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

to five alternative target inflation rates, $\pi^* = 0, 1, 2, 3, 4$ percent, where Φb_t is the implied growth rate of the adjusted monetary base, Φy_t^* is the 10-year moving average growth in real GDP, Φv_t^e is the 4-year moving average of base velocity growth, $\Phi x_{t/1}$ is the growth rate of nominal GDP, and $\lambda = 0.5$.

Page 11: **Implied One-Year Forward Rates** are calculated by this Bank from Treasury constant maturity yields. Yields to maturity, $R(m)$, for securities with $m = 1,\ldots, 10$ years to maturity are obtained by linear interpolation between reported yields. These yields are smoothed by fitting the regression suggested by Nelson and Siegel (1987),

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

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

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

where duration is approximated as $D(m) = (1 - e^{-R(m)\times m})/R(m)$. These rates are linear approximations to the true instantaneous forward rates; see Shiller (1990). For a discussion of the use of forward rates as indicators of inflation expectations, see Sharpe (1997). **Rates on 3-Month Eurodollar Futures** and **Rates on Selected Federal Funds Futures Contracts** trace through time the yield on three specific contracts. **Rates on Federal Funds Futures on Selected Dates** displays a single day's snapshot of yields for contracts expiring in the months shown on the horizontal axis. **Inflation-Indexed Treasury Securities and Yield Spreads** are those plotted on page 3. **Inflation-Indexed 10-Year Government Notes** shows the yield of an inflation-indexed note that is scheduled to mature in approximately (but not greater than) 10 years. The current French note has a maturity date of 7/25/2015, the current U.K. note has a maturity date of 8/16/2013, and the current U.S. note has a maturity date of 1/15/2018. **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.

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/.

Monetary Trends

September 2009

How *Not* To Reduce Excess Reserves

The Federal Reserve's actions to support financial markets and the broader economy have resulted in a large increase in bank reserves—both total reserves and reserves held in excess of legal requirements—since September 2008.[1] Excess reserves have risen from an average of less than 5 percent of total reserves during the 5 years ending in August 2008 to more than 90 percent since November 2008. Many observers contend that the large increase in excess reserves poses a significant inflation risk. A look back at a similar episode during the 1930s provides some insights about how not to reduce excess reserves.

As in the current situation, excess reserves grew rapidly and became a high percentage of total reserves during the mid-1930s. Depositor runs on banks and gold outflows caused reserves to contract sharply between 1929 and early 1933; subsequently, reserves began to grow in 1933 with the introduction of federal deposit insurance. Gold inflows increased reserves even more rapidly during 1934-36 and banks built up substantial excess reserves. By 1935 excess reserves comprised more than 50 percent of total reserves.

Federal Reserve officials viewed excess reserves as a potential source of inflation because they could support a rapid increase in bank lending. In 1936, officials decided to increase reserve requirements in three steps—from 13 percent to 26 percent on transactions deposits and from 3 to 6 percent on time deposits.[2] An alternative means of reducing excess reserves—selling securities in the open market—was not an option because, by July 1936, the excess reserves ($2.9 billion) exceeded the size of the Fed's securities portfolio ($2.4 billion).

The chart shows the dates of each increase in reserve requirements. The policy was successful in reducing both total excess reserves and the ratio of excess to total reserves. However, interest rates also rose, money stock growth declined sharply, and in May 1937 the economy entered a recession (the shaded region in the figure represents the recessionary period).

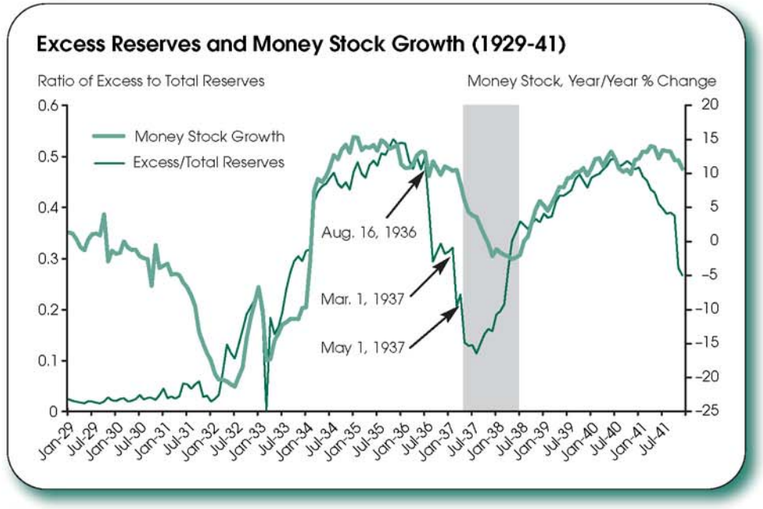
In hindsight, the impact of the hike in reserve requirements is not surprising. In raising the amount of non-interest-earning balances that banks were required to hold against each dollar of deposits, the hike encouraged banks to reduce lending in an effort to reduce deposits, which caused money stock growth to fall. The impact might have been less constrictive if the Fed had drained an equivalent amount of reserves by selling securities because the cost of holding deposits would have been unaffected. The impact might still have been large, however, if banks held excess reserves mainly as protection against depositor runs, rather than because they lacked profitable lending opportunities.

Much has changed since the 1930s. However, during the recent crisis, banks at times have found borrowing difficult or expensive; consequently, their desire for liquid assets—including excess reserves—may be unusually high. The experience of the 1930s suggests that financial market conditions and monetary and credit measures can signal whether any attempt to reduce excess reserves is too abrupt. Further, the experience demonstrates that raising reserve requirements is surely *not* the best way to eliminate excess reserves.

—David C. Wheelock

[1] Banks and other depository institutions are required to hold reserves in the form of deposits at Federal Reserve Banks or vault cash equal to 10 percent of their transactions deposits over $44.4 million (lesser amounts are subject to lower requirements).

[2] Before 1980, reserve requirements applied only to Federal Reserve member banks and varied according to a bank's location. In general, reserve requirements were higher for banks located in larger cities ("central reserve" and "reserve" cities) than those in smaller cities and towns ("country" banks).



Views expressed do not necessarily reflect official positions of the Federal Reserve System.

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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: $[(x_t/x_{t-12})-1]\times 100$.

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On March 23, 2006, the Board of Governors of the Federal Reserve System ceased the publication of the M3 monetary aggregate. It also ceased publishing the following components: large-denomination time deposits, RPs, and eurodollars.

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Definitions

M1: The sum of currency held outside the vaults of depository institutions, Federal Reserve Banks, and the U.S. Treasury; travelers checks; and demand and other checkable deposits issued by financial institutions (except demand deposits due to the Treasury and depository institutions), minus cash items in process of collection and Federal Reserve float.

MZM (money, zero maturity): M2 minus small-denomination time deposits, plus institutional money market mutual funds (that is, those included in M3 but excluded from M2). The label MZM was coined by William Poole (1991); the aggregate itself was proposed earlier by Motley (1988).

M2: M1 plus savings deposits (including money market deposit accounts) and small-denomination (under $100,000) time deposits issued by financial institutions; and shares in retail money market mutual funds (funds with initial investments under $50,000), net of retirement accounts.

M3: M2 plus large-denomination ($100,000 or more) time deposits; repurchase agreements issued by depository institutions; Eurodollar deposits, specifically, dollar-denominated deposits due to nonbank U.S. addresses held at foreign offices of U.S. banks worldwide and all banking offices in Canada and the United Kingdom; and institutional money market mutual funds (funds with initial investments of $50,000 or more).

Bank Credit: All loans, leases, and securities held by commercial banks.

Domestic Nonfinancial Debt: Total credit market liabilities of the U.S. Treasury, federally sponsored agencies, state and local governments, households, and nonfinancial firms. End-of-period basis.

Adjusted Monetary Base: The sum of currency in circulation outside Federal Reserve Banks and the U.S. Treasury, deposits of depository financial institutions at Federal Reserve Banks, and an adjustment for the effects of changes in statutory reserve requirements on the quantity of base money held by depositories. This series is a spliced chain index; see Anderson and Rasche (1996a,b, 2001, 2003).

