$((y_t - y_{t-40})/40) \times 400$, where y_t is the log of real GDP. The 4-year moving average of base velocity growth is calculated similarly. To adjust the monetary base for the effect of retail-deposit sweep programs, we add to the monetary base an amount equal to 10 percent of the total amount swept, as estimated by the Federal Reserve Board staff. These estimates are imprecise, at best. Sweep program data are found at research.stlouisfed.org/aggreg/swdata.html.

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 2000 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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Taylor, John B. (1993). "Discretion versus Policy Rules in Practice," *Carnegie-Rochester Conference Series on Public Policy*, vol. 39, pp. 195-214.

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

Monetary Trends

May 2009

Can Monetary Policy Affect GDP Growth?

The Fed has taken unconventional measures over the past 18 months to contain the financial crisis and limit ramifications for the broader economy. These measures have resulted in an extraordinary increase in reserve balances at commercial banks—which is a key component, along with currency, of the monetary base. Economist John Taylor of Stanford University estimates the current programs proposed by the Fed should increase reserves by about $2.285 trillion—nearly a 300-fold increase compared with the $8 billion level in early September 2008.[1]

Many analysts have raised concerns that the increased reserves will ultimately increase inflation and the price level. One might also expect such an enormous increase in reserves to stimulate aggregate output, thereby mitigating the adverse effects of the financial crisis on the economy. But can such an impact be estimated quantitatively?

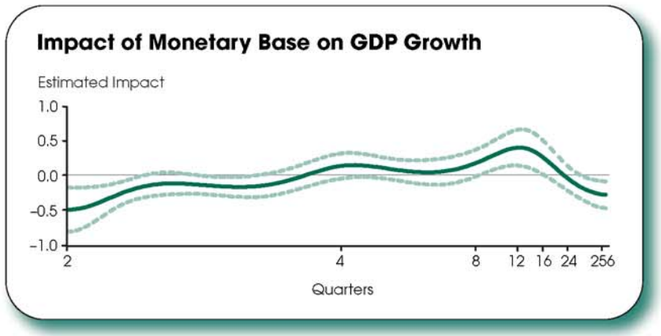
Historically, we can look at postwar U.S. data and see how much gross domestic product (GDP) growth can be associated with or forecasted by the growth rate of the monetary base. Note that such a statistical association is not "causal." We merely want to see whether, historically, fast growth of the monetary base has been associated with faster growth of real output. One approach is to use an analysis that captures the impact of current and past increases of the monetary base on current GDP growth, taking into consideration the influence of the history of GDP on its own future growth. This estimation can be done at different horizons using statistical tools.

The chart shows the association of monetary base growth with GDP growth at different horizons, where the horizontal axis is the number of quarters and the vertical axis indicates the estimated impact of money base growth on output growth. The solid line is the estimation and the dashed lines are one-standard-error bands, which quantify the uncertainty of the estimation. The chart indicates that in the very short run (say at the 2-quarter horizon), money base growth is slightly negatively associated with GDP growth. However, around the typical business cycle horizon (say within the horizon of 8 to 16 quarters or 2 to 4 years), money base growth has a significant positive relation with GDP growth. In particular, at the 12-quarter horizon, for every 1 percent increase in money base growth, there is about 0.4 percent corresponding increase in GDP growth. Such a positive relation disappears again in the very long run beyond the typical business cycle, perhaps because in the long run money growth is inflationary, which leads to higher prices and lower output.

Therefore, historical data tell us that if there is any positive association between money growth and GDP growth, the impact comes about 3 years after an initial acceleration of base growth. Such a long lag suggests that an observed and expected increase in the monetary base may not have a very large effect on output growth. Of course, the big caveat is that there has never been such an extraordinary increase in base growth. Therefore, the evidence based on historical data is not conclusive, but only a rough guide.

—Yi Wen

[1] Taylor, John B. "Monetary Policy and the Recent Extraordinary Measures Taken by the Federal Reserve." Testimony before the Committee on Financial Services, U.S. House of Representatives, February 26, 2009; www.stanford.edu/~johntayl/House%20FSC%20testimony%20Feb%2026.pdf.



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

Contents

Page

3	Monetary and Financial Indicators at a Glance
4	Monetary Aggregates and Their Components
6	Monetary Aggregates: Monthly Growth
7	Reserves Markets and Short-Term Credit Flows
8	Measures of Expected Inflation
9	Interest Rates
10	Policy-Based Inflation Indicators
11	Implied Forward Rates, Futures Contracts, and Inflation-Indexed Securities
12	Velocity, Gross Domestic Product, and M2
14	Bank Credit
15	Stock Market Index and Foreign Inflation and Interest Rates
16	Reference Tables
18	Definitions, Notes, and Sources

Conventions used in this publication:

1. Unless otherwise indicated, data are monthly.
2. Shaded areas indicate recessions, as determined by the National Bureau of Economic Research.
3. *Percent change at an annual rate* is the simple, not compounded, monthly percent change multiplied by 12. For example, using consecutive months, the percent change at an annual rate in x between month $t-1$ and the current month t is: $[(x_t/x_{t-1})-1]\times 1200$. Note that this differs from *National Economic Trends.* In that publication, monthly percent changes are compounded and expressed as annual growth rates.
4. The *percent change from year ago* refers to the percent change from the same period in the previous year. For example, the percent change from year ago in x between month $t-12$ and the current month t is: $[(x_t/x_{t-12})-1]\times 100$.

We welcome your comments addressed to:

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

or to:

stlsFRED@stls.frb.org

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

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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 as estimated by the Congressional Budget Office.

Monetary Base Growth and Inflation Targets shows the quarterly growth of the adjusted monetary base (modified to include an estimate of the effect of sweep programs) implied by applying McCallum's (1988, 1993) equation

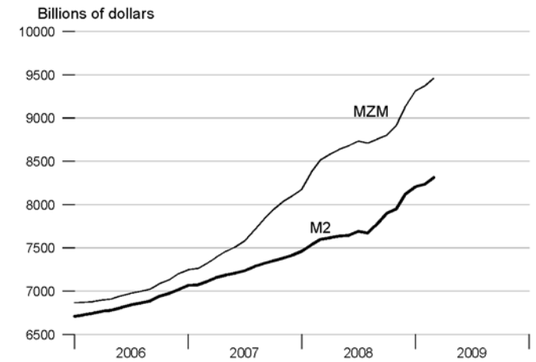
$$\Delta MB_t^* = \pi^* + (\text{10-year moving average growth of real GDP}) - (\text{4-year moving average of base velocity growth})$$

to five alternative target inflation rates, $\pi^* = 0, 1, 2, 3, 4$ percent, where ΔMB_t^* is the implied growth rate of the adjusted monetary base. The 10-year moving average growth of real GDP for a quarter t is calculated as the average quarterly growth during the previous 40 quarters, at an annual rate, by the formula

