

Deflation, Corrosive and Otherwise

Recently the Federal Open Market Committee (FOMC) mentioned deflation as a possible risk for the U.S. economy. In the statement released after the May policy meeting, the Committee stated that “the probability of an unwelcome substantial fall in inflation, though minor, exceeds that of a pickup in inflation from its already low level.” Later, Chairman Greenspan spoke about more than just a mild deflation. In comments to the International Monetary Conference in early June, Chairman Greenspan referred to the risk of “corrosive” deflation “that essentially feeds on itself, creates falling asset prices, which in turn brings down levels of economic activity...” What is the main evidence on deflation? Are there corrosive and benign forms? Does economic performance always suffer during periods of sustained deflation?

The accompanying table provides some evidence on deflation and lists periods in which the United States or Japan have experienced three or more years of a declining price level. There are three main episodes: the late 19th century in the United States, the Great Depression in the United States, and Japan since 1999. For each deflationary episode, the table lists the average real GDP growth rate and the average inflation rate based on two popular inflation measures, the GDP deflator and the consumer price index.

The table also lists a benchmark average growth rate of GDP for years surrounding the deflation experience, so we can consider whether deflation is associated with lower-than-average growth for the corresponding era or not.

Generally speaking, the United States experienced rapid growth during the late 19th century, with GDP growth averaging about 4.0 percent for the period 1876-1900,

despite an average deflation of about 1.0 percent. By itself, this suggests that a mild deflation is not necessarily associated with poor economic performance. However, averaging over a long period of time could mask severe distress that may accompany deflation. To address this issue, we examine the subperiods 1876-1879 and 1883-1885. During the former, GDP growth actually was greater than the benchmark value, despite a rather hefty 3.0 to 4.0 percent annual average decline in the price level. Evidently, this deflationary episode was rather benign. In contrast, the deflationary episode of 1883-1885 was not so benign. GDP growth fell well below the benchmark average for that time. The same is also true at the onset of the Great Depression (1930-1933) and the recent episode in Japan (1999-2002). During the Great Depression, GDP growth averaged a whopping -8.36 percent and inflation was around -6.5 percent. While not as severe, Japan also experienced slow growth during its deflationary episode.

As the table shows, U.S. experience with sustained deflation has been limited since the founding of the Federal Reserve in 1914. The results from 1930-1933 are uniformly bad, but deflation may simply have been a by-product of the economic collapse at that time. Japan’s experience is perhaps more relevant for today’s circumstances. Although sustained deflation is not everywhere and always “corrosive,” on balance the evidence suggests that deflationary episodes are marked by subpar growth.

—James B. Bullard and Charles M. Hokayem

Deflationary Episodes

Country/period	GDP deflator inflation	CPI inflation	Real GDP growth	Real GDP growth (benchmark years)
U.S. 1876-1900	-0.94%	-1.07%	4.03%	4.02% (1876-1913)
1876-1879	-3.82%	-3.96%	5.20%	4.02% (1876-1913)
1883-1885	-3.27%	-2.34%	1.68%	4.02% (1876-1913)
U.S. 1930-1933	-6.45%	-6.69%	-8.36%	2.73% (1919-1941)
Japan 1999-2002	-1.66%	-0.71%	0.90%	2.33% (1985-2002)

NOTE: GDP deflator and real GDP data: Robert J. Gordon, *Macroeconomics, 8th Ed.*, Addison-Wesley, 2000. CPI data: *Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Ed. Part 1*, U.S. Bureau of the Census, 1975.

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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 March 2001; however, the hatched shading indicates this recession ended in November 2001, as determined by a statistical model for dating business cycle turning points developed by Marcelle Chauvet (“An Econometric Characterization of Business Cycle Dynamics with Factor Structure and Regime Switching,” *International Economic Review*, November 1998, pp. 969-96) and discussed by Marcelle Chauvet and Jeremy Piger (“Identifying Business Cycle Turning Points in Real Time,” *Federal Reserve Bank of St. Louis Review*, March/April 2003, pp. 47-62).
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:

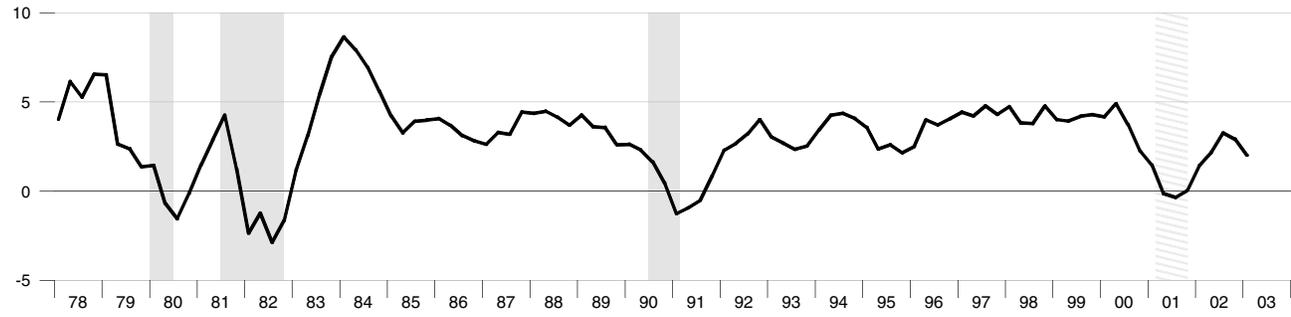
Editor, *National Economic Trends*
Research Division
Federal Reserve Bank of St. Louis
P.O. Box 442
St. Louis, MO 63166-0442

or to:

