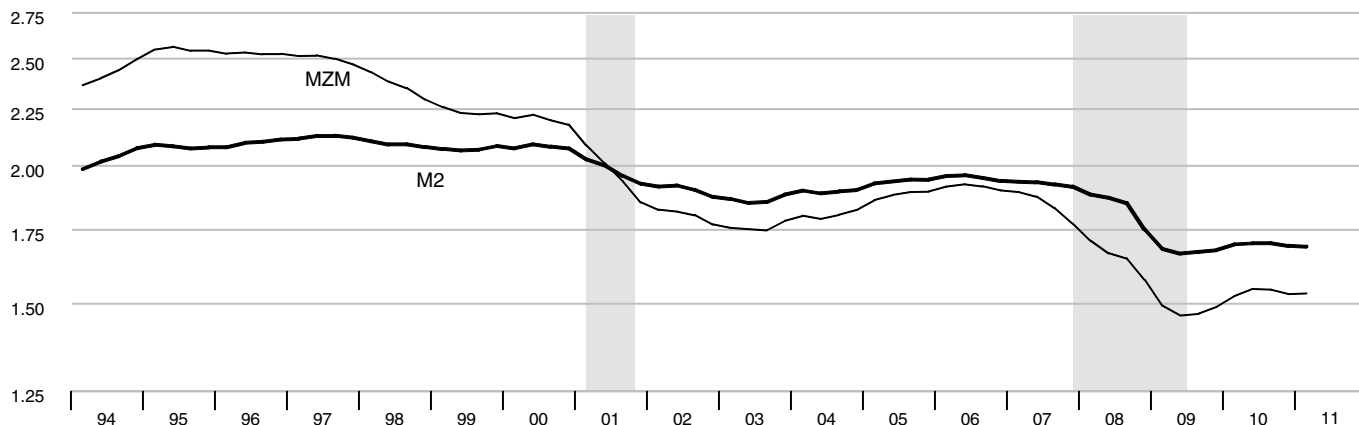
Inflation-Indexed 10-Year Government Yield Spreads

