

The Effects of Large-Scale Asset Purchases on TIPS Inflation Expectations

Policymakers have recently debated whether the U.S. economy may be falling into a Japanese-style “deflationary trap.”¹ Deflation is a persistent decline in the general level of prices. There is some debate as to whether deflation is responsible for slow growth, or whether it is merely a symptom of other factors contributing to slow growth. Some economists believe deflation slows growth by keeping the real rate of interest—the nominal interest rate less the inflation rate—excessively high. If this is true, one way to promote consumer and investment demand is to lead people to expect at least small amounts of inflation.

One proposal to avoid the adverse consequences of deflation suggests that a large monetary stimulus to create “healthy” (positive) inflation expectations may reduce real interest rates and thus promote growth. In particular, analysts have suggested the Federal Open Market Committee (FOMC) should reprise its large-scale asset purchases (LSAPs) of Treasuries and mortgage-backed securities. Their rationale is that LSAPs have successfully reduced the nominal yields on medium- and long-term Treasuries by 50 to 70 annualized basis points. These lower yields directly lower the cost of government borrowing and stimulate investment and consumption by households and firms. LSAPs could also reduce real rates by increasing inflation expectations.

Have the announcements of past asset purchases raised inflation expectations? To find out we examine expectations from 10-year Treasury Inflation-Protected Securities (TIPS) in two-day windows around three important Fed LSAP announcements dates.² We equate the nominal yields of 10-year Treasury notes with the real yields of 10-year TIPS to compute “break-even” (TIPS-implied) inflation expectations. We use a two-day

window because research shows market participants require more time to fully react to news open to interpretation.

The table shows that inflation expectations appear to react modestly to LSAP announcements, between 7 and 18 basis points per annum. The March 18, 2009, FOMC announcement appears to have increased 10-year expected annual inflation by 18 basis points. Numbers in parentheses indicate the proportion of two-day changes between June 2005 and May 2010 that were larger in absolute value than the observed change. For example, for March 18, expectations increased or decreased more than 18 basis points in only 3 percent of all possible two-day windows; thus, it is unlikely this increase occurred by chance. However, the November 25 and December 1 changes are small and possibly unrelated to the announcements. Although the 34-basis-point sum of the effects is not negligible, these effects do not necessarily correspond to the final, permanent reactions of inflation expectations, and disentangling the net, long-run effects of policy actions from normal market volatility remains difficult. Inflation expectations appear to rise after the announcements, however, which implies LSAPs may have limited power to raise TIPS-implied inflation expectations—something that might appeal to policymakers fighting deflation.

—Massimo Guidolin and Christopher J. Neely

¹ See James Bullard, “Seven Faces of ‘The Peril,’” *Federal Reserve Bank of St. Louis Review*, September/October 2010, 92(5) pp. 339-52.

² November 25, 2008: LSAPs announced; December 1, 2008: Chairman Bernanke acknowledges possible Fed purchases of longer-dated Treasuries; March 18, 2009: The FOMC commits to buy up to \$300 billion of Treasuries and expand its agency and mortgage-backed securities purchase program.

Two-Day Reaction of 10-Year TIPS Inflation Expectations to LSAP Announcements

	November 25, 2008	December 1, 2008	March 18, 2009	Sum
Implied 10-year break-even inflation rate (basis points)	7 (0.16)	9 (0.11)	18 (0.03)	34 (0.01)

NOTE: Pseudo *p*-values are in parentheses. See Christopher Neely, “The Large Scale Asset Purchases Had Large International Effects.” Working paper 2010-018A, Federal Reserve Bank of St. Louis, July 2010; <http://research.stlouisfed.org/wp/2010/2010-018.pdf>.

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Conventions used in this publication:

1. Except where otherwise noted, solid shading indicates recessions, as determined by the National Bureau of Economic Research. The NBER has not yet determined the end of the recession that began in December 2007; however, the hatched shading shows that the recession ended in July 2009. We made this determination based on a statistical model for dating business cycle turning points developed by Marcelle Chauvet and Jeremy Piger (“A Comparison of the Real-Time Performance of Business Cycle Dating Methods,” *Journal of Business and Economic Statistics*, 2008, 26, 42-49). For more information, see http://www.uoregon.edu/~jpiger/us_recession_probs.htm.
2. *Percent change* refers to simple percent changes. *Percent change from year ago* refers to the percent change from the same month or quarter during the previous year. *Compounded annual rate of change* shows what the growth rate would be over an entire year if the same simple percent change continued for four quarters or twelve months. The compounded annual rate of change of x between the previous quarter $t-1$ and the current quarter t is: $[(x_t/x_{t-1})^4 - 1] \times 100$. For monthly data replace 4 with 12.
3. All data with significant seasonal patterns are adjusted accordingly, unless labeled NSA.

We welcome your comments addressed to:

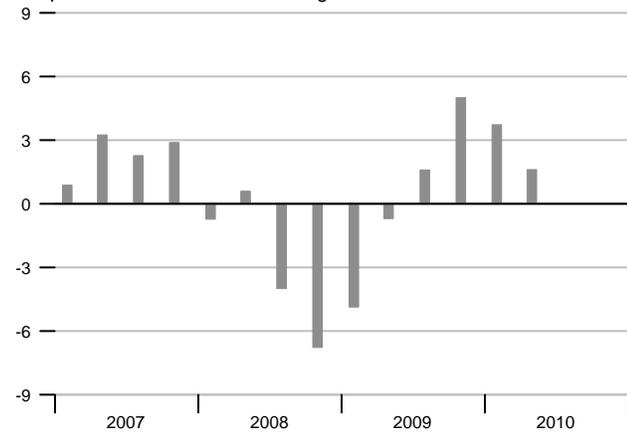
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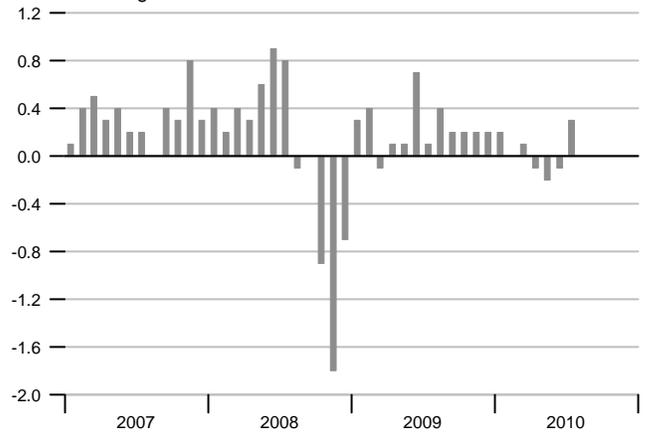
Real GDP Growth