Adjusted Reserves: The sum of vault cash and Federal Reserve Bank deposits held by depository institutions and an adjustment for the effects of changes in statutory reserve requirements on the quantity of base money held by depositories. This spliced chain index is numerically larger than the Board of Governors' measure, which excludes vault cash not used to satisfy statutory reserve requirements and Federal Reserve Bank deposits used to satisfy required clearing balance contracts; see Anderson and Rasche (1996a, 2001, 2003).

Monetary Services Index: An index that measures the flow of monetary services received by households and firms from their holdings of liquid assets; see Anderson, Jones, and Nesmith (1997). Indexes are shown for the assets included in M2, with additional data at research.stlouisfed.org/msi/index.html.

Note: M1, M2, M3, Bank Credit, and Domestic Nonfinancial Debt are constructed and published by the Board of Governors of the Federal Reserve System. For details, see *Statistical Supplement to the Federal Reserve Bulletin*, tables 1.21 and 1.26. MZM, Adjusted Monetary Base, Adjusted Reserves, and Monetary Services Index are constructed and published by the Research Division of the Federal Reserve Bank of St. Louis.

Notes

Page 3: Readers are cautioned that, since early 1994, the level and growth of M1 have been depressed by retail sweep programs that reclassify transactions deposits (demand deposits and other checkable deposits) as savings deposits overnight, thereby reducing banks' required reserves; see Anderson and Rasche (2001) and research.stlouisfed.org/aggreg/swdata.html. **Primary Credit Rate**, **Discount Rate,** and **Intended Federal Funds Rate** shown in the chart **Reserve Market Rates** are plotted as of the date of the change, while the **Effective Federal Funds Rate** is plotted as of the end of the month. Interest rates in the table are monthly averages from the Board of Governors H.15 Statistical Release. The **Treasury Yield Curve** and **Real Treasury Yield Curve** show constant maturity yields calculated by the U.S. Treasury for securities 5, 7, 10, and 20 years to maturity. **Inflation-Indexed Treasury Yield Spreads** are a measure of inflation compensation at those horizons, and it is simply the nominal constant maturity yield less the real constant maturity yield. Daily data and descriptions are available at research.stlouisfed.org/fred2/. See also *Statistical Supplement to the Federal Reserve Bulletin*, table 1.35. The 30-year constant maturity series was discontinued by the Treasury as of February 18, 2002.

Page 5: **Checkable Deposits** is the sum of demand and other checkable deposits. **Savings Deposits** is the sum of money market deposit accounts and passbook and statement savings. **Time Deposits** have a minimum initial maturity of 7 days. **Large Time Deposits** are deposits of $100,000 or more. **Retail** and **Institutional Money Market Mutual Funds** are as included in M2 and the non-M2 component of M3, respectively.

Page 7: **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 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

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

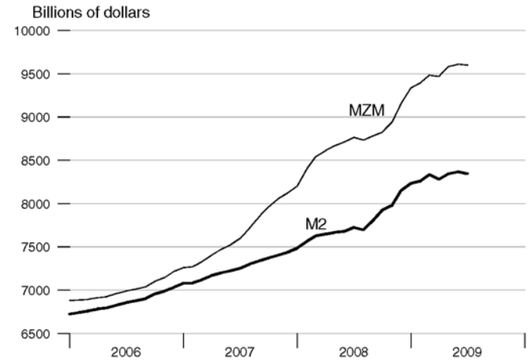
to five alternative target inflation rates, $\pi^* = 0, 1, 2, 3, 4$ percent, where f_t^* is the implied federal funds rate, π_{t-1} is the previous period's inflation rate (PCE) measured on a year-over-year basis, y_{t-1} is the log of the previous period's level of real gross domestic product (GDP), 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). Since the July 2009 NIPA revision, there is a discrepancy between real GDP (in billions of chained 2005 dollars) and CBO real potential GDP (in billions of Chained 2000 dollars). We have multiplied each quarterly observation of CBO real potential GDP by a factor of 1.14. This scaling factor is the average of the ratio of real GDP in billions of chained 2005 dollars to real GDP in billions of chained 2000 dollars for the four quarters of 2005.

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

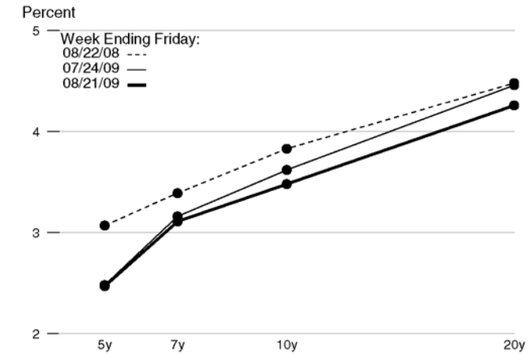
		M1	MZM	M2	M3*
Percent change at an annual rate					
2004		5.57	3.83	4.64	5.09
2005		2.03	2.10	4.22	5.97
2006		0.19	4.33	5.02	4.95
2007		-0.08	9.05	5.76	
2008		4.06	13.96	6.87	
2007	1	0.16	7.48	5.85	
	2	2.04	9.81	5.78	
	3	-1.43	13.65	5.54	
	4	1.25	16.84	5.86	
2008	1	1.36	16.68	8.37	
	2	1.95	13.49	5.62	
	3	8.75	4.40	4.05	
	4	32.05	9.85	14.27	
2009	1	9.23	19.14	12.86	
	2	12.02	6.33	2.62	
2007	Jul	2.26	11.18	4.67	
	Aug	1.93	19.79	8.14	
	Sep	-0.24	20.02	6.18	
	Oct	6.34	17.20	5.32	
	Nov	-3.71	14.18	5.31	
	Dec	-1.73	9.93	5.39	
2008	Jan	3.85	11.79	7.95	
	Feb	2.74	29.16	12.35	
	Mar	2.40	20.15	10.09	
	Apr	0.56	9.83	3.31	
	May	-0.19	7.86	3.09	
	Jun	8.66	6.11	1.88	
	Jul	13.40	7.00	6.98	
	Aug	-15.02	-4.21	-4.28	
	Sep	51.64	6.91	17.17	
	Oct	19.15	5.86	18.28	
	Nov	39.46	15.62	7.98	
	Dec	56.80	29.36	26.11	
2009	Jan	-14.28	23.16	12.10	
	Feb	-12.75	7.63	4.03	
	Mar	2.87	11.13	10.37	
	Apr	23.03	-1.63	-7.65	
	May	2.79	14.14	9.15	
	Jun	39.87	3.50	3.61	
	Jul	3.18	-1.13	-3.19	

*See table of contents for changes to the series.