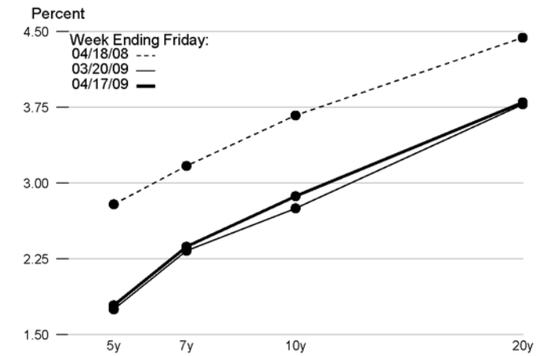
		M1	MZM	M2	M3*
Percent change at an annual rate					
2004		5.57	3.91	4.73	5.09
2005		2.03	2.13	4.26	5.97
2006		0.19	4.32	5.01	4.95
2007		-0.35	9.04	5.74	
2008		3.93	13.86	6.72	
2007	1	0.14	7.60	5.96	
	2	1.49	9.78	5.73	
	3	-2.18	13.47	5.33	
	4	0.21	16.62	5.59	
2008	1	0.90	16.54	8.12	
	2	1.83	13.36	5.42	
	3	10.92	4.62	4.27	
	4	33.01	10.03	14.31	
2009	1	8.26	19.10	13.07	
2007	Mar	1.91	9.24	6.04	
	Apr	9.28	12.30	8.25	
	May	0.84	10.45	4.77	
	Jun	-13.19	8.60	3.88	
	Jul	1.66	11.02	4.48	
	Aug	1.42	19.64	7.96	
	Sep	-1.74	19.70	5.80	
	Oct	4.90	16.91	4.97	
	Nov	-4.42	14.05	5.15	
	Dec	-1.83	9.91	5.36	
2008	Jan	3.34	11.61	7.57	
	Feb	2.21	28.98	12.09	
	Mar	1.75	19.95	9.82	
	Apr	0.70	9.73	3.13	
	May	-0.00	7.75	2.93	
	Jun	8.67	6.00	1.68	
	Jul	14.24	7.01	6.98	
	Aug	-6.95	-3.02	-2.96	
	Sep	51.67	6.78	17.02	
	Oct	19.16	5.90	18.27	
	Nov	39.44	15.77	7.71	
	Dec	56.68	29.63	26.00	
2009	Jan	-16.41	22.94	12.36	
	Feb	-13.34	7.53	4.54	
	Mar	2.21	10.95	10.90	

*See table of contents for changes to the series.

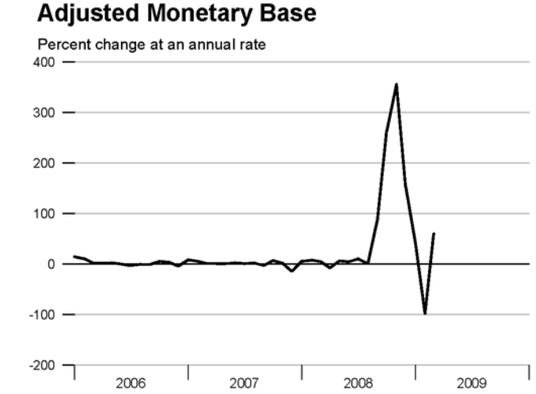
M2 and MZM



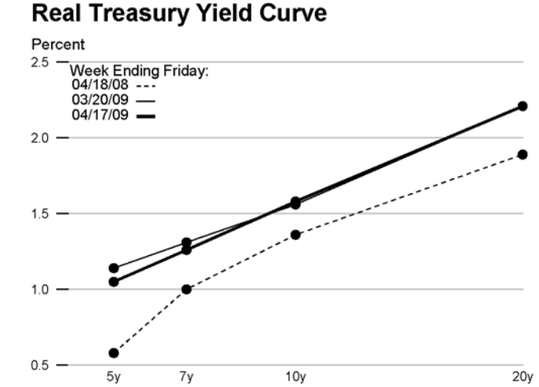
Treasury Yield Curve



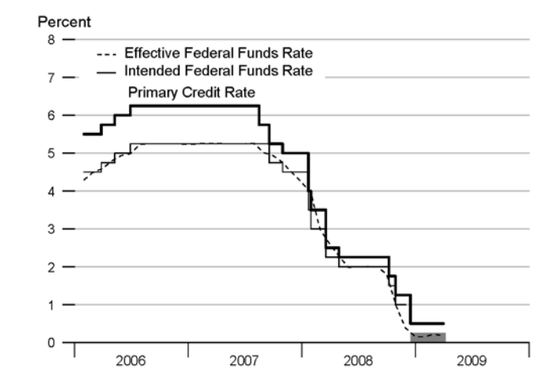
Adjusted Monetary Base



Real Treasury Yield Curve

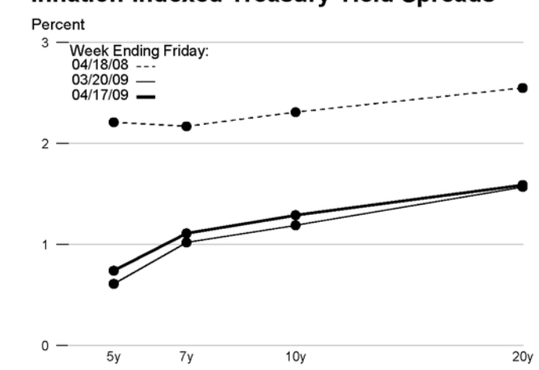


Reserve Market Rates



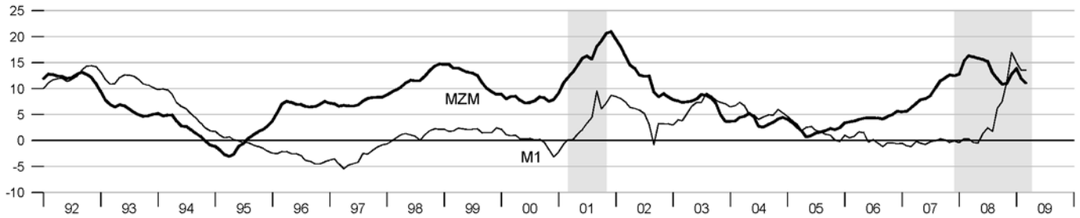
Data available as of January 2009.
Note: Effective December 16, 2008, FOMC reports the intended Federal Funds Rate as a range.