Compounded annual rates of change



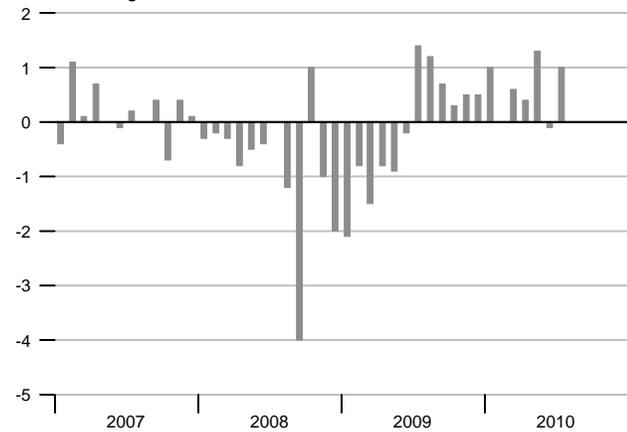
Consumer Price Index

Percent change



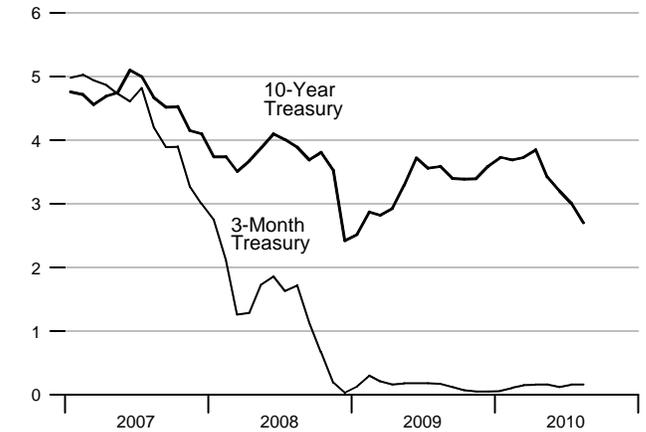
Industrial Production

Percent change



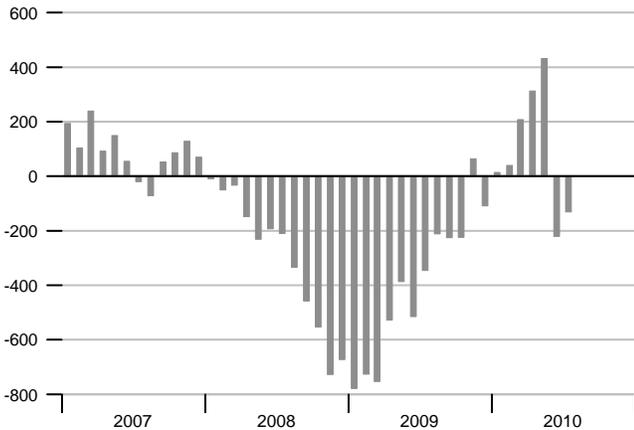
Interest Rates

Percent



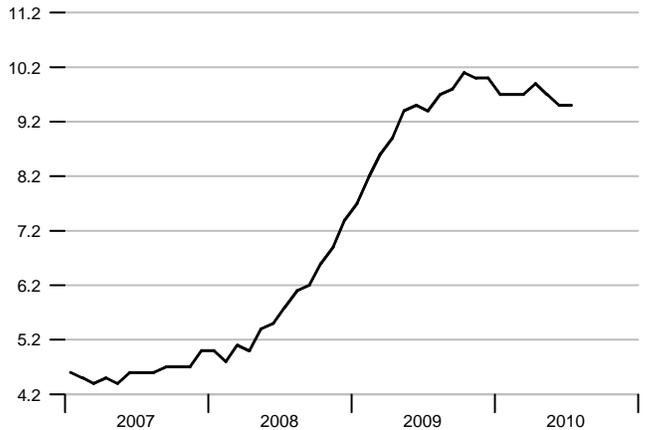
Change in Nonfarm Payrolls

Thousands



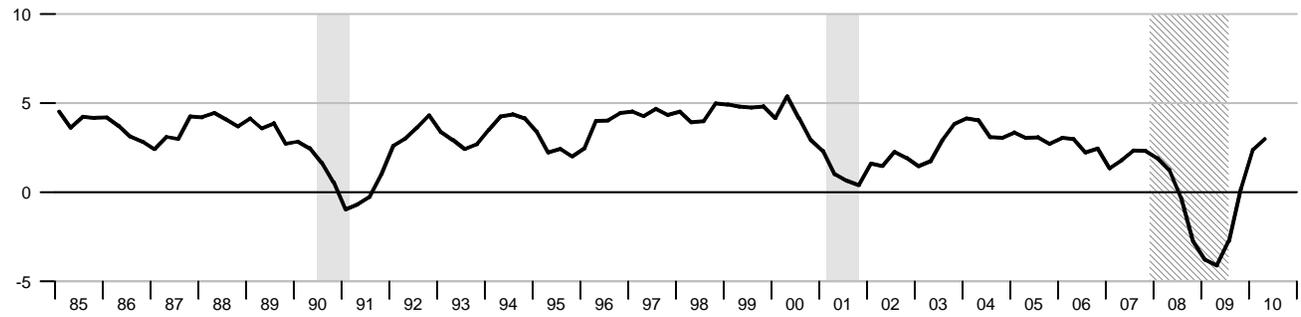
Unemployment Rate

Percent of labor force



Real Gross Domestic Product

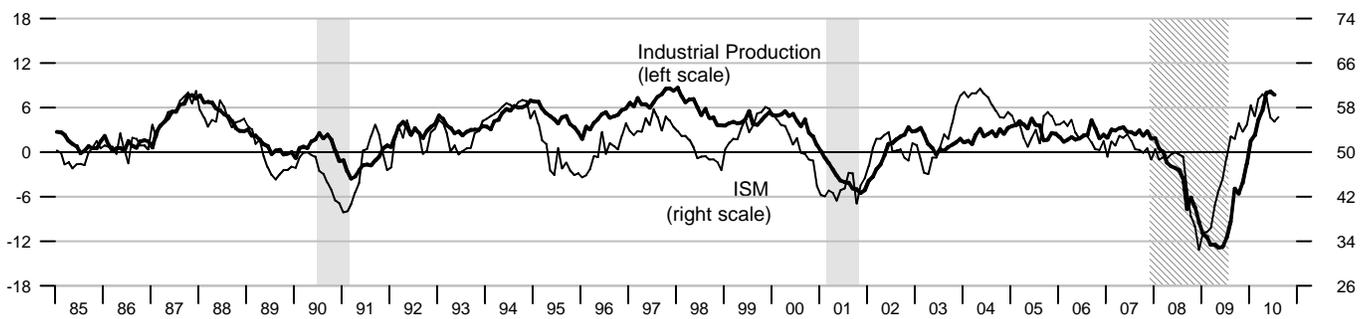
Percent change from year ago



Industrial Production and Institute for Supply Management (ISM) Indexes

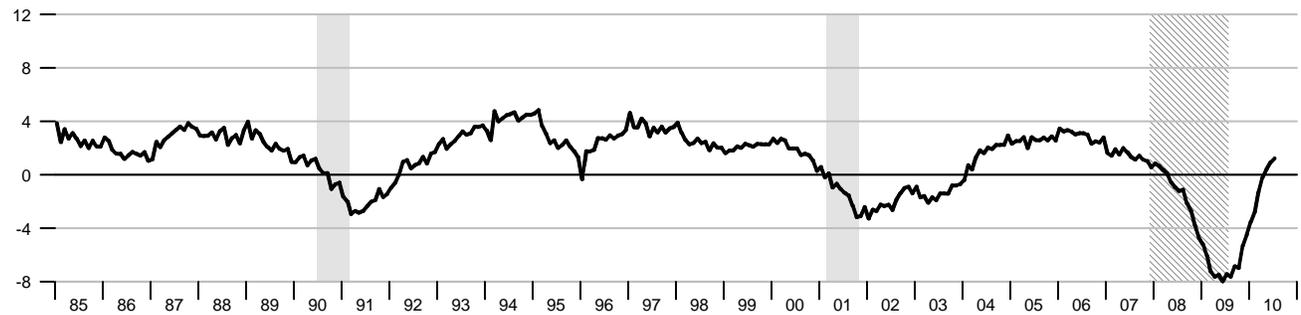
Percent change from year ago

Index



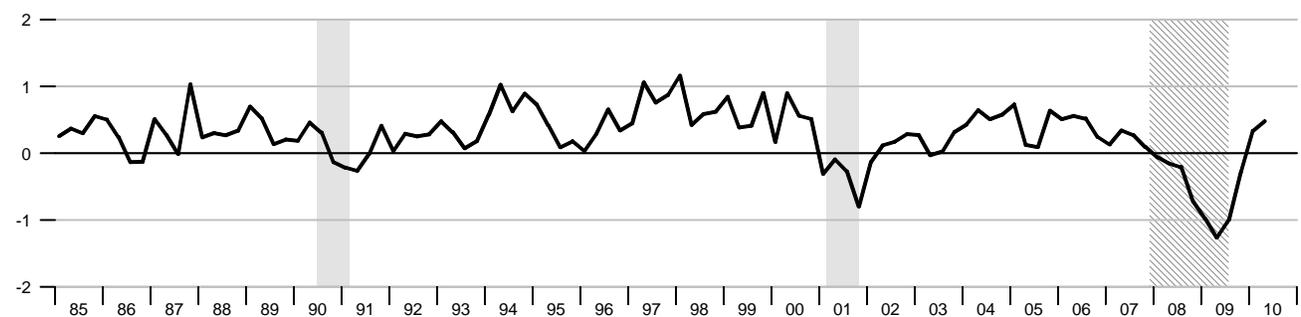
Aggregate Private Nonfarm Hours

Percent change from year ago



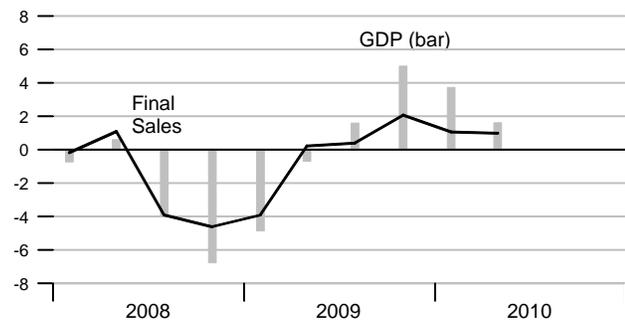
Real Change in Private Inventories

Percent of GDP



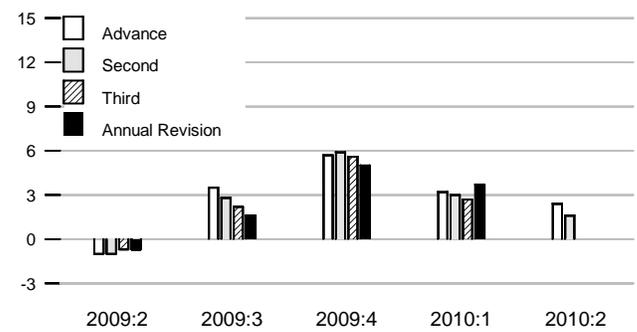
Real Final Sales and GDP

Compounded annual rates of change



Real GDP Revisions

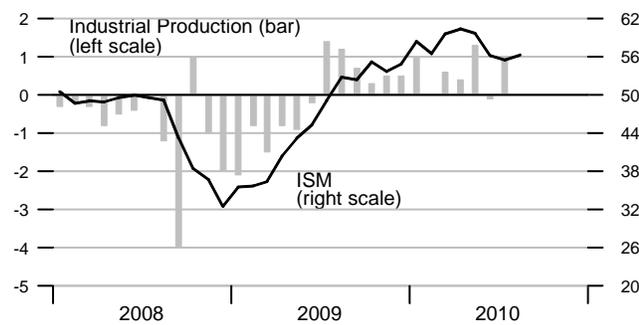
Compounded annual rates of change



Industrial Production and ISM Index

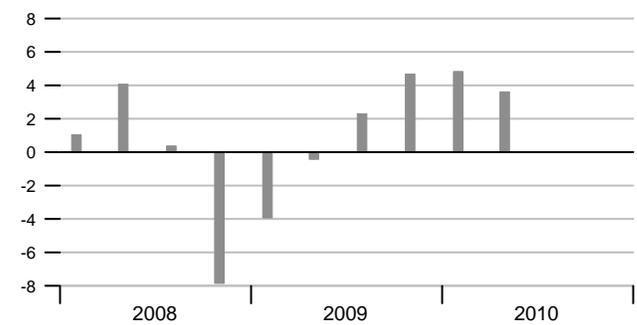
Percent change

Index



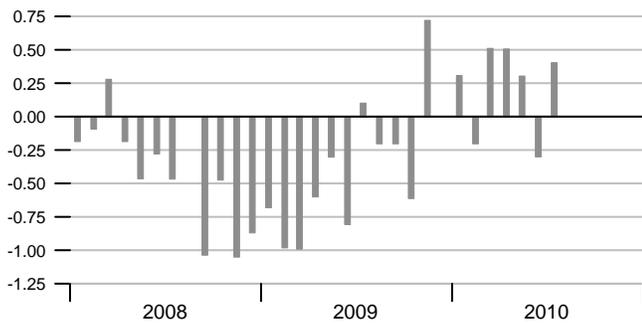
Nominal Gross Domestic Product

Compounded annual rates of change



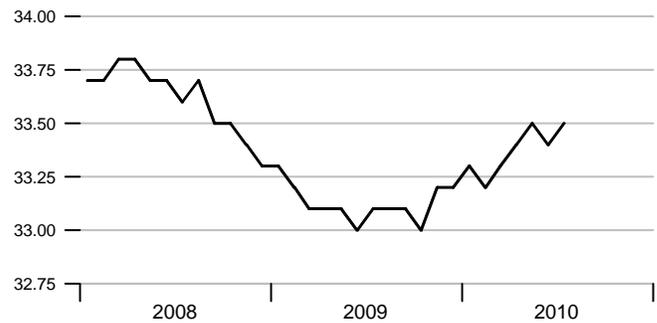
Aggregate Private Nonfarm Hours

Percent change



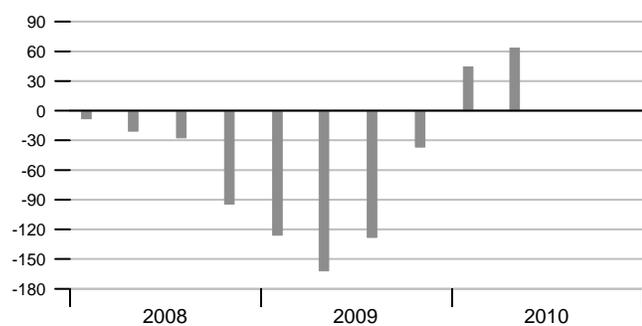
Average Weekly Private Nonfarm Hours

Hours



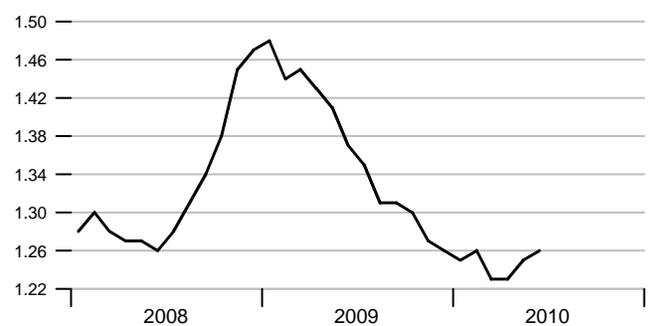
Real Change in Private Inventories

Billions of 2005 dollars



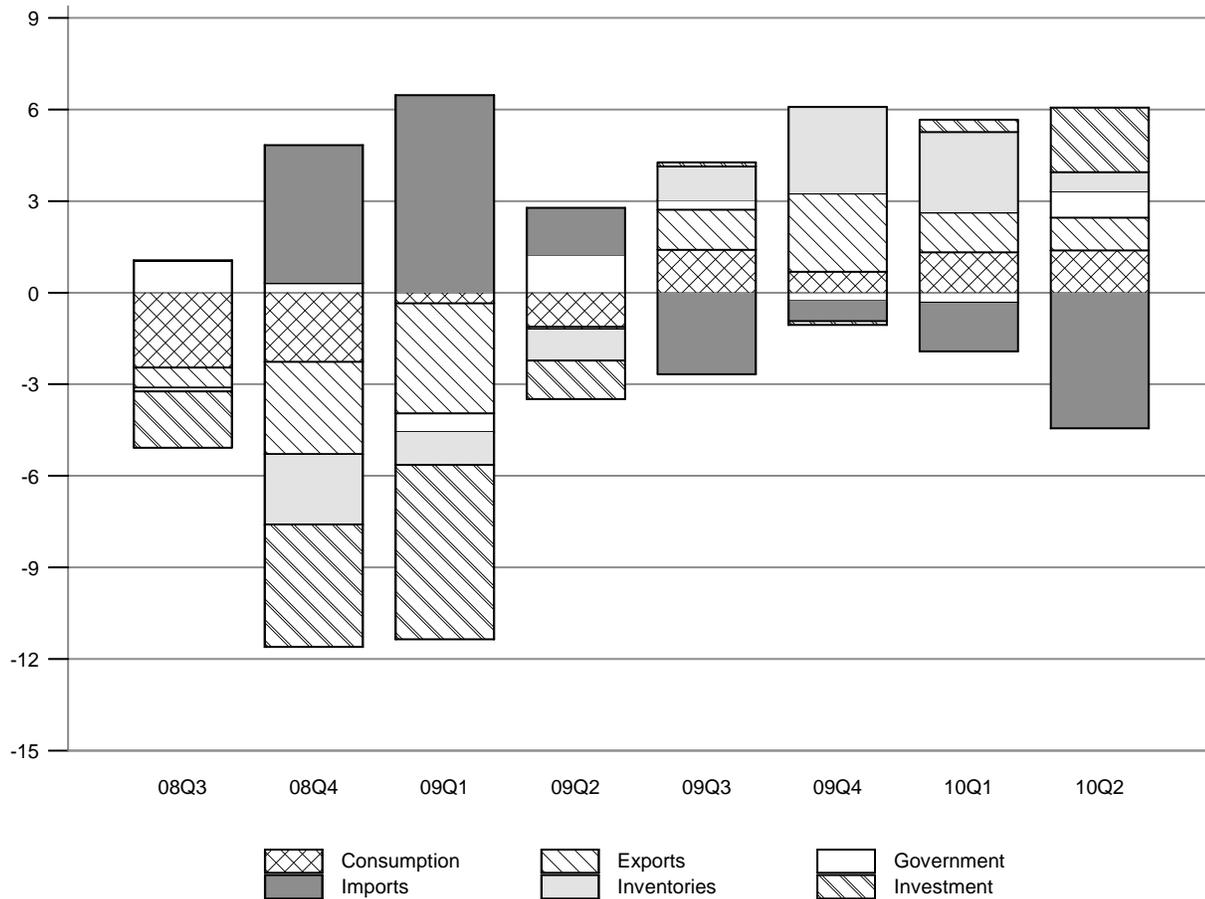
Inventory-Sales Ratio

Manufacturing and trade



Contribution of Components to Real GDP Growth

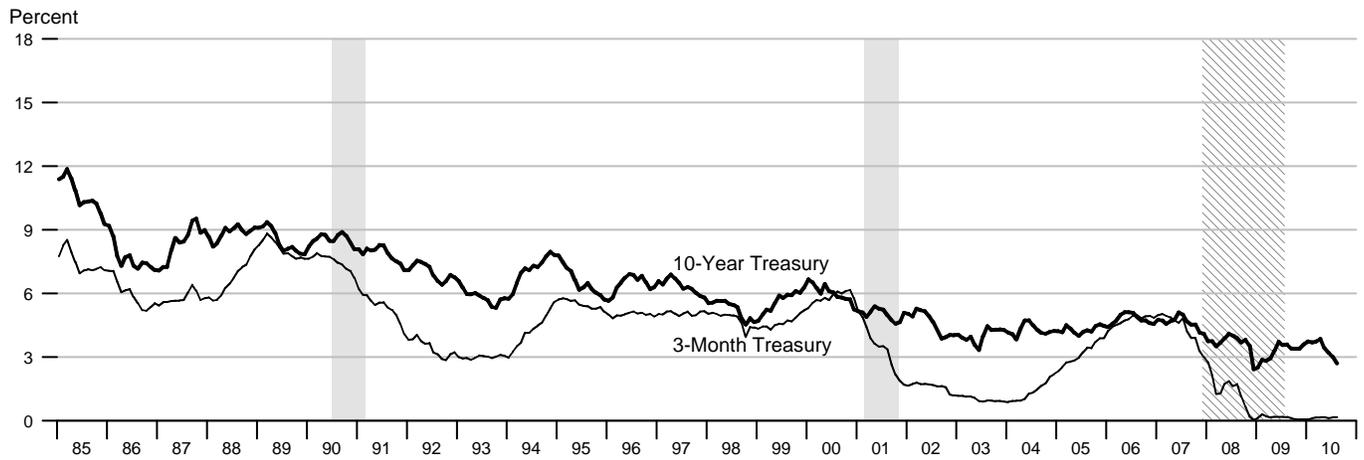
Percentage points at compounded annual rates



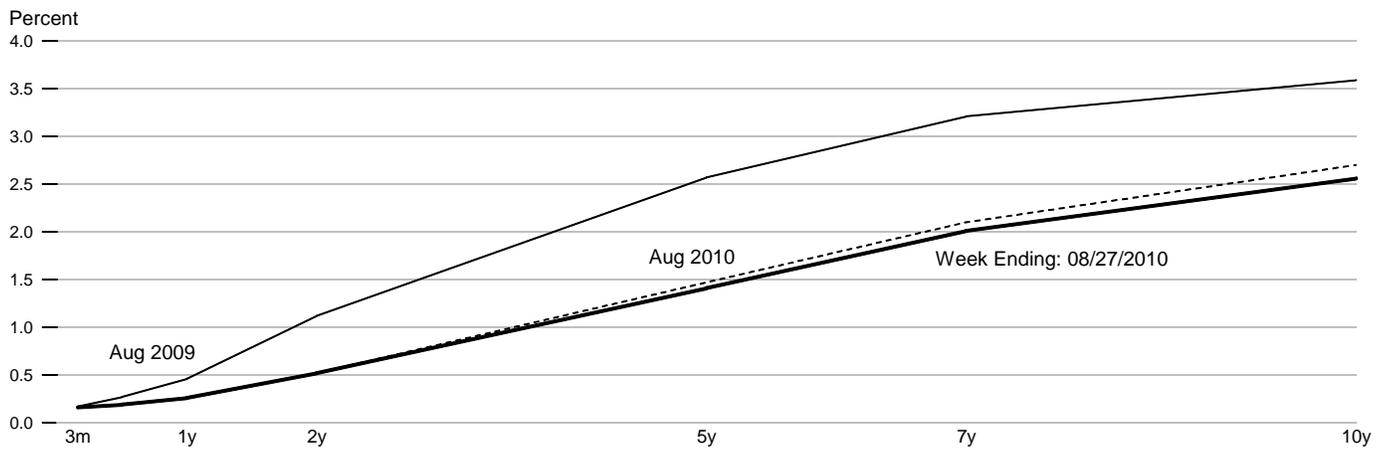
Contributions to Real GDP Growth Rate

	2008		2009				2010	
	3rd	4th	1st	2nd	3rd	4th	1st	2nd
Final Sales	-3.88	-4.46	-3.78	0.33	0.50	2.18	1.09	0.98
Consumption	-2.46	-2.26	-0.34	-1.12	1.41	0.69	1.33	1.38
Fixed Investment	-1.83	-4.01	-5.71	-1.26	0.12	-0.12	0.39	2.12
Nonresidential	-1.00	-2.84	-4.49	-0.72	-0.13	-0.10	0.71	1.54
Residential	-0.84	-1.18	-1.22	-0.54	0.25	-0.02	-0.32	0.58
Government	1.04	0.31	-0.61	1.24	0.33	-0.28	-0.32	0.86
Federal	1.00	0.61	-0.40	1.11	0.45	0.01	0.15	0.72
State and Local	0.04	-0.30	-0.21	0.13	-0.12	-0.29	-0.48	0.14
Net Exports	-0.63	1.50	2.88	1.47	-1.37	1.90	-0.31	-3.37
Exports	-0.66	-3.03	-3.61	-0.08	1.30	2.56	1.30	1.08
Imports	0.03	4.53	6.48	1.55	-2.67	-0.66	-1.61	-4.45
Change in Inventory	-0.12	-2.31	-1.09	-1.03	1.10	2.83	2.64	0.63
Residual	0.18	0.16	0.19	0.27	0.24	-0.04	0.03	-0.19
Real GDP Growth	-4.00	-6.77	-4.87	-0.70	1.60	5.01	3.73	1.61