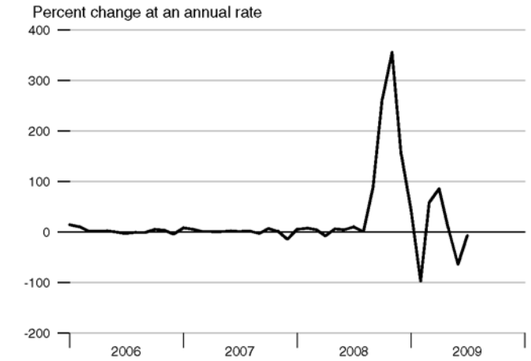
M2 and MZM



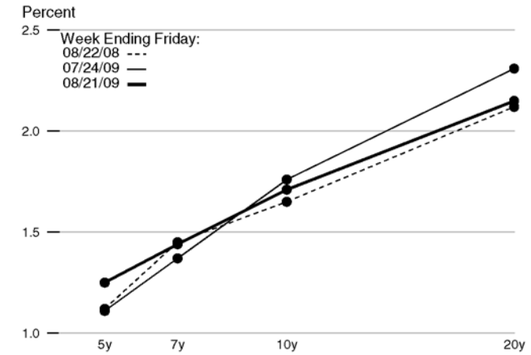
Treasury Yield Curve



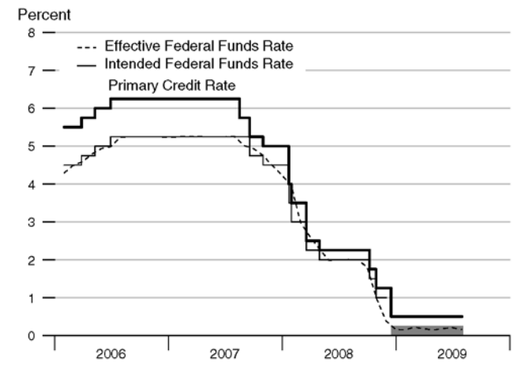
Adjusted Monetary Base



Real Treasury Yield Curve

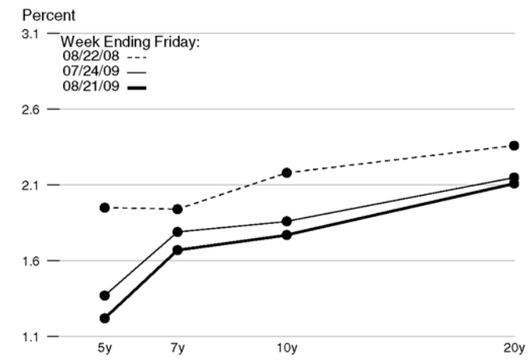


Reserve Market Rates



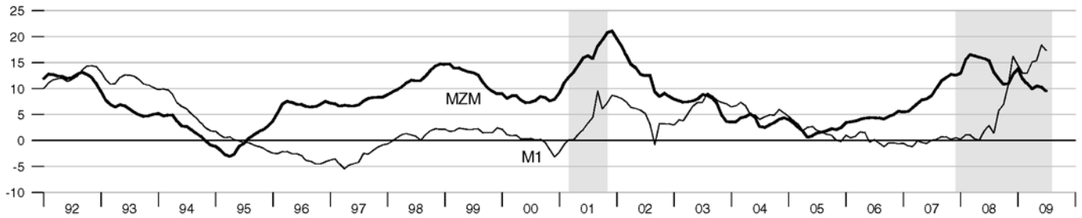
Note: Effective December 16, 2008, FOMC reports the intended Federal Funds Rate as a range.

Inflation-Indexed Treasury Yield Spreads



MZM and M1

Percent change from year ago

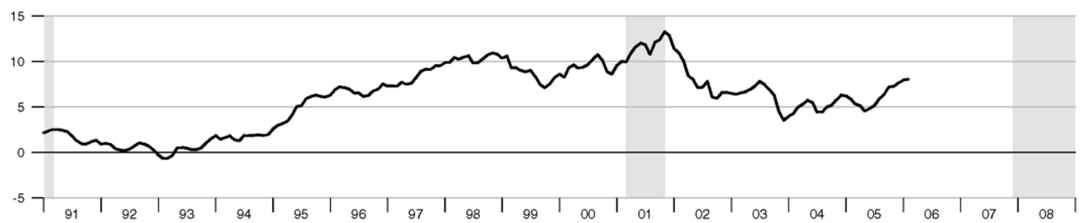


M2

Percent change from year ago

M3*

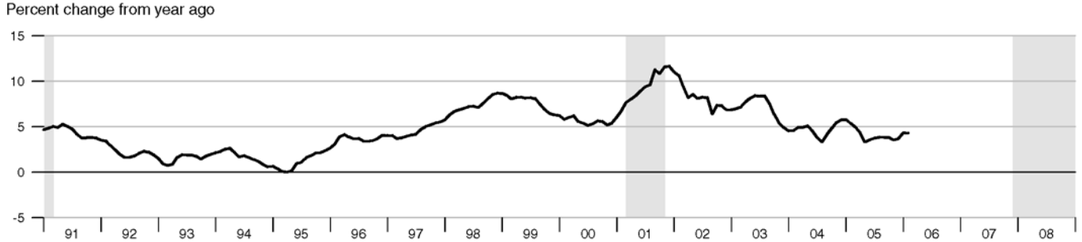
Percent change from year ago



*See table of contents for changes to the series.

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.

		Federal Funds	Primary Credit Rate	Prime Rate	3-mo CDs	Treasury Yields 3-mo	3-yr	10-yr	Corporate Aaa Bonds	Municipal Aaa Bonds	Conventional Mortgage
2004		1.35	2.34	4.34	1.56	1.40	2.78	4.27	5.63	4.50	5.84
2005		3.21	4.19	6.19	3.51	3.21	3.93	4.29	5.23	4.28	5.86
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
2007	1	5.26	6.25	8.25	5.31	5.12	4.68	4.68	5.36	3.91	6.22
	2	5.25	6.25	8.25	5.32	4.87	4.76	4.85	5.58	4.13	6.37
	3	5.07	5.93	8.18	5.42	4.42	4.41	4.73	5.75	4.27	6.55
	4	4.50	5.02	7.52	5.02	3.47	3.50	4.26	5.53	4.24	6.23
2008	1	3.18	3.67	6.21	3.23	2.09	2.17	3.66	5.46	4.39	5.88
	2	2.09	2.33	5.08	2.76	1.65	2.67	3.89	5.60	4.43	6.09
	3	1.94	2.25	5.00	3.06	1.52	2.63	3.86	5.65	4.50	6.31
	4	0.51	1.31	4.06	2.82	0.30	1.48	3.25	5.82	5.02	5.87
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
2007	Jul	5.26	6.25	8.25	5.32	4.96	4.82	5.00	5.73	4.24	6.70
	Aug	5.02	6.01	8.25	5.49	4.32	4.34	4.67	5.79	4.30	6.57
	Sep	4.94	5.53	8.03	5.46	3.99	4.06	4.52	5.74	4.26	6.38
	Oct	4.76	5.24	7.74	5.08	4.00	4.01	4.53	5.66	4.20	6.38
	Nov	4.49	5.00	7.50	4.97	3.35	3.35	4.15	5.44	4.26	6.21
	Dec	4.24	4.83	7.33	5.02	3.07	3.13	4.10	5.49	4.25	6.10
2008	Jan	3.94	4.48	6.98	3.84	2.82	2.51	3.74	5.33	4.13	5.76
	Feb	2.98	3.50	6.00	3.06	2.17	2.19	3.74	5.53	4.42	5.92
	Mar	2.61	3.04	5.66	2.79	1.28	1.80	3.51	5.51	4.63	5.97
	Apr	2.28	2.49	5.24	2.85	1.31	2.23	3.68	5.55	4.45	5.92
	May	1.98	2.25	5.00	2.66	1.76	2.69	3.88	5.57	4.34	6.04
	Jun	2.00	2.25	5.00	2.76	1.89	3.08	4.10	5.68	4.50	6.32
	Jul	2.01	2.25	5.00	2.79	1.66	2.87	4.01	5.67	4.44	6.43
	Aug	2.00	2.25	5.00	2.79	1.75	2.70	3.89	5.64	4.44	6.48
	Sep	1.81	2.25	5.00	3.59	1.15	2.32	3.69	5.65	4.61	6.04
	Oct	0.97	1.81	4.56	4.32	0.69	1.86	3.81	6.28	5.05	6.20
	Nov	0.39	1.25	4.00	2.36	0.19	1.51	3.53	6.12	4.83	6.09
	Dec	0.16	0.86	3.61	1.77	0.03	1.07	2.42	5.05	5.17	5.33
2009	Jan	0.15	0.50	3.25	1.02	0.13	1.13	2.52	5.05	4.64	5.06
	Feb	0.22	0.50	3.25	1.16	0.30	1.37	2.87	5.27	4.56	5.13
	Mar	0.18	0.50	3.25	1.07	0.22	1.31	2.82	5.50	4.74	5.00
	Apr	0.15	0.50	3.25	0.89	0.16	1.32	2.93	5.39	4.48	4.81
	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		5.22