Percent, weekly data



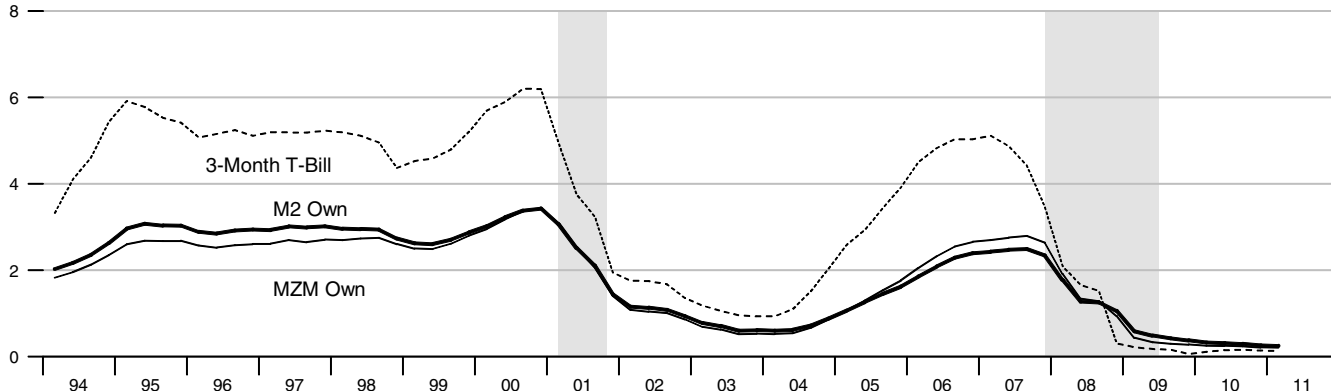
Velocity

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



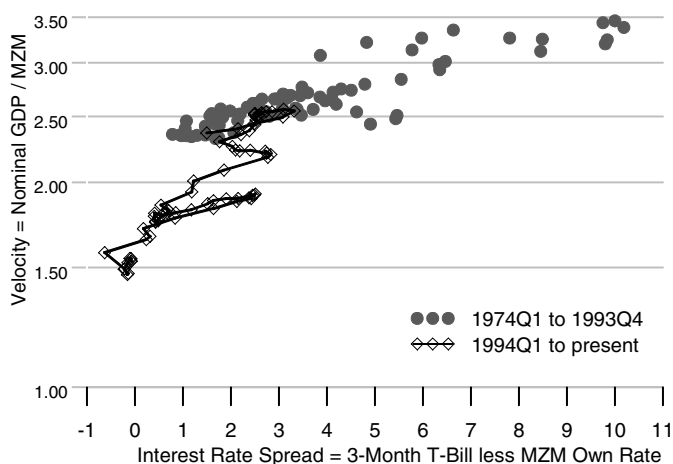
Interest Rates

Percent
8



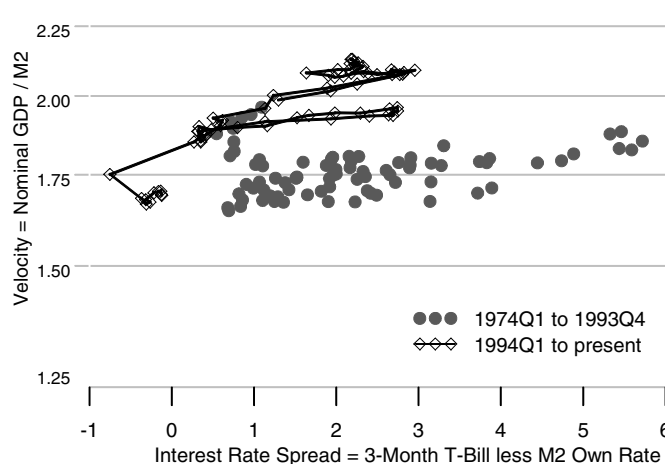
MZM Velocity and Interest Rate Spread

Ratio Scale



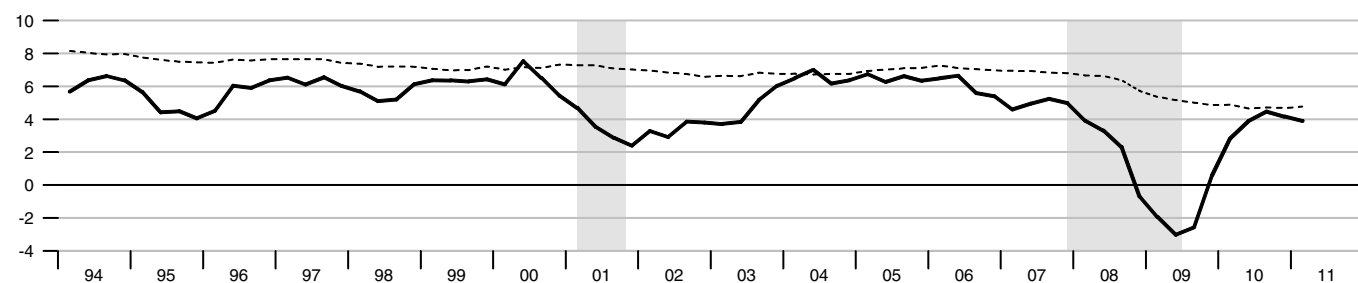
M2 Velocity and Interest Rate Spread

Ratio Scale



Gross Domestic Product

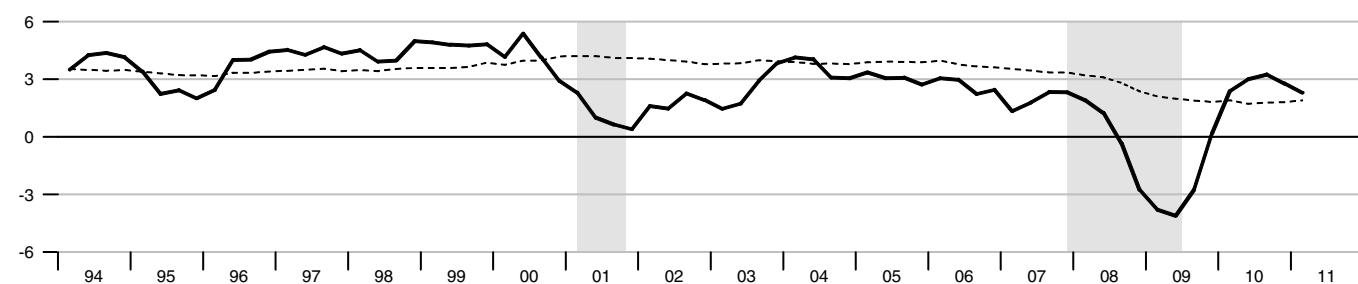
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Real Gross Domestic Product