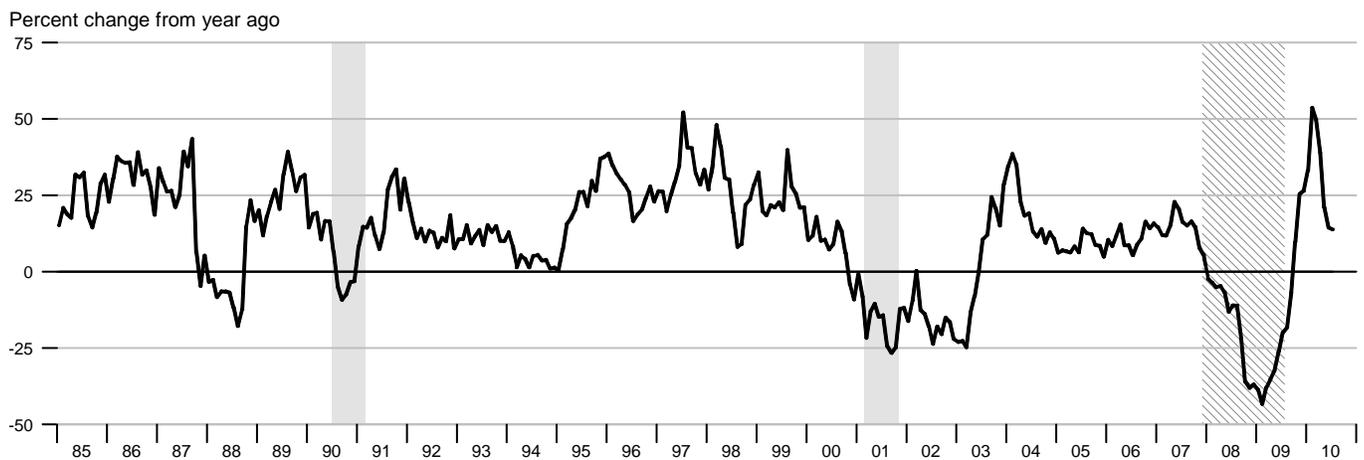
Interest Rates



Treasury Yield Curve

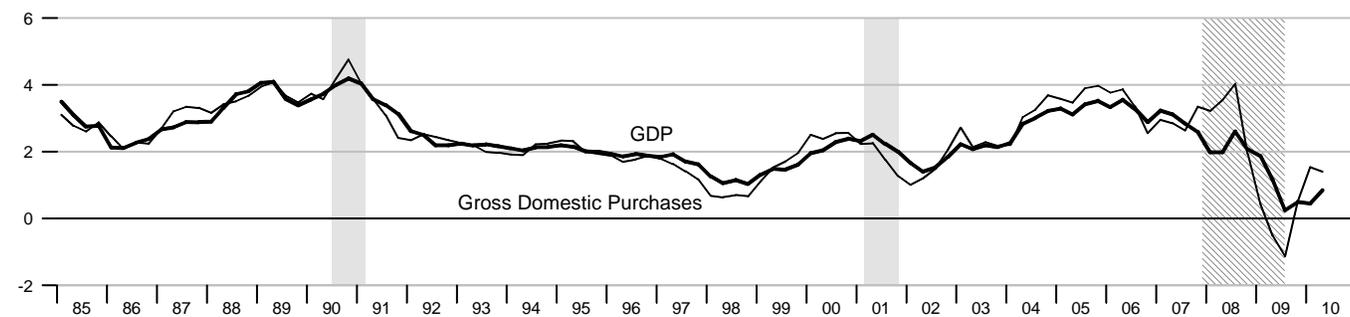


Standard and Poor's 500 Index with Reinvested Dividends



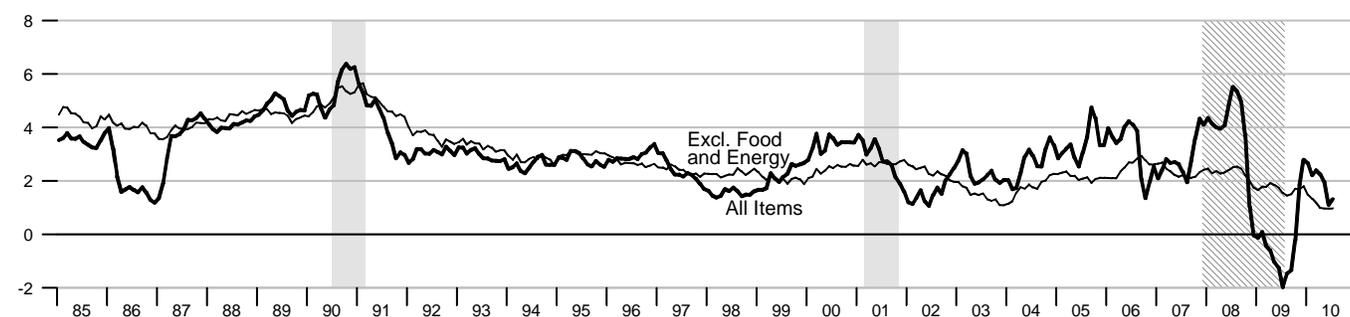
NIPA Chain Price Indexes

Percent change from year ago



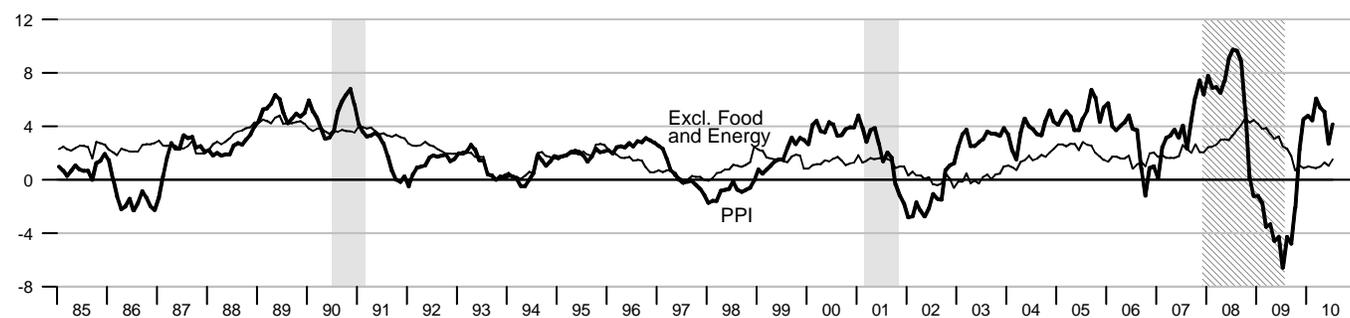
Consumer Price Index

Percent change from year ago



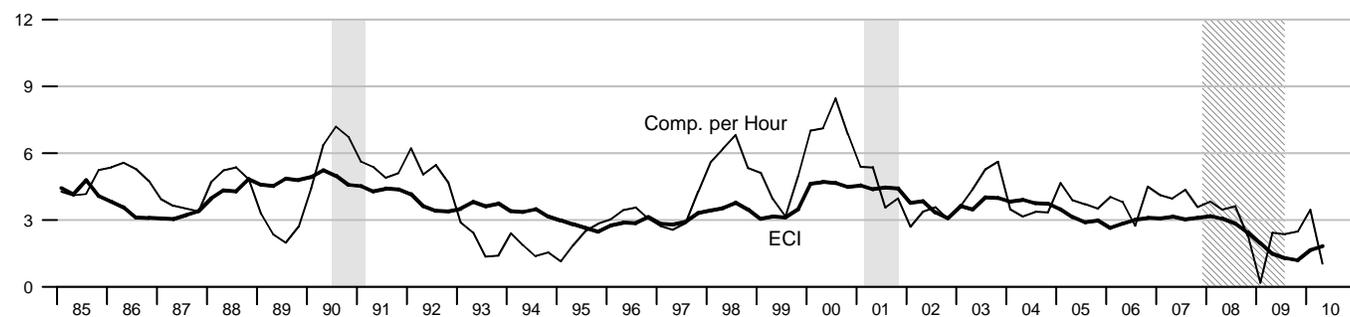
Producer Price Index, Finished Goods

Percent change from year ago

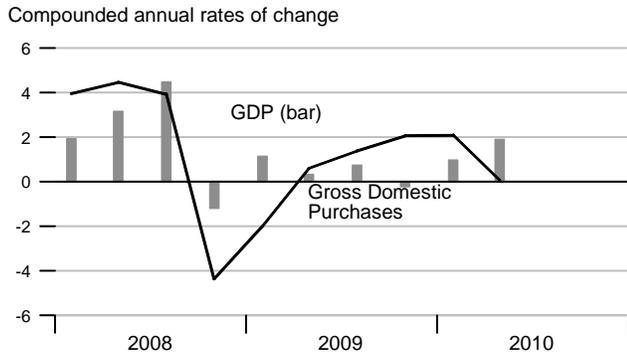


Employment Cost Index and Compensation per Hour

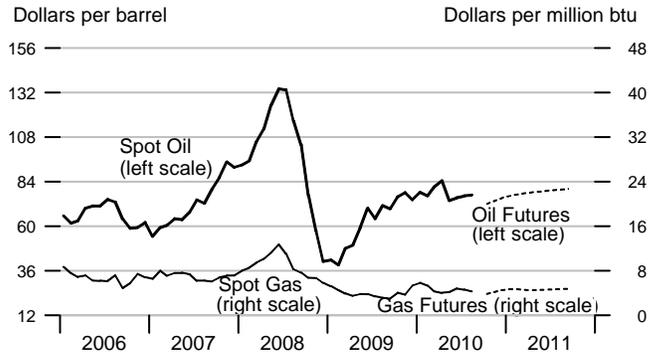
Percent change from year ago



NIPA Chain Price Indexes

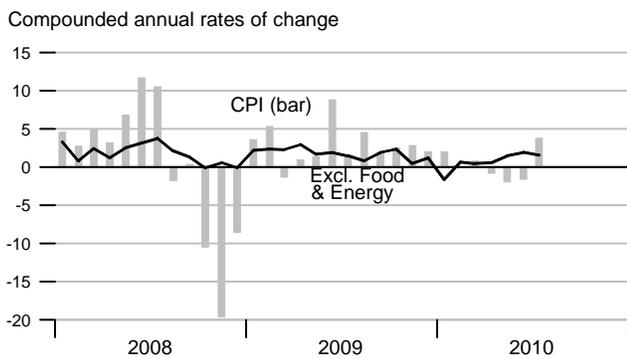


Oil & Natural Gas Prices: Spot & Futures

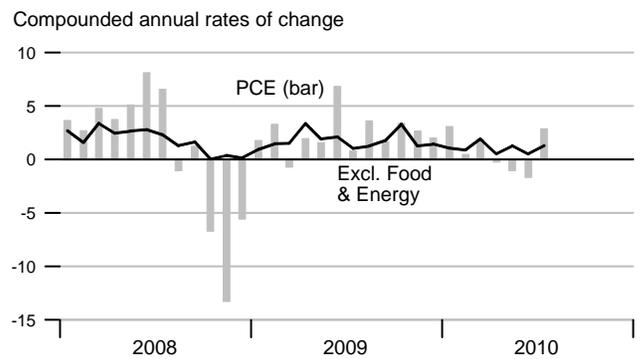


Note: Futures prices as of 8/31/2010.

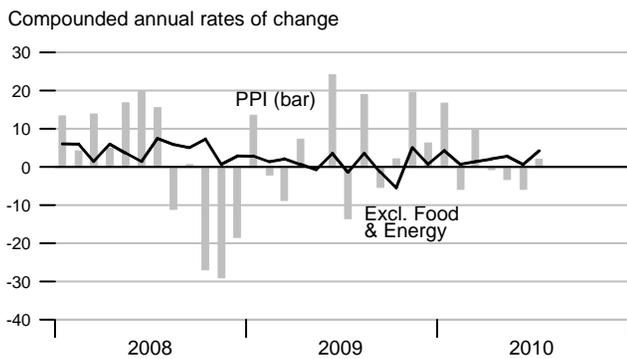
Consumer Price Index



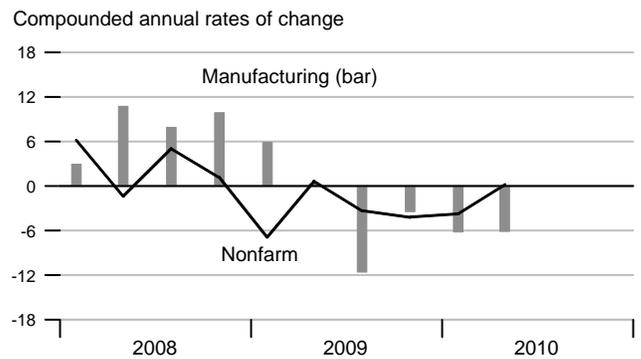
Consumption Chain Price Index



Producer Price Index, Finished Goods



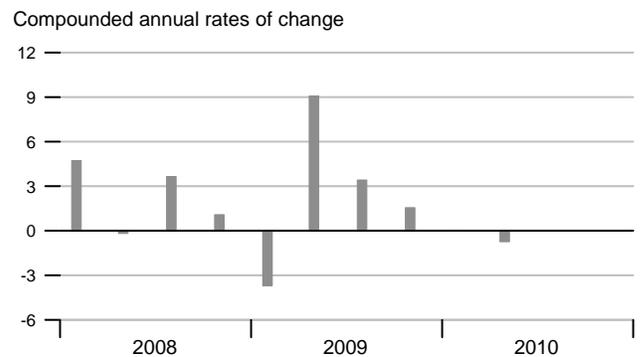
Unit Labor Cost



Employment Cost Index

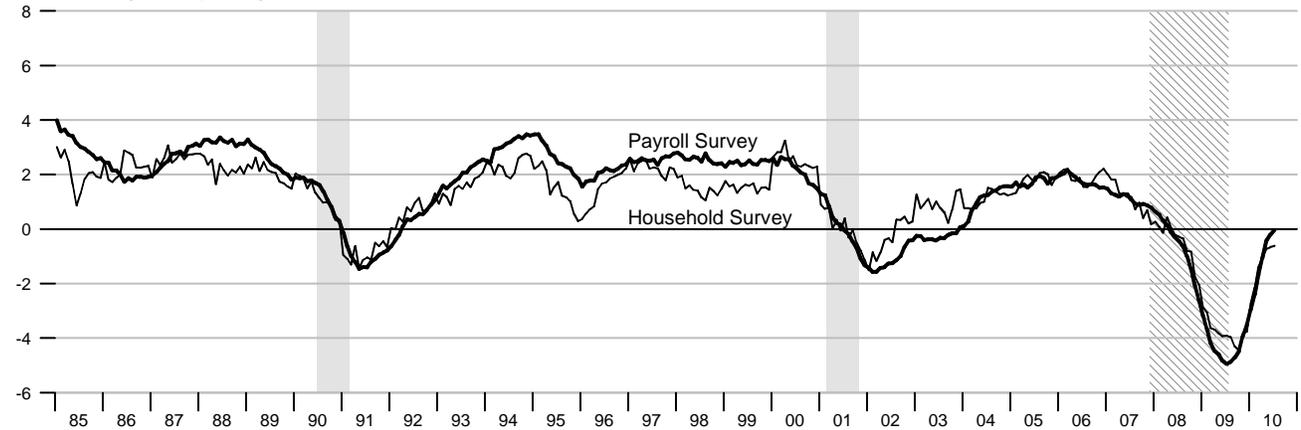


Compensation per Hour



Employment

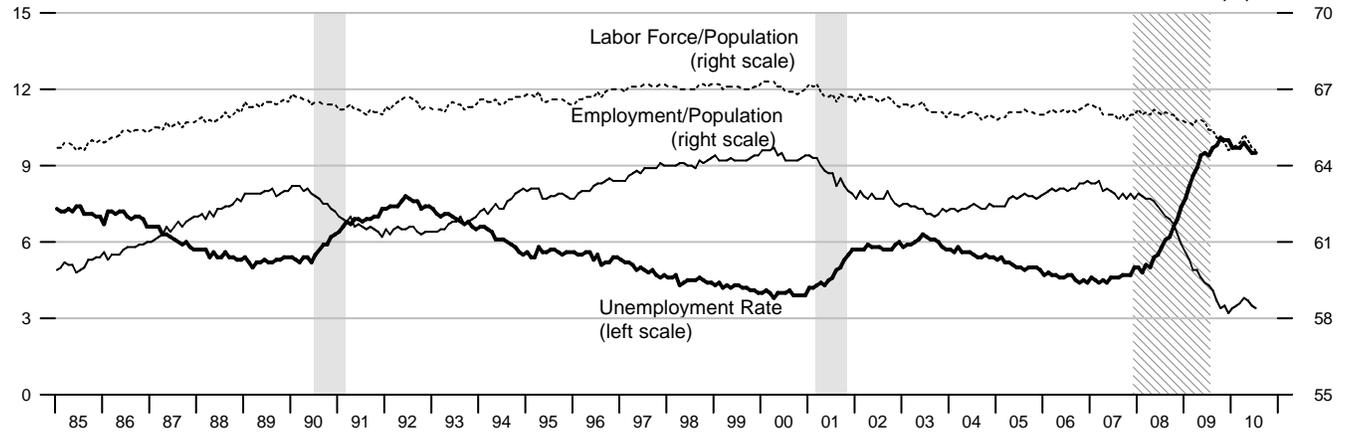
Percent change from year ago



Unemployment, Labor Force Participation, and Employment Rates

Percent of labor force

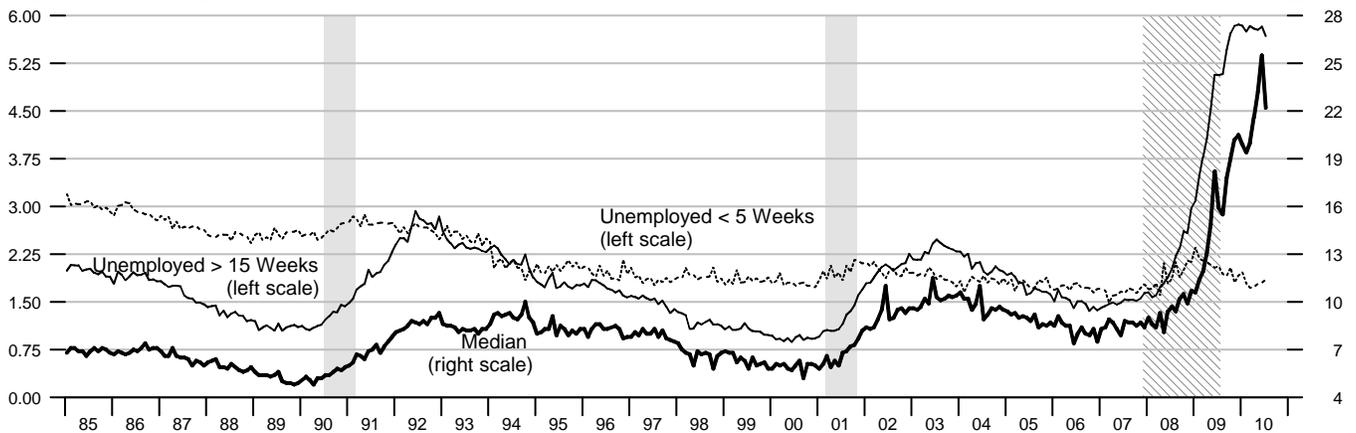
Percent of population



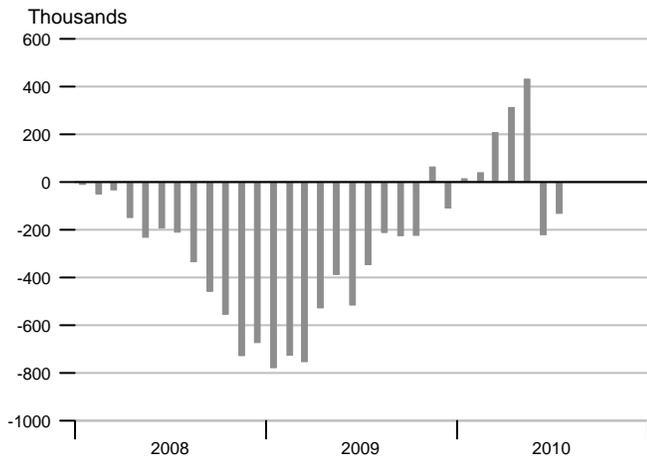
Duration of Unemployment

Percent of labor force

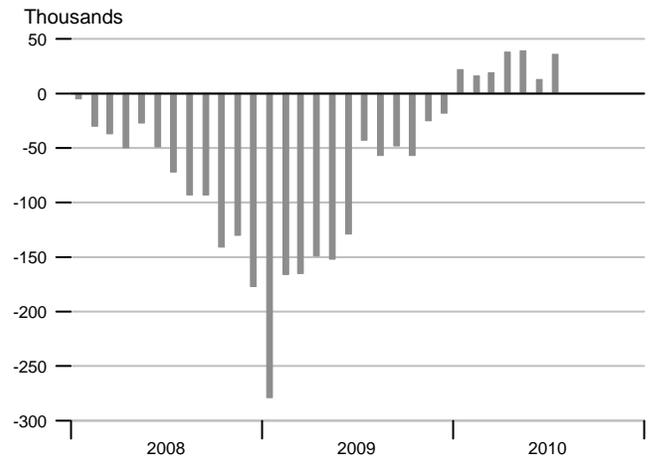
Weeks



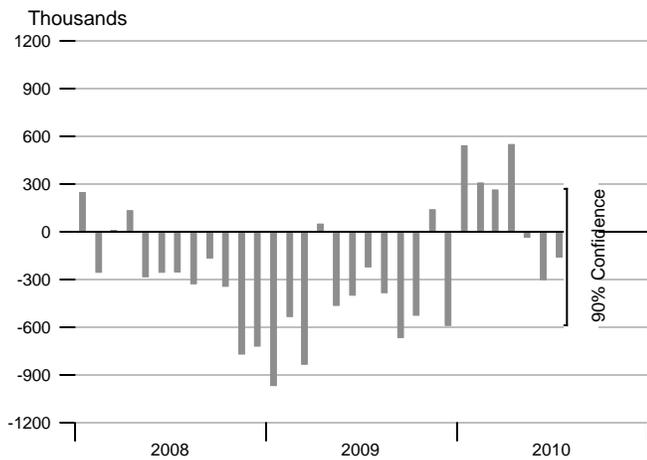
Change in Nonfarm Payrolls



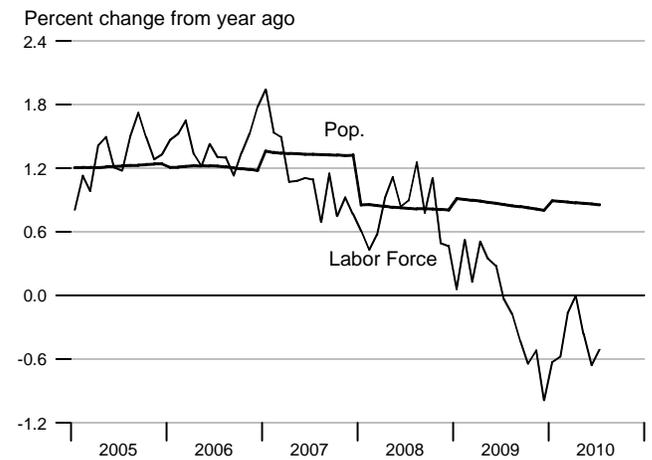
Change in Manufacturing Payrolls



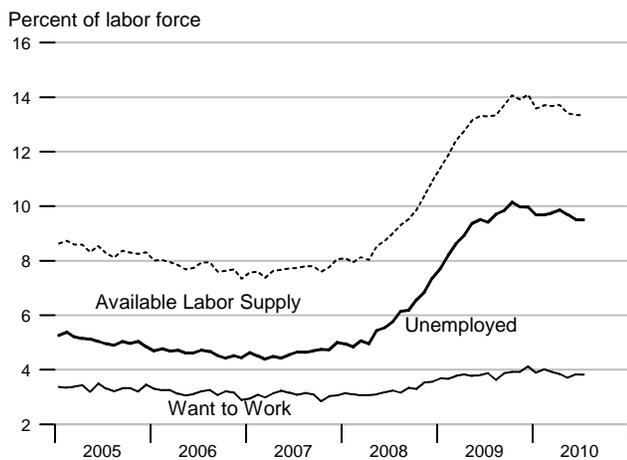
Change in Household Employment



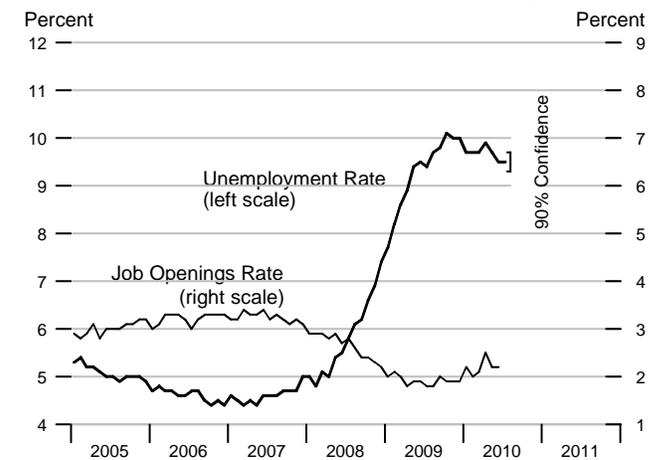
Labor Force and Population



Available Labor Supply and Components

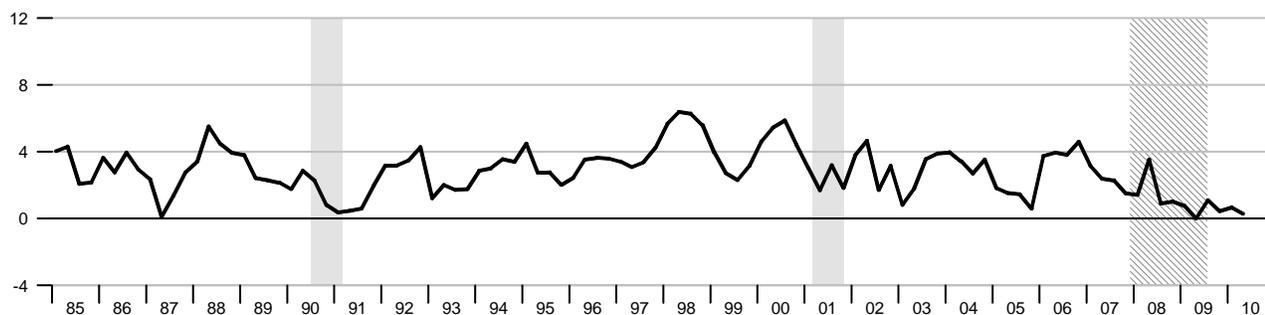


Unemployment Rate & Job Openings Rate



Real Disposable Personal Income

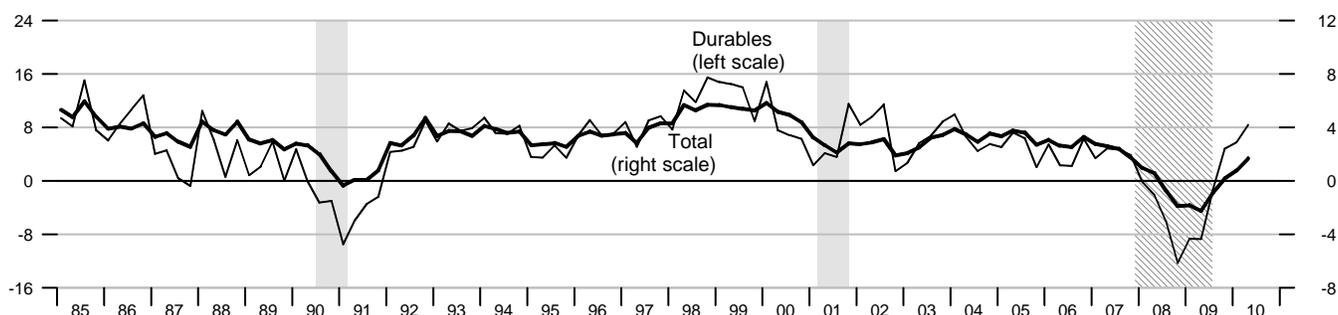
Percent change from year ago, quarterly data