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

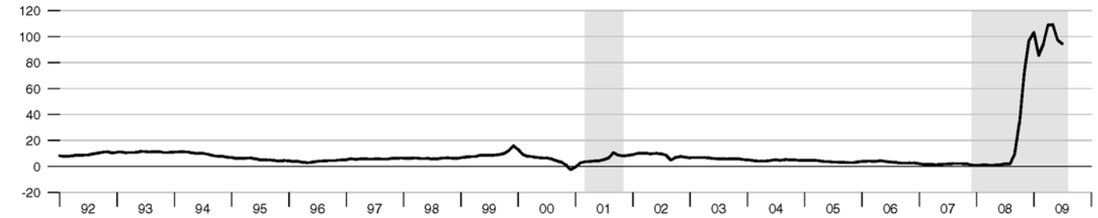
		Money Stock				Bank	Adjusted		
		M1	MZM	M2	M3*	Credit	Monetary Base	Reserves	MSI M2**
	2004	1344.402	6569.805	6262.734	9234.718	6339.387	776.768	96.130	329.873
	2005	1371.751	6707.812	6527.286	9786.477	6986.233	806.628	96.560	343.539
	2006	1374.358	6998.306	6855.111	10270.74	7659.746	835.039	94.913	
	2007	1373.204	7631.767	7249.709		8403.538	850.565	94.181	
	2008	1429.012	8696.990	7747.773		9104.870	1009.740	232.140	
2007	1	1369.341	7288.950	7096.279		8129.742	846.309	94.123	
	2	1376.332	7467.781	7198.776		8246.613	849.917	93.536	
	3	1371.422	7722.617	7298.459		8475.331	852.247	95.409	
	4	1375.722	8047.719	7405.322		8762.465	853.787	93.656	
2008	1	1380.407	8383.297	7560.200		8974.244	856.281	96.134	
	2	1387.124	8666.121	7666.478		8991.919	859.282	94.328	
	3	1417.472	8761.428	7744.084		9062.935	892.651	117.725	
	4	1531.044	8977.114	8020.328		9390.382	1430.746	620.374	
2009	1	1566.370	9406.713	8278.142		9303.435	1663.080	820.767	
	2	1613.429	9555.489	8332.306		9325.666	1763.776	917.223	
2007	Jul	1370.043	7596.167	7253.113		8367.739	851.866	94.613	
	Aug	1372.247	7721.432	7302.341		8473.087	853.413	96.623	
	Sep	1371.975	7850.252	7339.922		8585.166	851.463	94.990	
	Oct	1379.223	7962.766	7372.484		8692.417	856.426	93.491	
	Nov	1374.961	8056.860	7405.112		8764.139	857.480	95.721	
	Dec	1372.981	8123.530	7438.371		8830.840	847.454	91.757	
2008	Jan	1377.385	8203.343	7487.626		8922.886	851.406	95.044	
	Feb	1380.535	8402.715	7564.691		8970.963	856.904	96.151	
	Mar	1383.300	8543.832	7628.284		9028.882	860.532	97.207	
	Apr	1383.945	8613.813	7649.316		8971.126	855.198	94.327	
	May	1383.721	8670.218	7669.036		9002.545	859.644	94.868	
	Jun	1393.705	8714.333	7681.082		9002.086	863.005	93.788	
	Jul	1409.267	8765.149	7725.746		9016.310	870.491	96.794	
	Aug	1391.630	8734.432	7698.172		9014.391	871.284	96.486	
	Sep	1451.519	8784.703	7808.334		9158.103	936.177	159.896	
	Oct	1474.683	8827.585	7927.292		9491.948	1142.205	347.653	
	Nov	1523.176	8942.482	7980.016		9360.613	1480.768	674.089	
	Dec	1595.272	9161.276	8153.677		9318.586	1669.264	839.379	
2009	Jan	1576.292	9338.083	8235.909		9297.650	1730.469	870.231	
	Feb	1559.544	9397.445	8263.555		9316.522	1590.254	758.684	
	Mar	1563.275	9484.611	8334.962		9296.132	1668.517	833.386	
	Apr	1593.273	9471.750	8281.818		9270.098	1787.809	949.463	
	May	1596.978	9583.382	8344.994		9357.422	1799.387	946.319	
	Jun	1650.035	9611.335	8370.107		9349.479	1704.131	855.887	
	Jul	1654.402	9602.307	8347.842		9258.969	1693.705	841.452	

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.

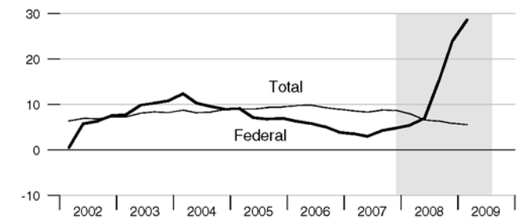
Adjusted Monetary Base

Percent change from year ago



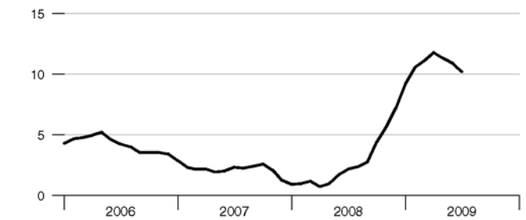
Domestic Nonfinancial Debt

Percent change from year ago



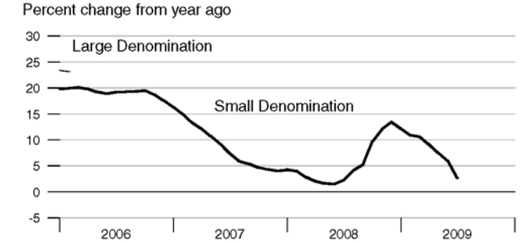
Currency Held by the Nonbank Public

Percent change from year ago



Time Deposits*

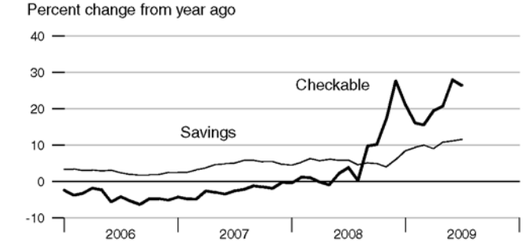
Percent change from year ago



*See table of contents for changes to the series.

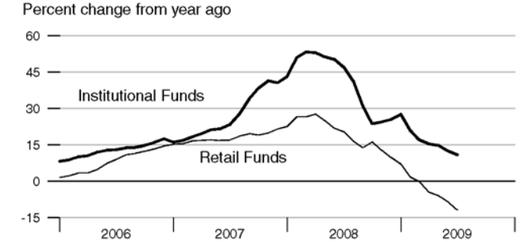
Checkable and Savings Deposits

Percent change from year ago



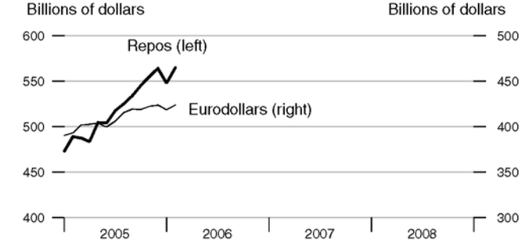
Money Market Mutual Fund Shares

Percent change from year ago



Repurchase Agreements and Eurodollars*

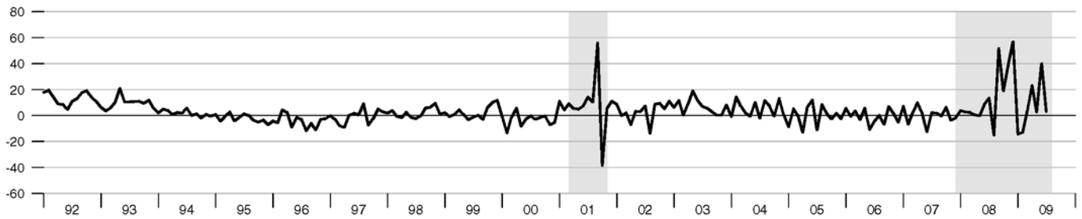
Billions of dollars | Billions of dollars



*See table of contents for changes to these series.