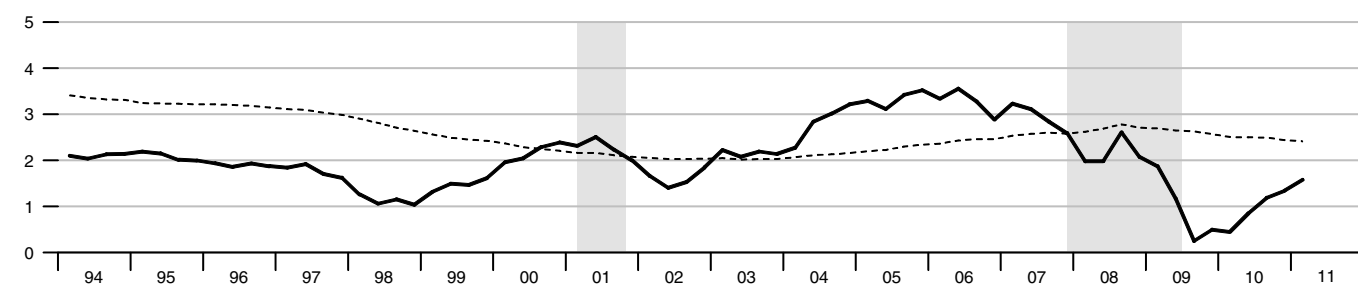
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Gross Domestic Product Price Index

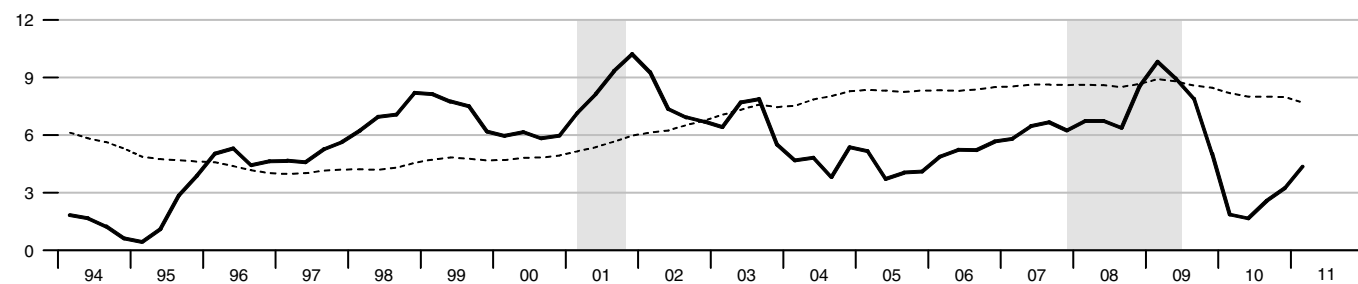
Percent change from year ago



Dashed lines indicate 10-year moving averages.

M2

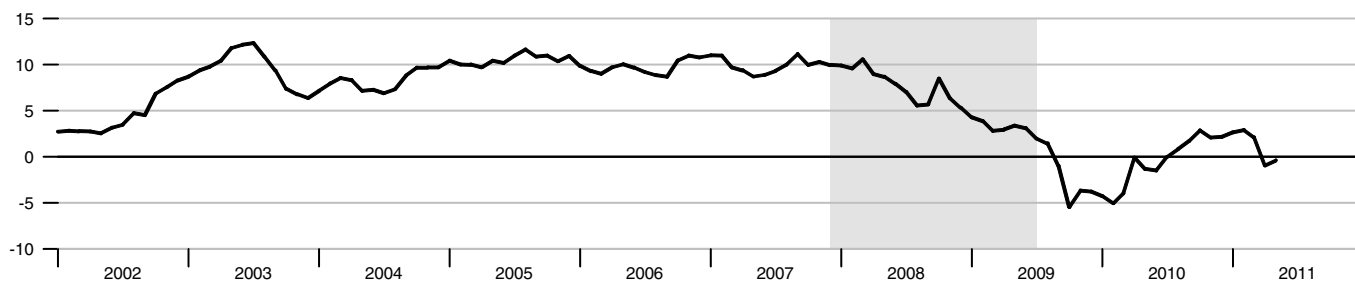
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Bank Credit