stlsFRED@stls.frb.org

Real Gross Domestic Product

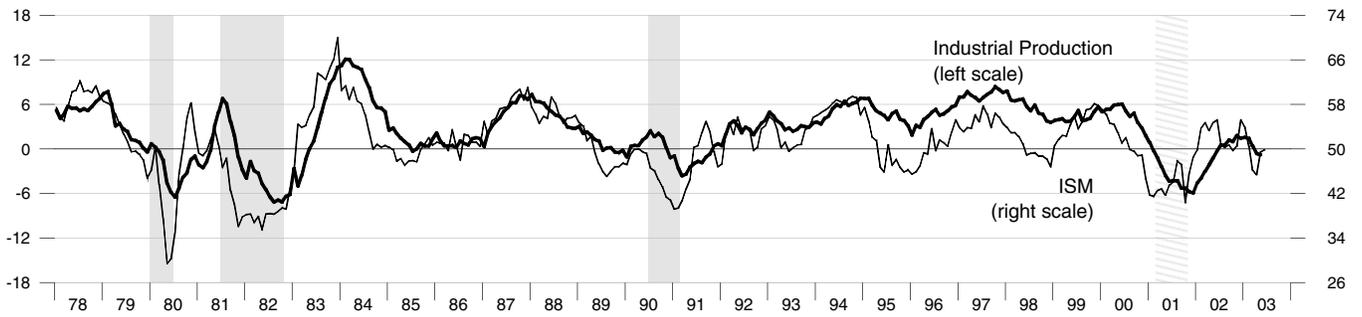
Percent change from year ago



Industrial Production and Institute for Supply Management (ISM) Indexes

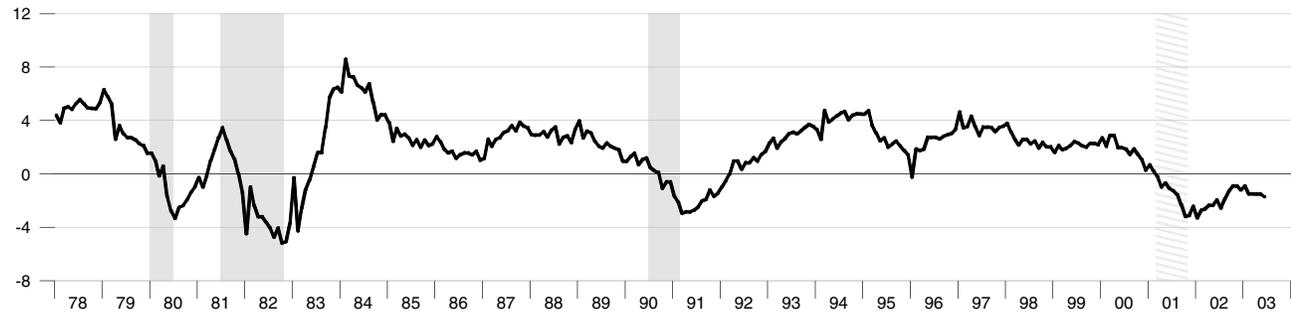
Percent change from year ago

Index



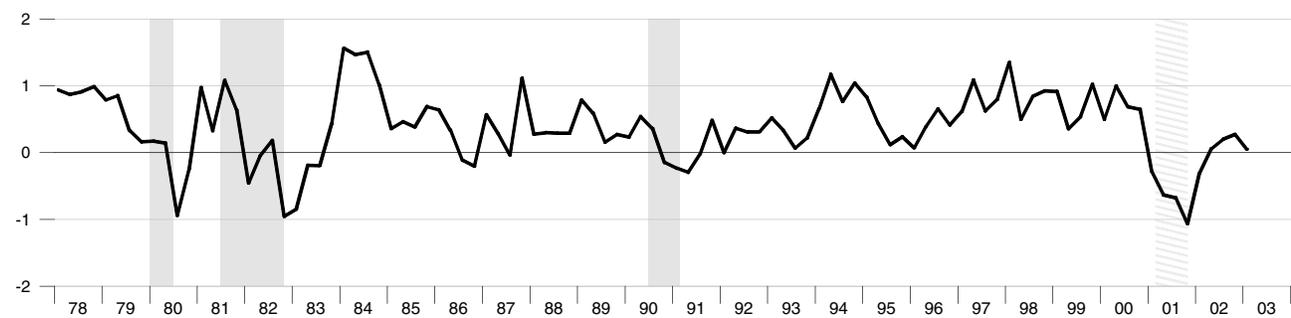
Aggregate Private Nonfarm Hours

Percent change from year ago

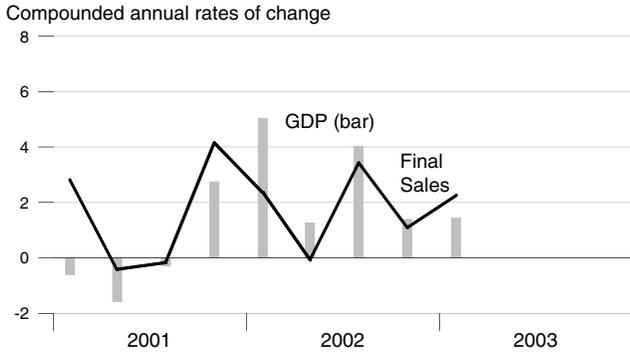


Real Change in Private Inventories

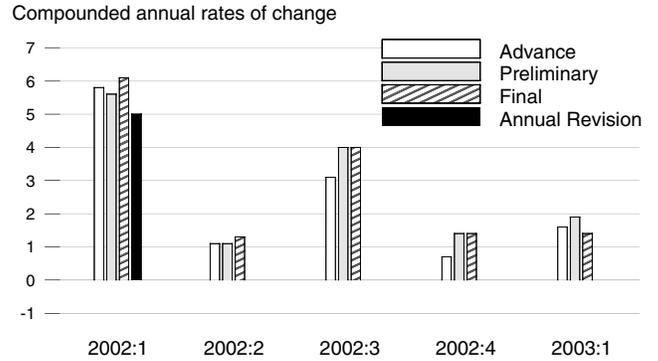
Percent of GDP



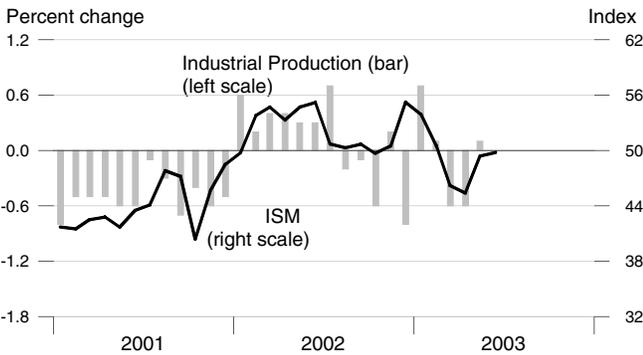
Real Final Sales and GDP



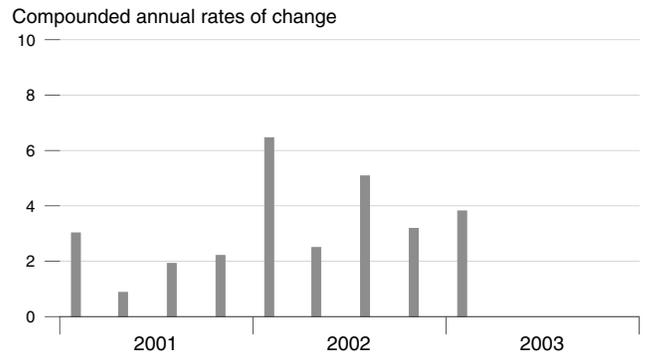
Real GDP Revisions



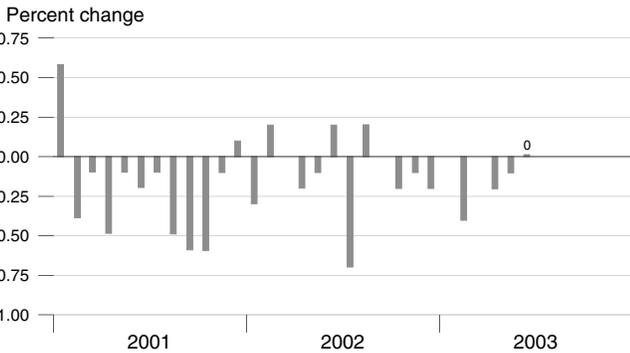
Industrial Production and ISM Index



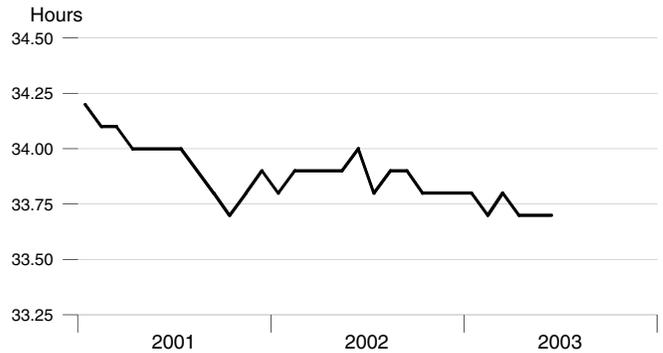
Nominal Gross Domestic Product



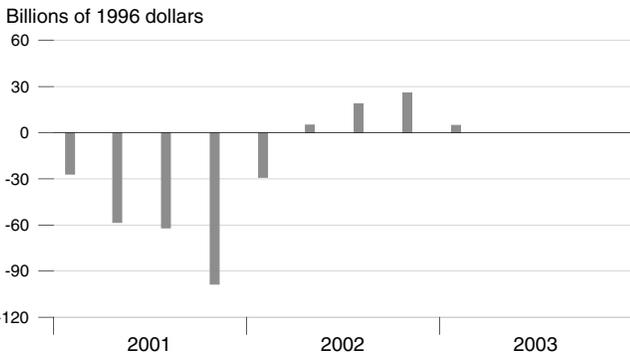
Aggregate Private Nonfarm Hours



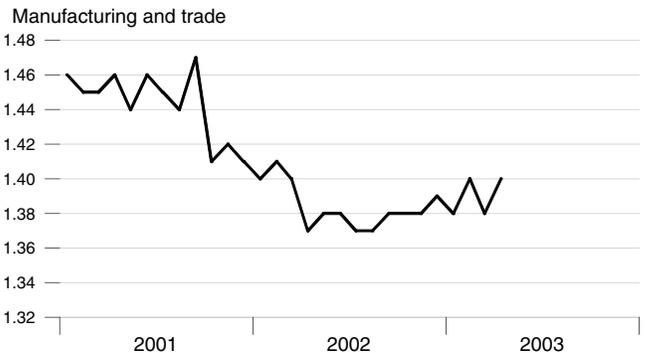
Average Weekly Private Nonfarm Hours



Real Change in Private Inventories

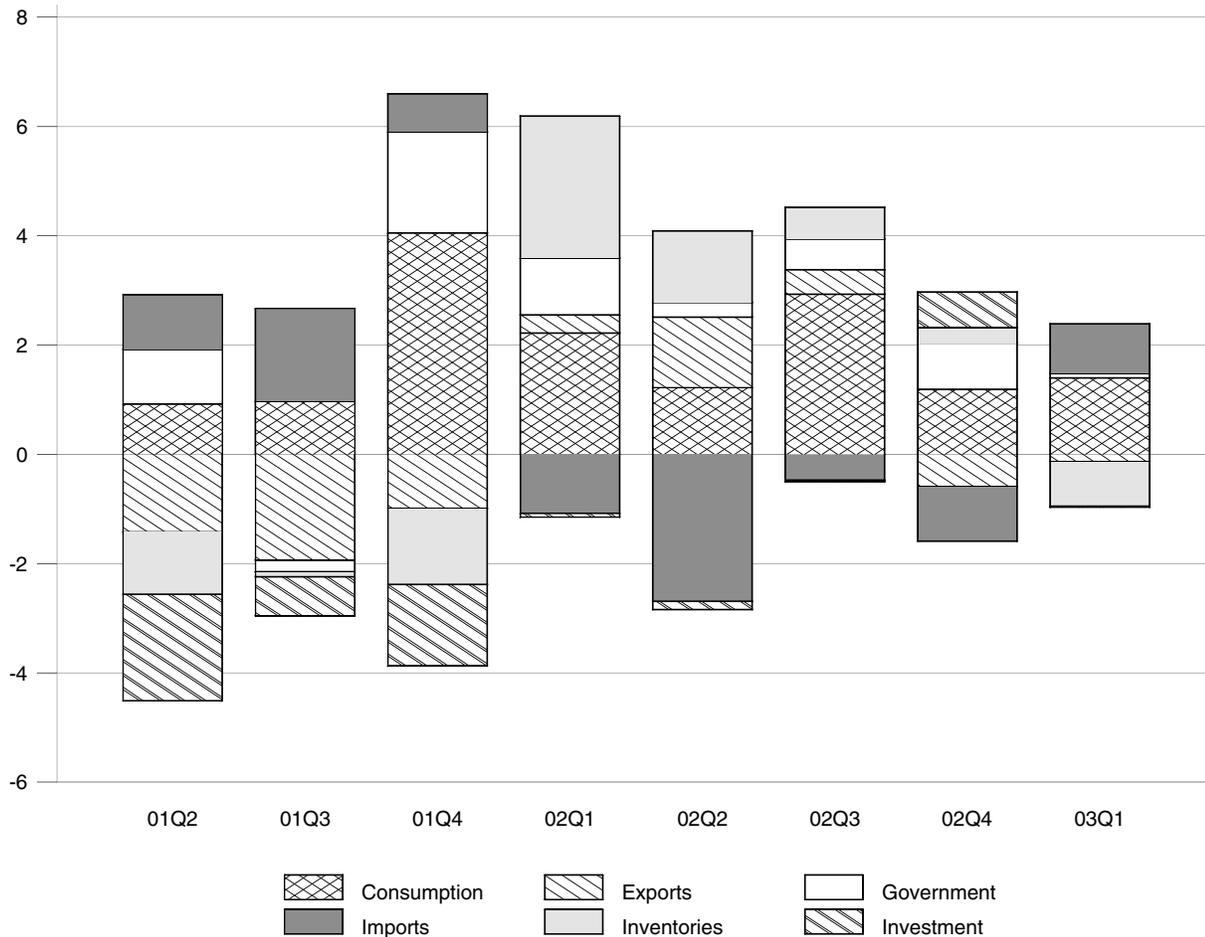


Inventory-Sales Ratio



Contribution of Components to Real GDP Growth

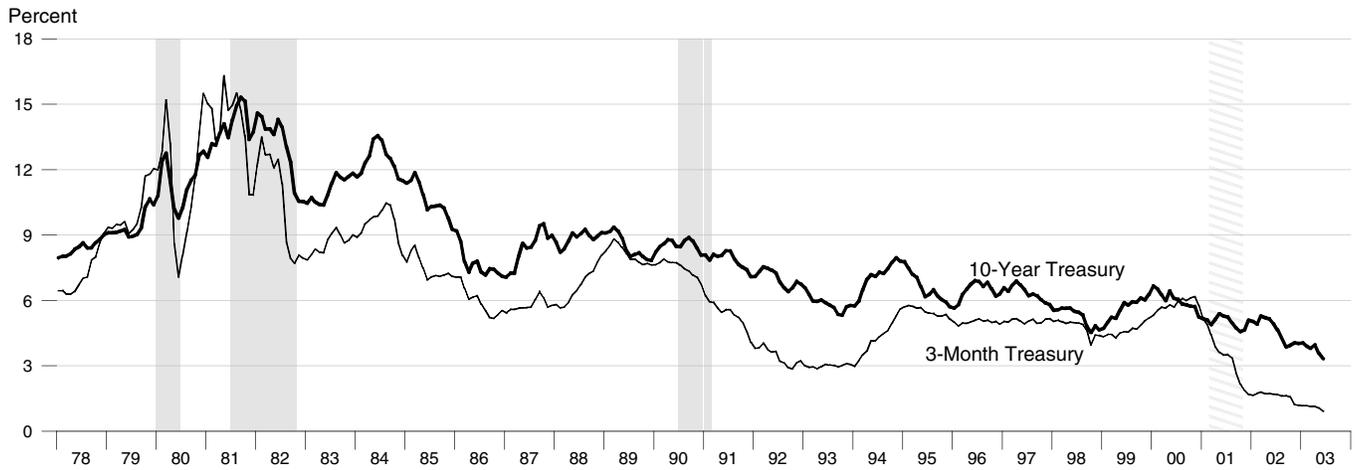
Percentage points at compounded annual rates



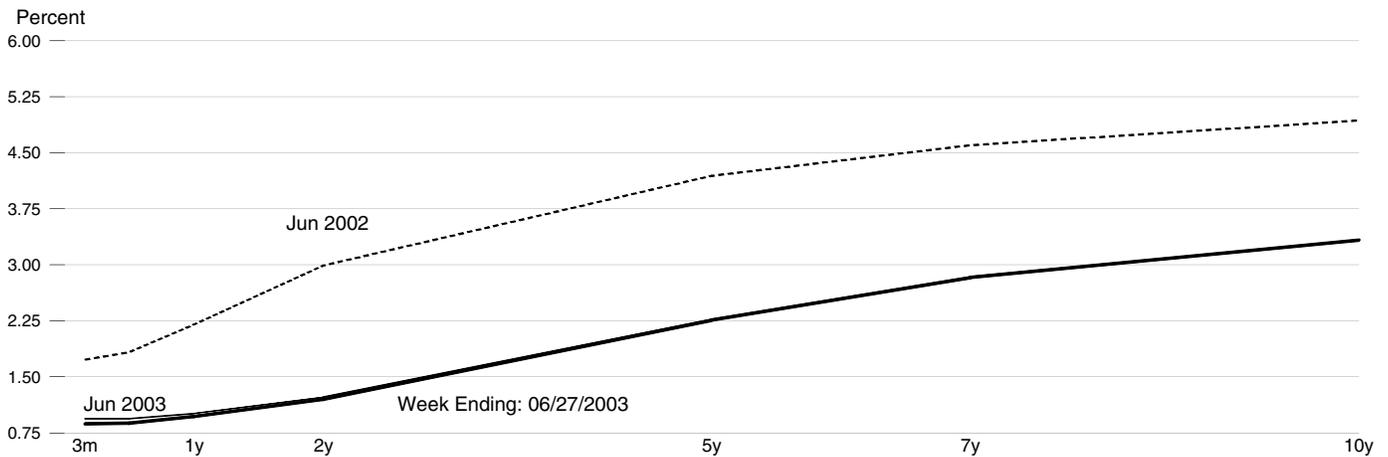
Contributions to Real GDP Growth Rate

	2001			2002				2003
	2nd	3rd	4th	1st	2nd	3rd	4th	1st
Final Sales	-0.45	-0.20	4.13	2.44	-0.06	3.45	1.10	2.25
Change in Inventory	-1.14	-0.09	-1.39	2.60	1.31	0.58	0.28	-0.82
Consumption	0.92	0.97	4.05	2.22	1.22	2.93	1.19	1.40
Fixed Investment	-1.95	-0.72	-1.49	-0.07	-0.15	-0.03	0.65	-0.02
Nonresidential	-1.93	-0.73	-1.33	-0.66	-0.27	-0.08	0.24	-0.47
Residential	-0.02	0.02	-0.16	0.60	0.12	0.05	0.41	0.45
Government	1.00	-0.21	1.85	1.04	0.27	0.56	0.85	0.08
Federal	0.36	0.07	0.80	0.47	0.47	0.29	0.70	0.05
State and Local	0.64	-0.28	1.05	0.56	-0.21	0.27	0.15	0.03
Net Exports	-0.42	-0.24	-0.28	-0.75	-1.40	-0.01	-1.59	0.78
Exports	-1.42	-1.94	-0.99	0.33	1.29	0.45	-0.59	-0.13
Imports	1.00	1.70	0.70	-1.08	-2.69	-0.47	-1.00	0.91
Residual	0.50	0.07	0.42	-0.05	0.27	0.06	0.28	0.08
Real GDP Growth	-1.59	-0.29	2.74	5.04	1.25	4.03	1.38	1.43