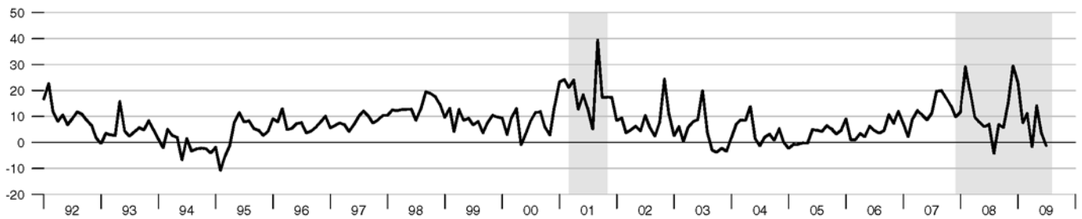
M1

Percent change at an annual rate



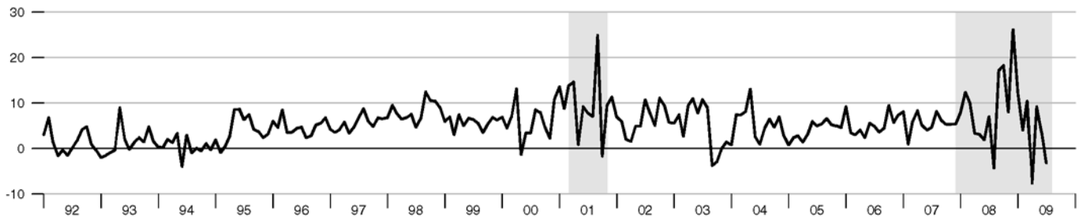
MZM

Percent change at an annual rate



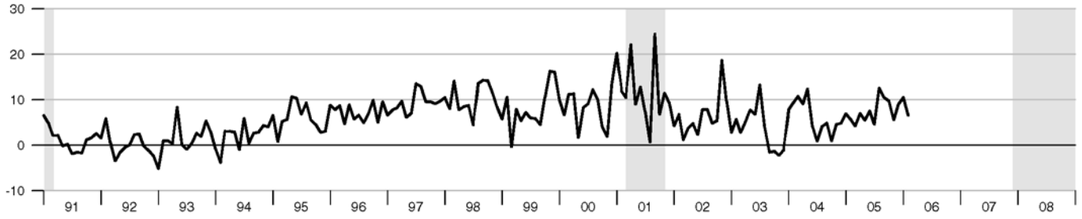
M2

Percent change at an annual rate



M3*

Percent change at an annual rate



*See table of contents for changes to the series.

Standard & Poor's 500

Recent Inflation and Long-Term Interest Rates

	Consumer Price Inflation Rates (Percent change from year ago)				Long-Term Government Bond Rates (Percent)			
	2008Q3	2008Q4	2009Q1	2009Q2	Apr09	May09	Jun09	Jul09
United States	5.23	1.53	-0.18	-0.94	2.93	3.29	3.72	3.56
Canada	3.43	1.91	1.25	0.06	2.92	3.22	3.47	3.42
France	3.25	1.76	0.63	-0.21	3.66	3.80	3.90	.
Germany	3.07	1.65	0.82	0.25	3.13	3.37	3.47	3.34
Italy	3.97	2.80	1.48	0.85	4.36	4.42	4.61	4.37
Japan	2.06	1.03	-0.10	-0.98	1.40	1.48	1.36	1.39
United Kingdom	4.81	3.88	3.01	2.12	3.41	3.62	3.72	3.82

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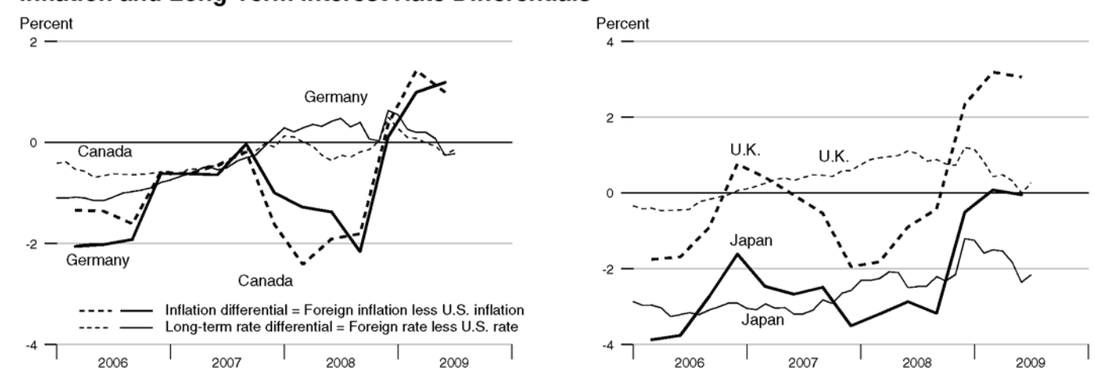
Inflation and Long-Term Interest Rate Differentials

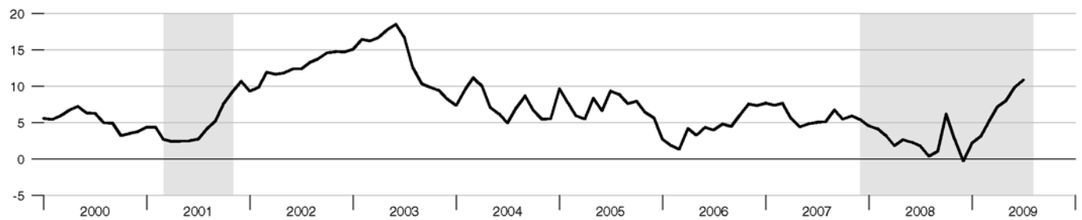


Bank Credit

Percent change from year ago

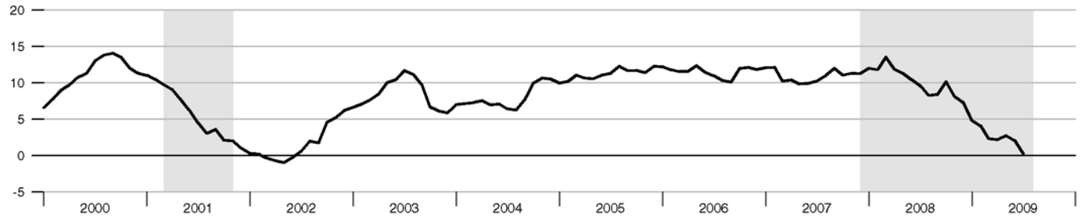
Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago



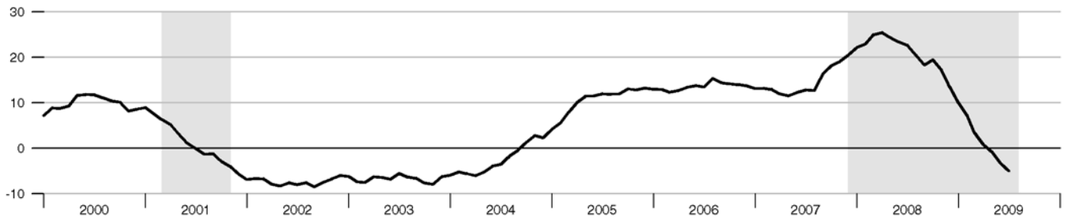
Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago



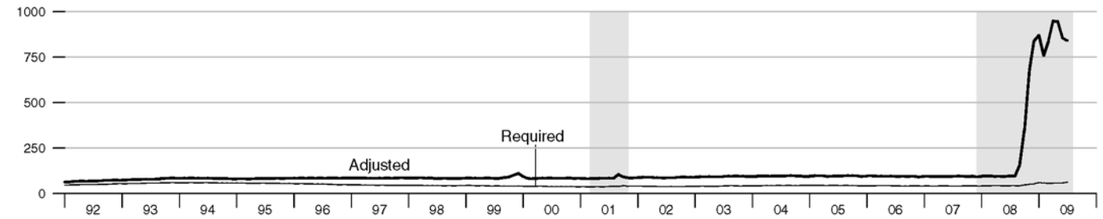
Commercial and Industrial Loans at Commercial Banks