Percent change from year ago



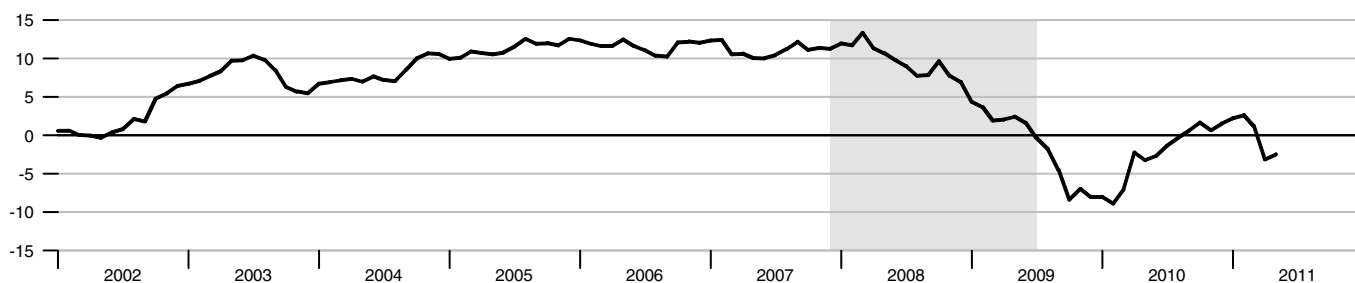
Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago



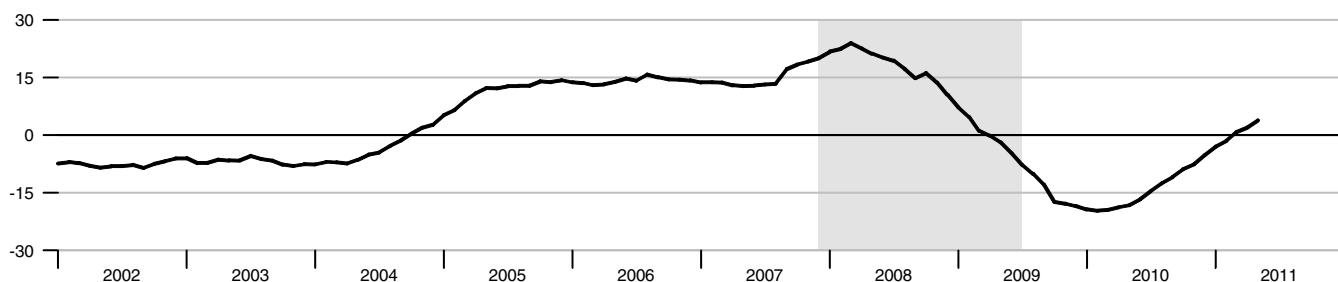
Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago

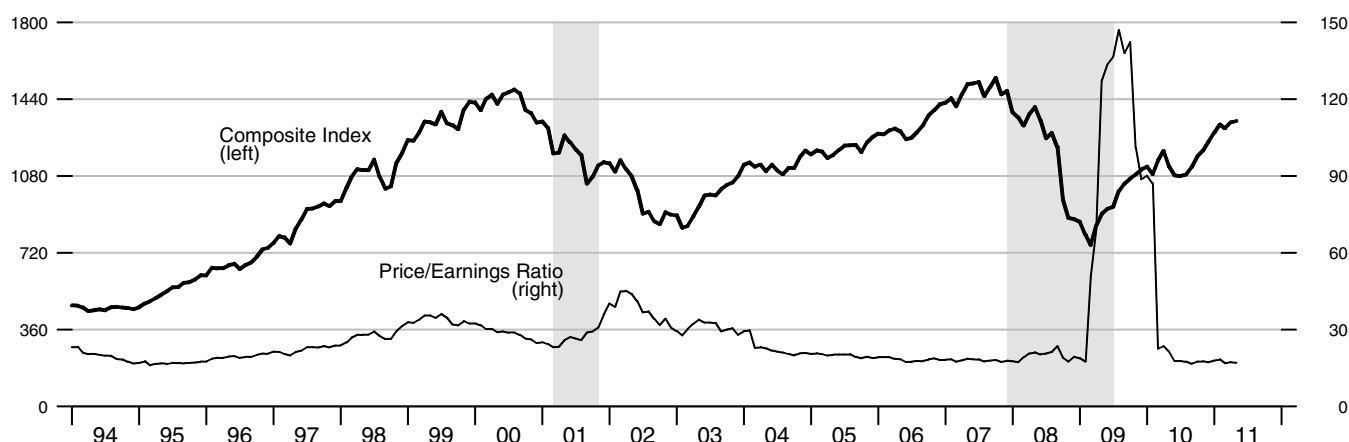


Commercial and Industrial Loans at Commercial Banks

Percent change from year ago



Standard & Poor's 500

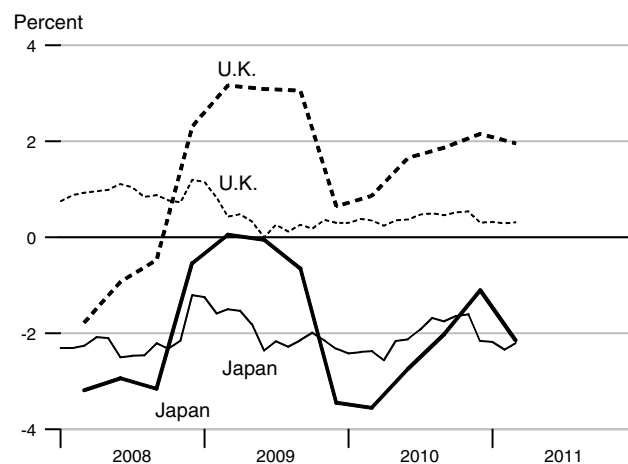
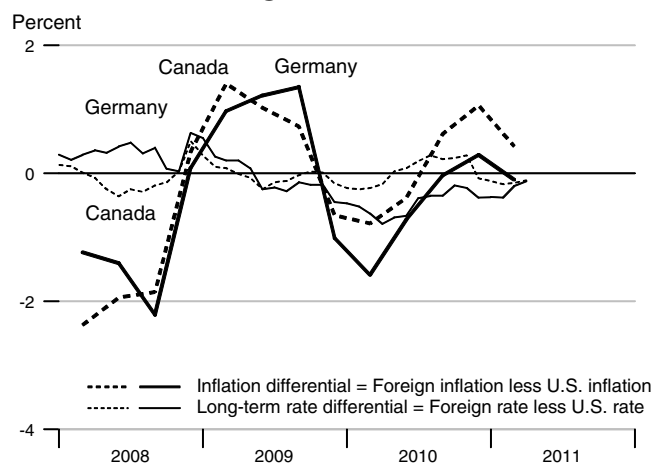


Recent Inflation and Long-Term Interest Rates

	Consumer Price Inflation Rates				Long-Term Government Bond Rates			
	Percent change from year ago				Percent			
	2010Q2	2010Q3	2010Q4	2011Q1	Feb11	Mar11	Apr11	May11
United States	1.78	1.22	1.20	2.17	3.58	3.41	3.46	3.17
Canada	1.40	1.83	2.27	2.60	3.41	3.26	3.35	.
France	1.61	1.53	1.65	1.81	3.60	.	.	.
Germany	1.06	1.18	1.49	2.08	3.20	3.21	3.34	.
Italy	1.41	1.62	1.79	2.34	4.73	4.88	4.84	.
Japan	-0.96	-0.80	0.10	0.03	1.24	1.21	.	.
United Kingdom	3.44	3.09	3.36	4.13	3.87	3.72	.	.