Real Consumption

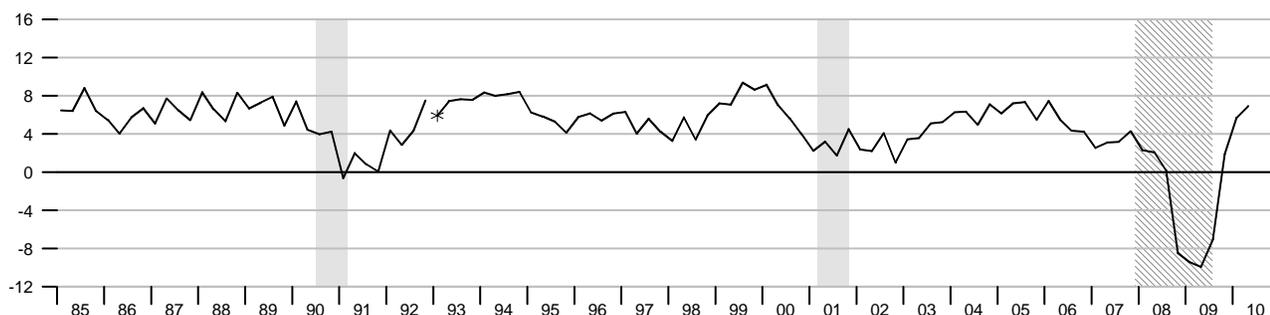
Percent change from year ago, quarterly data

Percent change from year ago, quarterly data



Retail and Food Services Sales

Percent change from year ago, quarterly average

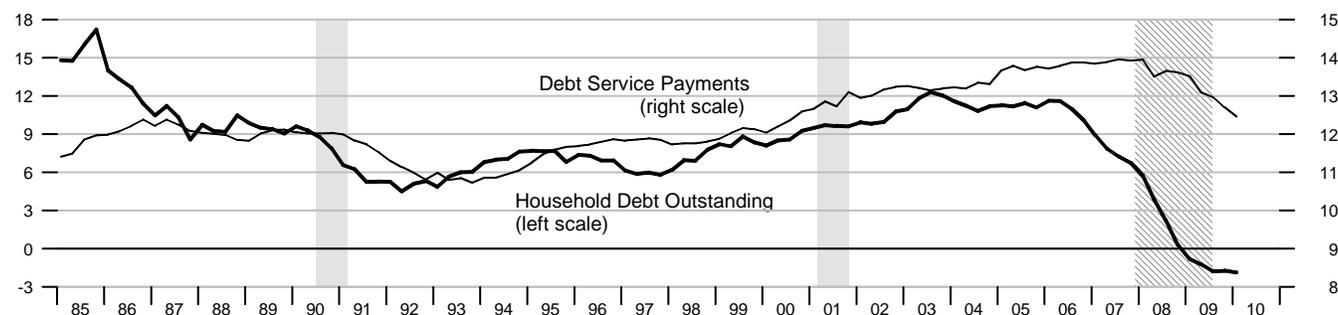


*Data from Jan. 1992 to the present are on a NAICS basis; data prior to Jan. 1992 are on an SIC basis and are not strictly comparable (see End Note).

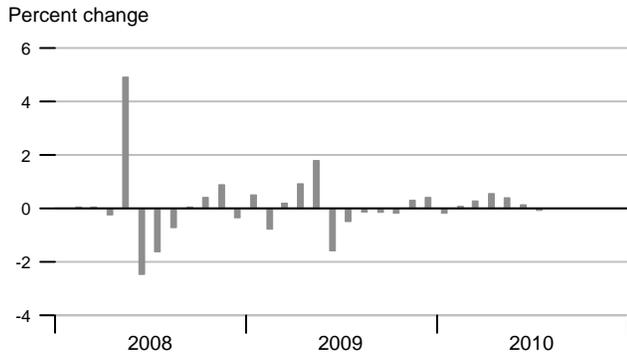
Debt Service Payments and Household Debt Outstanding

Percent change from year ago, quarterly data

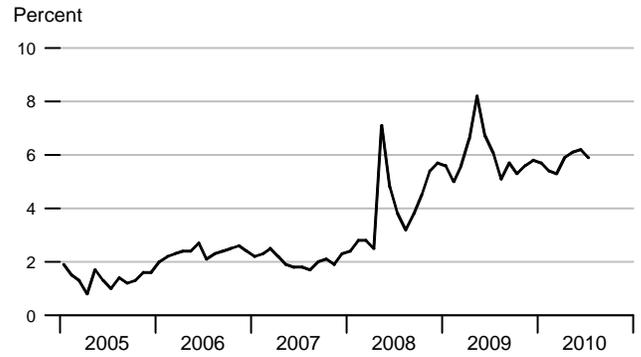
Percent of disposable personal income



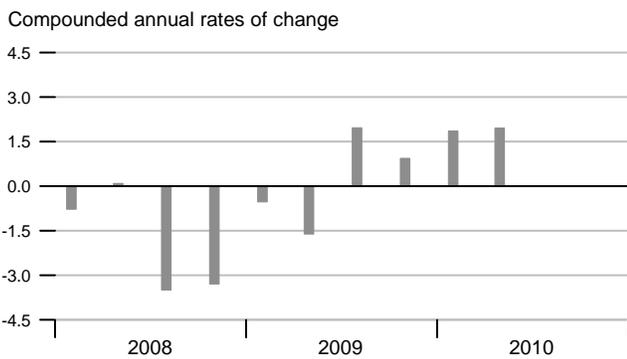
Real Disposable Personal Income



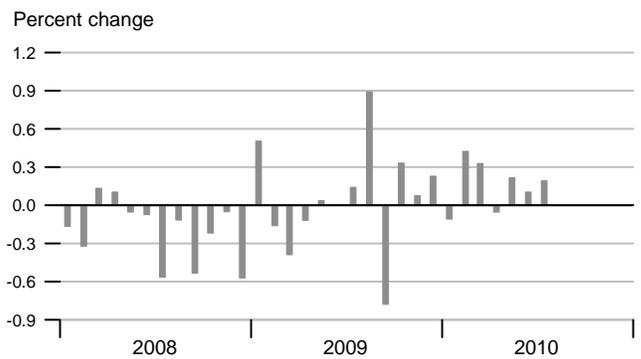
Personal Saving Rate



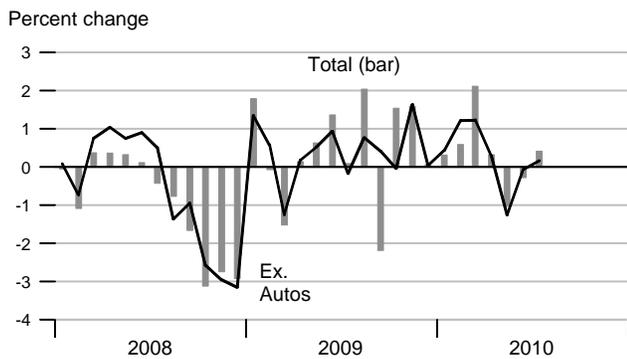
Real Consumption



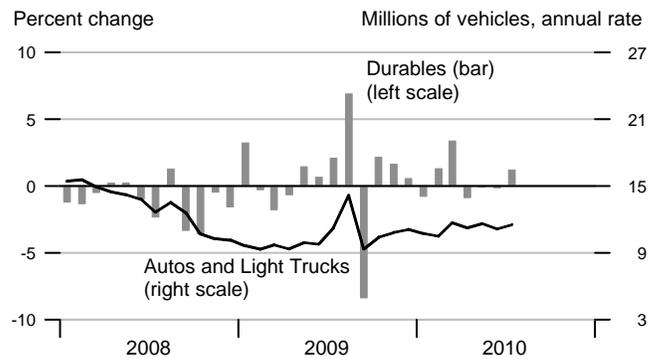
Real Consumption



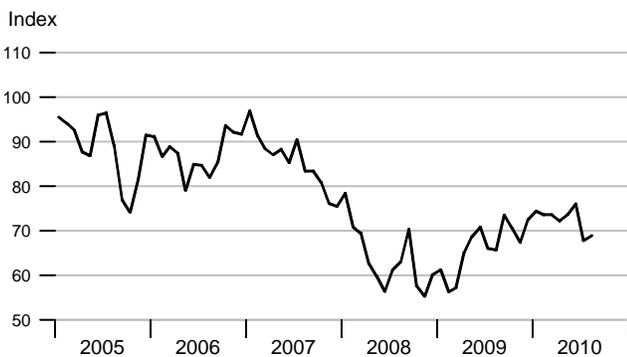
Retail & Food Services



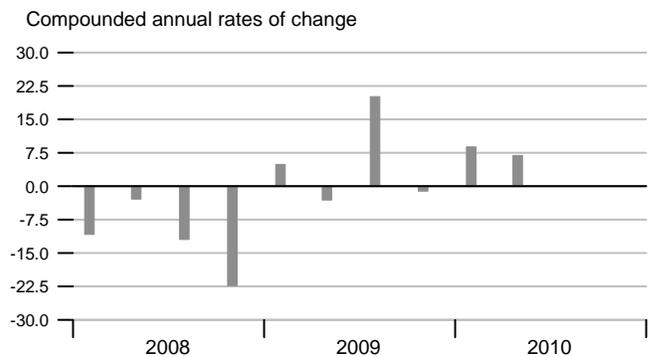
Real Durables Consumption & Vehicle Sales



Consumer Sentiment (U. of Michigan)

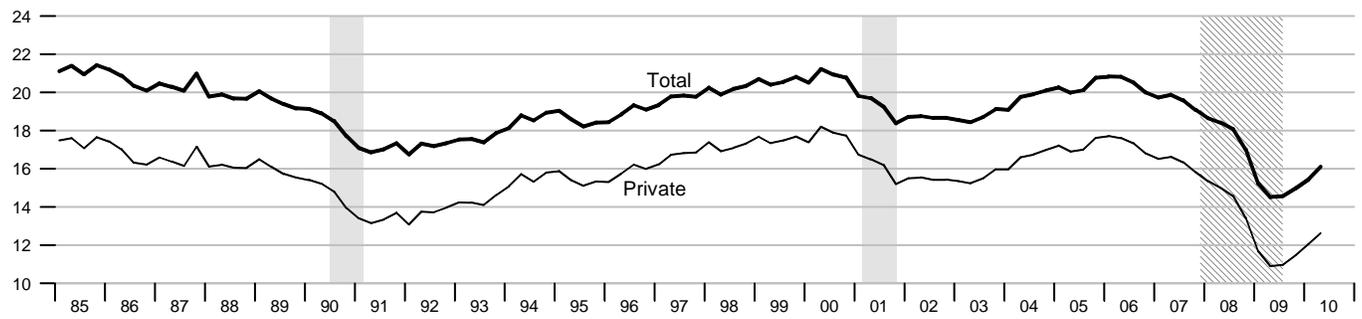


Real Durables Consumption



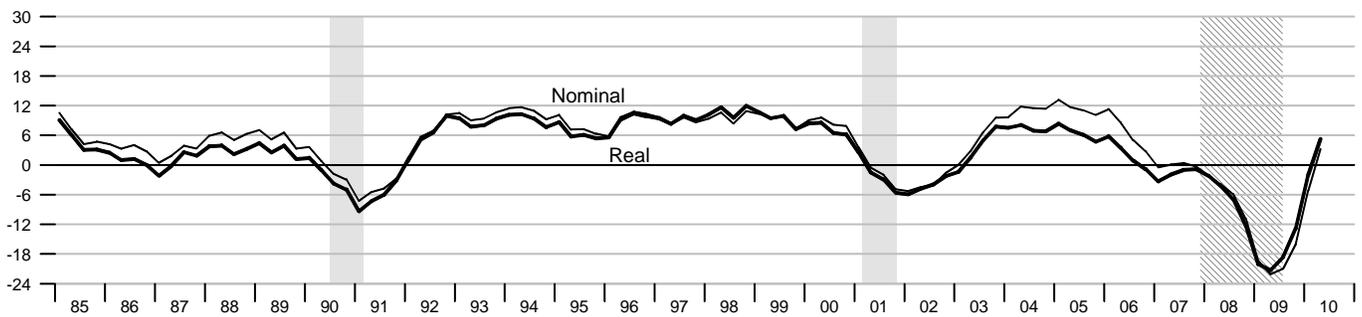
Investment

Percent of nominal GDP



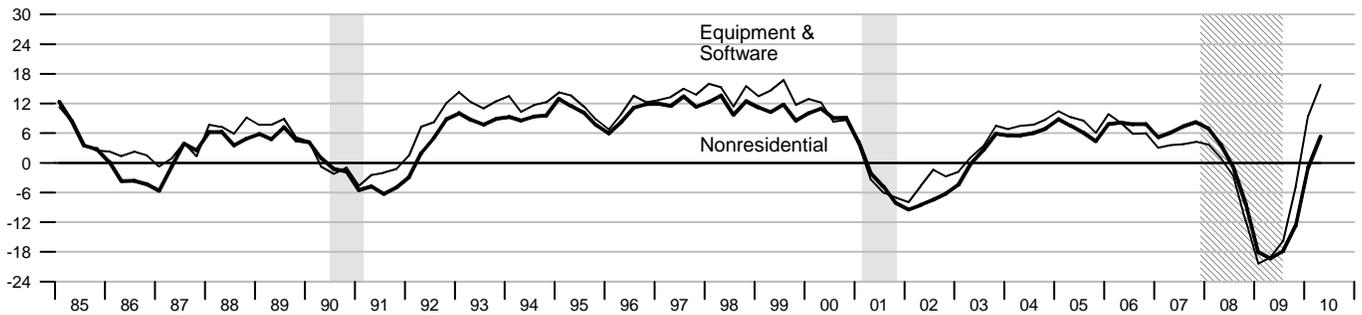
Private Fixed Investment

Percent change from year ago



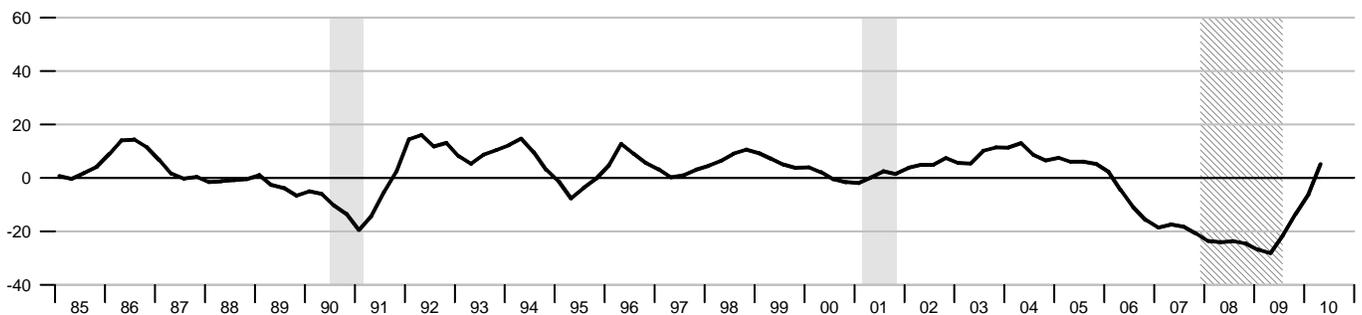
Real Nonresidential Fixed and Equipment & Software Investment

Percent change from year ago

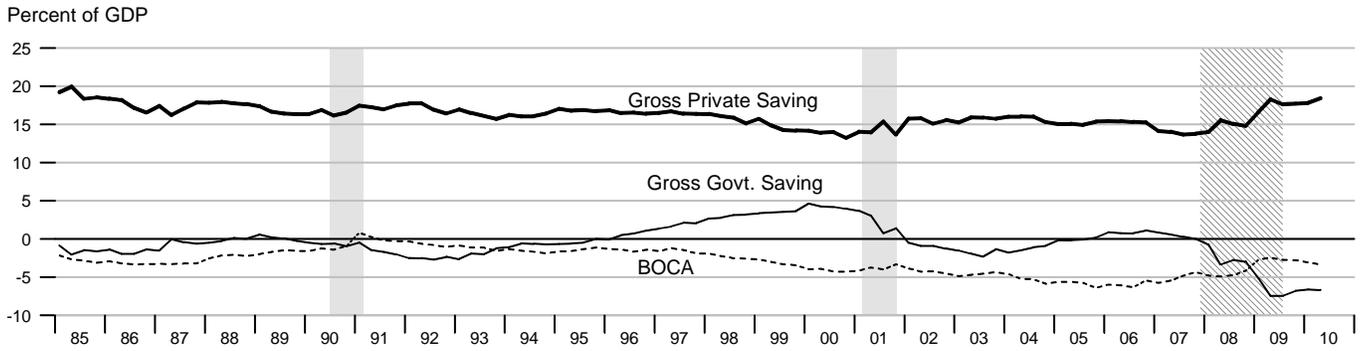


Real Residential Fixed Investment

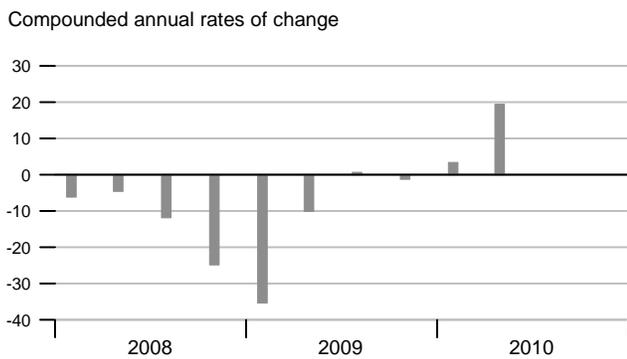
Percent change from year ago



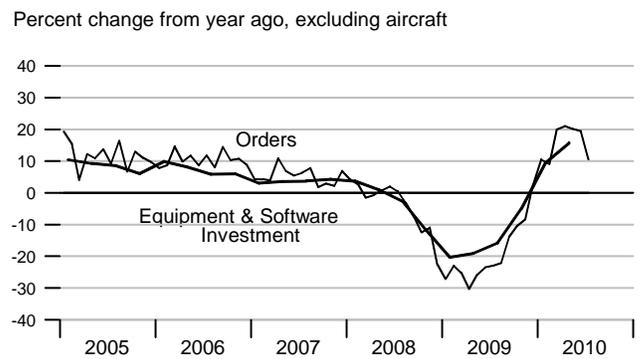
Gross Saving Rates and Balance on Current Account (NIPA)