Percent change from year ago



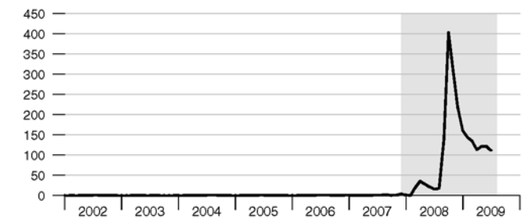
Adjusted and Required Reserves

Billions of dollars



Total Borrowings, nsa

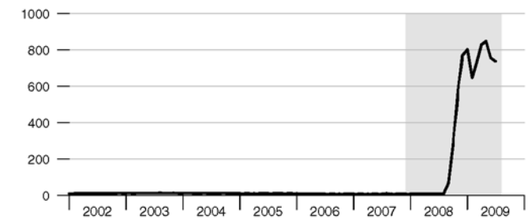
Billions of dollars



* Data exclude term auction credit

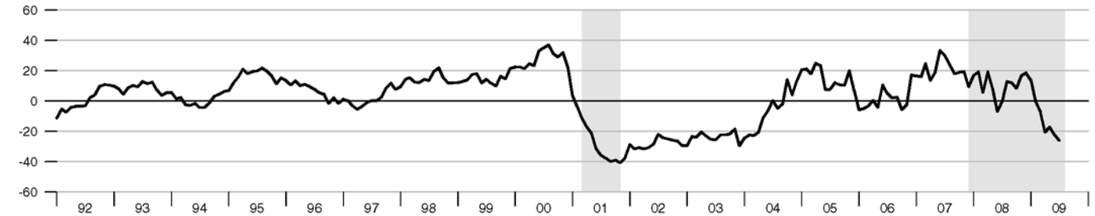
Excess Reserves plus RCB Contracts

Billions of dollars



Nonfinancial Commercial Paper

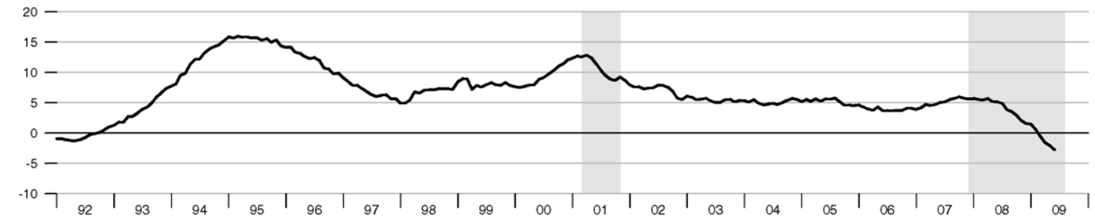
Percent change from year ago



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.

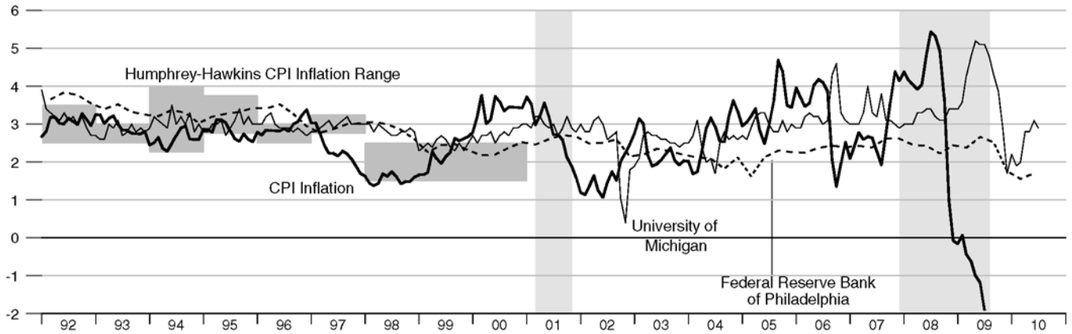
Consumer Credit

Percent change from year ago



CPI Inflation and 1-Year-Ahead CPI Inflation Expectations

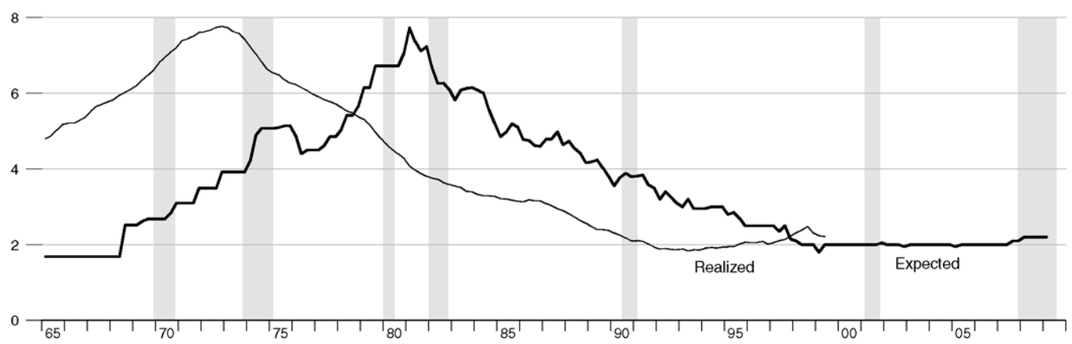
Percent



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

10-Year Ahead PCE Inflation Expectations and Realized Inflation

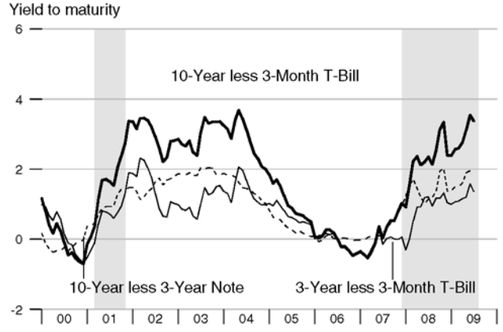
Percent



See the notes section for an explanation of the chart.

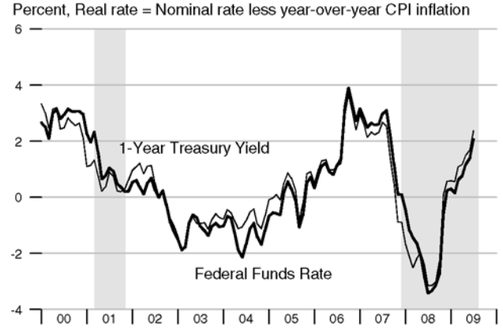
Treasury Security Yield Spreads

Yield to maturity



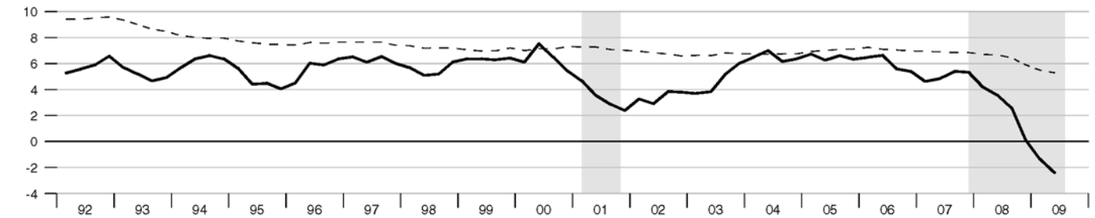
Real Interest Rates

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



Gross Domestic Product

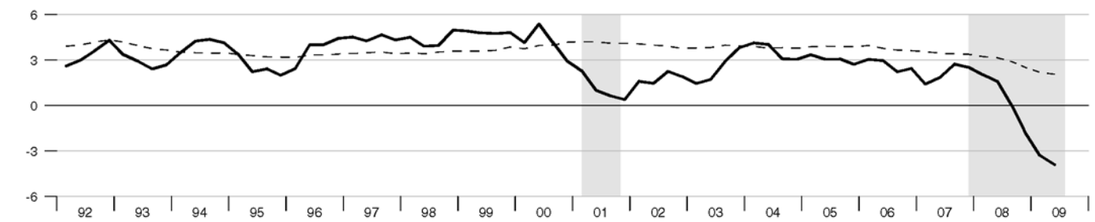
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Real Gross Domestic Product