Inflation-Indexed Treasury Yield Spreads



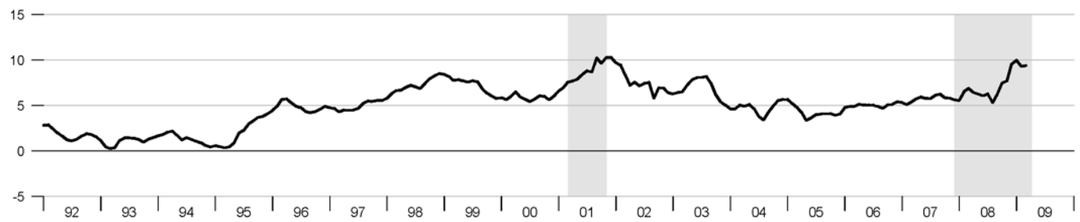
MZM and M1

Percent change from year ago



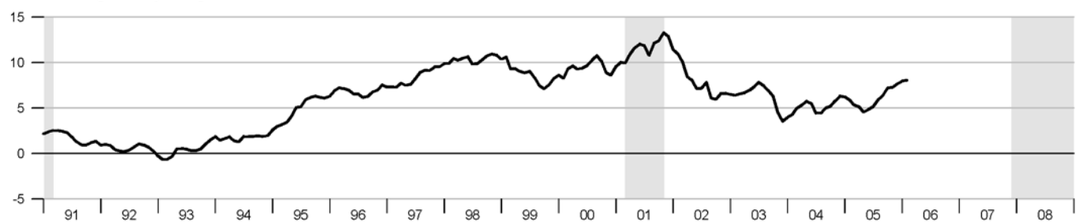
M2

Percent change from year ago



M3*

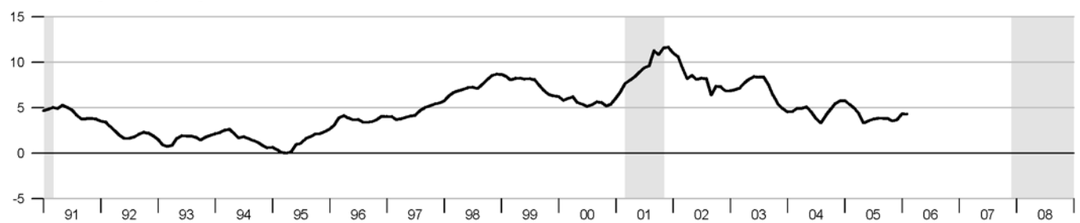
Percent change from year ago



*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
2007	Mar	5.26	6.25	8.25	5.30	5.08	4.51	4.56	5.30	3.88	6.16
	Apr	5.25	6.25	8.25	5.31	5.01	4.60	4.69	5.47	3.99	6.18
	May	5.25	6.25	8.25	5.31	4.87	4.69	4.75	5.47	4.04	6.26
	Jun	5.25	6.25	8.25	5.33	4.74	5.00	5.10	5.79	4.36	6.66
	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

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

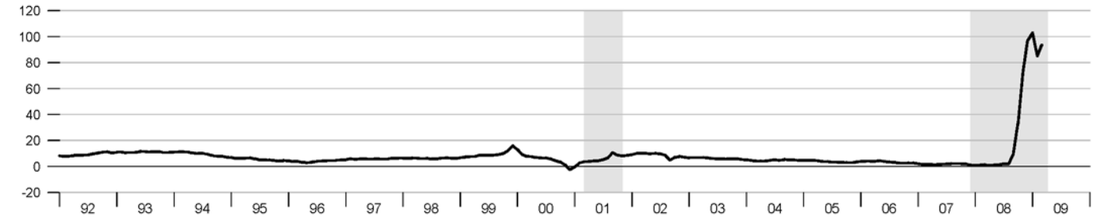
		Money Stock				Bank	Adjusted		
		M1	MZM	M2	M3*	Credit	Monetary Base	Reserves	MSI M2**
2004		1344.402	6554.572	6247.501	9234.718	6595.832	776.768	96.130	329.873
2005		1371.751	6694.430	6513.905	9786.477	7247.080	806.628	96.560	343.539
2006		1374.358	6983.573	6840.378	10270.74	7958.707	835.039	94.913	
2007		1369.521	7615.031	7232.867		8742.712	850.579	94.200	
2008		1423.363	8670.768	7718.626		9558.509	1009.767	232.161	
2007	1	1369.265	7276.088	7083.417		8450.068	846.309	94.123	
	2	1374.355	7454.023	7184.966		8568.528	849.919	93.558	
	3	1366.869	7704.958	7280.629		8811.221	852.267	95.428	
	4	1367.594	8025.054	7382.455		9141.030	853.821	93.690	
2008	1	1370.664	8356.791	7532.399		9388.139	856.319	96.172	
	2	1376.944	8635.866	7634.399		9413.802	859.325	94.366	
	3	1414.550	8735.648	7715.823		9471.198	892.677	117.739	
	4	1531.294	8954.767	7991.881		9960.899	1430.746	620.365	
2009	1	1562.903	9382.386	8253.019		9834.445	1660.112	820.969	
2007	Mar	1368.186	7318.259	7109.358		8450.526	848.174	93.758	
	Apr	1378.770	7393.291	7158.243		8508.130	848.960	93.603	
	May	1379.732	7457.672	7186.718		8569.651	849.615	92.773	
	Jun	1364.564	7511.107	7209.936		8627.802	851.181	94.299	
	Jul	1366.456	7580.095	7236.871		8699.272	851.857	94.604	
	Aug	1368.069	7704.166	7284.905		8808.186	853.438	96.648	
	Sep	1366.083	7830.613	7320.112		8926.206	851.506	95.032	
	Oct	1371.657	7940.938	7350.456		9048.093	856.459	93.525	
	Nov	1366.605	8033.931	7381.983		9169.035	857.516	95.757	
	Dec	1364.519	8100.294	7414.927		9205.963	847.487	91.789	
2008	Jan	1368.318	8178.689	7461.703		9307.233	851.441	95.078	
	Feb	1370.840	8376.218	7536.900		9361.657	856.945	96.192	
	Mar	1372.835	8515.466	7598.594		9495.527	860.571	97.247	
	Apr	1373.640	8584.516	7618.442		9417.813	855.241	94.369	
	May	1373.637	8639.934	7637.032		9422.411	859.686	94.906	
	Jun	1383.556	8683.147	7647.723		9401.182	863.047	93.823	
	Jul	1399.978	8733.881	7692.178		9426.002	870.533	96.823	
	Aug	1391.868	8711.929	7673.216		9414.976	871.320	96.511	
	Sep	1451.803	8761.135	7782.076		9572.615	936.179	159.882	
	Oct	1474.984	8804.215	7900.584		9982.935	1142.208	347.643	
	Nov	1523.467	8919.910	7951.374		9924.738	1480.771	674.081	
	Dec	1595.431	9140.175	8123.685		9975.023	1669.260	839.371	
2009	Jan	1573.607	9314.936	8207.391		9881.972	1727.930	870.226	
	Feb	1556.119	9373.364	8238.426		9821.772	1586.836	758.712	
	Mar	1558.983	9458.857	8313.241		9799.592	1665.569	833.968	

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.

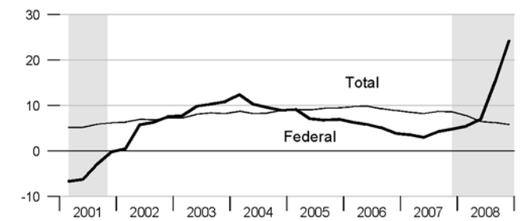
Adjusted Monetary Base

Percent change from year ago



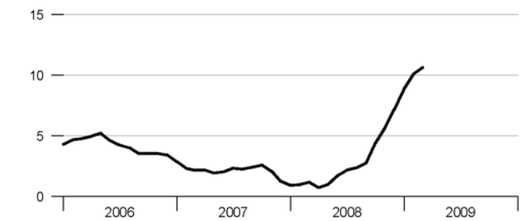
Domestic Nonfinancial Debt

Percent change from year ago



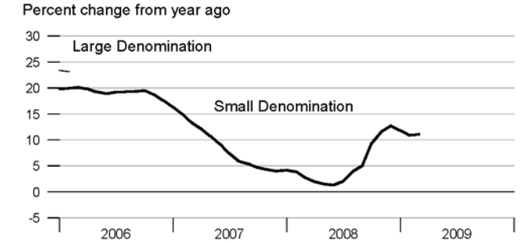
Currency Held by the Nonbank Public

Percent change from year ago



Time Deposits*

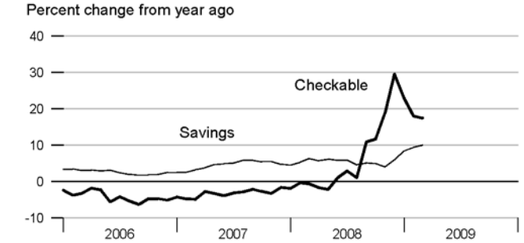
Percent change from year ago



*See table of contents for changes to the series.