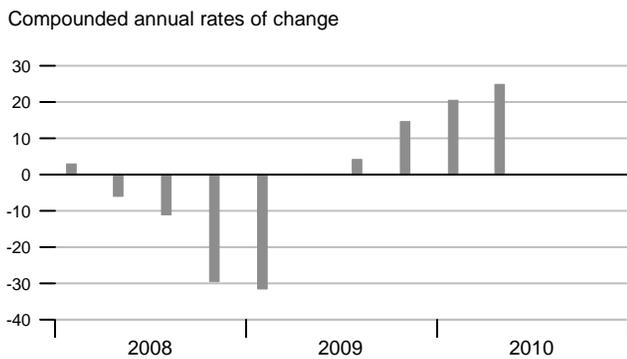
Real Private Fixed Investment



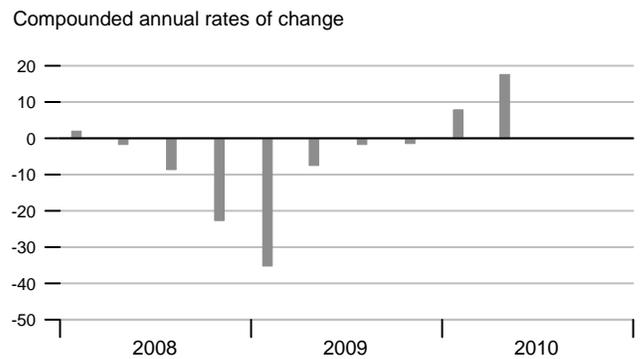
Nondefense Capital Goods Orders



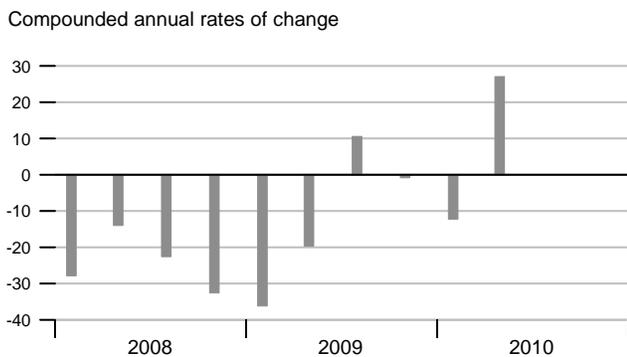
Real Equipment & Software Investment



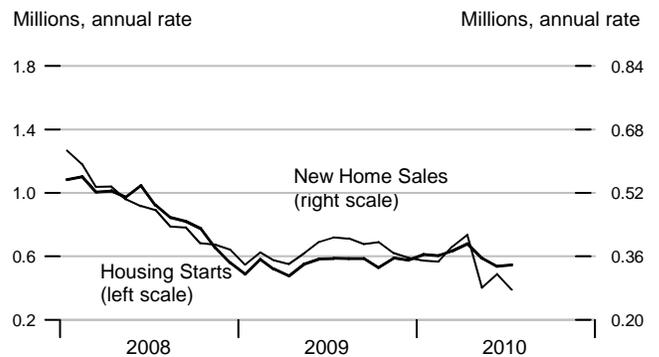
Real Nonresidential Fixed Investment



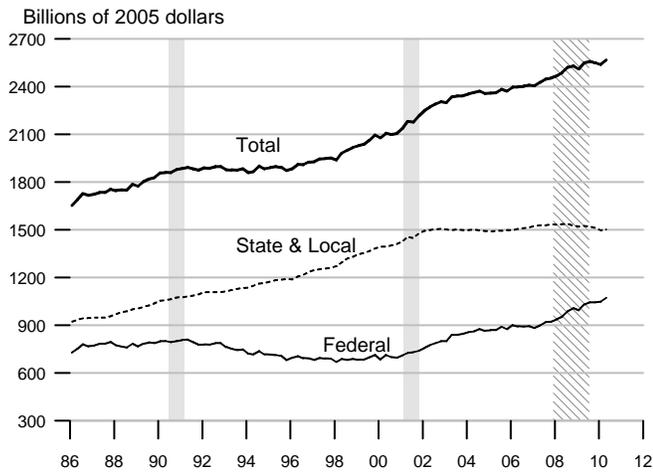
Real Residential Fixed Investment



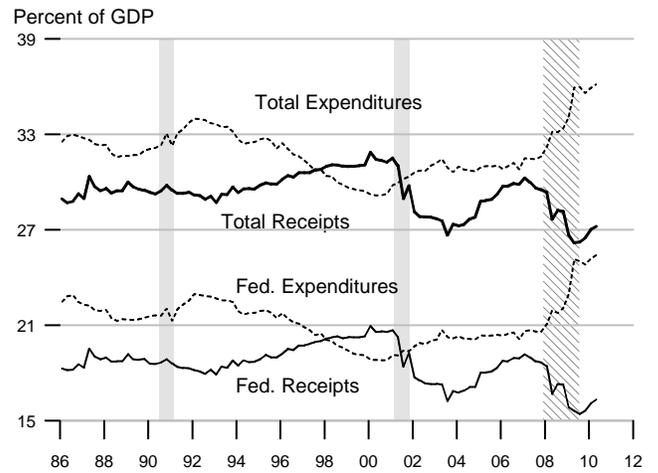
Housing Starts and New Home Sales



Govt. Consumption and Investment



Govt. Current Receipts and Expenditures



Government Budgets

Billions of dollars

National Income Accounts

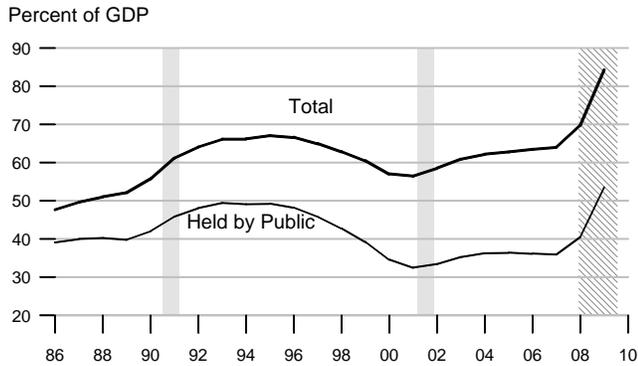
Calendar Years

Unified Budget

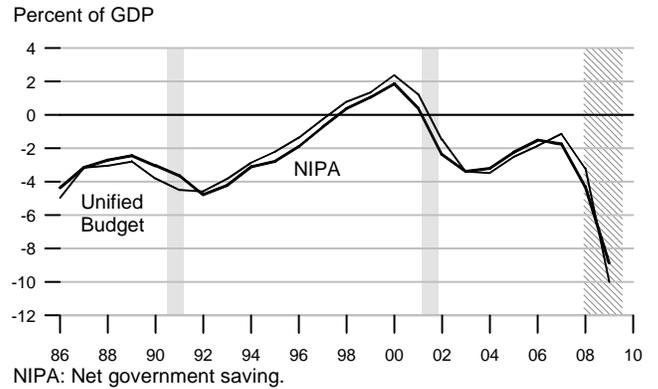
Fiscal Years

	State and Local			Federal			Federal		
	Receipts	Expenditures	Surplus or Deficit (-)	Receipts	Expenditures	Surplus or Deficit (-)	Receipts	Outlays	Surplus or Deficit (-)
1996	1045.1	1022.1	23.0	1526.4	1674.7	-148.3	1453.1	1560.5	-107.4
1997	1099.5	1063.2	36.3	1656.2	1716.3	-60.1	1579.2	1601.1	-21.9
1998	1164.5	1117.6	46.9	1777.9	1744.3	33.6	1721.7	1652.5	69.3
1999	1240.4	1198.6	41.8	1895.0	1796.2	98.8	1827.5	1701.8	125.6
2000	1322.6	1281.3	41.3	2057.1	1871.9	185.2	2025.2	1789.0	236.2
2001	1374.0	1389.9	-15.9	2020.3	1979.8	40.5	1991.1	1862.9	128.2
2002	1412.7	1466.8	-54.1	1859.3	2112.1	-252.8	1853.1	2010.9	-157.8
2003	1496.3	1535.1	-38.8	1885.1	2261.5	-376.4	1782.3	2159.9	-377.6
2004	1601.0	1609.3	-8.3	2013.9	2393.4	-379.5	1880.1	2292.9	-412.7
2005	1730.4	1704.5	25.9	2290.1	2573.1	-283.0	2153.6	2472.0	-318.3
2006	1829.7	1778.6	51.1	2524.5	2728.3	-203.8	2406.9	2655.1	-248.2
2007	1923.1	1910.8	12.3	2654.7	2900.0	-245.3	2568.0	2728.7	-160.7
2008	1967.2	2014.6	-47.4	2503.1	3119.3	-616.2	2524.0	2982.6	-458.6
2009	2005.8	2025.9	-20.1	2205.8	3457.5	-1252	2105.0	3518.0	-1413
2008Q3	1979.0	2043.9	-64.9	2506.1	3152.8	-646.7	590.0	758.9	-169.0
2008Q4	1948.1	2009.9	-61.8	2452.9	3132.9	-680.0	547.4	879.9	-332.5
2009Q1	1964.8	2006.4	-41.6	2223.9	3227.1	-1003	442.3	891.2	-448.9
2009Q2	1986.6	2020.2	-33.6	2191.2	3527.9	-1337	598.8	903.7	-304.9
2009Q3	2017.2	2036.4	-19.2	2176.3	3532.9	-1357	515.9	845.3	-329.4
2009Q4	2054.4	2040.6	13.8	2231.7	3542.0	-1310	487.8	875.8	-388.1
2010Q1	2095.7	2067.2	28.5	2322.8	3637.1	-1314	466.1	795.0	-328.9
2010Q2	2112.8	2091.6	21.2	2378.3	3703.6	-1325	643.1	930.1	-287.0

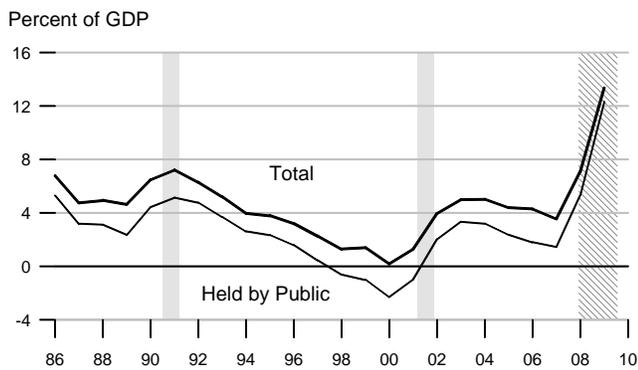
Federal Debt



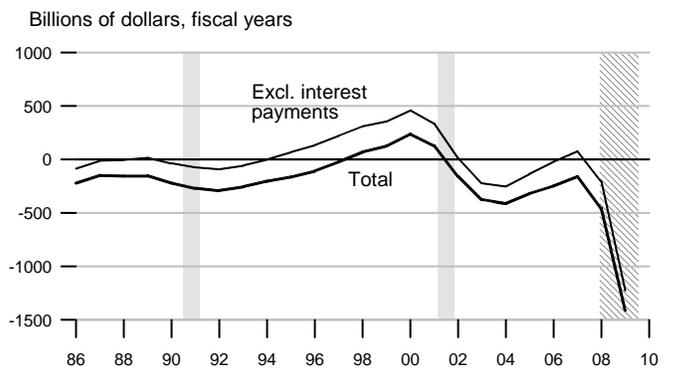
Federal Surplus (+) / Deficit (-)



Change in Federal Debt



Federal Surplus (+) / Deficit (-), Unified Basis

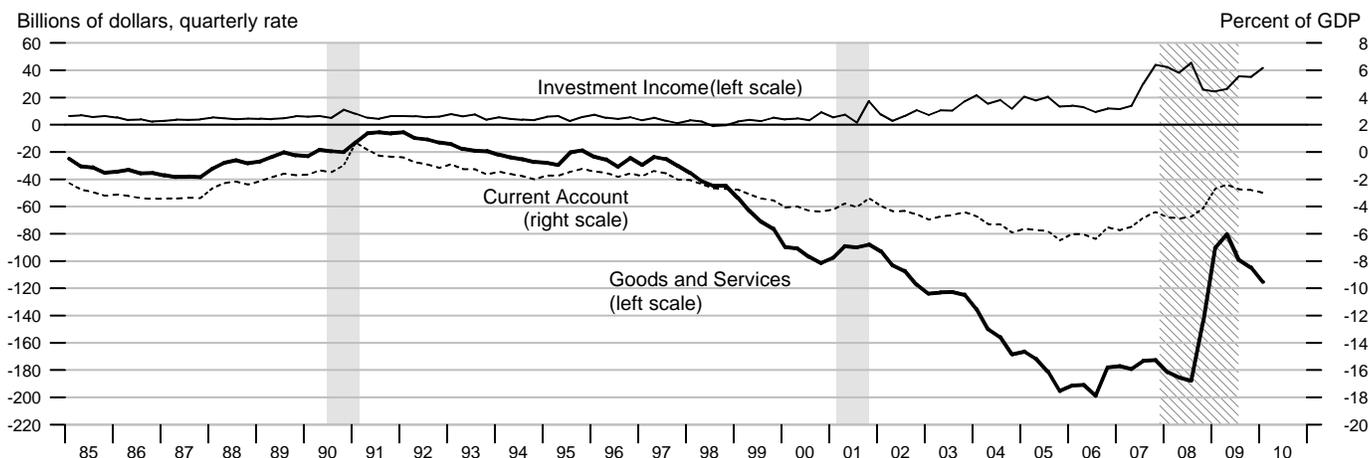


Federal Government Debt

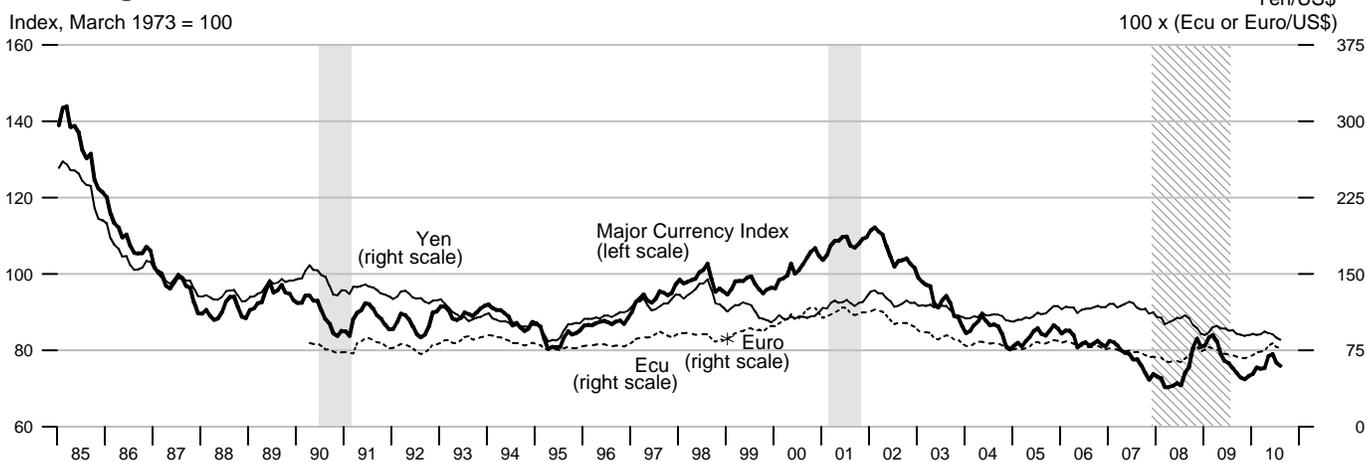
Billions of dollars, end of month or fiscal year
Excludes Agency-issued debt

		Total Public Debt	Held by Agencies and Trusts	Held by Public		Held by Private Investors	
				Total	Federal Reserve Banks	Total	Foreign and International
2007		9007.7	3958.4	5049.2	779.6	4269.7	2235.3
2008		10024.7	4210.5	5814.2	476.6	5332.0	2799.5
2009		11909.8	4355.3	7554.5	769.2	6782.7	3575.3
2007	March	8849.7	3795.4	5054.3	780.9	4273.1	2194.8
	June	8867.7	3924.7	4943.0	790.5	4152.6	2192.0
	September	9007.7	3958.4	5049.2	779.6	4269.7	2235.3
	December	9229.2	4092.9	5136.3	740.6	4395.7	2353.2
2008	March	9437.6	4103.6	5334.0	591.2	4742.9	2505.8
	June	9492.0	4207.0	5285.0	478.8	4806.2	2587.2
	September	10024.7	4210.5	5814.2	476.6	5332.0	2799.5
	December	10699.8	4327.2	6372.7	475.9	5893.4	3075.9
2009	March	11126.9	4290.6	6836.3	492.3	6341.7	3264.6
	June	11545.3	4368.8	7176.5	656.5	6518.5	3460.3
	September	11909.8	4355.3	7554.5	769.2	6782.7	3575.3
	December	12311.4	4497.0	7814.4	776.6	7034.5	3691.5
2010	March	12773.1	4478.9	8294.3	776.7	7513.3	3884.0

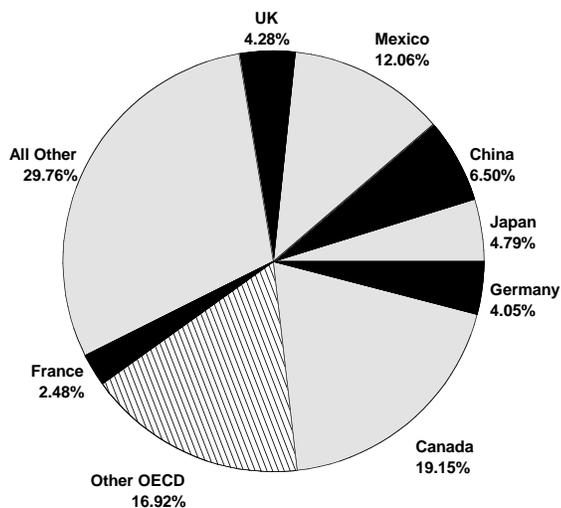
Current Account, Trade and Investment Income Balances