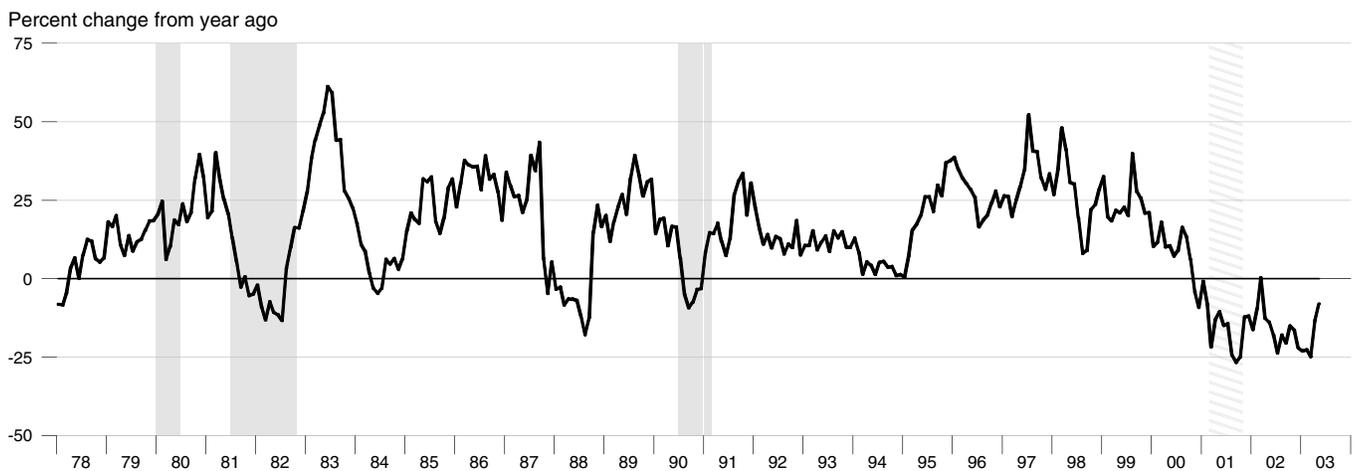
Interest Rates



Treasury Yield Curve

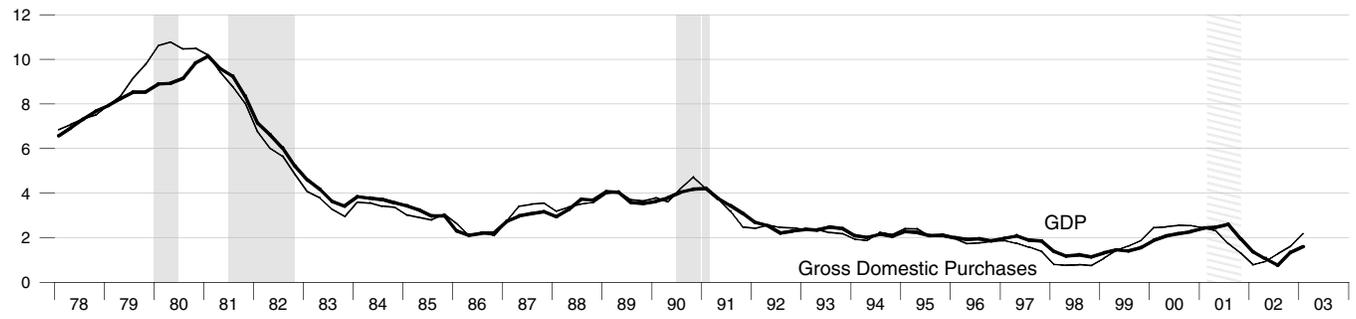


Standard and Poor's 500 Index with Reinvested Dividends



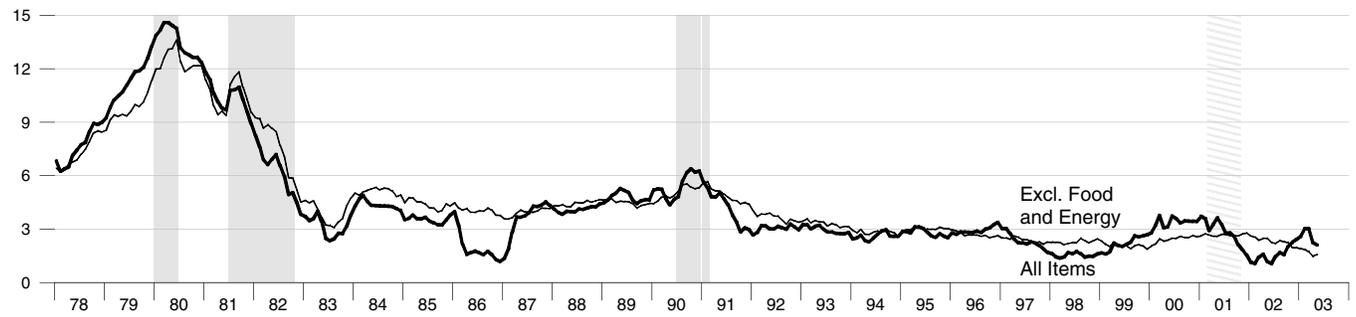
NIPA Chain Price Indexes

Percent change from year ago



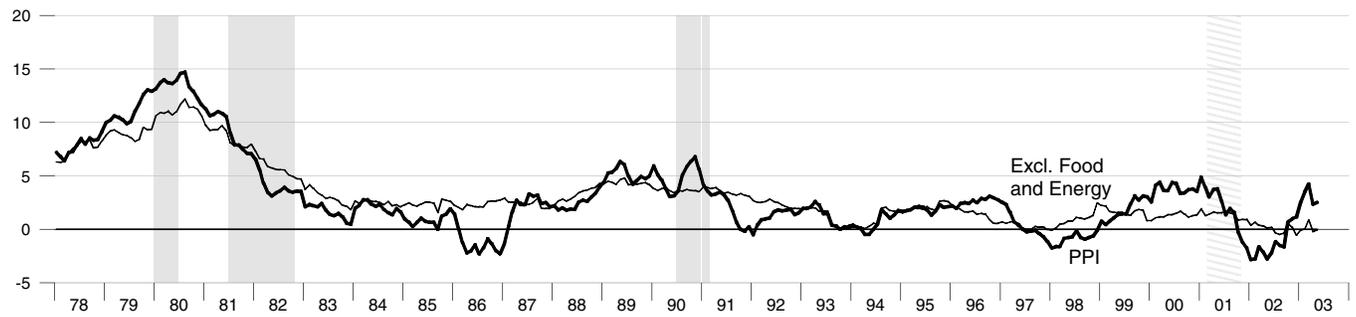
Consumer Price Index

Percent change from year ago



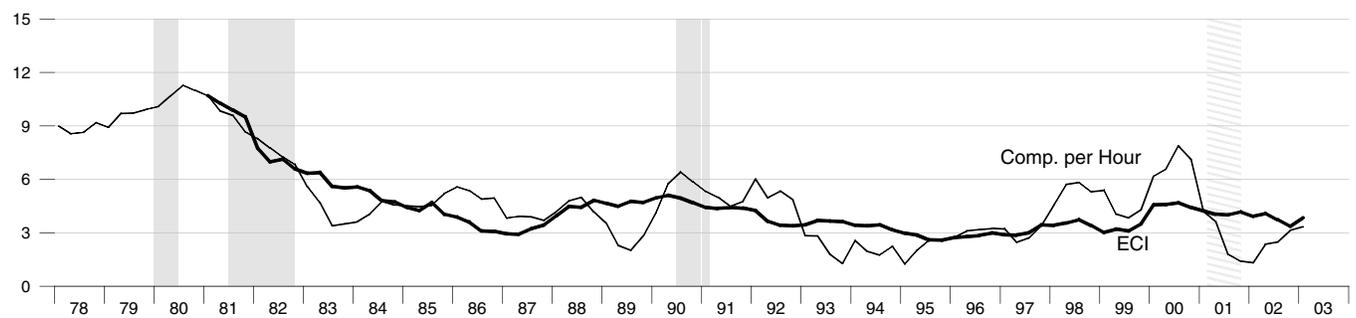
Producer Price Index, Finished Goods

Percent change from year ago

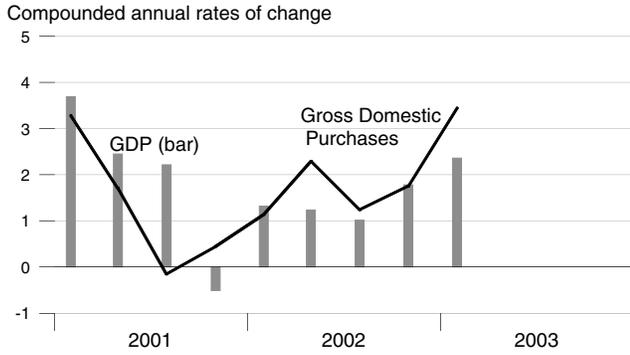


Employment Cost Index and Compensation per Hour

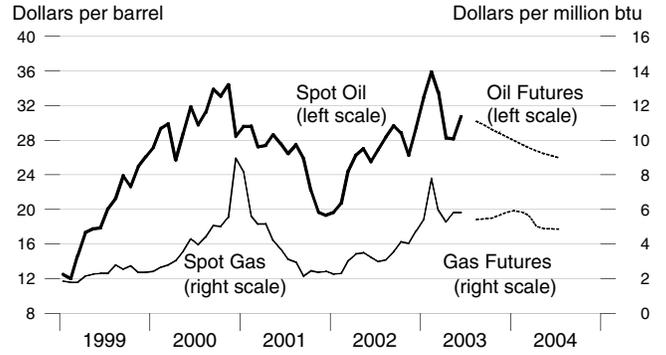
Percent change from year ago



NIPA Chain Price Indexes

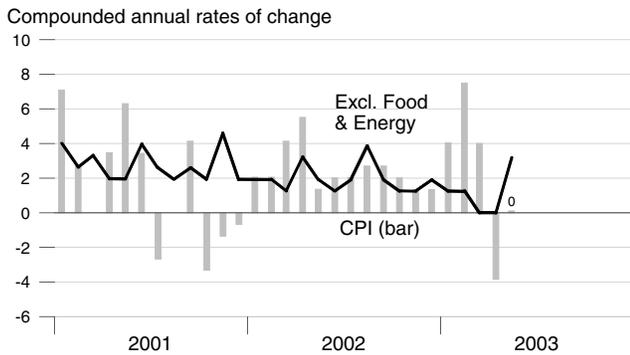


Oil & Natural Gas Prices: Spot & Futures

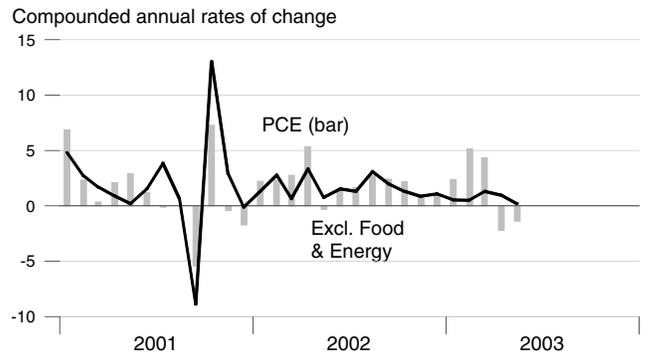


Note: Futures prices as of 6/30/2003.

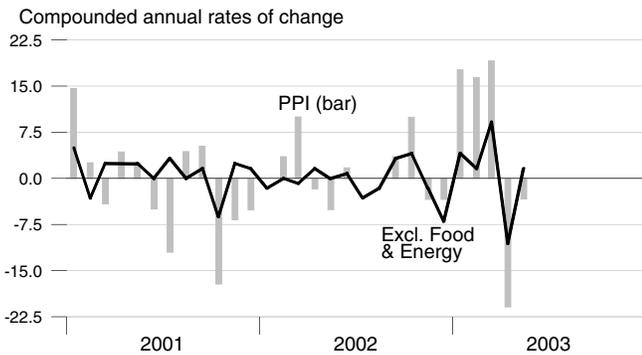
Consumer Price Index



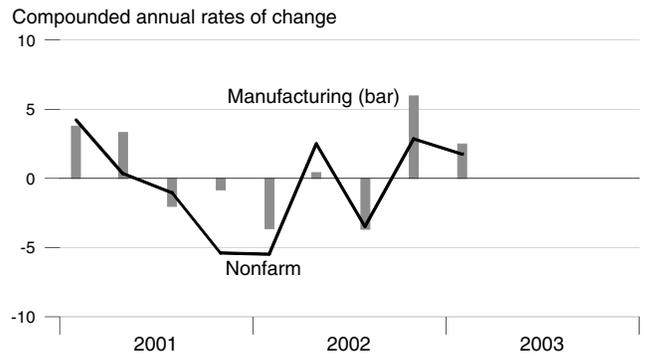
Consumption Chain Price Index



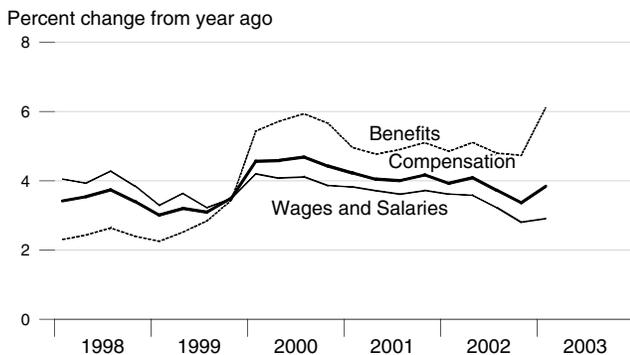
Producer Price Index, Finished Goods



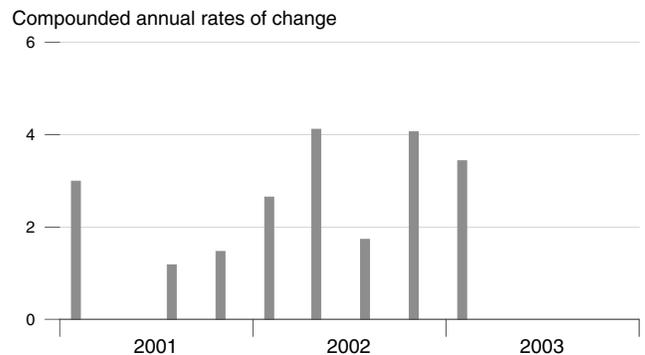
Unit Labor Cost



Employment Cost Index

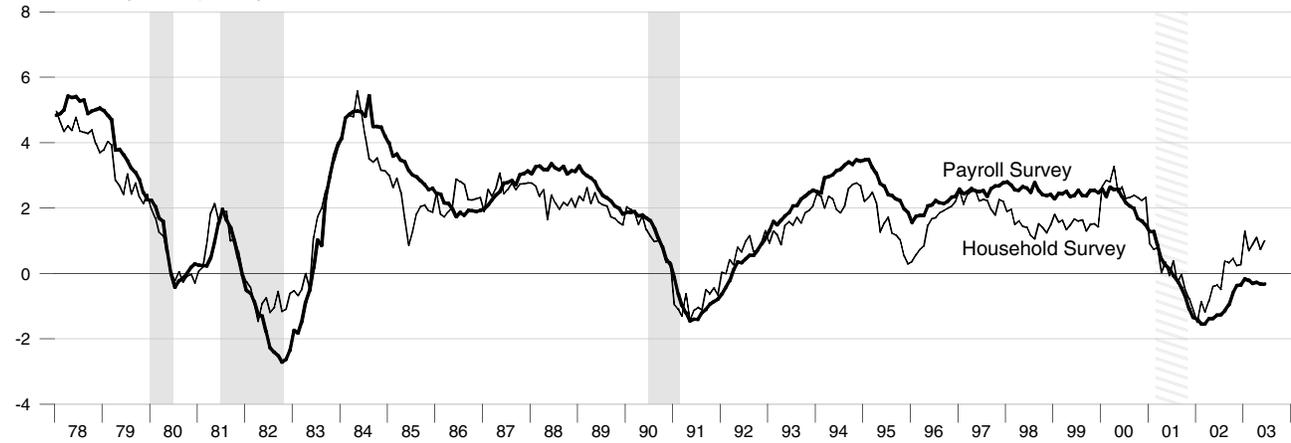


Compensation per Hour



Employment

Percent change from year ago

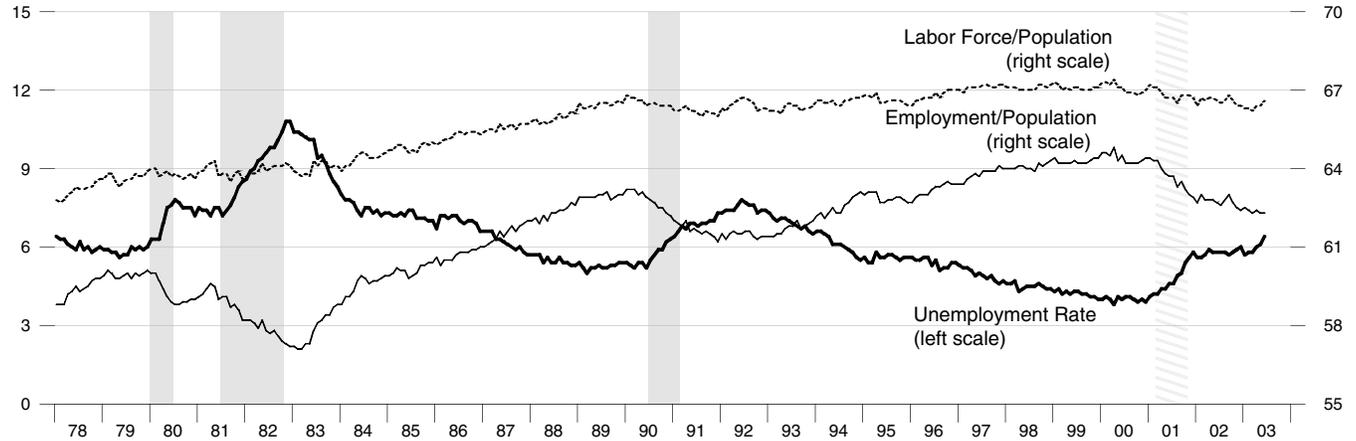


See the Notes section at the end of this publication for the Feb. 7, 2003, revisions to the Household Survey, and the June 6, 2003, revisions to the Establishment Survey.