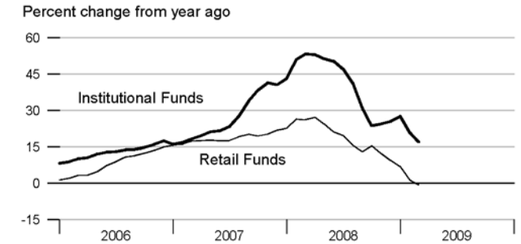
Checkable and Savings Deposits

Percent change from year ago



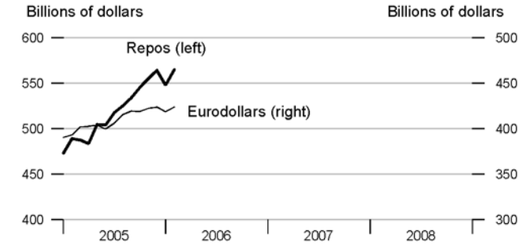
Money Market Mutual Fund Shares

Percent change from year ago



Repurchase Agreements and Eurodollars*

Billions of dollars | Billions of dollars



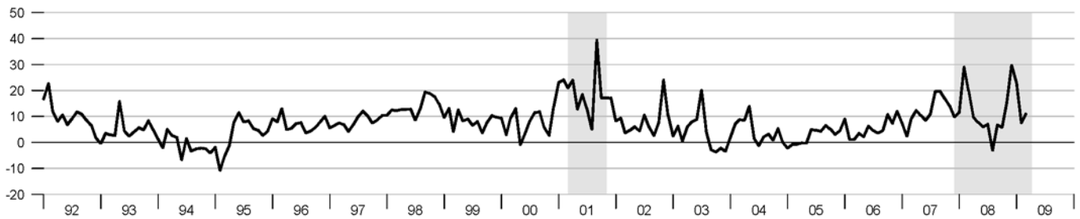
*See table of contents for changes to these series.

M1

Percent change at an annual rate

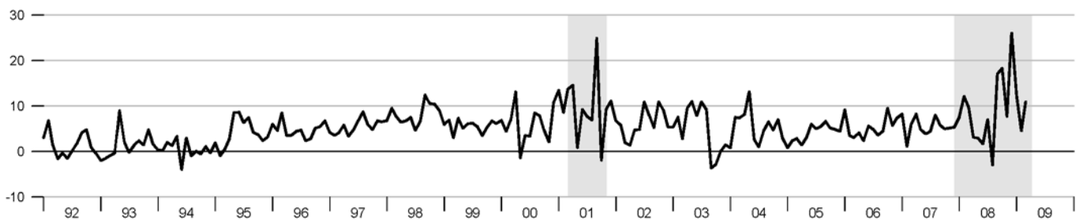
MZM

Percent change at an annual rate



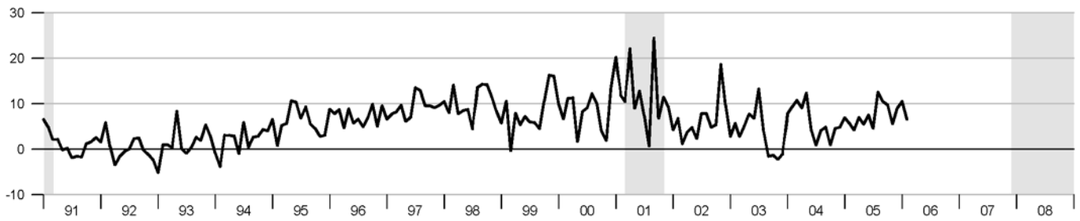
M2

Percent change at an annual rate



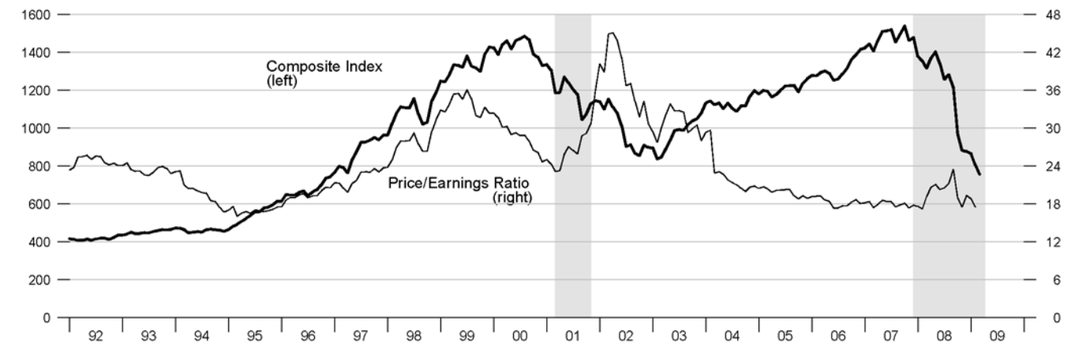
M3*

Percent change at an annual rate



*See table of contents for changes to the series.