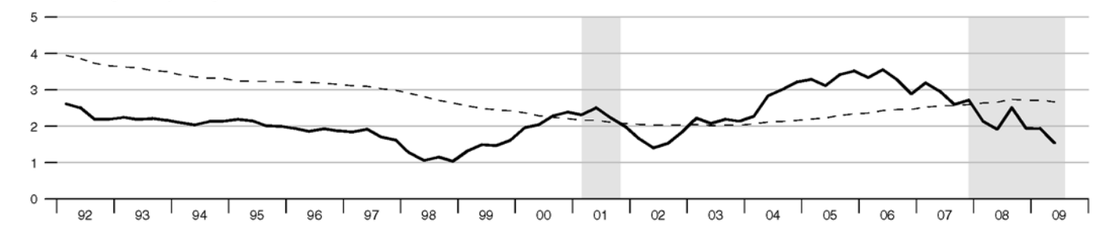
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Gross Domestic Product Price Index

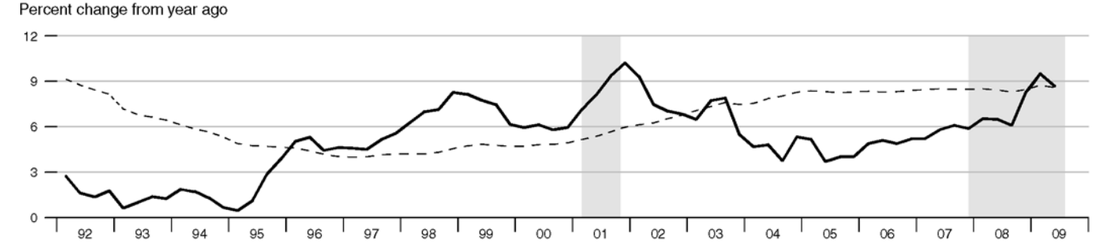
Percent change from year ago



Dashed lines indicate 10-year moving averages.

M2

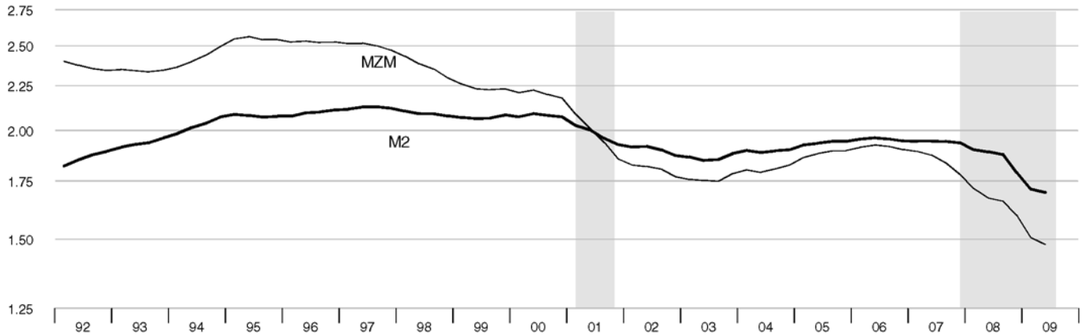
Percent change from year ago



Dashed lines indicate 10-year moving averages.