Unemployment, Labor Force Participation, and Employment Rates

Percent of labor force

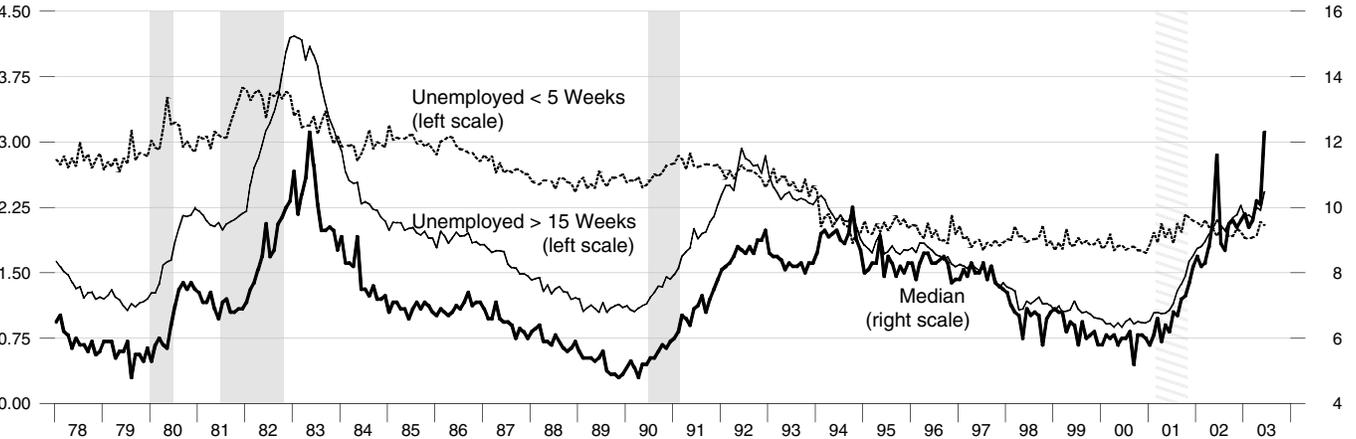
Percent of population



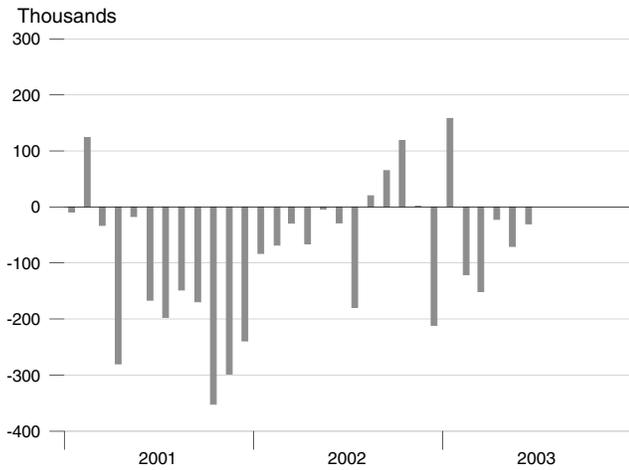
Duration of Unemployment

Percent of labor force

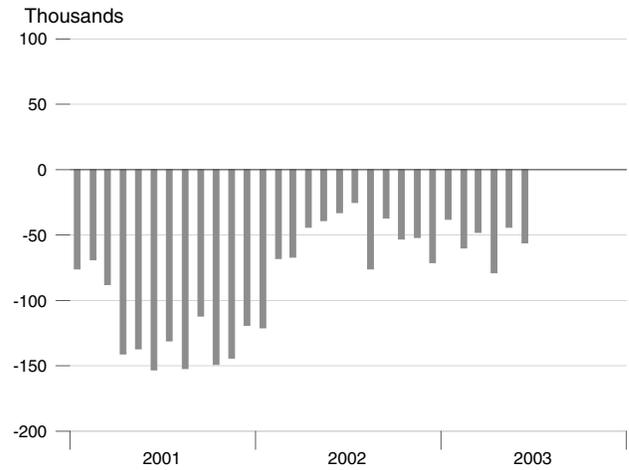
Weeks



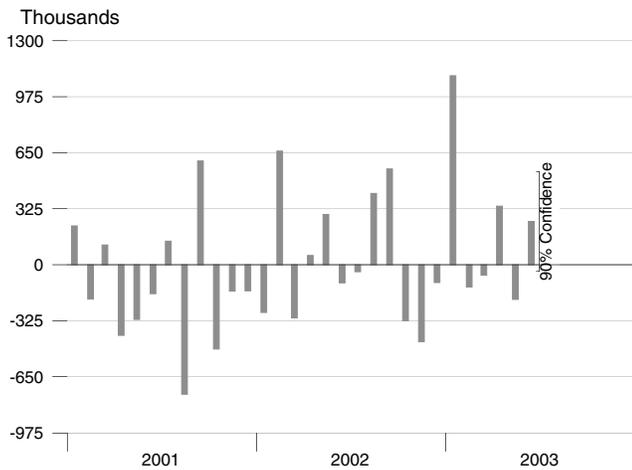
Change in Nonfarm Payrolls



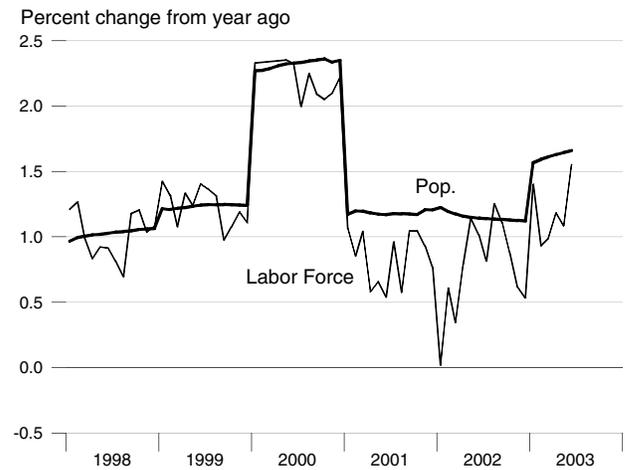
Change in Manufacturing Payrolls



Change in Household Employment



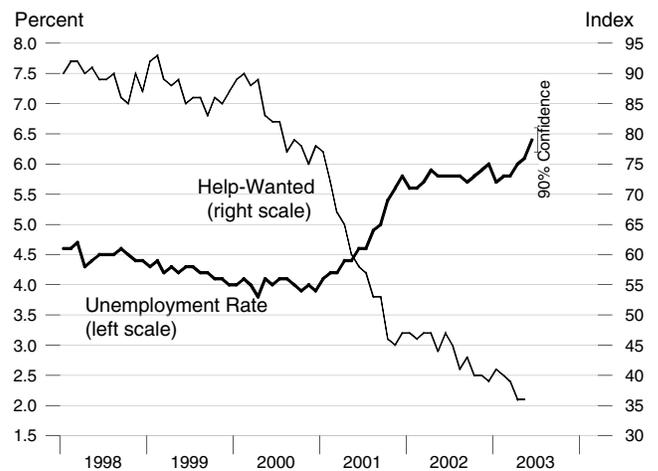
Labor Force and Population



Available Labor Supply and Components

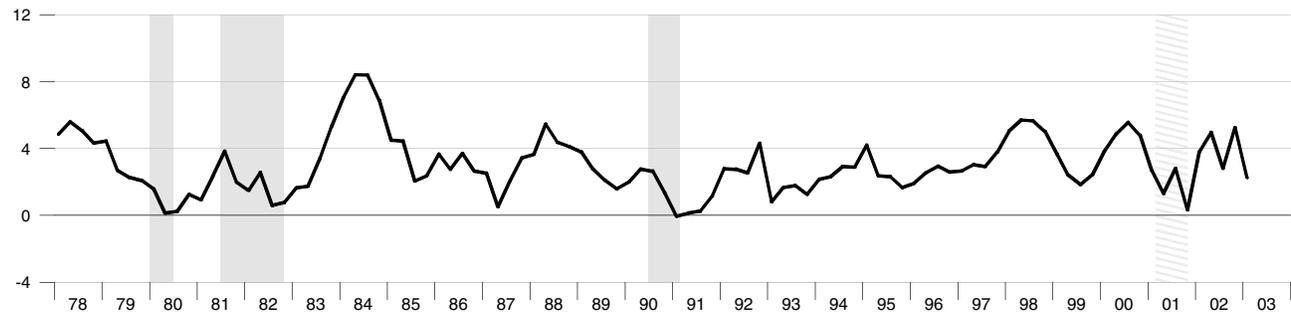


Unemployment Rate & Help-Wanted Index



Real Disposable Personal Income

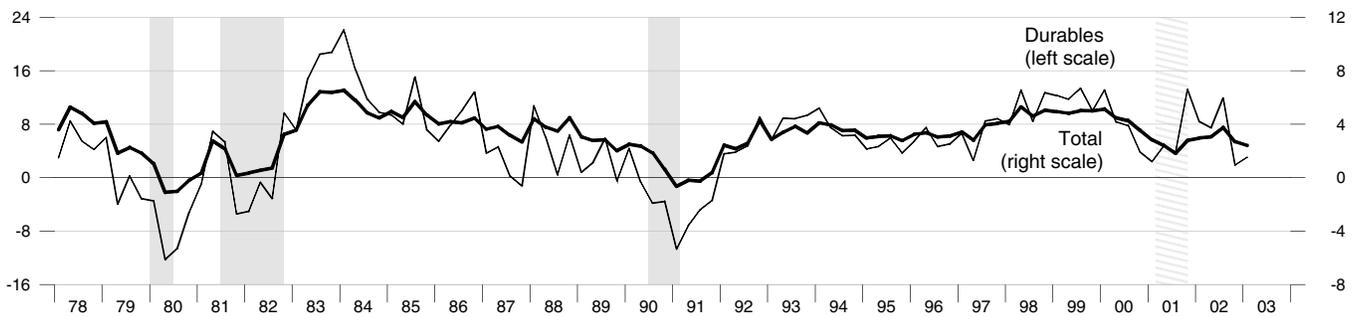
Percent change from year ago, quarterly data



Real Consumption

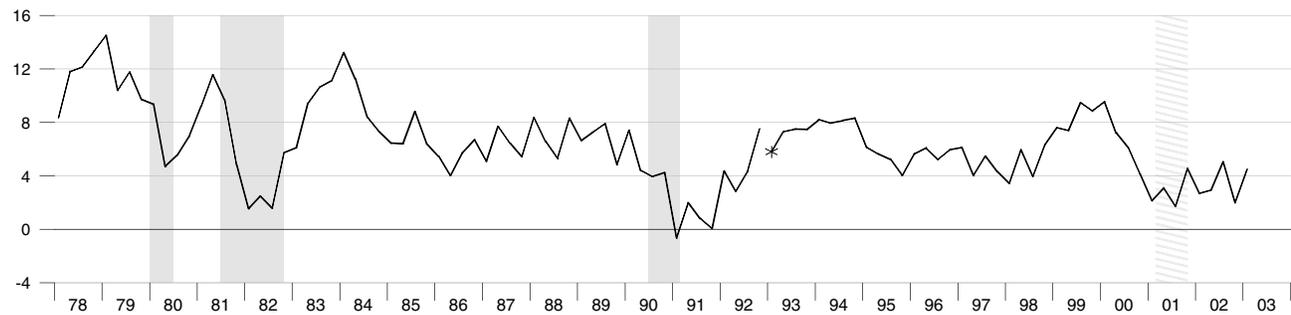
Percent change from year ago, quarterly data

Percent change from year ago, quarterly data



Retail and Food Services Sales

Percent change from year ago, quarterly average

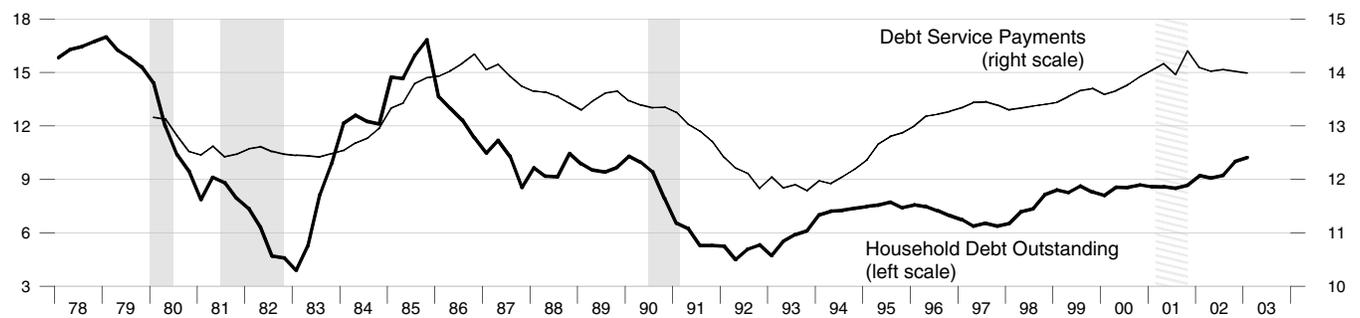


*Data before January 1992 are not strictly comparable (see End Notes).

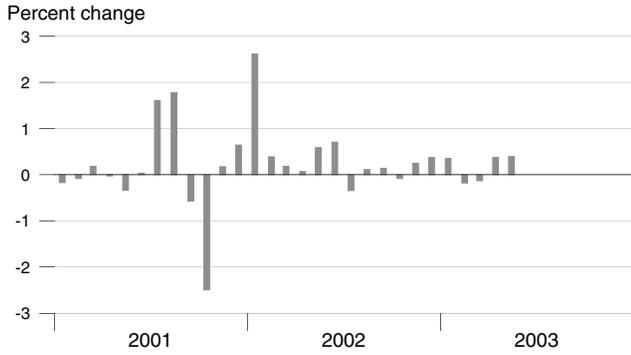
Debt Service Payments and Household Debt Outstanding