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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	
	2006	1374.188	7001.798	6866.541	10270.74	7697.334	835.035	94.908	
	2007	1372.137	7636.258	7299.208		8462.691	850.529	94.145	
	2008	1433.111	8709.467	7818.237		9122.596	1010.131	232.536	
	2009	1636.776	9543.240	8434.235		9192.134	1796.541	944.770	
	2010	1743.629	9540.770	8631.144		9138.281	2031.696	1144.110	
2009	1	1577.790	9402.206	8354.327		9331.459	1662.910	820.583	
	2	1624.005	9586.660	8426.757		9292.137	1763.619	917.024	
	3	1660.865	9605.969	8446.197		9138.793	1747.180	895.440	
	4	1684.444	9578.124	8509.659		9006.146	2012.456	1146.035	
2010	1	1698.709	9479.752	8509.436		8918.323	2089.184	1217.038	
	2	1711.581	9424.597	8566.907		9201.345	2034.289	1158.460	
	3	1752.371	9544.067	8663.383		9214.869	2003.654	1117.931	
	4	1811.854	9714.664	8784.849		9218.588	1999.655	1083.013	
2011	1	1872.288	9792.032	8880.264		9145.688	2243.004	1310.626	
2009	May	1610.536	9603.647	8433.531		9317.862	1799.197	946.072	
	Jun	1651.680	9634.655	8454.487		9295.153	1703.979	855.727	
	Jul	1661.492	9638.629	8454.396		9208.368	1693.704	841.469	
	Aug	1655.327	9588.052	8430.273		9150.741	1728.107	879.586	
	Sep	1665.775	9591.226	8453.922		9057.269	1819.730	965.266	
	Oct	1679.827	9584.714	8484.266		8971.552	1975.374	1122.200	
	Nov	1679.910	9582.939	8513.768		9040.281	2044.685	1182.377	
	Dec	1693.594	9566.720	8530.942		9006.606	2017.309	1133.527	
	Jan	1680.953	9486.882	8471.613		8940.084	2010.106	1105.459	
	Feb	1703.192	9511.616	8539.311		8874.872	2150.916	1296.193	
	Mar	1711.983	9440.757	8517.383		8940.012	2106.530	1249.461	
	Apr	1700.244	9404.893	8529.244		9253.424	2044.306	1179.142	
2010	May	1707.068	9422.723	8570.349		9194.393	2034.554	1149.872	
	Jun	1727.431	9446.176	8601.129		9156.219	2024.007	1146.366	
	Jul	1731.024	9476.281	8617.286		9205.239	2015.190	1131.097	
	Aug	1751.541	9541.918	8662.621		9226.905	2014.632	1133.725	
	Sep	1774.549	9614.001	8710.243		9212.463	1981.141	1088.971	
	Oct	1783.936	9668.309	8750.240		9227.581	1998.498	1099.672	
	Nov	1820.708	9723.087	8787.352		9227.803	1991.149	1076.396	
	Dec	1830.919	9752.597	8816.956		9200.380	2009.319	1072.970	
	Jan	1853.180	9741.227	8836.759		9176.518	2057.153	1095.882	
	Feb	1873.700	9786.412	8891.189		9131.758	2243.618	1327.530	
	Mar	1889.985	9848.457	8912.843		9128.788	2428.242	1508.466	
	Apr	1900.986	9937.833	8945.946		9165.428	2531.654	1599.246	
	May	1935.300	10033.48	9000.674		9157.988	2590.366	1627.523	