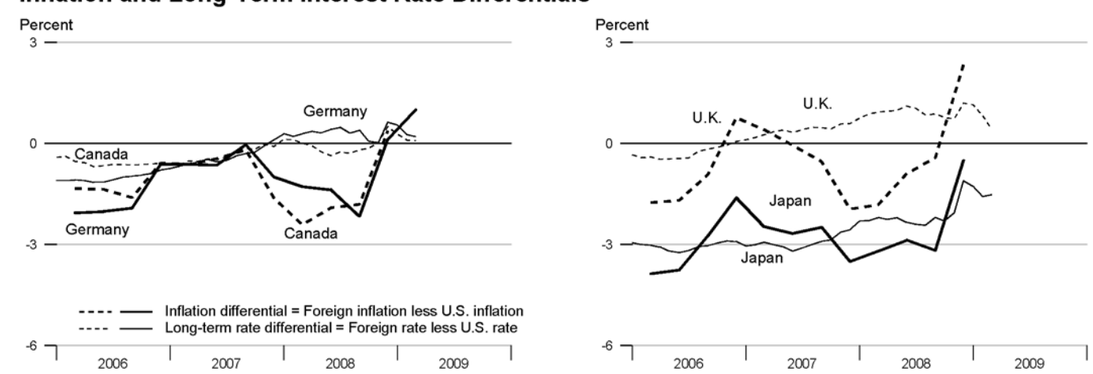
Standard & Poor's 500



Recent Inflation and Long-Term Interest Rates

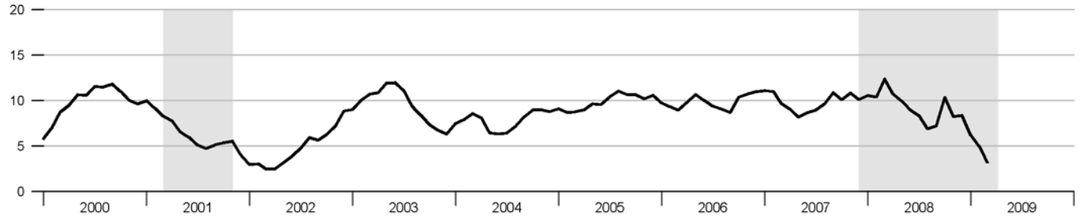
	Consumer Price Inflation Rates (Percent change from year ago)				Long-Term Government Bond Rates (Percent)			
	2008Q2	2008Q3	2008Q4	2009Q1	Dec08	Jan09	Feb09	Mar09
United States	4.27	5.23	1.53	-0.18	2.42	2.52	2.87	2.82
Canada	2.36	3.43	1.91	.	2.92	2.80	2.97	2.90
France	3.30	3.25	1.76	.	3.54	3.60	3.68	.
Germany	2.90	3.07	1.65	0.82	3.05	3.07	3.13	3.02
Italy	3.57	3.97	2.80	1.48	4.47	4.62	4.54	.
Japan	1.40	2.06	1.03	.	1.31	1.25	1.30	1.30
United Kingdom	3.37	4.81	3.88	.	3.62	3.67	3.69	3.25

Inflation and Long-Term Interest Rate Differentials



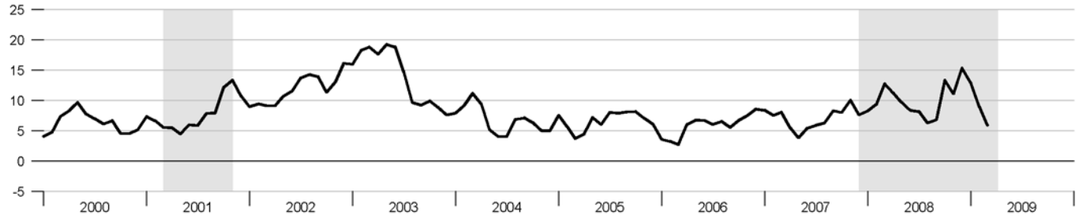
Bank Credit

Percent change from year ago



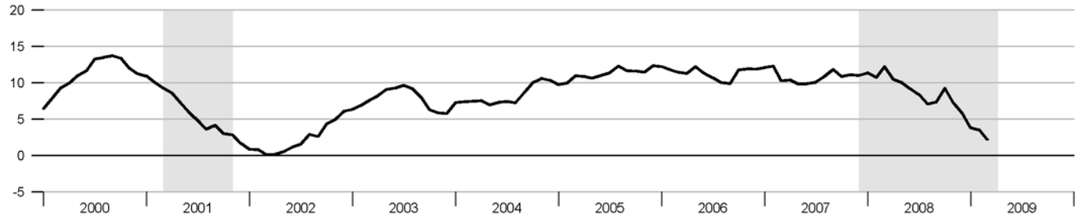
Investment Securities in Bank Credit at Commercial Banks

Percent change from year ago



Total Loans and Leases in Bank Credit at Commercial Banks

Percent change from year ago

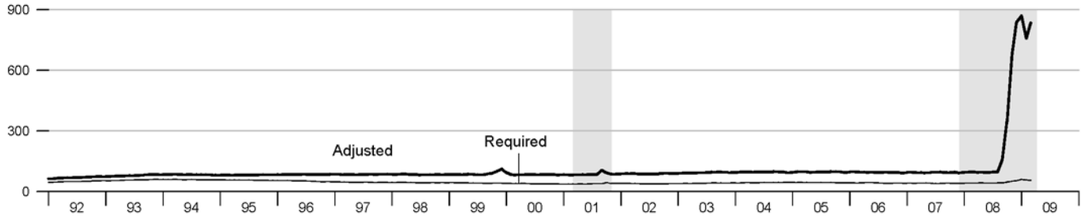


Commercial and Industrial Loans at Commercial Banks

Percent change from year ago

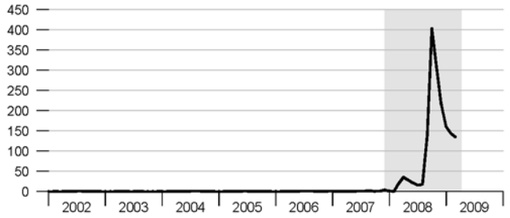
Adjusted and Required Reserves

Billions of dollars



Total Borrowings, nsa

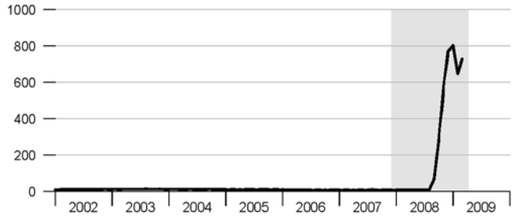
Billions of dollars



* Data exclude term auction credit

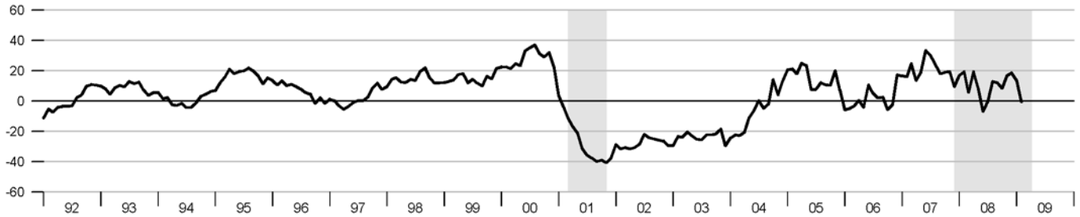
Excess Reserves plus RCB Contracts

Billions of dollars



Nonfinancial Commercial Paper

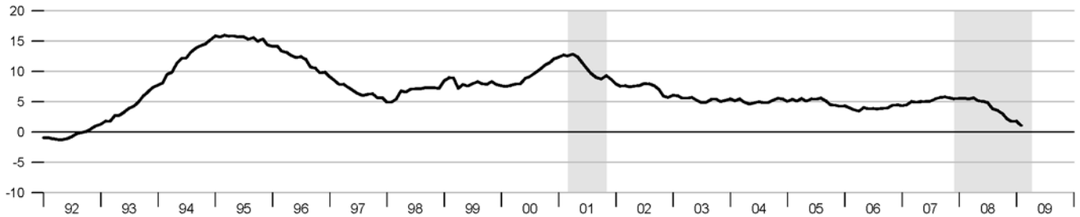
Percent change from year ago



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.