Percent change from year ago, quarterly data

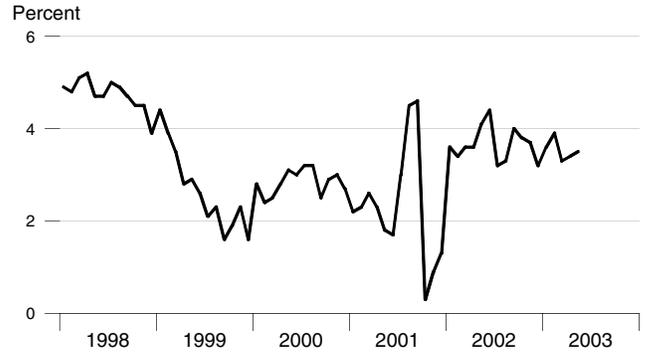
Percent of disposable personal income



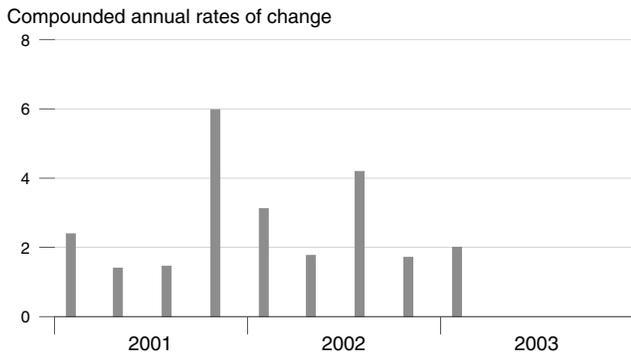
Real Disposable Personal Income



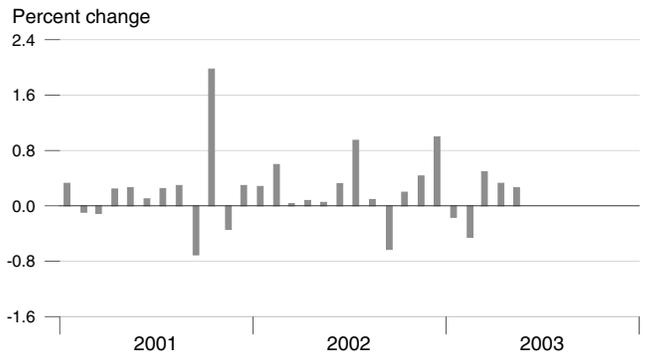
Personal Saving Rate



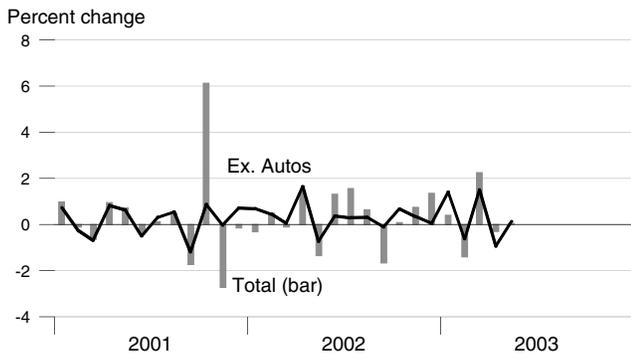
Real Consumption



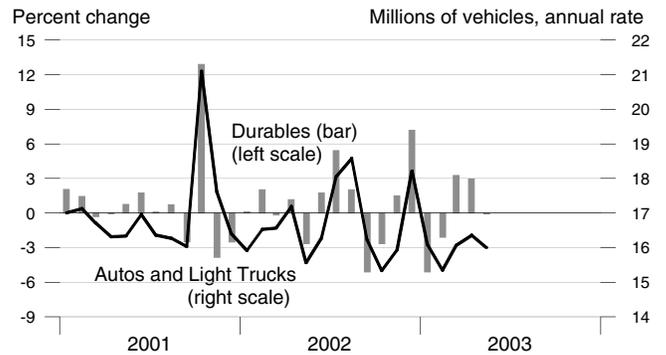
Real Consumption



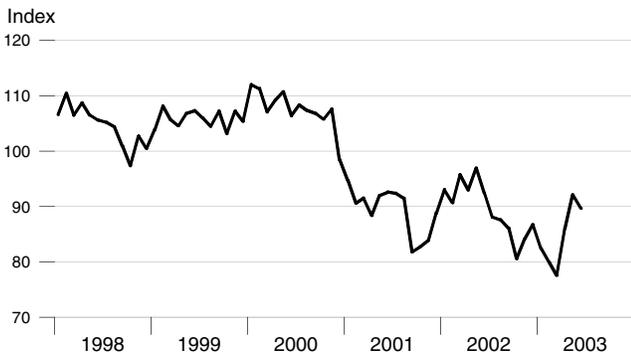
Retail & Food Services



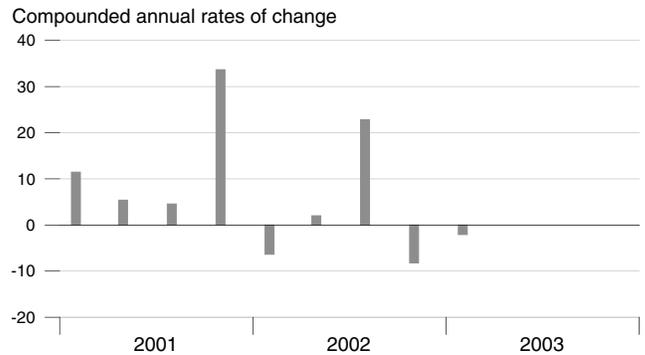
Real Durables Consumption & Vehicle Sales



Consumer Sentiment (U. of Michigan)

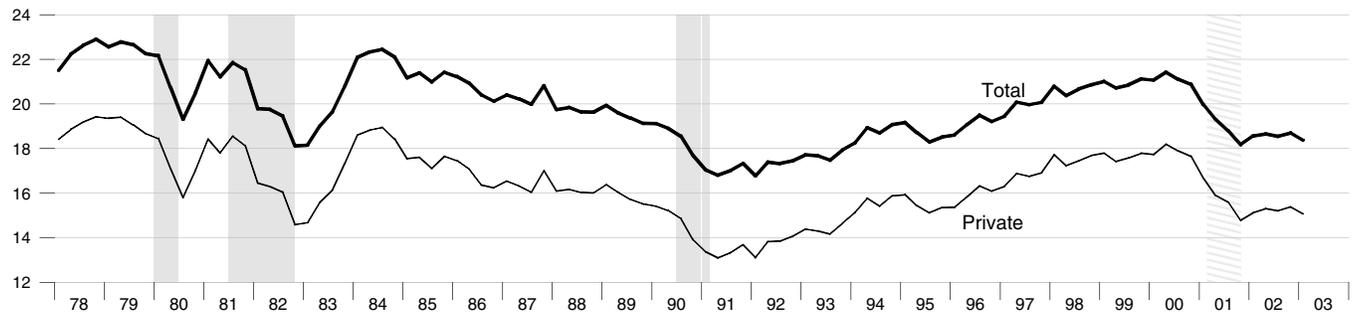


Real Durables Consumption



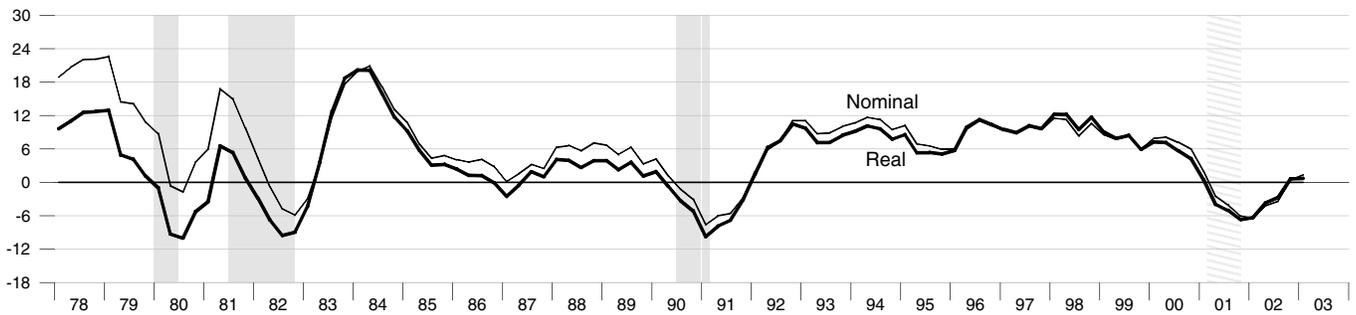
Investment

Percent of nominal GDP



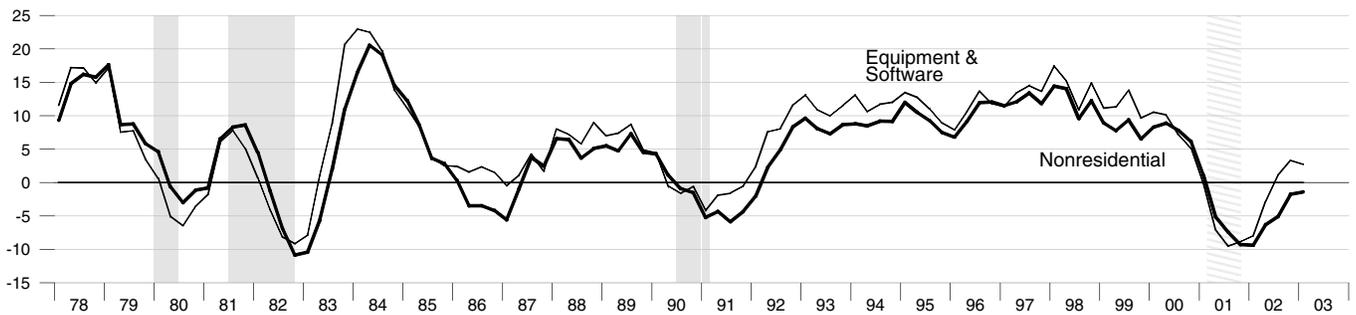
Private Fixed Investment

Percent change from year ago



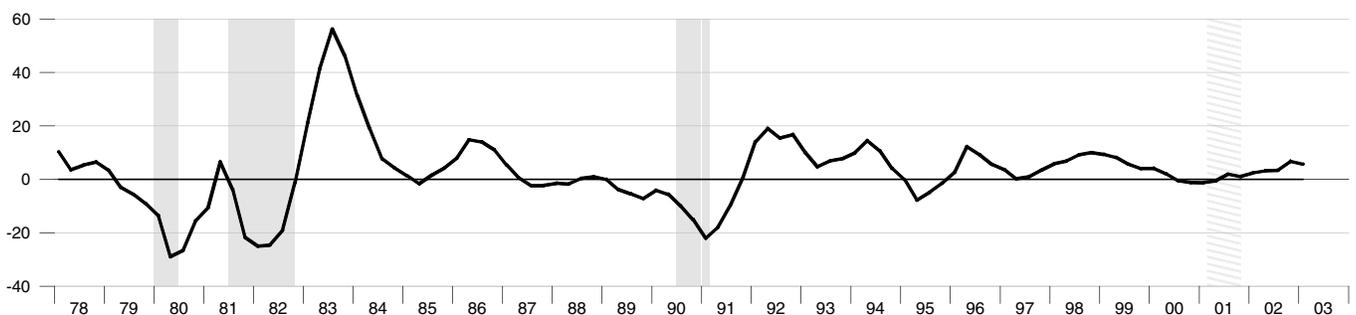
Real Nonresidential Fixed and Equipment & Software Investment

Percent change from year ago

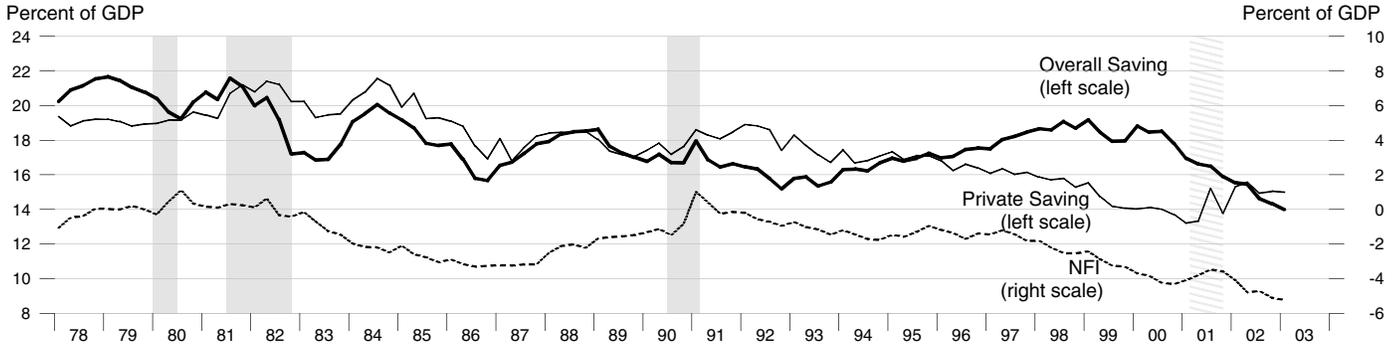


Real Residential Fixed Investment

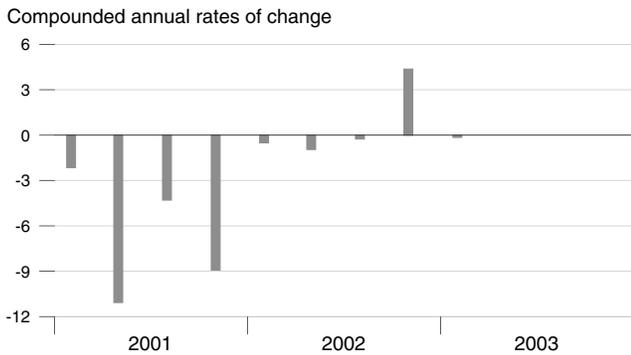
Percent change from year ago



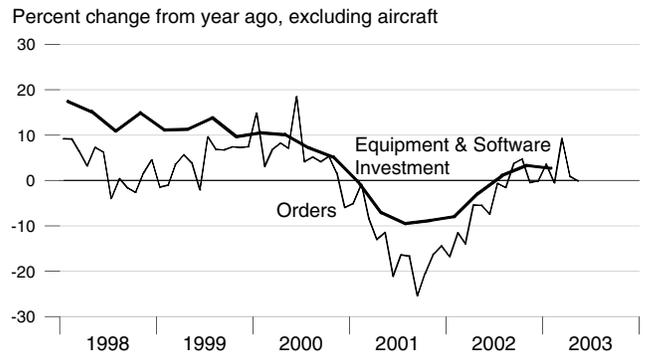
Gross Saving Rates and Net Foreign Investment