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

**We will not update the MSI series until we revise the code to accommodate the discontinuation of M3.

		Federal Funds	Primary Credit	Prime Rate	3-mo CDs	Treasury Yields			Corporate Aaa Bonds	Municipal Aaa Bonds	Conventional Mortgage
						3-mo	3-yr	10-yr			
2006		4.96	5.96	7.96	5.15	4.85	4.77	4.79	5.59	4.15	6.41
2007		5.02	5.86	8.05	5.27	4.47	4.34	4.63	5.56	4.13	6.34
2008		1.93	2.39	5.09	2.97	1.39	2.24	3.67	5.63	4.58	6.04
2009		0.16	0.50	3.25	0.56	0.15	1.43	3.26	5.31	4.27	5.04
2010		0.17	0.72	3.25	0.31	0.14	1.11	3.21	4.94	3.90	4.69
2009	1	0.18	0.50	3.25	1.08	0.22	1.27	2.74	5.27	4.64	5.06
	2	0.18	0.50	3.25	0.62	0.17	1.49	3.31	5.51	4.43	5.03
	3	0.16	0.50	3.25	0.30	0.16	1.56	3.52	5.27	4.11	5.16
	4	0.12	0.50	3.25	0.22	0.06	1.39	3.46	5.20	3.91	4.92
2010	1	0.13	0.61	3.25	0.21	0.11	1.47	3.72	5.29	3.93	5.00
	2	0.19	0.75	3.25	0.42	0.15	1.38	3.49	5.04	3.83	4.91
	3	0.19	0.75	3.25	0.34	0.16	0.83	2.79	4.58	3.58	4.45
	4	0.19	0.75	3.25	0.28	0.14	0.74	2.86	4.86	4.24	4.41
2011	1	0.16	0.75	3.25	0.28	0.13	1.16	3.46	5.13	4.71	4.85
2009	May	0.18	0.50	3.25	0.57	0.18	1.39	3.29	5.54	4.26	4.86
	Jun	0.21	0.50	3.25	0.39	0.18	1.76	3.72	5.61	4.56	5.42
	Jul	0.16	0.50	3.25	0.35	0.18	1.55	3.56	5.41	4.36	5.22
	Aug	0.16	0.50	3.25	0.30	0.17	1.65	3.59	5.26	4.17	5.19
	Sep	0.15	0.50	3.25	0.25	0.12	1.48	3.40	5.13	3.81	5.06
	Oct	0.12	0.50	3.25	0.24	0.07	1.46	3.39	5.15	3.85	4.95
	Nov	0.12	0.50	3.25	0.21	0.05	1.32	3.40	5.19	3.99	4.88
	Dec	0.12	0.50	3.25	0.22	0.05	1.38	3.59	5.26	3.89	4.93
2010	Jan	0.11	0.50	3.25	0.20	0.06	1.49	3.73	5.26	3.96	5.03
	Feb	0.13	0.59	3.25	0.19	0.11	1.40	3.69	5.35	3.91	4.99
	Mar	0.16	0.75	3.25	0.23	0.15	1.51	3.73	5.27	3.91	4.97
	Apr	0.20	0.75	3.25	0.30	0.16	1.64	3.85	5.29	3.95	5.10
	May	0.20	0.75	3.25	0.45	0.16	1.32	3.42	4.96	3.75	4.89
	Jun	0.18	0.75	3.25	0.52	0.12	1.17	3.20	4.88	3.81	4.74
	Jul	0.18	0.75	3.25	0.41	0.16	0.98	3.01	4.72	3.69	4.56
	Aug	0.19	0.75	3.25	0.32	0.16	0.78	2.70	4.49	3.44	4.43
	Sep	0.19	0.75	3.25	0.28	0.15	0.74	2.65	4.53	3.63	4.35
	Oct	0.19	0.75	3.25	0.27	0.13	0.57	2.54	4.68	3.62	4.23
	Nov	0.19	0.75	3.25	0.27	0.14	0.67	2.76	4.87	4.44	4.30
	Dec	0.18	0.75	3.25	0.30	0.14	0.99	3.29	5.02	4.67	4.71
2011	Jan	0.17	0.75	3.25	0.29	0.15	1.03	3.39	5.04	4.86	4.76
	Feb	0.16	0.75	3.25	0.28	0.13	1.28	3.58	5.22	4.79	4.95
	Mar	0.14	0.75	3.25	0.28	0.10	1.17	3.41	5.13	4.47	4.84
	Apr	0.10	0.75	3.25	0.23	0.06	1.21	3.46	5.16	4.93	4.84
	May	0.09	0.75	3.25	0.21	0.04	0.94	3.17	4.96	4.33	4.64

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

		M1	M2M	M2	M3*
Percent change at an annual rate					
2006		0.19	4.34	5.25	4.95
2007		-0.15	9.06	6.30	
2008		4.44	14.05	7.11	
2009		14.21	9.57	7.88	
2010		6.53	-0.03	2.33	

2009	1	12.72	18.08	12.45
	2	11.72	7.85	3.47
	3	9.08	0.81	0.92
	4	5.68	-1.16	3.01
2010	1	3.39	-4.11	-0.01
	2	3.03	-2.33	2.70
	3	9.53	5.07	4.50
	4	13.58	7.15	5.61
2011	1	13.34	3.19	4.34

2009	May	0.55	10.33	5.90
	Jun	30.66	3.87	2.98
	Jul	7.13	0.49	-0.01
	Aug	-4.45	-6.30	-3.42
	Sep	7.57	0.40	3.37
	Oct	10.12	-0.81	4.31
	Nov	0.06	-0.22	4.17
	Dec	9.77	-2.03	2.42