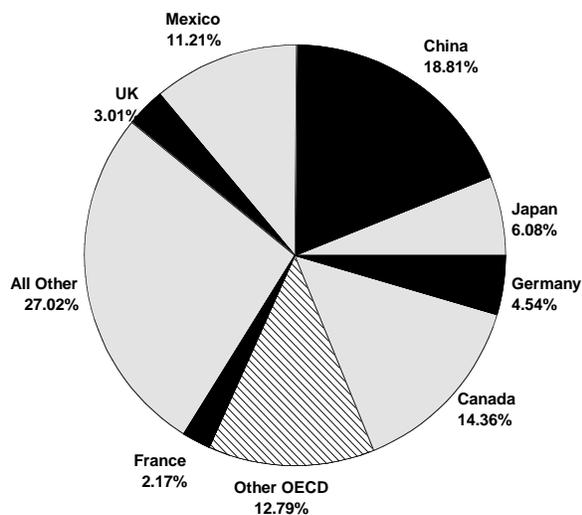
Exchange Rates



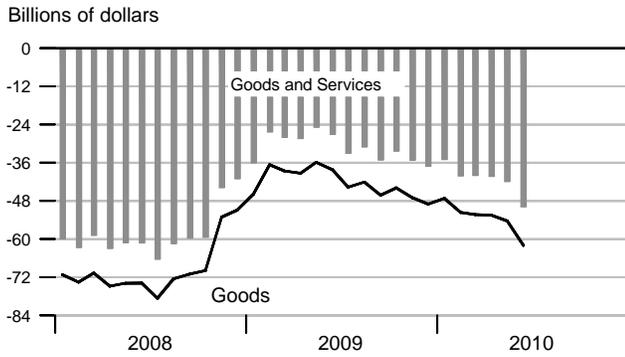
Goods Export Shares, 2009



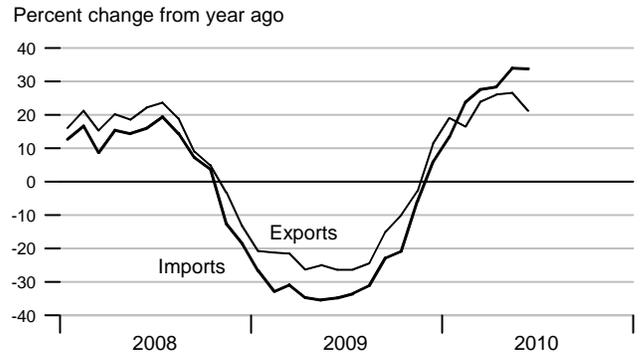
Goods Import Shares, 2009



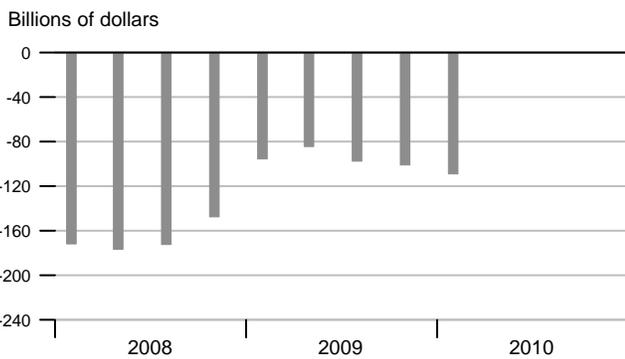
Trade Balance



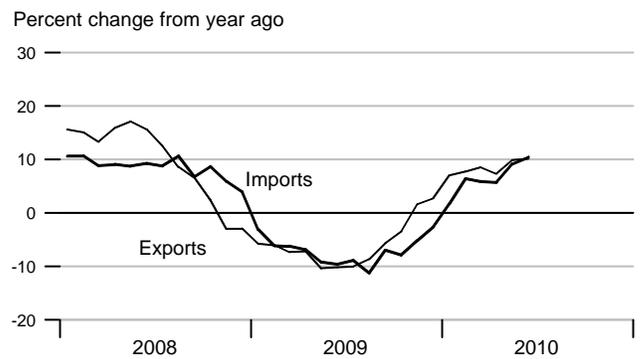
Goods Trade



Current Account Balance



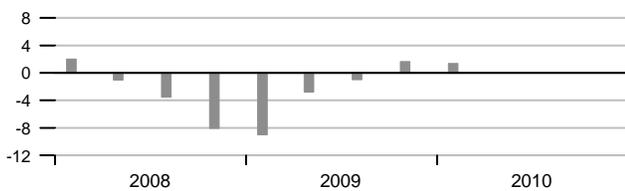
Services Trade



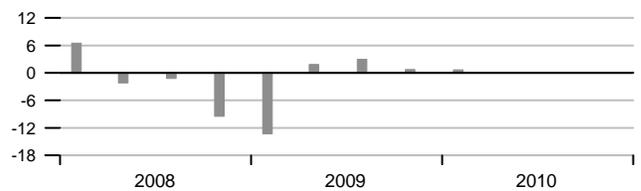
Real GDP Growth of Major Trading Partners

Compounded annual rates of change

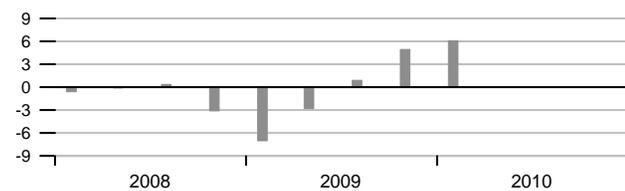
United Kingdom



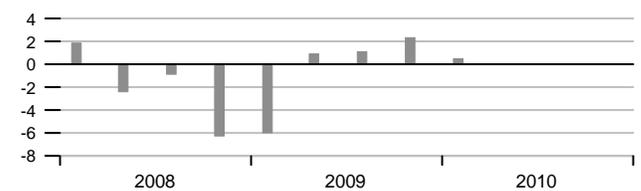
Germany



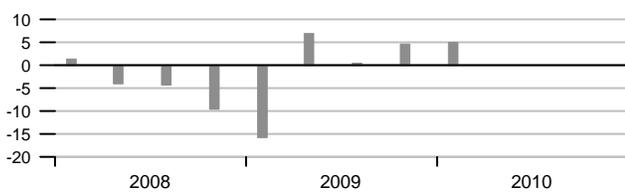
Canada



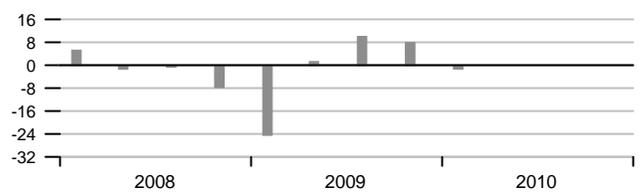
France



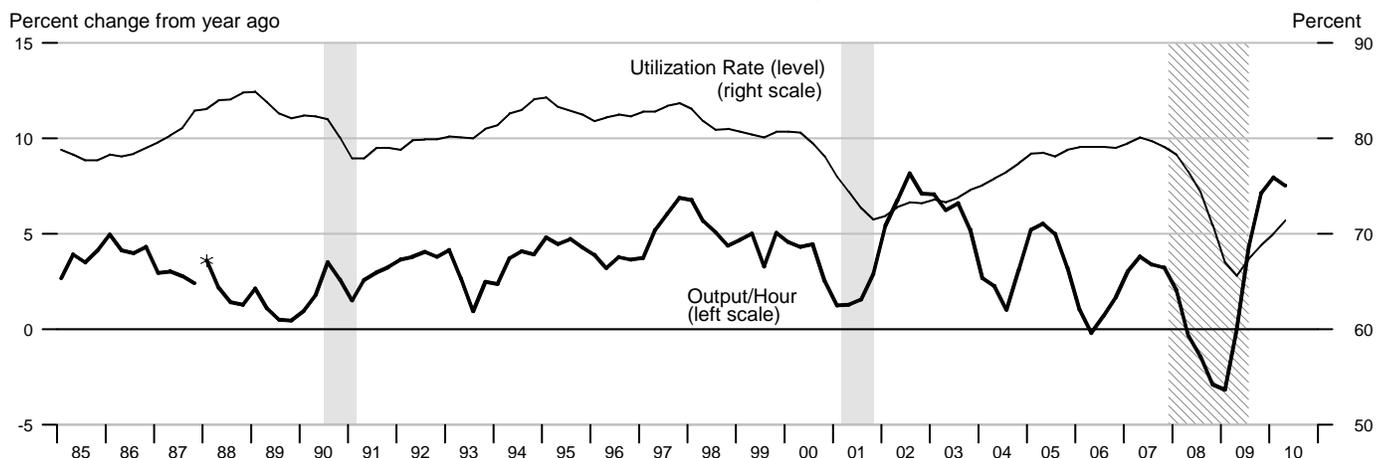
Japan



Mexico

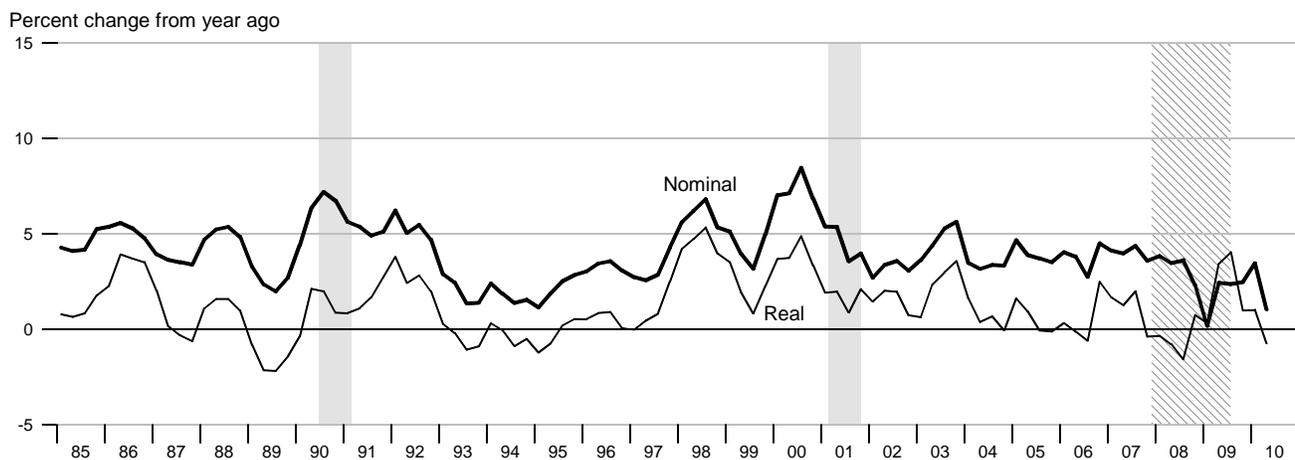


Output per Hour and Capacity Utilization, Manufacturing

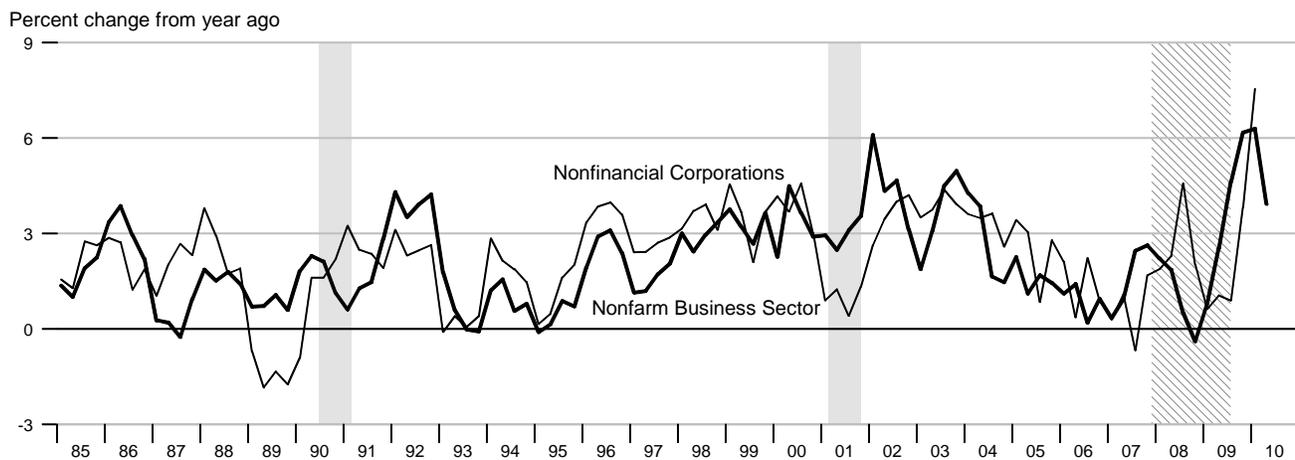


*Data from 1987 to the present are on a NAICS basis; data prior to 1987 are on an SIC basis and are not strictly comparable (see End Note).

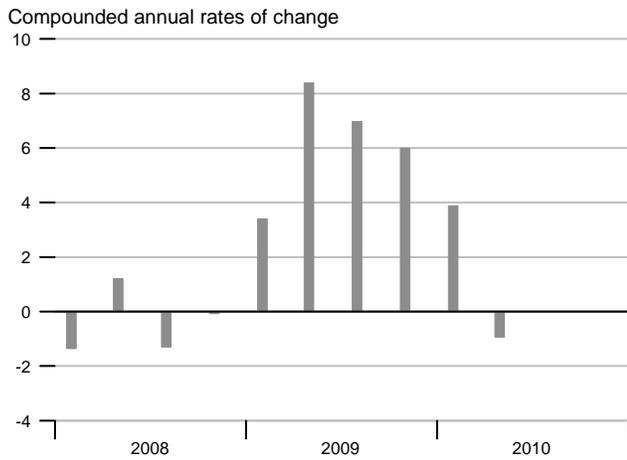
Nonfarm Compensation per Hour



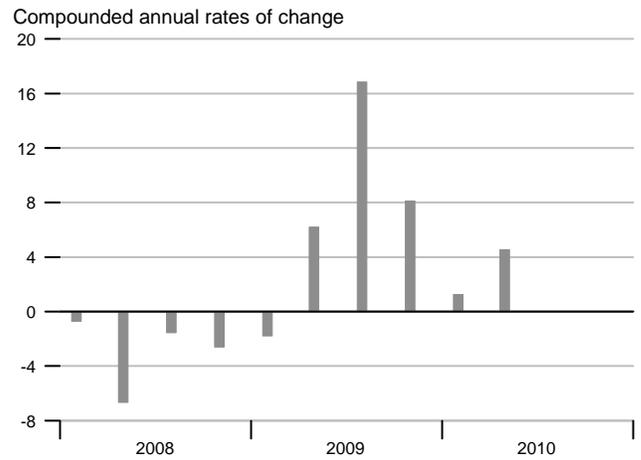
Output per Hour, Nonfarm Business and Nonfinancial Corporations