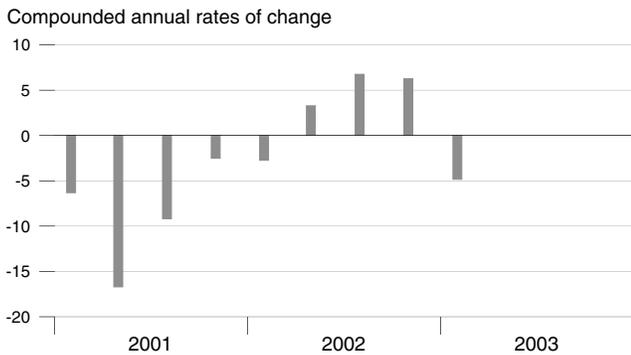
Real Private Fixed Investment



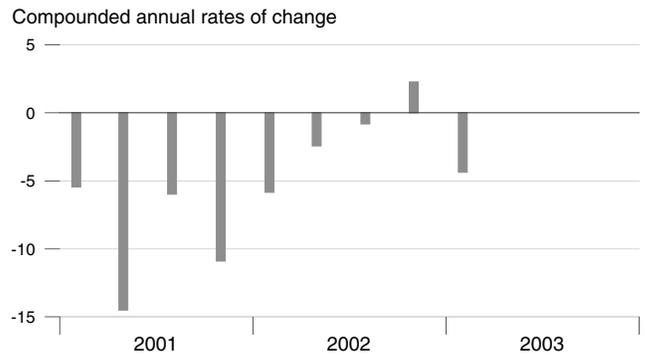
Nondefense Capital Goods Orders



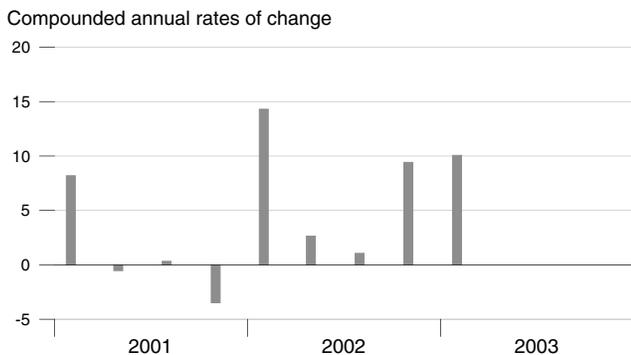
Real Equipment & Software Investment



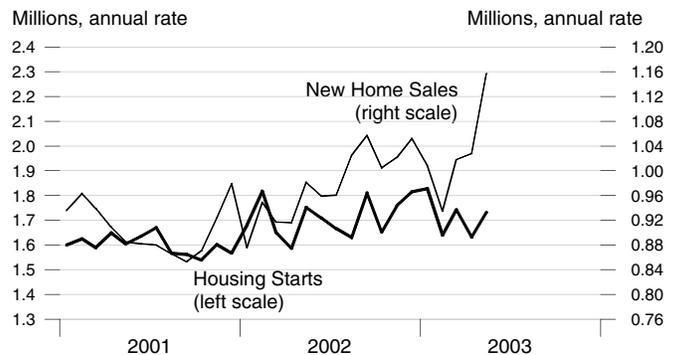
Real Nonresidential Fixed Investment



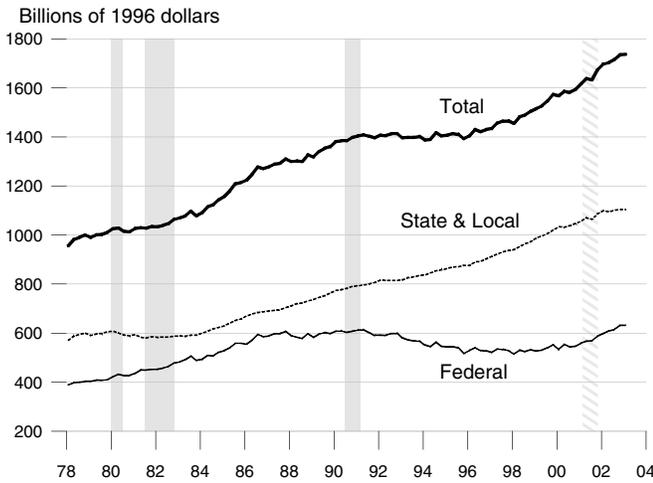
Real Residential Fixed Investment



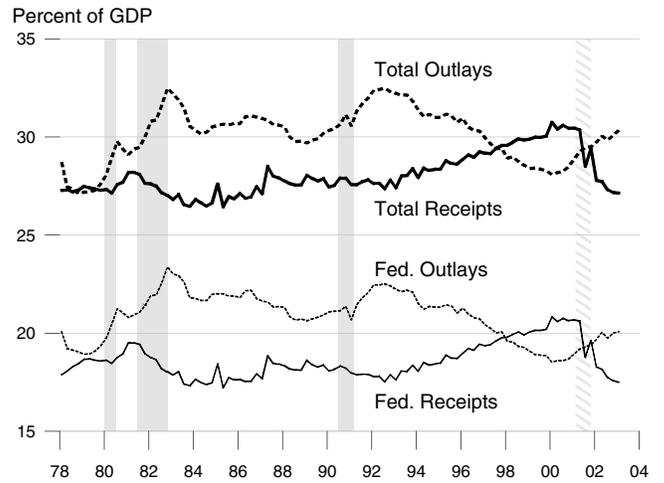
Housing Starts and New Home Sales



Govt. Consumption and Investment



Government Receipts and Outlays



Government Budgets

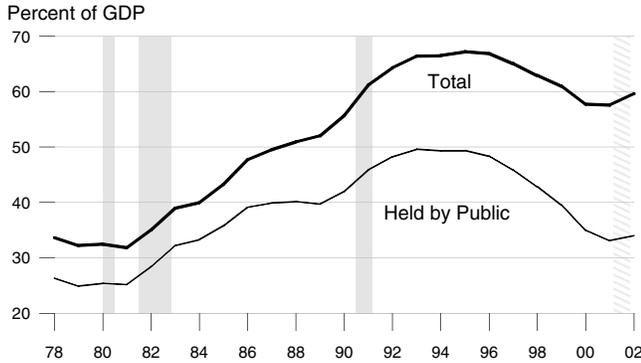
Billions of dollars

National Income Accounts
Calendar Years

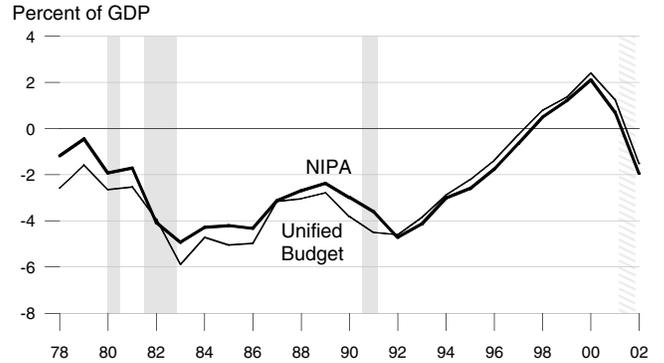
Unified Budget
Fiscal Years

	State and Local			Federal			Federal		
	Receipts	Expenditures	Surplus or Deficit (-)	Receipts	Expenditures	Surplus or Deficit (-)	Receipts	Outlays	Surplus or Deficit (-)
1991	716.0	723.8	-7.8	1072.3	1287.6	-215.3	1055.0	1324.4	-269.4
1992	772.2	777.2	-5.0	1121.3	1418.9	-297.6	1091.3	1381.7	-290.4
1993	823.2	821.7	1.5	1197.3	1471.5	-274.2	1154.4	1409.5	-255.1
1994	873.8	865.2	8.6	1293.7	1506.0	-212.3	1258.6	1461.9	-203.3
1995	917.9	902.5	15.4	1383.7	1575.7	-192.0	1351.8	1515.8	-164.0
1996	960.4	939.0	21.4	1499.1	1635.9	-136.8	1453.1	1560.6	-107.5
1997	1011.3	980.3	31.0	1625.5	1678.8	-53.3	1579.3	1601.3	-22.0
1998	1074.4	1033.7	40.7	1749.7	1705.9	43.8	1721.8	1652.6	69.2
1999	1144.1	1105.8	38.3	1867.2	1755.3	111.9	1827.5	1701.9	125.5
2000	1214.2	1196.2	18.0	2033.9	1827.1	206.8	2025.2	1788.8	236.4
2001	1261.3	1292.6	-31.3	2008.4	1936.4	72.0	1991.0	1863.9	127.1
2002	1304.5	1356.4	-51.9	1873.3	2075.5	-202.2	1853.2	2011.0	-157.8
2000Q2	1204.7	1184.5	20.2	2022.9	1825.7	197.2	656.0	444.3	211.8
2000Q3	1225.4	1206.2	19.2	2049.1	1835.9	213.2	491.7	431.3	60.4
2000Q4	1230.8	1231.0	-0.2	2054.1	1860.3	193.8	462.0	464.3	-2.3
2001Q1	1247.3	1263.8	-16.5	2072.9	1899.1	173.8	459.8	482.2	-22.5
2001Q2	1261.1	1293.4	-32.3	2072.3	1927.8	144.5	660.3	466.5	193.7
2001Q3	1253.6	1299.8	-46.2	1896.0	1947.7	-51.7	409.0	450.7	-41.7
2001Q4	1283.2	1313.3	-30.1	1992.3	1971.0	21.3	466.3	501.7	-35.4
2002Q1	1273.3	1329.1	-55.8	1884.7	2030.5	-145.8	412.6	509.2	-96.6
2002Q2	1302.5	1347.6	-45.1	1883.7	2079.3	-195.6	522.6	506.9	15.6
2002Q3	1310.3	1365.0	-54.7	1864.1	2074.6	-210.5	451.7	493.2	-41.5
2002Q4	1331.6	1384.0	-52.4	1860.8	2117.4	-256.6	427.4	536.1	-108.7
2003Q1	1344.0	1410.9	-66.9	1869.8	2145.1	-275.3	397.8	541.7	-143.9

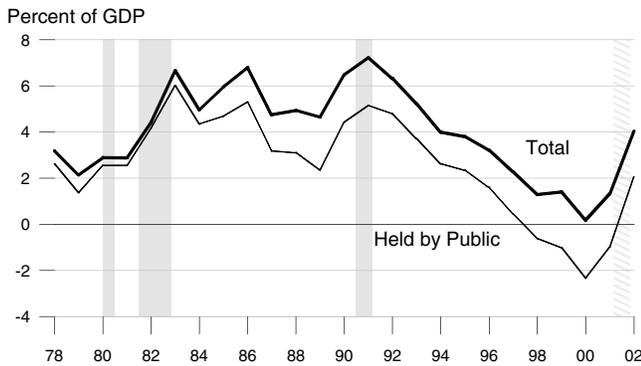
Federal Debt



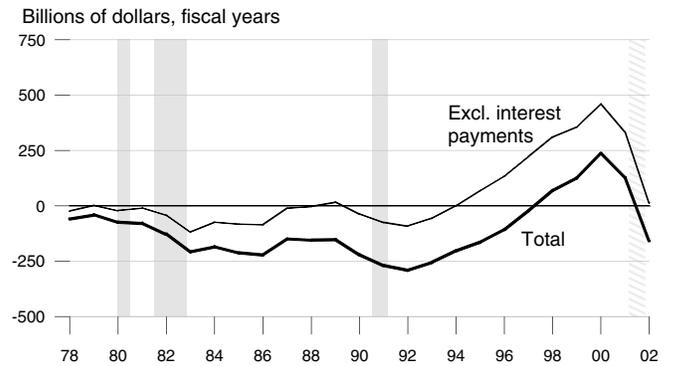
Federal Surplus (+) / Deficit (-)



Change in Federal Debt



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

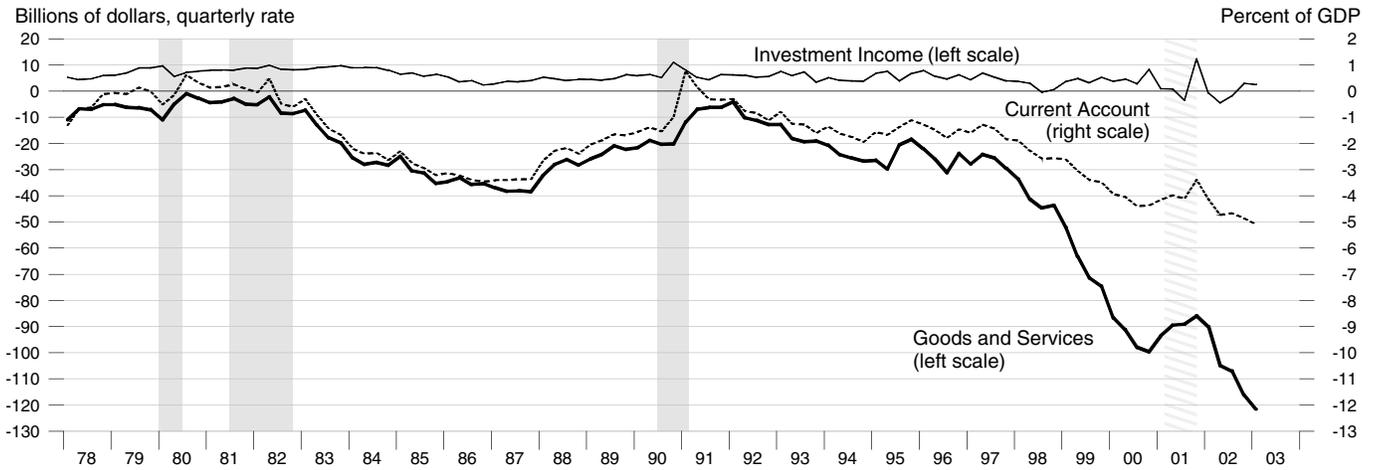


Federal Government Debt

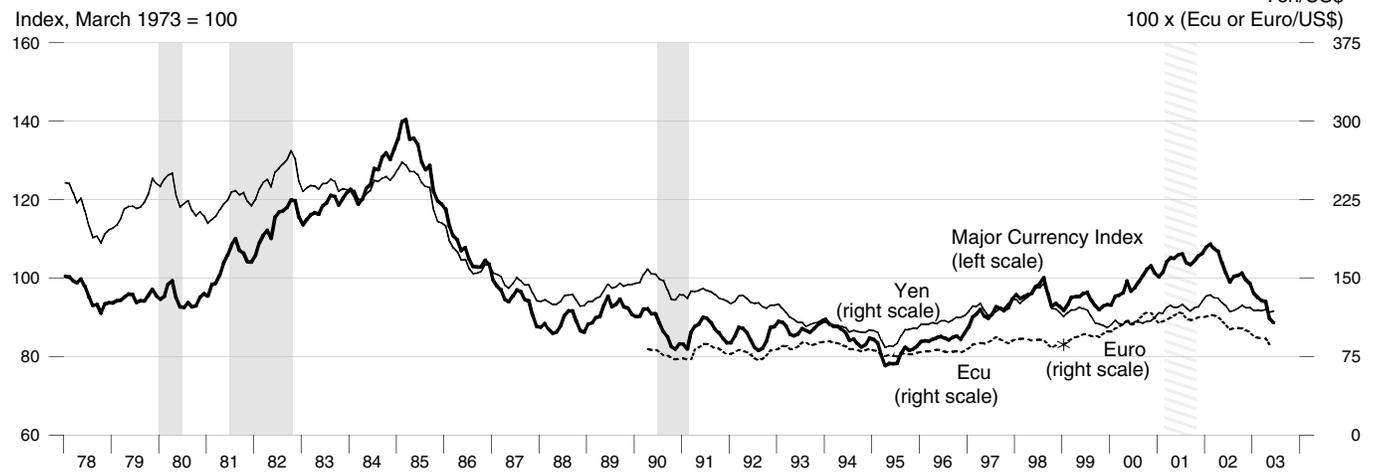
Billions of dollars, end of month or fiscal year
Excludes Agency-issued debt