2010	Jan	-8.96	-10.01	-8.35
	Feb	15.88	3.13	9.59
	Mar	6.19	-8.94	-3.08
	Apr	-8.23	-4.56	1.67
	May	4.82	2.27	5.78
	Jun	14.31	2.99	4.31
	Jul	2.50	3.82	2.25
	Aug	14.22	8.31	6.31
	Sep	15.76	9.07	6.60
	Oct	6.35	6.78	5.51
	Nov	24.74	6.80	5.09
	Dec	6.73	3.64	4.04

2011	Jan	14.59	-1.40	2.70
	Feb	13.29	5.57	7.39
	Mar	10.43	7.61	2.92
	Apr	6.98	10.89	4.46
	May	21.66	11.55	7.34

*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 Reserves plus RCB (Required Clearing Balance) Contracts** equals the amount of deposits at Federal Reserve Banks held by depository institutions but not applied to satisfy statutory reserve requirements. (This measure excludes the vault cash held by depository institutions that is not applied to satisfy statutory reserve requirements.) **Consumer Credit** includes most short- and intermediate-term credit extended to individuals. See *Statistical Supplement to the Federal Reserve Bulletin*, table 1.55.

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

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

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

Page 9: **FOMC Intended Federal Funds Rate** is the level (or midpoint of the range, if applicable) of the federal funds rate that the staff of the FOMC expected to be consistent with the desired degree of pressure on bank reserve positions. In recent years, the FOMC has set an explicit target for the federal funds rate.

Page 10: **Federal Funds Rate and Inflation Targets** shows the observed federal funds rate, quarterly, and the level of the funds rate implied by applying Taylor's (1993) equation

$$f_t^* = 2.5 + \pi_{t-1} + (\pi_{t-1} - \pi^*)/2 + 100 \times (y_{t-1} - y_{t-1}^P)/2$$

to five alternative target inflation rates, $\pi^* = 0, 1, 2, 3, 4$ percent, where f_t^* is the implied federal funds rate, π_{t-1} is the previous period's inflation rate (PCE) measured on a year-over-year basis, y_{t-1} is the log of the previous period's level of real gross domestic product (GDP), and y_{t-1}^P is the log of an estimate of the previous period's level of potential output. **Potential Real GDP** is estimated by the Congressional Budget Office (CBO).

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

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

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

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

Page 11: Implied One-Year Forward Rates are calculated by this Bank from Treasury constant maturity yields. Yields to maturity, $R(m)$, for securities with $m = 1, \dots, 10$ 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 2000 dollars. The **Gross Domestic Product Price Index** is the implicit price deflator for GDP, which is defined by the Bureau of Economic Analysis, U.S. Department of Commerce, as the ratio of GDP measured in current dollars to GDP measured in chained 2005 dollars.

Page 14: Investment Securities are all securities held by commercial banks in both investment and trading accounts.

Page 15: Inflation Rate Differentials are the differences between the foreign consumer price inflation rates and year-over-year changes in the U.S. all-items Consumer Price Index.

Page 17: Treasury Yields are Treasury constant maturities as reported in the Board of Governors of the Federal Reserve System's H.15 release.

Sources

Agence France Trésor: French note yields.

Bank of Canada: Canadian note yields.

Bank of England: U.K. note yields.

Board of Governors of the Federal Reserve System:

Monetary aggregates and components: H.6 release. Bank credit and components: H.8 release. Consumer credit: G.19 release. Required reserves, excess reserves, clearing balance contracts, and discount window borrowing: H.4.1 and H.3 releases. Interest rates: H.15 release. Nonfinancial commercial paper: Board of Governors website. Nonfinancial debt: Z.1 release. M2 own rate. Senior Loan Officer Opinion Survey on Bank Lending Practices.

Bureau of Economic Analysis: GDP.

Bureau of Labor Statistics: CPI.

Chicago Board of Trade: Federal funds futures contract.

Chicago Mercantile Exchange: Eurodollar futures.

Congressional Budget Office: Potential real GDP.

Federal Reserve Bank of Philadelphia: Survey of Professional Forecasters inflation expectations.

Federal Reserve Bank of St. Louis: Adjusted monetary base and adjusted reserves, monetary services index, MZM own rate, one-year forward rates.

Organization for Economic Cooperation and Development: International interest and inflation rates.

Standard & Poor's: Stock price-earnings ratio, stock price composite index.

University of Michigan Survey Research Center: Median expected price change.

U.S. Department of the Treasury: U.S. security yields.

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