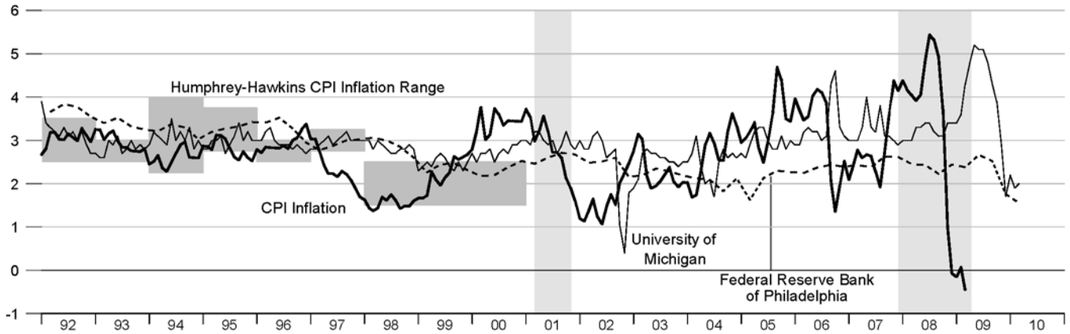
Consumer Credit

Percent change from year ago



CPI Inflation and 1-Year-Ahead CPI Inflation Expectations

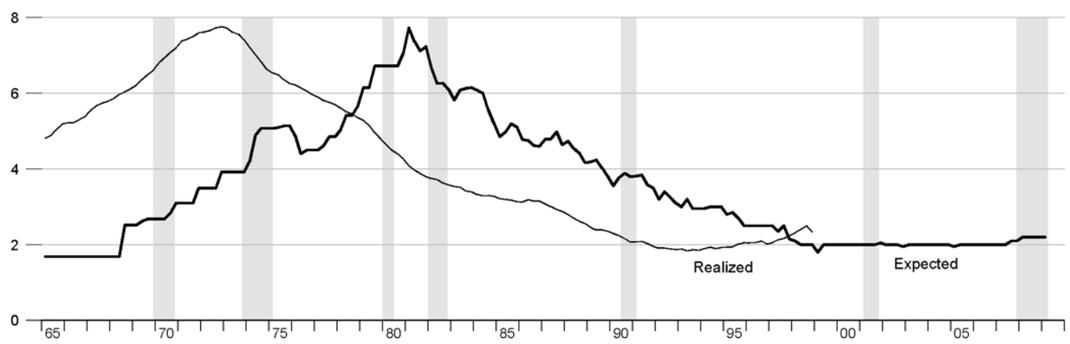
Percent



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

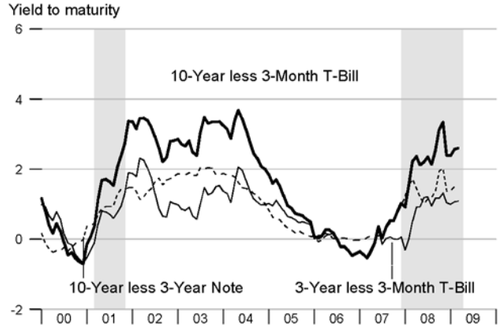
Percent



See the notes section for an explanation of the chart.

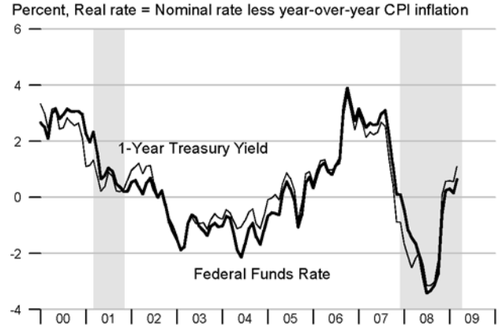
Treasury Security Yield Spreads

Yield to maturity



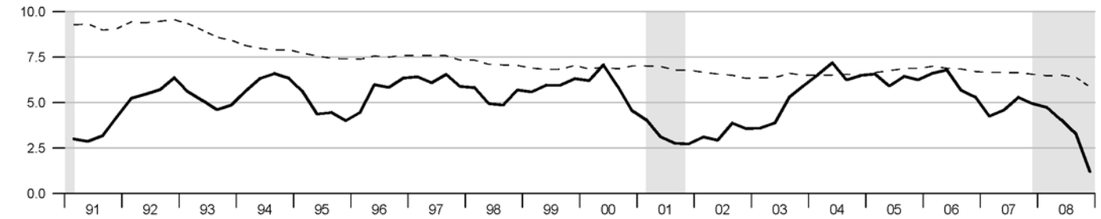
Real Interest Rates

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



Gross Domestic Product

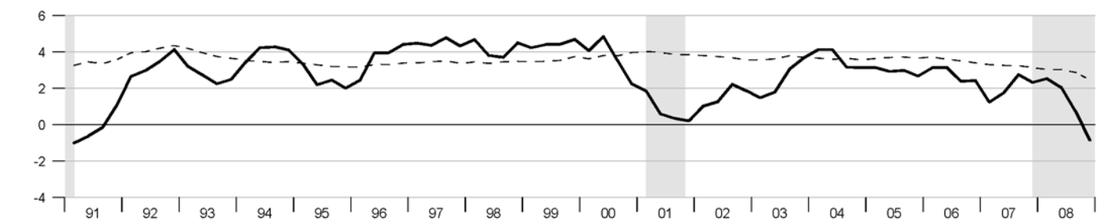
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Real Gross Domestic Product

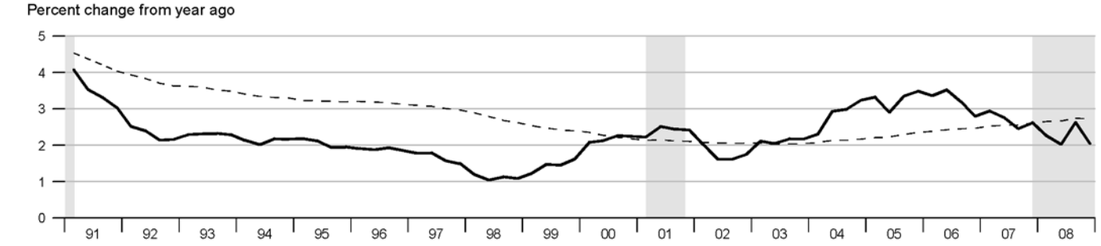
Percent change from year ago



Dashed lines indicate 10-year moving averages.

Gross Domestic Product Price Index

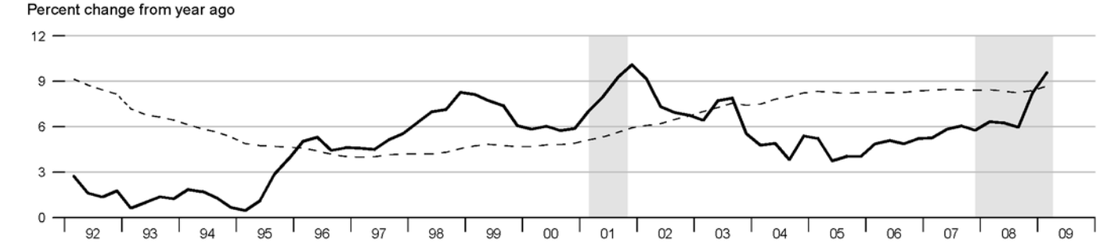
Percent change from year ago



Dashed lines indicate 10-year moving averages.