	Total Public Debt	Held by Agencies and Trusts	Held by Public		Held by Private Investors	
			Total	Federal Reserve Banks	Total	Foreign and International
2000	5674.2	2235.7	3438.5	511.4	2936.3	1057.9
2001	5807.5	2468.8	3338.7	534.1	2779.7	1005.5
2002	6228.2	2675.7	3552.6	604.2	2924.8	1167.1
2000						
March	5773.4	2085.4	3688.0	501.7	3182.8	1106.9
June	5685.9	2190.2	3495.7	505.0	2987.3	1082.0
September	5674.2	2235.7	3438.5	511.4	2936.3	1057.9
December	5662.2	2248.7	3527.4	511.7	2880.4	1034.2
2001						
March	5773.7	2339.4	3434.4	523.9	2892.8	1029.9
June	5726.8	2452.6	3274.2	535.1	2722.6	1000.5
September	5807.5	2468.8	3338.7	534.1	2779.7	1005.5
December	5943.4	2549.7	3393.8	551.7	2819.5	1051.2
2002						
March	6006.0	2562.4	3443.7	575.4	2849.2	1067.0
June	6126.5	2662.9	3463.5	590.7	2849.8	1101.9
September	6228.2	2675.7	3552.6	604.2	2924.8	1167.1
December	6405.7	2758.3	3647.4	629.4	3018.5	1212.7
2003						
March	6460.8	2750.0	3710.8	641.5	3055.6	1250.5

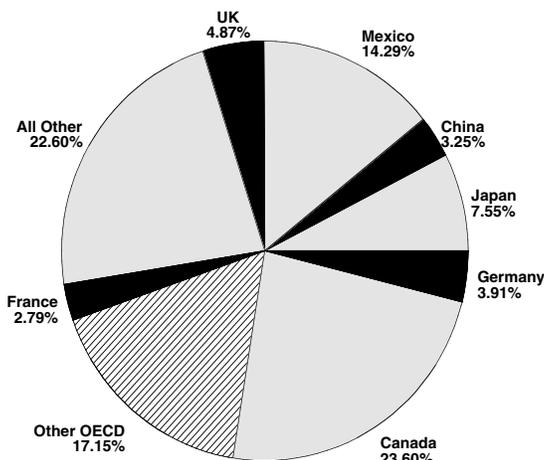
Current Account, Trade and Investment Income Balances



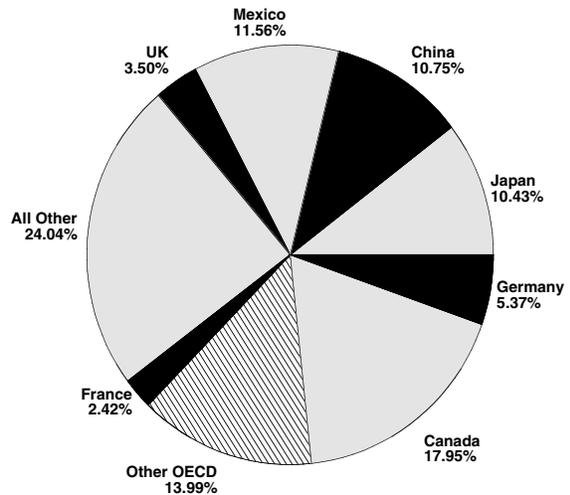
Exchange Rates



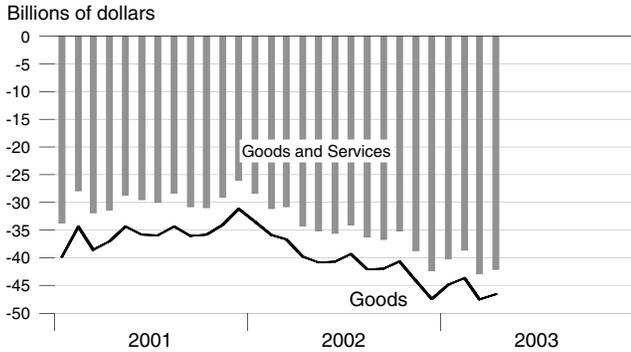
Goods Export Shares, 2002



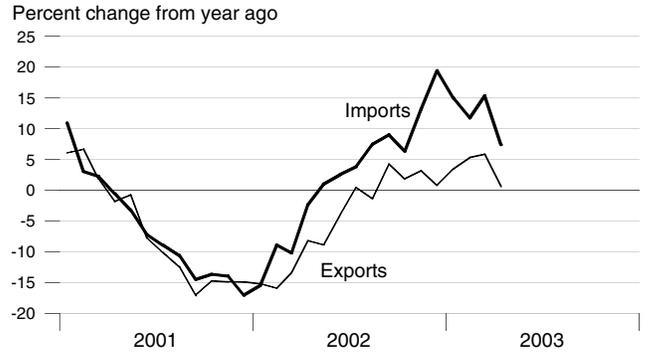
Goods Import Shares, 2002



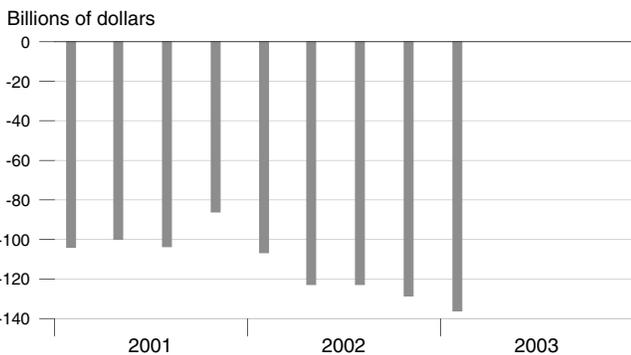
Trade Balance



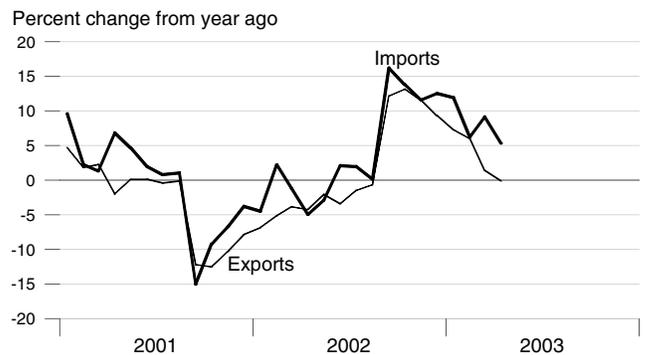
Goods Trade



Current Account Balance



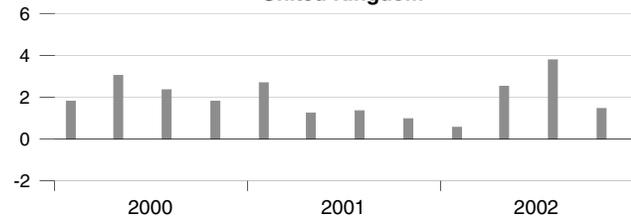
Services Trade



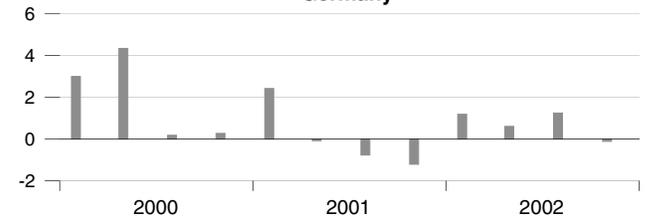
Real GDP Growth of Major Trading Partners

Compounded annual rates of change

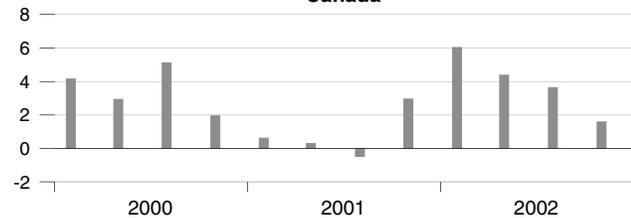
United Kingdom



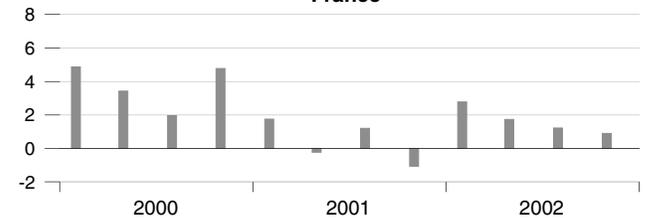
Germany



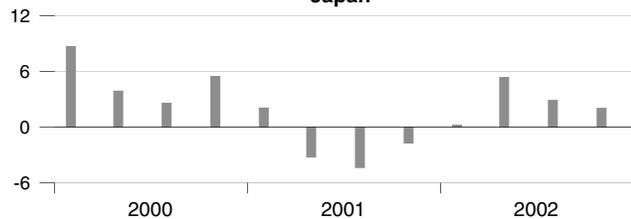
Canada



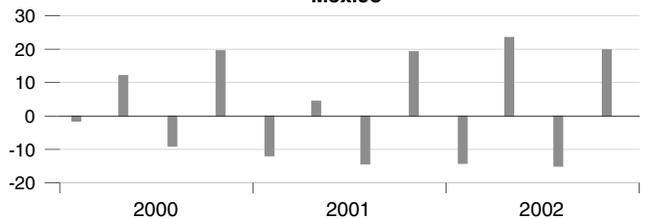
France



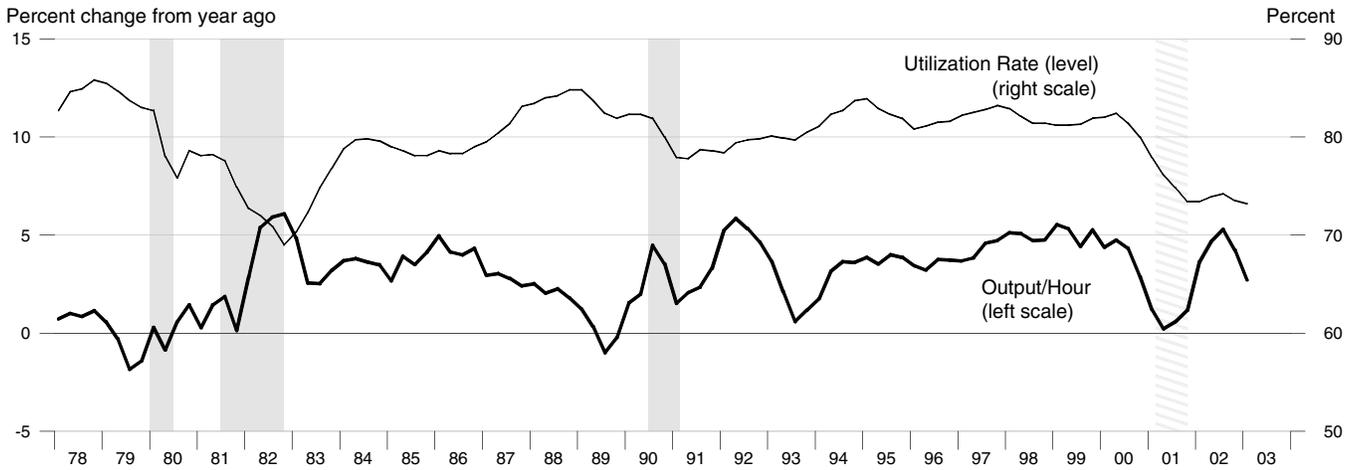
Japan



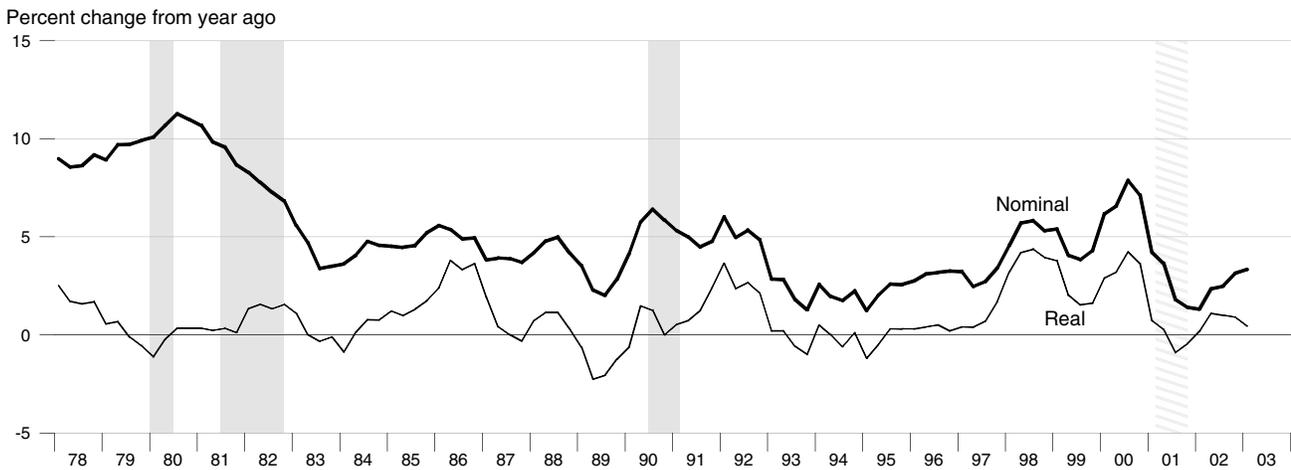
Mexico



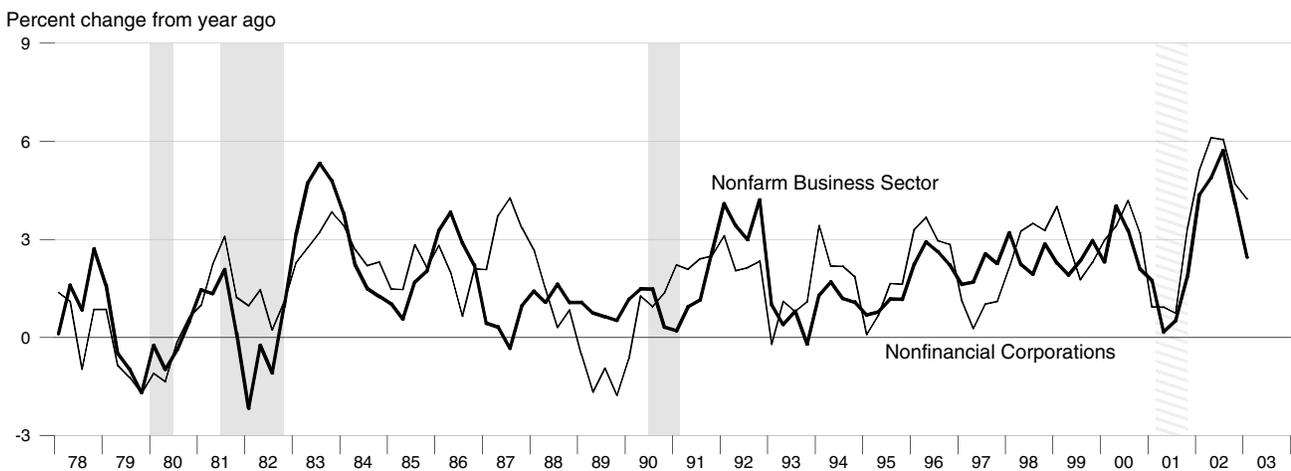
Output per Hour and Capacity Utilization, Manufacturing