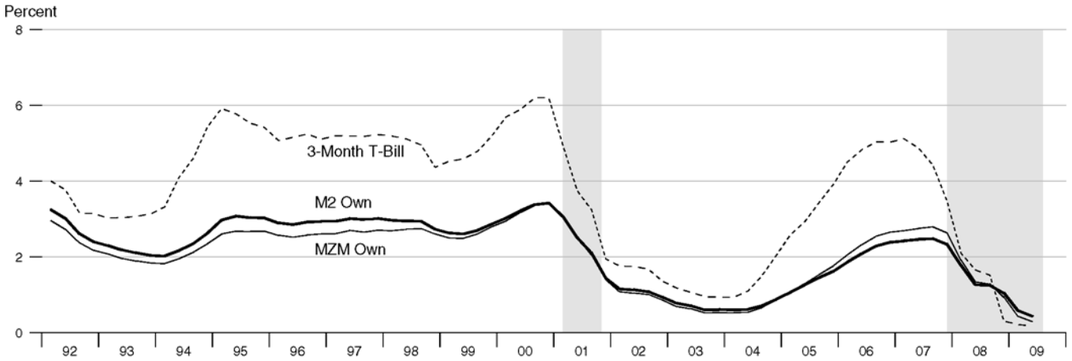
Velocity

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



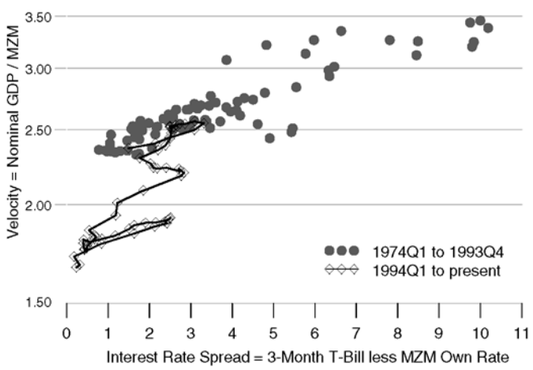
Interest Rates

Percent



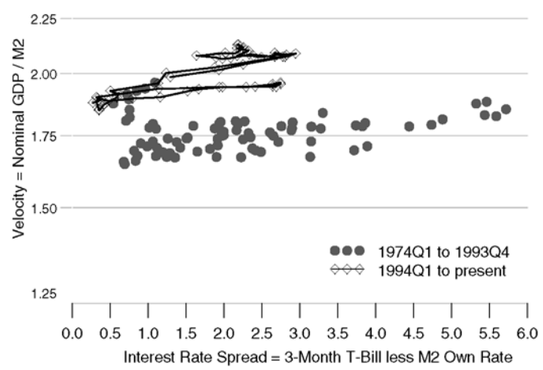
MZM Velocity and Interest Rate Spread

Ratio Scale



M2 Velocity and Interest Rate Spread

Ratio Scale

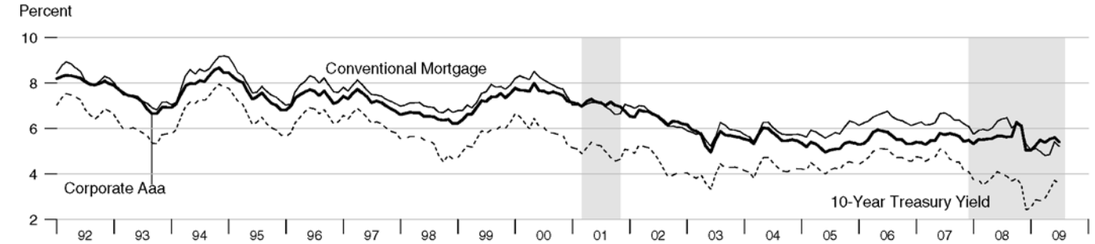


Short-Term Interest Rates

Percent

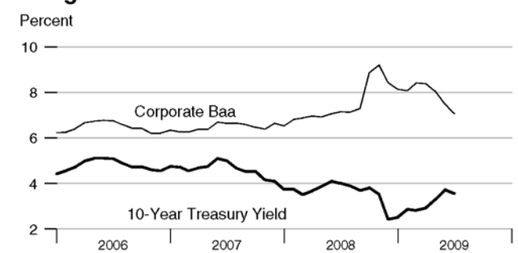
Long-Term Interest Rates

Percent



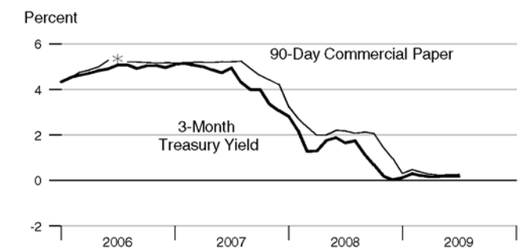
Long-Term Interest Rates

Percent



Short-Term Interest Rates

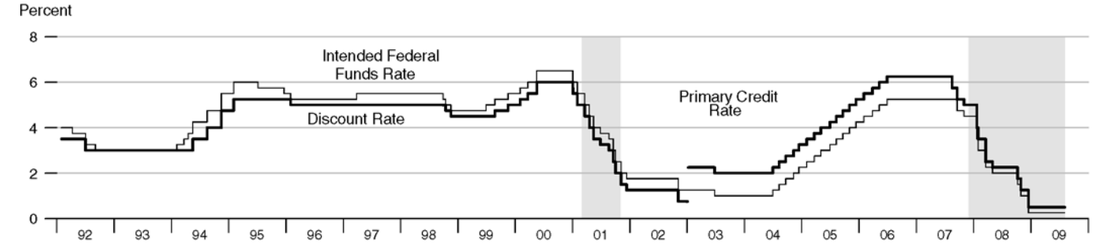
Percent



*90-Day Commercial Paper data are not available for December 2005, January 2006, and July 2006.

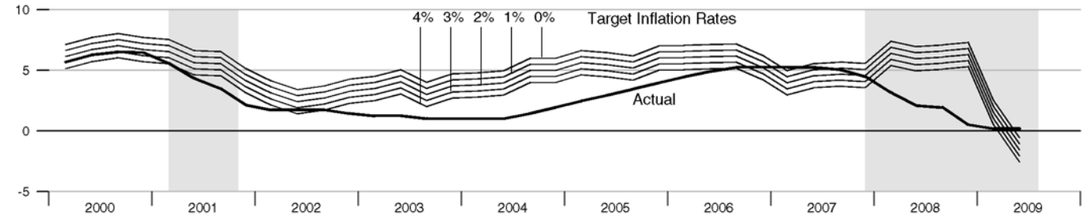
FOMC Intended Federal Funds Rate, Discount Rate, and Primary Credit Rate

Percent



Federal Funds Rate and Inflation Targets

Percent

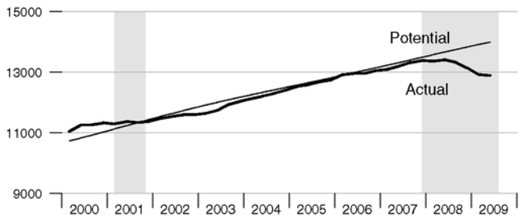


Calculated federal funds rate is based on Taylor's rule.

Components of Taylor's Rule

Actual and Potential Real GDP

Billions of chain-weighted 2005 dollars



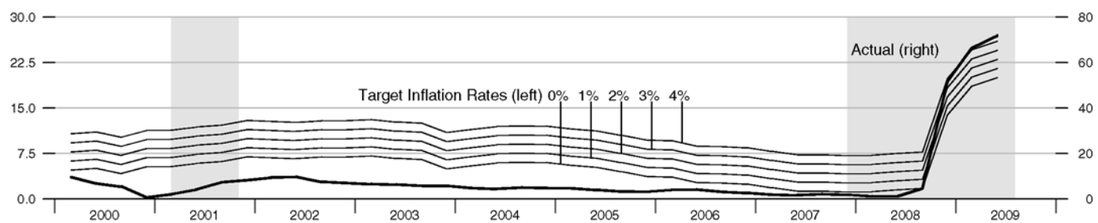
PCE Inflation

Percent change from year ago

See notes section for further explanation.

Monetary Base Growth and Inflation Targets

Percent

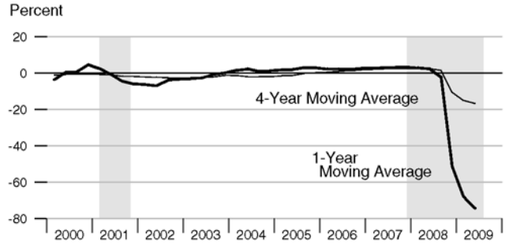


Calculated base growth is based on McCallum's rule. Actual base growth is percent change from year ago.

Components of McCallum's Rule

Monetary Base Velocity Growth

Percent

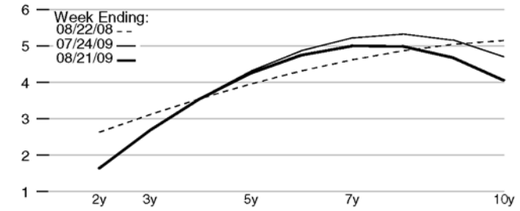


Real Output Growth

Percent

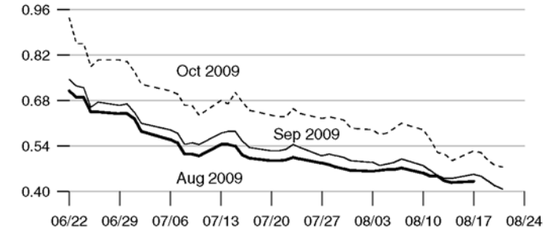
Implied One-Year Forward Rates

Percent



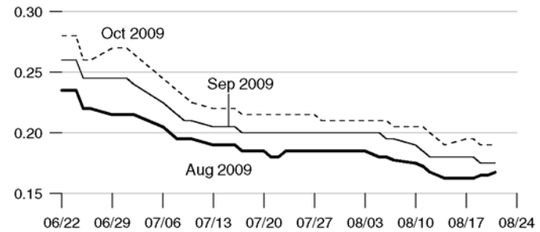
Rates on 3-Month Eurodollar Futures

Percent, daily data



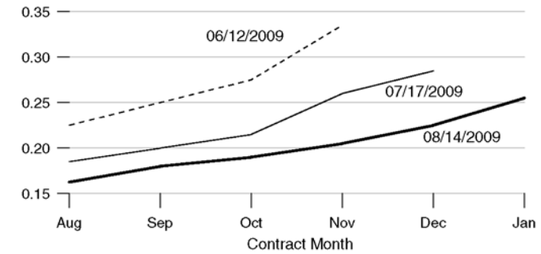
Rates on Selected Federal Funds Futures Contracts

Percent, daily data



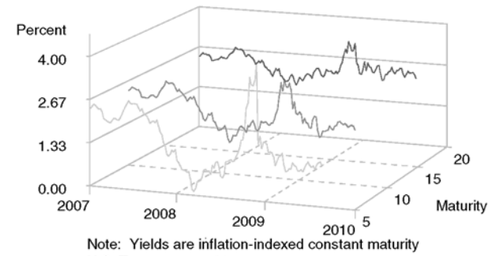
Rates on Federal Funds Futures on Selected Dates

Percent



Inflation-Indexed Treasury Securities

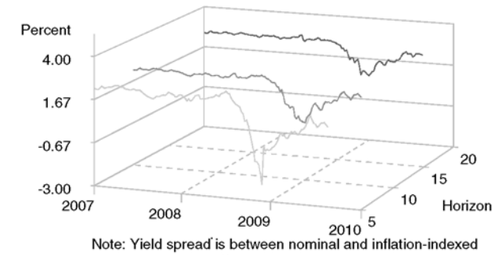
Weekly data



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

Inflation-Indexed Treasury Yield Spreads

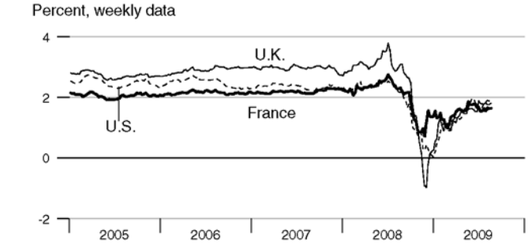
Weekly data



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

Inflation-Indexed 10-Year Government Notes

Percent, weekly data

Inflation-Indexed 10-Year Government Yield Spreads

Percent, weekly data