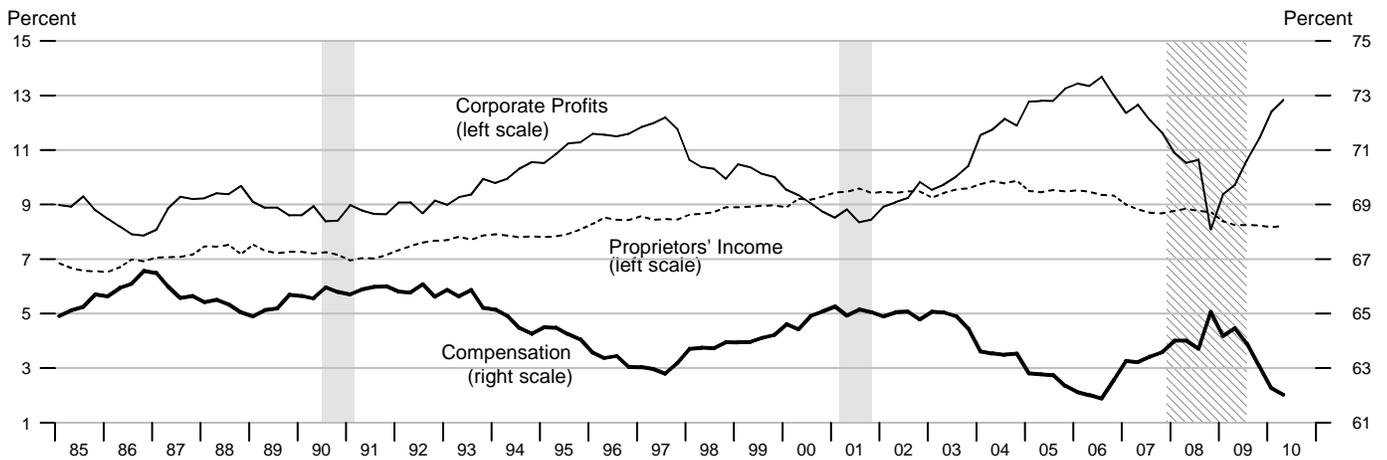
Nonfarm Output per Hour



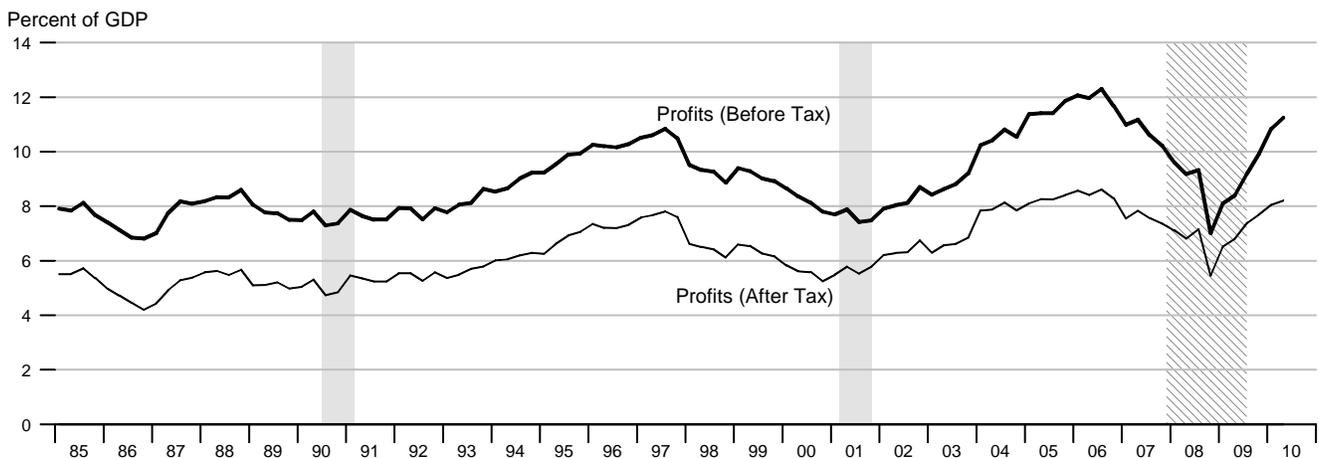
Manufacturing Output per Hour



Selected Component Shares of National Income

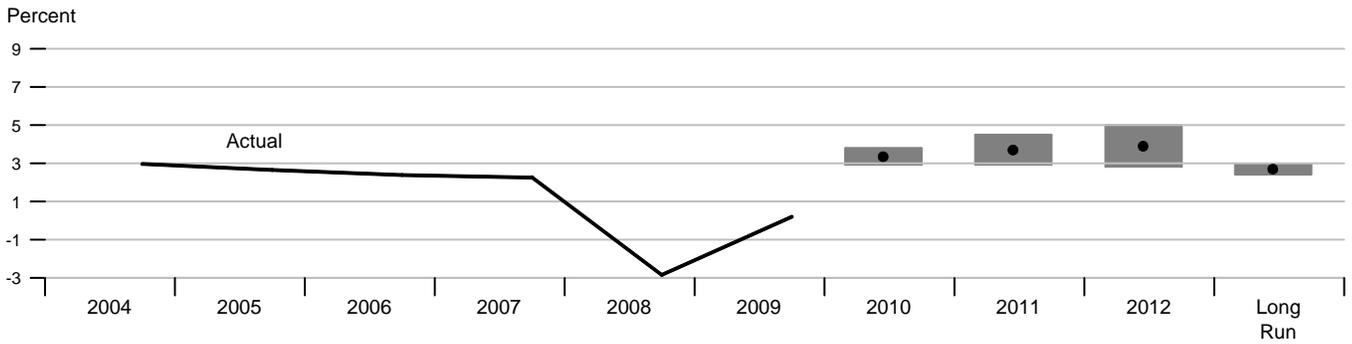


Corporate Profits

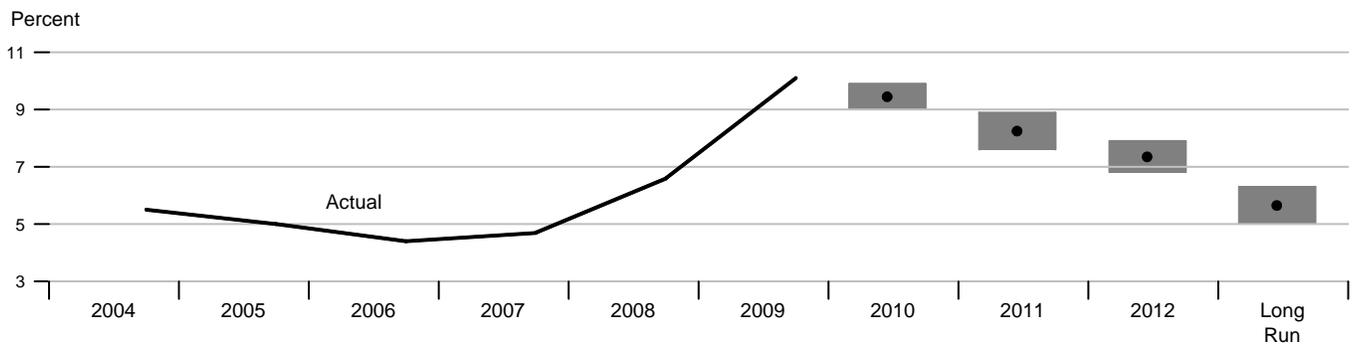


June 2010 FOMC Projections

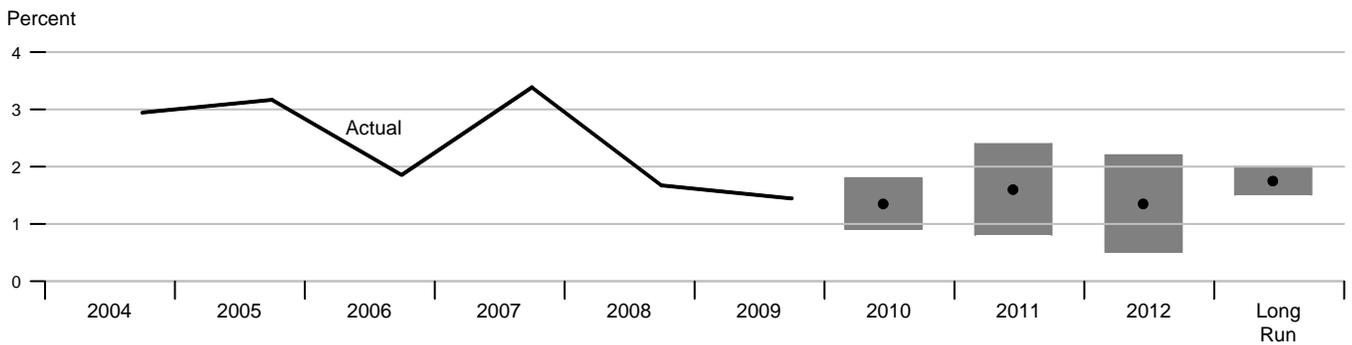
Change in Real GDP (Q4/Q4)



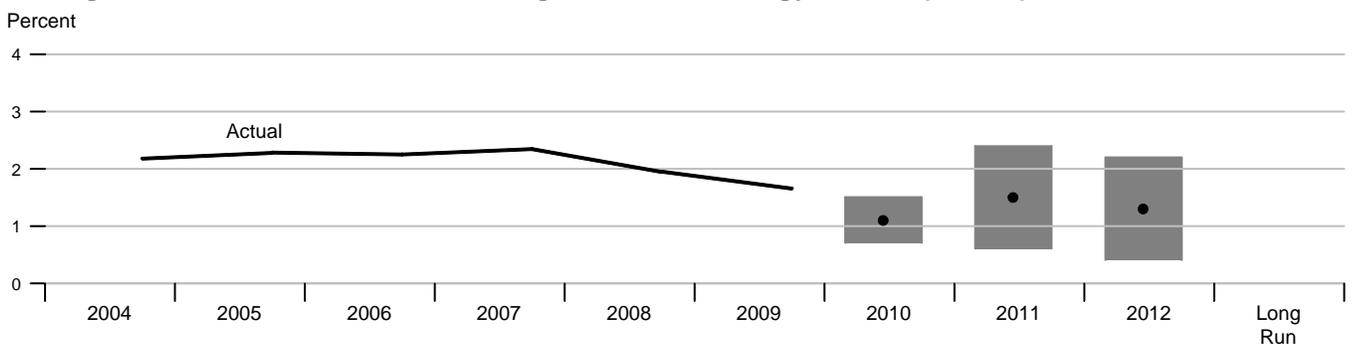
Unemployment Rate (Q4)



Change in PCE Price Index (Q4/Q4)

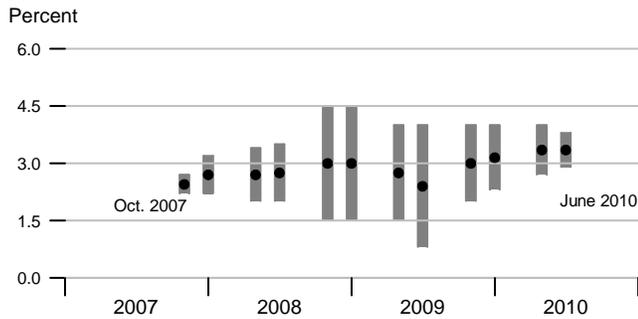


Change in PCE Price Index Excluding Food and Energy Prices (Q4/Q4)

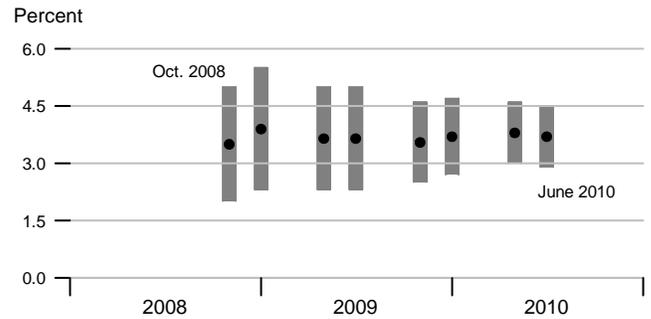


FOMC Quarterly Projections for 2010 and 2011: A Timeline

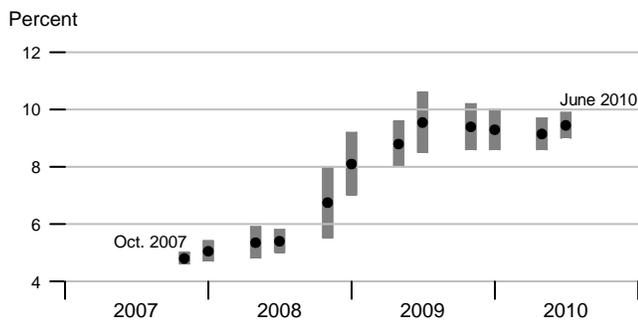
Change in Real GDP for 2010



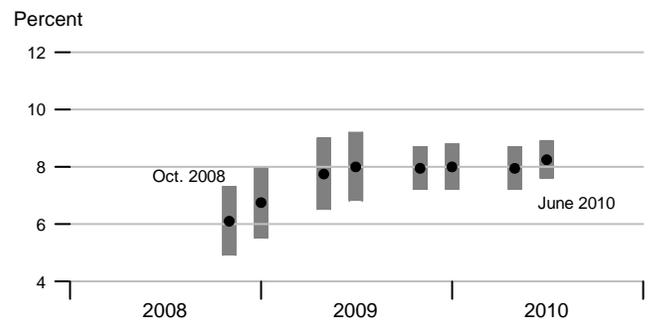
Change in Real GDP for 2011



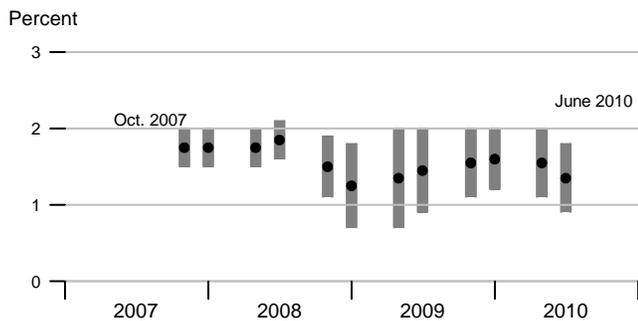
Unemployment Rate for 2010 (Q4)



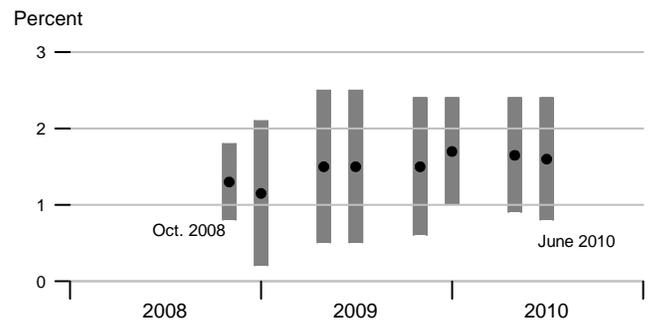
Unemployment Rate for 2011 (Q4)



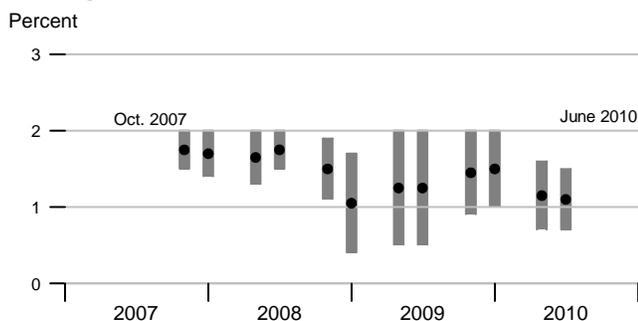
Change in PCE Price Index for 2010



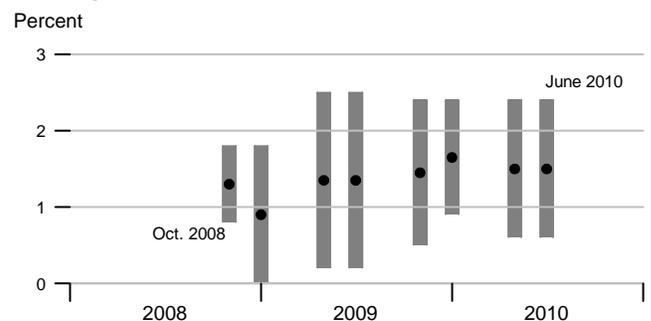
Change in PCE Price Index for 2011



Change in PCE Core Price Index for 2010



Change in PCE Core Price Index for 2011



	GDP Chain Price Index			Employment Cost Index			ECI: Wages			ECI: Benefits		
	Index	Percent change		Index	Percent change		Index	Percent change		Index	Percent change	
		Annual rate	Year ago		Annual rate	Year ago		Annual rate	Year ago		Annual rate	Year ago
2006	103.263		3.3	102.1		2.9	102.0		2.9	102.1		2.9
2007	106.301		2.9	105.2		3.1	105.5		3.4	104.5		2.4
2008	108.598		2.2	108.2		2.9	108.7		3.0	107.2		2.6
2009	109.618		0.9	109.8		1.5	110.4		1.5	108.5		1.2
2007 1	105.366	4.4	3.2	103.9	2.3	3.1	104.3	3.9	3.6	103.1	-0.8	2.3
2	106.188	3.2	3.1	104.8	3.5	3.1	105.1	3.1	3.4	104.2	4.3	2.6
3	106.709	2.0	2.8	105.6	3.1	3.0	105.9	3.1	3.3	105.0	3.1	2.4
4	106.940	0.9	2.6	106.5	3.5	3.1	106.7	3.1	3.3	105.8	3.1	2.4
2008 1	107.454	1.9	2.0	107.2	2.7	3.2	107.6	3.4	3.2	106.5	2.7	3.3
2	108.295	3.2	2.0	108.0	3.0	3.1	108.4	3.0	3.1	107.0	1.9	2.7
3	109.488	4.5	2.6	108.6	2.2	2.8	109.1	2.6	3.0	107.5	1.9	2.4
4	109.154	-1.2	2.1	109.1	1.9	2.4	109.6	1.8	2.7	107.9	1.5	2.0
2009 1	109.465	1.1	1.9	109.3	0.7	2.0	109.8	0.7	2.0	108.1	0.7	1.5
2	109.555	0.3	1.2	109.6	1.1	1.5	110.1	1.1	1.6	108.3	0.7	1.2
3	109.759	0.7	0.2	110.0	1.5	1.3	110.5	1.5	1.3	108.6	1.1	1.0
4	109.693	-0.2	0.5	110.4	1.5	1.2	111.0	1.8	1.3	108.9	1.1	0.9
2010 1	109.959	1.0	0.5	111.1	2.6	1.6	111.4	1.4	1.5	110.4	5.6	2.1
2	110.481	1.9	0.8	111.6	1.8	1.8	111.9	1.8	1.6	111.0	2.2	2.5
	Exports			Imports			Nonfarm Output per Hour			Nonfarm Compensation per Hour		
	Billions of 2005 \$	Percent change		Billions of 2005 \$	Percent change		Index	Percent change		Index	Percent change	
		Annual rate	Year ago		Annual rate	Year ago		Annual rate	Year ago		Annual rate	Year ago
2006	1422.020		9.0	2151.204		6.1	100.914		0.9	103.769		3.8
2007	1554.404		9.3	2209.290		2.7	102.517		1.6	107.924		4.0
2008	1647.699		6.0	2151.749		-2.6	103.582		1.0	111.475		3.3
2009	1490.742		-9.5	1853.766		-13.8	107.212		3.5	113.544		1.9
2007 1	1496.360	6.4	7.7	2192.720	4.6	3.4	101.282	0.2	0.3	106.857	3.8	4.1
2	1521.264	6.8	7.7	2217.475	4.6	3.4	101.937	2.6	0.9	107.178	1.2	4.0
3	1577.995	15.8	11.6	2244.568	5.0	3.4	102.977	4.1	2.5	107.988	3.1	4.4
4	1621.999	11.6	10.1	2182.397	-10.6	0.7	103.881	3.6	2.6	109.674	6.4	3.6
2008 1	1644.695	5.7	9.9	2174.606	-1.4	-0.8	103.527	-1.4	2.2	110.950	4.7	3.8
2	1696.610	13.2	11.5	2190.400	2.9	-1.2	103.837	1.2	1.9	110.898	-0.2	3.5
3	1674.951	-5.0	6.1	2189.780	-0.1	-2.4	103.497	-1.3	0.5	111.898	3.7	3.6
4	1574.541	-21.9	-2.9	2052.211	-22.9	-6.0	103.477	-0.1	-0.4	112.202	1.1	2.3
2009 1	1451.598	-27.8	-11.7	1840.835	-35.3	-15.3	104.346	3.4	0.8	111.148	-3.7	0.2
2	1447.840	-1.0	-14.7	1789.850	-10.6	-18.3	106.467	8.4	2.5	113.587	9.1	2.4
3	1490.030	12.2	-11.0	1880.823	21.9	-14.1	108.276	7.0	4.6	114.543	3.4	2.4
4	1573.500	24.4	-0.1	1903.558	4.9	-7.2	109.862	6.0	6.2	114.983	1.5	2.5
2010 1	1616.422	11.4	11.4	1954.800	11.2	6.2	110.912	3.9	6.3	114.984	0.0	3.5
2	1652.166	9.1	14.1	2097.027	32.4	17.2	110.649	-0.9	3.9	114.769	-0.7	1.0

	Household Survey Employment				Nonfarm Payroll Employment				Nonfarm Aggregate Hours				
	Thousands	Change	Percent change		Thousands	Change	Percent change		Index	Percent change			
			Annual rate	Year ago			Annual rate	Year ago		Monthly rate	Annual rate	Year ago	
2005	141710	2470		1.8	133694	2275		1.7	102.8			2.6	
2006	144414	2704		1.9	136086	2392		1.8	105.8			3.0	
2007	146042	1629		1.1	137588	1503		1.1	107.3			1.4	
2008	145363	-680		-0.5	136777	-812		-0.6	105.9			-1.3	
2009	139881	-5482		-3.8	130911	-5866		-4.3	98.8			-6.7	
2008	1	146253	73	0.2	0.1	137897	35	0.1	0.5	107.4	-0.1	-0.2	0.6
	2	146032	-221	-0.6	0.1	137491	-406	-1.2	-0.1	107.0	-0.4	-1.7	-0.5
	3	145241	-791	-2.2	-0.5	136700	-791	-2.3	-0.7	105.7	-1.2	-4.5	-1.5
	4	143924	-1317	-3.6	-1.5	135019	-1680	-4.8	-2.1	103.5	-2.1	-8.3	-3.8
2009	1	141587	-2337	-6.3	-3.2	132814	-2205	-6.4	-3.7	100.8	-2.6	-9.9	-6.2
	2	140459	-1128	-3.1	-3.8	131112	-1702	-5.0	-4.6	98.7	-2.1	-8.0	-7.7
	3	139339	-1120	-3.2	-4.1	130078	-1035	-3.1	-4.8	98.0	-0.7	-2.9	-7.3
	4	138138	-1201	-3.4	-4.0	129639	-438	-1.3	-4.0	97.7	-0.3	-1.4	-5.6
2010	1	138626	488	1.4	-2.1	129697	58	0.2	-2.3	98.2	0.6	2.3	-2.5
	2	139331	705	2.0	-0.8	130376	679	2.1	-0.6	99.1	0.9	3.6	0.4
2008	Jul	145515	-253	-2.1	-0.3	137075	-210	-1.8	-0.4	106.1	-0.5	-5.5	-1.2
	Aug	145187	-328	-2.7	-0.3	136741	-334	-2.9	-0.6	106.1	0.0	0.0	-1.1
	Sep	145021	-166	-1.4	-0.8	136283	-458	-3.9	-1.0	105.0	-1.0	-11.8	-2.1
	Oct	144677	-344	-2.8	-0.8	135729	-554	-4.8	-1.5	104.5	-0.5	-5.6	-2.7
	Nov	143907	-770	-6.2	-1.8	135001	-728	-6.2	-2.1	103.4	-1.1	-11.9	-3.8
	Dec	143188	-719	-5.8	-2.0	134328	-673	-5.8	-2.6	102.5	-0.9	-10.0	-4.7
2009	Jan	142221	-967	-7.8	-2.9	133549	-779	-6.7	-3.2	101.8	-0.7	-7.9	-5.2
	Feb	141687	-534	-4.4	-3.1	132823	-726	-6.3	-3.7	100.8	-1.0	-11.2	-6.1
	Mar	140854	-833	-6.8	-3.6	132070	-753	-6.6	-4.2	99.8	-1.0	-11.3	-7.2
	Apr	140902	48	0.4	-3.7	131542	-528	-4.7	-4.5	99.2	-0.6	-7.0	-7.6
	May	140438	-464	-3.9	-3.8	131155	-387	-3.5	-4.6	98.9	-0.3	-3.6	-7.5
	Jun	140038	-400	-3.4	-3.9	130640	-515	-4.6	-4.8	98.1	-0.8	-9.3	-8.0
	Jul	139817	-221	-1.9	-3.9	130294	-346	-3.1	-4.9	98.2	0.1	1.2	-7.4
	Aug	139433	-384	-3.2	-4.0	130082	-212	-1.9	-4.9	98.0	-0.2	-2.4	-7.6
	Sep	138768	-665	-5.6	-4.3	129857	-225	-2.1	-4.7	97.8	-0.2	-2.4	-6.9
	Oct	138242	-526	-4.5	-4.4	129633	-224	-2.1	-4.5	97.2	-0.6	-7.1	-7.0
	Nov	138381	139	1.2	-3.8	129697	64	0.6	-3.9	97.9	0.7	9.0	-5.3
	Dec	137792	-589	-5.0	-3.8	129588	-109	-1.0	-3.5	97.9	0.0	0.0	-4.5
2010	Jan	138333	541	4.8	-2.7	129602	14	0.1	-3.0	98.2	0.3	3.7	-3.5
	Feb	138641	308	2.7	-2.1	129641	39	0.4	-2.4	98.0	-0.2	-2.4	-2.8
	Mar	138905	264	2.3	-1.4	129849	208	1.9	-1.7	98.5	0.5	6.3	-1.3
	Apr	139455	550	4.9	-1.0	130162	313	2.9	-1.0	99.0	0.5	6.3	-0.2
	May	139420	-35	-0.3	-0.7	130594	432	4.1	-0.4	99.3	0.3	3.7	0.4
	Jun	139119	-301	-2.6	-0.7	130373	-221	-2.0	-0.2	99.0	-0.3	-3.6	0.9
	Jul	138960	-159	-1.4	-0.6	130242	-131	-1.2	-0.0	99.4	0.4	5.0	1.2