M2

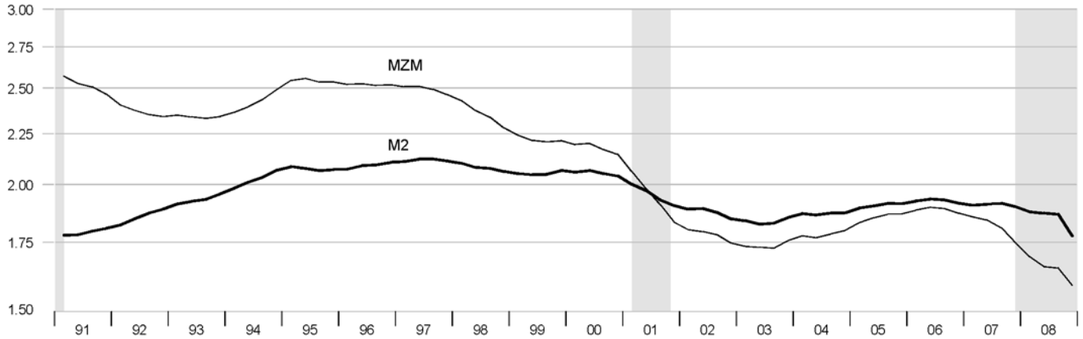
Percent change from year ago



Dashed lines indicate 10-year moving averages.

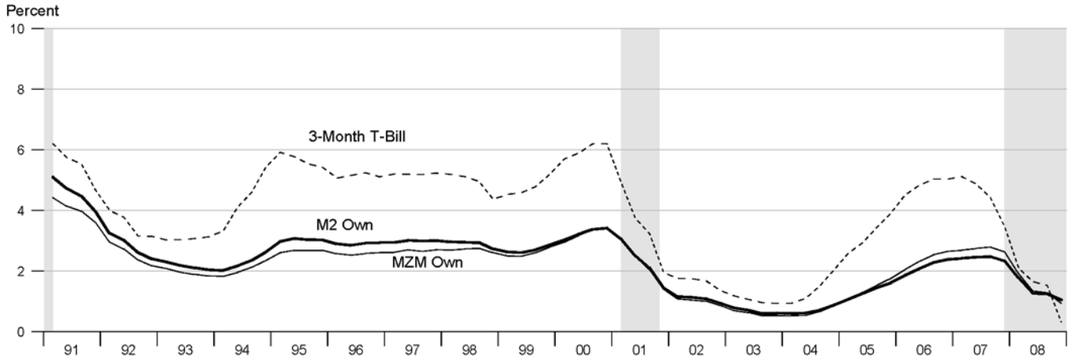
Velocity

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



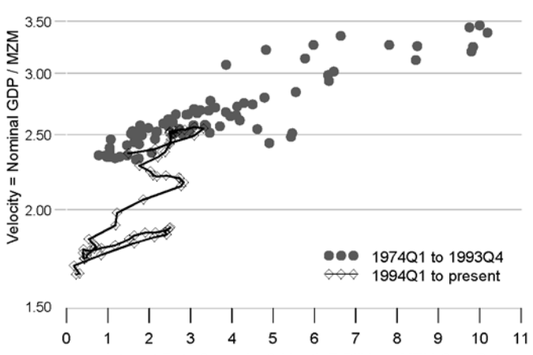
Interest Rates

Percent



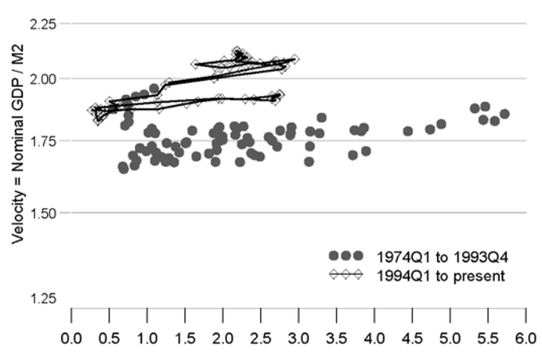
MZM Velocity and Interest Rate Spread

Ratio Scale



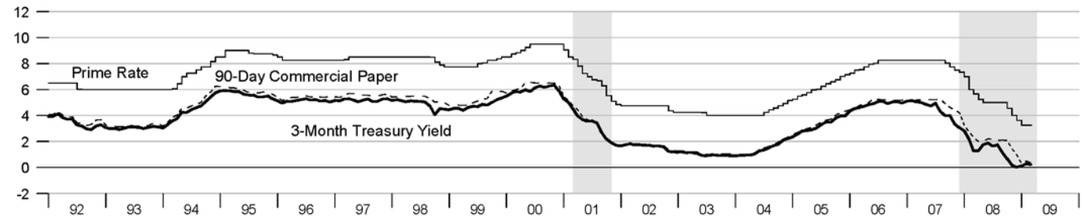
M2 Velocity and Interest Rate Spread

Ratio Scale



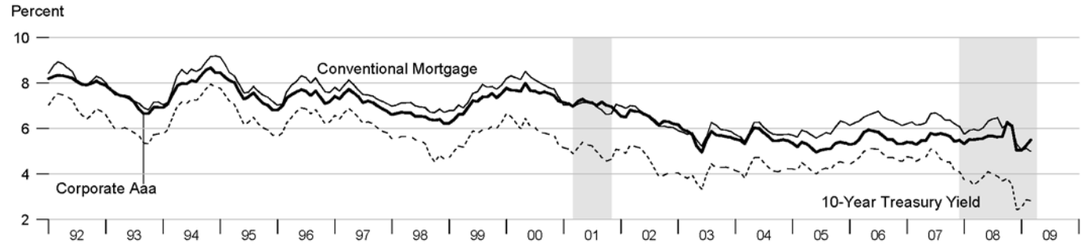
Short-Term Interest Rates

Percent



Long-Term Interest Rates

Percent

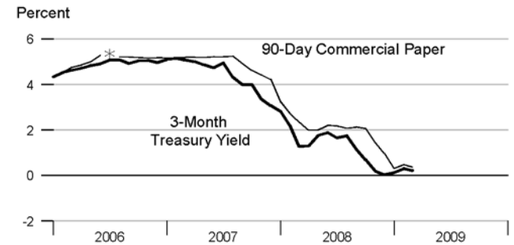


Long-Term Interest Rates

Percent

Short-Term Interest Rates

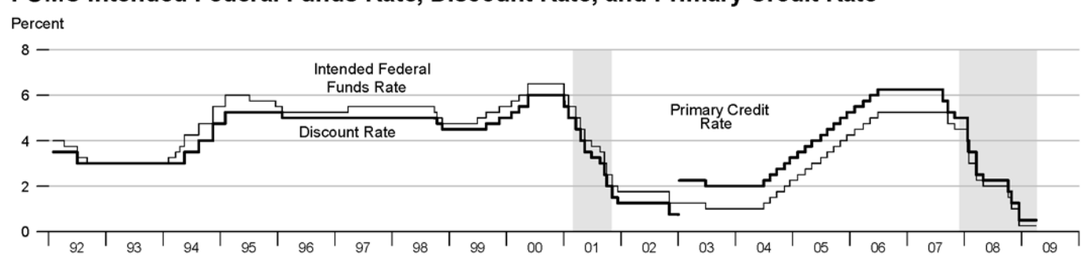
Percent



*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

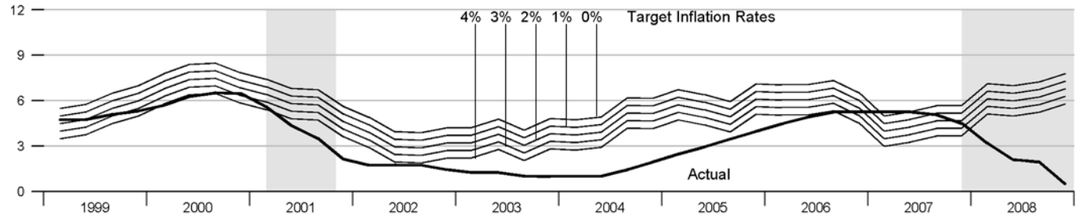
Percent



Data available as of January 2009.