	Unempl. Rate	Retail and Food Services Sales					Industrial Production				Treasury Yields	
		Billions of dollars	Percent change			Index	Percent change			(Percent)		
			Monthly/ quarterly	Annual rate	Year ago		Monthly/ quarterly	Annual rate	Year ago	3-mo	10-yr	
2005	5.1	4092.650			6.5	95.2558			3.2	3.15	4.29	
2006	4.6	4312.711			5.4	97.3910			2.2	4.73	4.79	
2007	4.6	4454.282			3.3	100.0000			2.7	4.35	4.63	
2008	5.8	4409.379			-1.0	96.6917			-3.3	1.37	3.67	
2009	9.3	4131.845			-6.3	87.7159			-9.3	0.15	3.26	
2008	1	5.0	1125.390	-0.7	-2.6	2.3	99.8781	-0.4	-1.6	0.8	2.04	3.66
	2	5.3	1131.023	0.5	2.0	2.1	98.3712	-1.5	-5.9	-1.8	1.63	3.89
	3	6.0	1116.164	-1.3	-5.2	0.2	95.9030	-2.5	-9.7	-4.5	1.49	3.86
	4	7.0	1036.802	-7.1	-25.5	-8.5	92.6147	-3.4	-13.0	-7.6	0.30	3.25
2009	1	8.2	1019.214	-1.7	-6.6	-9.4	88.2492	-4.7	-17.6	-11.6	0.21	2.74
	2	9.3	1018.867	-0.0	-0.1	-9.9	85.8926	-2.7	-10.3	-12.7	0.17	3.31
	3	9.6	1037.482	1.8	7.5	-7.0	87.6144	2.0	8.3	-8.6	0.16	3.52
	4	10.0	1056.282	1.8	7.4	1.9	89.1076	1.7	7.0	-3.8	0.06	3.46
2010	1	9.7	1077.305	2.0	8.2	5.7	90.6446	1.7	7.1	2.7	0.11	3.72
	2	9.7	1089.420	1.1	4.6	6.9	92.1163	1.6	6.7	7.2	0.15	3.49
2008	Aug	6.1	373.158	-0.8	-8.9	0.8	96.7919	-1.2	-13.3	-3.5	1.72	3.89
	Sep	6.2	366.950	-1.7	-18.2	-1.8	92.9633	-4.0	-38.4	-7.7	1.13	3.69
	Oct	6.6	355.484	-3.1	-31.7	-5.3	93.8781	1.0	12.5	-6.1	0.67	3.81
	Nov	6.9	345.704	-2.8	-28.4	-9.0	92.9318	-1.0	-11.4	-7.4	0.19	3.53
	Dec	7.4	335.614	-2.9	-29.9	-11.1	91.0342	-2.0	-21.9	-9.4	0.03	2.42
2009	Jan	7.7	341.617	1.8	23.7	-9.5	89.1316	-2.1	-22.4	-11.0	0.13	2.52
	Feb	8.2	341.390	-0.1	-0.8	-8.5	88.4567	-0.8	-8.7	-11.5	0.30	2.87
	Mar	8.6	336.207	-1.5	-16.8	-10.3	87.1592	-1.5	-16.2	-12.5	0.21	2.82
	Apr	8.9	336.671	0.1	1.7	-10.5	86.4726	-0.8	-9.1	-12.5	0.16	2.93
	May	9.4	338.785	0.6	7.8	-10.2	85.6975	-0.9	-10.2	-12.9	0.18	3.29
	Jun	9.5	343.411	1.4	17.7	-9.1	85.5076	-0.2	-2.6	-12.7	0.18	3.72
	Jul	9.4	343.705	0.1	1.0	-8.6	86.6896	1.4	17.9	-11.5	0.18	3.56
	Aug	9.7	350.727	2.0	27.5	-6.0	87.7569	1.2	15.8	-9.3	0.17	3.59
	Sep	9.8	343.050	-2.2	-23.3	-6.5	88.3967	0.7	9.1	-4.9	0.12	3.40
	Oct	10.1	348.321	1.5	20.1	-2.0	88.6350	0.3	3.3	-5.6	0.07	3.39
	Nov	10.0	353.863	1.6	20.9	2.4	89.1049	0.5	6.6	-4.1	0.05	3.40
	Dec	10.0	354.098	0.1	0.8	5.5	89.5830	0.5	6.6	-1.6	0.05	3.59
2010	Jan	9.7	355.197	0.3	3.8	4.0	90.4834	1.0	12.8	1.5	0.06	3.73
	Feb	9.7	357.272	0.6	7.2	4.7	90.4613	-0.0	-0.3	2.3	0.11	3.69
	Mar	9.7	364.836	2.1	28.6	8.5	90.9890	0.6	7.2	4.4	0.15	3.73
	Apr	9.9	365.997	0.3	3.9	8.7	91.3233	0.4	4.5	5.6	0.16	3.85
	May	9.7	362.219	-1.0	-11.7	6.9	92.5374	1.3	17.2	8.0	0.16	3.42
	Jun	9.5	361.204	-0.3	-3.3	5.2	92.4881	-0.1	-0.6	8.2	0.12	3.20
	Jul	9.5	362.688	0.4	5.0	5.5	93.4009	1.0	12.5	7.7	0.16	3.01
	Aug										0.16	2.70

		Consumer Price Index					Consumer Price Index less Food and Energy					Producer Price Index Finished Goods			
		Percent change					Percent change					Percent change			
		Index	Monthly/ quarterly	Annual rate	Year ago	Year to date	Index	Monthly/ quarterly	Annual rate	Year ago	Year to date	Index	Monthly/ quarterly	Annual rate	Year ago
2005		195.267			3.4		200.867			2.1		155.8			4.9
2006		201.550			3.2		205.942			2.5		160.3			2.9
2007		207.335			2.9		210.729			2.3		166.6			3.9
2008		215.247			3.8		215.568			2.3		177.2			6.4
2009		214.549			-0.3		219.236			1.7		172.7			-2.5
2008	1	212.824	1.1	4.7	4.2	4.7	213.951	0.6	2.5	2.4	2.5	174.3	2.2	9.0	7.2
	2	215.557	1.3	5.2	4.3	4.9	214.985	0.5	1.9	2.3	2.2	178.9	2.6	11.0	7.7
	3	218.909	1.6	6.4	5.3	5.4	216.501	0.7	2.9	2.5	2.4	182.5	2.0	8.3	9.4
	4	213.698	-2.4	-9.2	1.6	1.6	216.834	0.2	0.6	2.0	2.0	173.0	-5.2	-19.3	1.4
2009	1	212.493	-0.6	-2.2	-0.2	-2.2	217.670	0.4	1.6	1.7	1.6	170.6	-1.4	-5.5	-2.2
	2	213.473	0.5	1.9	-1.0	-0.2	218.934	0.6	2.3	1.8	1.9	171.6	0.6	2.5	-4.1
	3	215.417	0.9	3.7	-1.6	1.1	219.752	0.4	1.5	1.5	1.8	173.0	0.8	3.2	-5.2
	4	216.813	0.6	2.6	1.5	1.5	220.590	0.4	1.5	1.7	1.7	175.6	1.5	6.2	1.5
2010	1	217.636	0.4	1.5	2.4	1.5	220.569	-0.0	-0.0	1.3	-0.0	179.3	2.1	8.5	5.1
	2	217.244	-0.2	-0.7	1.8	0.4	221.064	0.2	0.9	1.0	0.4	179.2	-0.1	-0.2	4.4
2008	Jul	219.102	0.8	10.5	5.5	6.3	216.173	0.3	3.8	2.5	2.5	183.7	1.2	15.6	9.7
	Aug	218.779	-0.1	-1.8	5.3	5.3	216.548	0.2	2.1	2.5	2.4	181.9	-1.0	-11.1	9.6
	Sep	218.846	0.0	0.4	5.0	4.7	216.783	0.1	1.3	2.5	2.3	182.0	0.1	0.7	8.9
	Oct	216.832	-0.9	-10.5	3.7	3.1	216.768	-0.0	-0.1	2.2	2.0	177.3	-2.6	-26.9	5.3
	Nov	212.923	-1.8	-19.6	1.0	0.8	216.873	0.0	0.6	2.0	1.9	172.3	-2.8	-29.1	0.2
	Dec	211.339	-0.7	-8.6	-0.0	-0.0	216.860	-0.0	-0.1	1.7	1.7	169.4	-1.7	-18.4	-1.2
2009	Jan	211.959	0.3	3.6	-0.1	3.6	217.249	0.2	2.2	1.7	2.2	171.2	1.1	13.5	-1.2
	Feb	212.877	0.4	5.3	0.1	4.4	217.674	0.2	2.4	1.8	2.3	170.9	-0.2	-2.1	-1.7
	Mar	212.643	-0.1	-1.3	-0.4	2.5	218.086	0.2	2.3	1.8	2.3	169.6	-0.8	-8.8	-3.5
	Apr	212.810	0.1	0.9	-0.6	2.1	218.617	0.2	3.0	1.9	2.5	170.6	0.6	7.3	-3.3
	May	213.050	0.1	1.4	-1.0	2.0	218.920	0.1	1.7	1.8	2.3	170.6	0.0	0.0	-4.6
	Jun	214.558	0.7	8.8	-1.3	3.1	219.265	0.2	1.9	1.7	2.2	173.7	1.8	24.1	-4.3
	Jul	214.774	0.1	1.2	-2.0	2.8	219.533	0.1	1.5	1.6	2.1	171.6	-1.2	-13.6	-6.6
	Aug	215.566	0.4	4.5	-1.5	3.0	219.687	0.1	0.8	1.4	2.0	174.1	1.5	19.0	-4.3
	Sep	215.911	0.2	1.9	-1.3	2.9	220.035	0.2	1.9	1.5	2.0	173.3	-0.5	-5.4	-4.8
	Oct	216.357	0.2	2.5	-0.2	2.9	220.459	0.2	2.3	1.7	2.0	173.6	0.2	2.1	-2.1
	Nov	216.859	0.2	2.8	1.8	2.9	220.546	0.0	0.5	1.7	1.9	176.2	1.5	19.5	2.3
	Dec	217.224	0.2	2.0	2.8	2.8	220.764	0.1	1.2	1.8	1.8	177.1	0.5	6.3	4.5
2010	Jan	217.587	0.2	2.0	2.7	2.0	220.463	-0.1	-1.6	1.5	-1.6	179.4	1.3	16.7	4.8
	Feb	217.591	0.0	0.0	2.2	1.0	220.579	0.1	0.6	1.3	-0.5	178.5	-0.5	-5.9	4.4
	Mar	217.729	0.1	0.8	2.4	0.9	220.664	0.0	0.5	1.2	-0.2	179.9	0.8	9.8	6.1
	Apr	217.579	-0.1	-0.8	2.2	0.5	220.768	0.0	0.6	1.0	0.0	179.8	-0.1	-0.7	5.4
	May	217.224	-0.2	-1.9	2.0	0.0	221.037	0.1	1.5	1.0	0.3	179.3	-0.3	-3.3	5.1
	Jun	216.929	-0.1	-1.6	1.1	-0.3	221.388	0.2	1.9	1.0	0.6	178.4	-0.5	-5.9	2.7
	Jul	217.597	0.3	3.8	1.3	0.3	221.676	0.1	1.6	1.0	0.7	178.7	0.2	2.0	4.1

Notes

Pages 4, 5: **Final Sales** is gross domestic product (GDP) minus change in private inventories. **Advance, Second, and Third GDP Growth Rates** are released during the first, second, and third months of the following quarter. Changes result from incorporation of more complete information. Real GDP is measured in 2005 dollars. The **ISM** (formerly Purchasing Managers') **Index** is a weighted average of diffusion indexes for new orders, production, supplier deliveries, inventories, and employment. **Aggregate and Average Weekly Hours** are paid hours of production and nonsupervisory employees. The **Inventory-Sales Ratio** uses nominal (current-dollar) inventory and sales data.

Page 6: For information on how to calculate the **Contribution** of a component to the overall GDP growth rate, see the October 1999 issue of the Survey of Current Business, p. 16. The sign is changed for **Imports**.

Page 7: Ten-year **Treasury Yields** are adjusted to constant maturity; three-month yields are secondary market averages. All rates used in the yield curves are adjusted to constant maturity. **Standard and Poor's 500 Index with Reinvested Dividends** shows the total return: capital gains plus dividends.

Pages 8, 9: **Oil** (West Texas intermediate) and **Natural Gas** (Henry Hub) spot and futures **prices** are listed in the *Wall Street Journal*. Spot prices are monthly averages of daily prices; futures prices are usually taken from the last trading day of the month. **Consumer Price Index** is for all urban consumers. The **Consumption Chain Price Index** is the index associated with the personal consumption expenditures component of GDP. The **Employment Cost Index (ECI)** covers private nonfarm employers. **ECI Compensation** refers to a fixed sample of jobs, while **Compensation per Hour** covers all workers in the nonfarm business sector in a given quarter. In both cases, compensation is wages and salaries plus benefits.

Pages 10, 11: Effective with the January 2008 **Employment Situation**, the establishment survey data for employment, hours, and earnings have been converted from the 2002 NAICS system to the 2007 NAICS system. For more information see <http://www.bls.gov/ces/>. **Nonfarm Payroll Employment** is counted in a survey of about 400,000 establishments (Current Employment Statistics). It excludes self-employed individuals and workers in private households, but double-counts individuals with more than one job. The **Household Survey** (Current Population Survey) of about 60,000 households provides estimates of civilian employment, unemployment rate, labor force participation rate, and employment-population ratio. **Population** is civilian, noninstitutional, 16 years and over. The 90 percent confidence intervals for the unemployment rate (± 0.2 percentage points) and change in household survey employment ($\pm 430,000$) measure uncertainty due to sample size. Because the household survey was changed in January 1994, data prior to this date are not strictly comparable. The Bureau of Labor Statistics announced several revisions to the Household Survey on Feb. 7, 2003, with the release of the January 2003 data. For more information, see www.bls.gov/cps/. The **Job Openings rate** is the number of job openings on the last business day of the month as a percent of total employment plus job openings.

Page 13: The **Michigan Consumer Sentiment Index** shows changes in a summary measure of consumers' answers to five questions about their current and expected financial situation, expectations about future economic conditions, and attitudes about making large purchases. The survey is based on a representative sample of U.S. households.

Page 15: **Gross Private Saving** is the sum of personal saving, undistributed corporate profits with IVA and CCAj (see notes for pp. 18-19), and private wage accruals less disbursements. **Gross Government Saving** is net government saving (surplus/deficit) plus consumption of fixed capital. **Balance on Current Account (NIPA)** is net capital transfer payments to the rest of the world plus net lending or net borrowing (international trade and income flows).

Pages 16, 17: **Government Consumption and Investment** is current expenditures on goods and services, including capital consumption (depreciation) and gross investment, as reported in the NIPAs. The **Unified Federal Budget Surplus/Deficit** differs from **NIPA Basis** in four main ways: (1) NIPA excludes transactions involving existing assets; (2) NIPA outlays exclude government

investment and include consumption of government capital, while unified budget outlays do the reverse; (3) NIPA accounts exclude Puerto Rico and U.S. territories; and (4) various timing issues are handled differently. **Outlays and Receipts** are from the NIPAs, except as noted. Since 1977, the federal **Fiscal Year** starts on October 1. Excluded agency debt was 0.6 percent of federal debt at the end of fiscal 1997. **Federal Debt Held by the Public** includes holdings of the Federal Reserve System and excludes holdings of the social security and other federal trust funds. Federal grants in aid to state and local governments appear in both state and local receipts and federal outlays.

Pages 18, 19: The **Trade Balance** (shown on a balance of payments basis) is the difference between exports and imports of goods (merchandise) and services. It is nearly identical in concept to the **Net Exports** component of GDP, but differs slightly in accounting details. The **Investment Income Balance** equals income received from U.S.-owned assets in other countries minus income paid on foreign-owned assets in the U.S. The investment income balance is nearly identical in concept to the difference between gross national product and gross domestic product, but differs in accounting details. The **Current Account Balance** is the trade balance plus the balance on investment income plus net unilateral transfers to the U.S. from other countries.

Pages 20, 21: **Output per Hour (Y/H)**, **Unit Labor Cost (C/Y)**, and **Compensation per Hour (C/H)** are indexes which approximately obey the following relationship: $\%(Y/H) + \%(C/Y) = \%(C/H)$ with $\%()$ meaning percent changes. Unit labor cost is shown on page 9. **Real Compensation per Hour** uses the CPI to adjust for the effects of inflation. Nonfarm business accounted for about 77 percent of the value of GDP in 2000, while nonfinancial corporations accounted for about 54 percent. **Inventory Valuation Adjustments (IVA)** remove the effect of changes in the value of existing inventories from corporate profits and proprietors' income. (This change in value does not correspond to current production and therefore is not part of GDP). **Capital Consumption Adjustments (CCAdj)** increase profits and proprietors' income by the difference between estimates of economic depreciation and depreciation allowed by the tax code. Components of national income not shown are rental income of persons and net interest.

Pages 22, 23: The economic projections of the **Federal Open Market Committee (FOMC)** are published four times a year. Except for the unemployment rate, the projections for the current and following years are on a Q4/Q4 horizon. The shaded area represents the range of the economic projections of the FOMC members, and the dot signifies the mid-point of the ranges. The projections of the changes in the total PCE price index and the core PCE price index (excluding food and energy prices) are presumed to converge over time.

Sources

Bureau of Economic Analysis (BEA), U.S. Dept. of Commerce

National income and product accounts, international trade and investment data (except by country), auto and light truck sales.

Census Bureau, U.S. Dept. of Commerce

Inventory-sales ratios, retail sales, capital goods orders, housing starts, exports and imports by country.

Bureau of Labor Statistics (BLS), U.S. Dept. of Labor

All employment-related data, employment cost index, consumer and producer price indexes, unit labor cost, output per hour, compensation per hour, multifactor productivity.

United States Department of Treasury

Unified budget receipts, outlays, deficit, debt.

Federal Reserve Board

Index of industrial production, treasury yields, exchange rates, capacity utilization, household debt.

The Survey Research Center, The University of Michigan

Consumer sentiment index.

Organization for Economic Cooperation and Development (OECD)

GDP for major trading partners (not available on FRED).