Federal Funds Rate and Inflation Targets

Percent



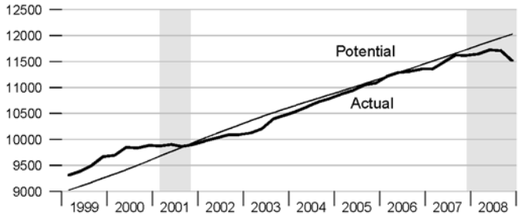
Calculated federal funds rate is based on Taylor's rule.

See notes on page 19.

Components of Taylor's Rule

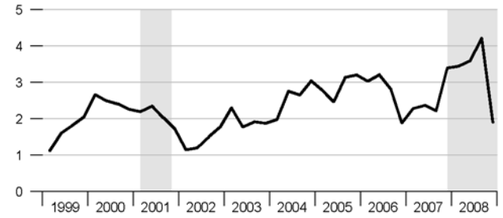
Actual and Potential Real GDP

Billions of chain-weighted 2000 dollars



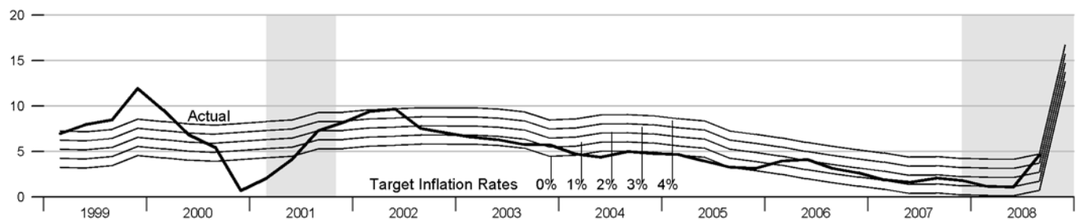
PCE Inflation

Percent change from year ago



Monetary Base Growth* and Inflation Targets

Percent



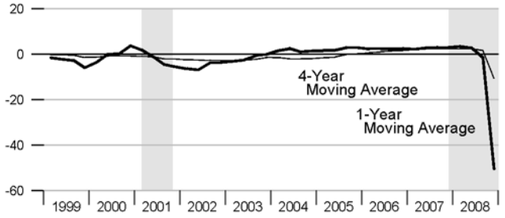
*Modified for the effects of sweeps programs on reserve demand.
Calculated base growth is based on McCallum's rule. Actual base growth is percent change from year ago.

See notes on page 19.

Components of McCallum's Rule

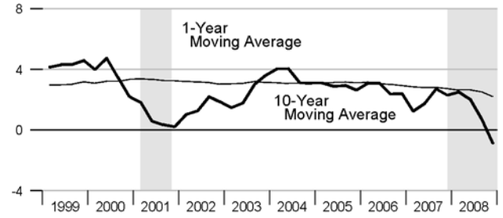
Monetary Base Velocity Growth

Percent



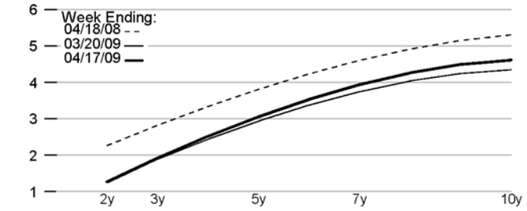
Real Output Growth

Percent



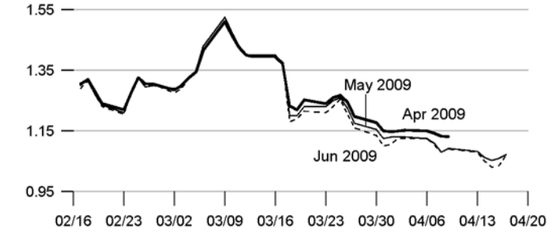
Implied One-Year Forward Rates

Percent



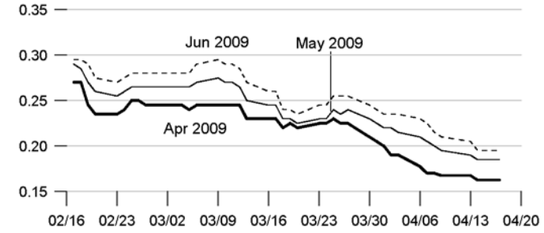
Rates on 3-Month Eurodollar Futures

Percent, daily data



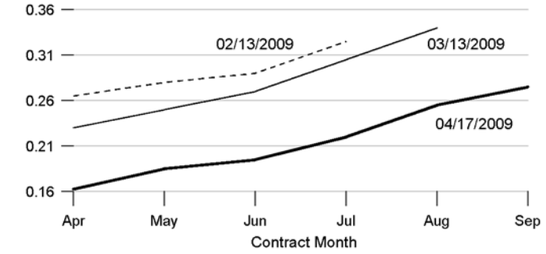
Rates on Selected Federal Funds Futures Contracts

Percent, daily data



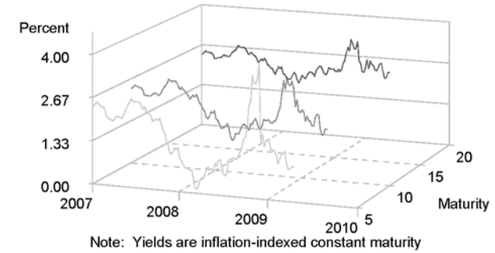
Rates on Federal Funds Futures on Selected Dates

Percent



Inflation-Indexed Treasury Securities

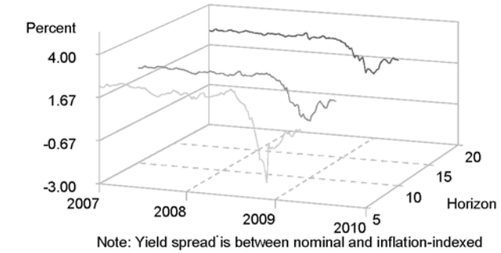
Weekly data



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

Inflation-Indexed Treasury Yield Spreads

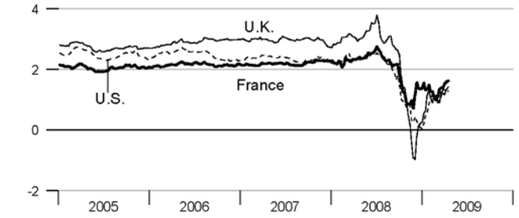
Weekly data



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