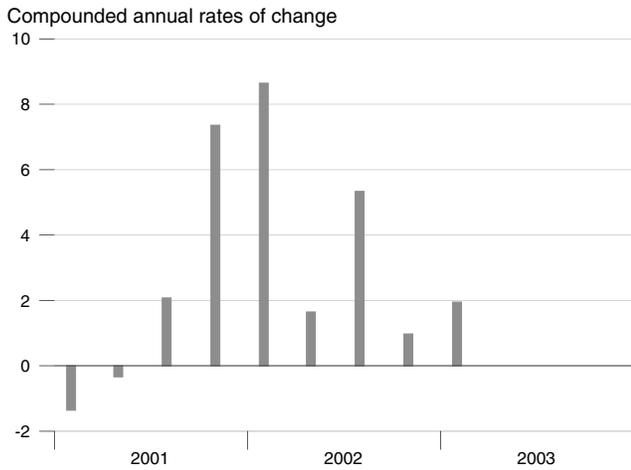
Nonfarm Compensation per Hour



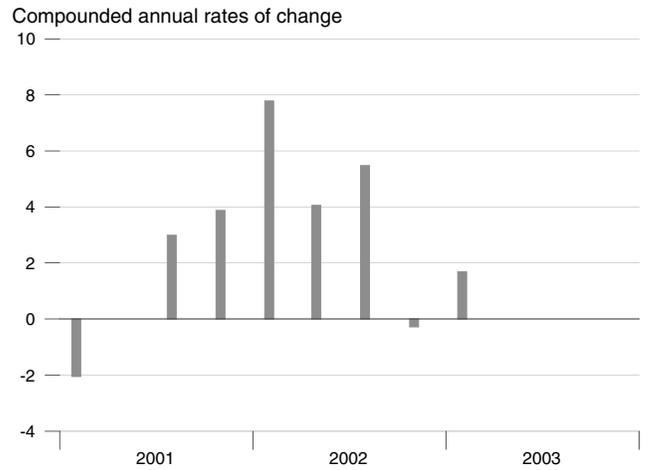
Output per Hour, Nonfarm Business and Nonfarm, Nonfinancial Corporations



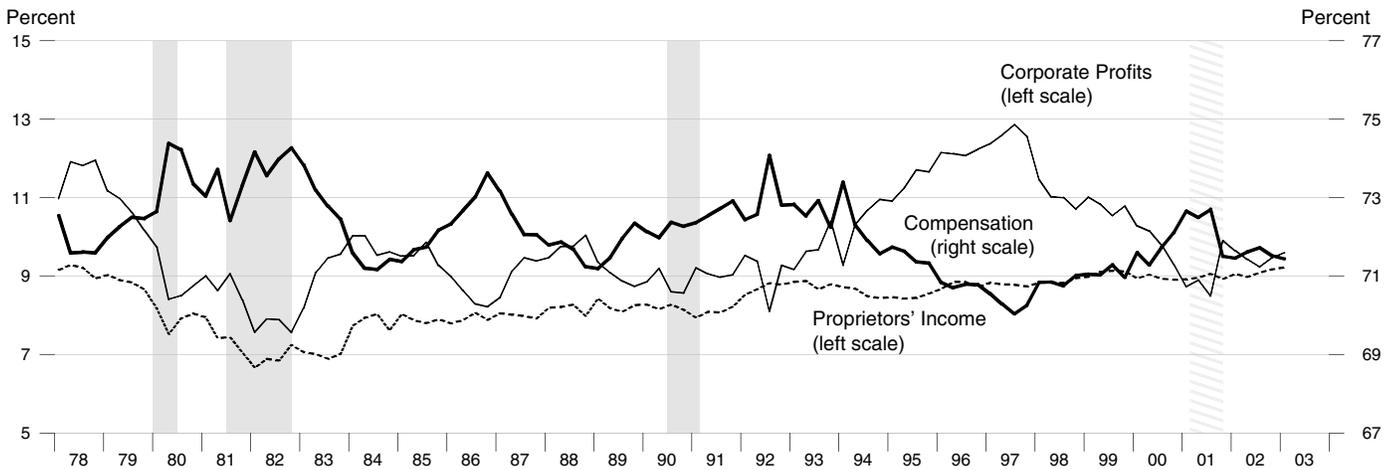
Nonfarm Output per Hour



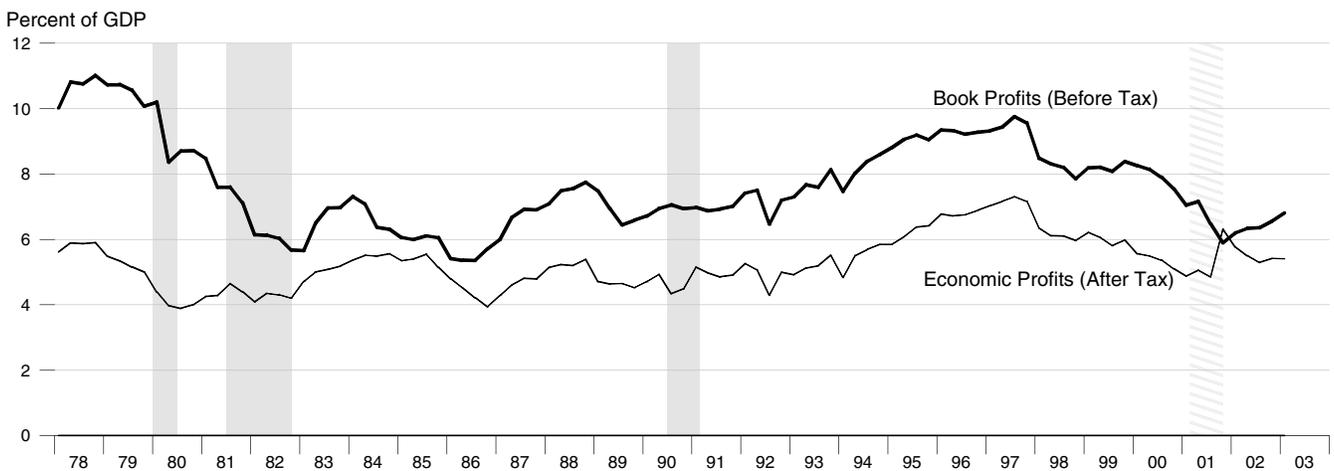
Manufacturing Output per Hour



Selected Component Shares of National Income



Corporate Profits



Note: Economic Profits include IVA and CCAAdj; Book Profits exclude them (see Notes).

	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
1999	104.690		1.4	142.4		3.2	140.3		3.4	147.6		2.8
2000	106.890		2.1	148.9		4.6	146.0		4.1	156.0		5.7
2001	109.420		2.4	155.0		4.1	151.4		3.7	163.7		4.9
2002	110.660		1.1	160.9		3.8	156.4		3.3	171.7		4.9
2000 1	106.080	3.1	1.9	146.6	5.4	4.6	143.9	4.3	4.2	153.2	8.2	5.4
2	106.690	2.3	2.1	148.2	4.4	4.6	145.4	4.2	4.1	155.1	5.1	5.7
3	107.130	1.7	2.2	149.7	4.1	4.7	146.7	3.6	4.1	157.0	5.0	5.9
4	107.680	2.1	2.3	151.1	3.8	4.4	147.9	3.3	3.9	158.7	4.4	5.7
2001 1	108.660	3.7	2.4	152.8	4.6	4.2	149.4	4.1	3.8	160.8	5.4	5.0
2	109.320	2.5	2.5	154.2	3.7	4.0	150.8	3.8	3.7	162.5	4.3	4.8
3	109.920	2.2	2.6	155.7	3.9	4.0	152.0	3.2	3.6	164.7	5.5	4.9
4	109.780	-0.5	2.0	157.4	4.4	4.2	153.4	3.7	3.7	166.8	5.2	5.1
2002 1	110.140	1.3	1.4	158.8	3.6	3.9	154.8	3.7	3.6	168.6	4.4	4.9
2	110.480	1.2	1.1	160.5	4.4	4.1	156.2	3.7	3.6	170.8	5.3	5.1
3	110.760	1.0	0.8	161.5	2.5	3.7	156.9	1.8	3.2	172.6	4.3	4.8
4	111.250	1.8	1.3	162.7	3.0	3.4	157.7	2.1	2.8	174.7	5.0	4.7
2003 1	111.900	2.4	1.6	164.9	5.5	3.8	159.3	4.1	2.9	178.9	10.0	6.1
	Exports			Imports			Nonfarm Output per Hour			Nonfarm Compensation per Hour		
	Billions of 1996 \$	Percent change		Billions of 1996 \$	Percent change		Index	Percent change		Index	Percent change	
		Annual rate	Year ago		Annual rate	Year ago		Annual rate	Year ago		Annual rate	Year ago
1999	1036.329		3.4	1356.816		10.9	112.9		2.4	124.3		4.4
2000	1137.199		9.7	1535.958		13.2	116.2		2.9	133.0		7.0
2001	1076.121		-5.4	1492.010		-2.9	117.5		1.1	136.6		2.7
2002	1058.832		-1.6	1547.373		3.7	123.1		4.8	139.8		2.3
2000 1	1095.781	7.7	8.8	1464.619	14.7	13.5	114.7	0.0	2.3	130.8	15.0	6.2
2	1133.877	14.6	11.4	1528.465	18.6	14.3	116.4	6.1	4.0	131.5	2.2	6.6
3	1165.469	11.6	11.6	1578.615	13.8	14.1	116.6	0.7	3.3	134.3	8.8	7.9
4	1153.668	-4.0	7.3	1572.152	-1.6	11.1	117.1	1.7	2.1	135.3	3.0	7.1
2001 1	1135.809	-6.0	3.7	1540.311	-7.9	5.2	116.7	-1.4	1.7	136.3	3.0	4.2
2	1098.832	-12.4	-3.1	1513.594	-6.8	-1.0	116.6	-0.3	0.2	136.3	0.0	3.7
3	1048.017	-17.3	-10.1	1466.988	-11.8	-7.1	117.2	2.1	0.5	136.7	1.2	1.8
4	1021.827	-9.6	-11.4	1447.158	-5.3	-8.0	119.3	7.4	1.9	137.2	1.5	1.4
2002 1	1030.560	3.5	-9.3	1477.140	8.5	-4.1	121.8	8.6	4.4	138.1	2.6	1.3
2	1065.526	14.3	-3.0	1552.919	22.2	2.6	122.3	1.7	4.9	139.5	4.1	2.3
3	1077.659	4.6	2.8	1565.680	3.3	6.7	123.9	5.3	5.7	140.1	1.7	2.5
4	1061.584	-5.8	3.9	1593.755	7.4	10.1	124.2	1.0	4.1	141.5	4.1	3.1
2003 1	1058.069	-1.3	2.7	1568.377	-6.2	6.2	124.8	1.9	2.5	142.7	3.4	3.3

		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
	1998	131476	1904		1.5	125924	3157		2.6	99.5			2.5
	1999	133498	2022		1.5	128994	3070		2.4	101.5			2.1
	2000	136899	3401		2.5	131790	2796		2.2	103.4			1.9
	2001	136941	42		0.0	131830	40		0.0	102.1			-1.3
	2002	136486	-455		-0.3	130376	-1454		-1.1	100.0			-2.0
2001	1	137752	424	1.2	0.8	132508	199	0.6	1.1	103.4	-0.2	-0.6	0.2
	2	137086	-666	-1.9	0.1	132180	-327	-1.0	0.3	102.6	-0.8	-3.2	-0.9
	3	136707	-379	-1.1	0.0	131712	-468	-1.4	-0.2	101.8	-0.8	-3.1	-1.7
	4	136218	-488	-1.4	-0.8	130920	-792	-2.4	-1.1	100.6	-1.2	-4.6	-2.9
2002	1	136128	-90	-0.3	-1.2	130523	-397	-1.2	-1.5	100.4	-0.1	-0.5	-2.9
	2	136355	227	0.7	-0.5	130403	-120	-0.4	-1.3	100.3	-0.1	-0.5	-2.2
	3	136804	449	1.3	0.1	130239	-164	-0.5	-1.1	99.8	-0.5	-1.8	-1.9
	4	136656	-148	-0.4	0.3	130338	99	0.3	-0.4	99.6	-0.3	-1.1	-1.0
2003	1	137431	774	2.3	1.0	130225	-113	-0.3	-0.2	99.1	-0.4	-1.7	-1.3
	2	137637	207	0.6	0.9	130005	-220	-0.7	-0.3	98.7	-0.4	-1.6	-1.6
2001	Jun	136869	-167	-1.5	-0.1	132064	-166	-1.5	0.1	102.4	-0.2	-2.3	-1.1
	Jul	137006	137	1.2	0.4	131867	-197	-1.8	-0.1	102.3	-0.1	-1.2	-1.3
	Aug	136256	-750	-6.4	-0.3	131719	-148	-1.3	-0.2	101.8	-0.5	-5.7	-1.5
	Sep	136858	602	5.4	-0.0	131550	-169	-1.5	-0.4	101.2	-0.6	-6.8	-2.3
	Oct	136370	-488	-4.2	-0.5	131198	-352	-3.2	-0.7	100.6	-0.6	-6.9	-3.2
	Nov	136218	-152	-1.3	-0.8	130900	-298	-2.7	-1.1	100.5	-0.1	-1.2	-3.1
	Dec	136067	-151	-1.3	-1.1	130661	-239	-2.2	-1.3	100.6	0.1	1.2	-2.4
2002	Jan	135791	-276	-2.4	-1.5	130578	-83	-0.8	-1.4	100.3	-0.3	-3.5	-3.3
	Feb	136450	659	6.0	-0.9	130510	-68	-0.6	-1.5	100.5	0.2	2.4	-2.7
	Mar	136143	-307	-2.7	-1.2	130481	-29	-0.3	-1.5	100.5	0.0	0.0	-2.6
	Apr	136196	53	0.5	-0.8	130415	-66	-0.6	-1.4	100.3	-0.2	-2.4	-2.3
	May	136487	291	2.6	-0.4	130411	-4	-0.0	-1.4	100.2	-0.1	-1.2	-2.3
	Jun	136383	-104	-0.9	-0.4	130383	-28	-0.3	-1.3	100.4	0.2	2.4	-2.0
	Jul	136343	-40	-0.4	-0.5	130204	-179	-1.6	-1.3	99.7	-0.7	-8.1	-2.5
	Aug	136757	414	3.7	0.4	130224	20	0.2	-1.1	99.9	0.2	2.4	-1.9
	Sep	137312	555	5.0	0.3	130289	65	0.6	-1.0	99.9	0.0	0.0	-1.3
	Oct	136988	-324	-2.8	0.5	130408	119	1.1	-0.6	99.7	-0.2	-2.4	-0.9
	Nov	136542	-446	-3.8	0.2	130409	1	0.0	-0.4	99.6	-0.1	-1.2	-0.9
	Dec	136439	-103	-0.9	0.3	130198	-211	-1.9	-0.4	99.4	-0.2	-2.4	-1.2
2003	Jan	137536	1097	10.1	1.3	130356	158	1.5	-0.2	99.4	0.0	0.0	-0.9
	Feb	137408	-128	-1.1	0.7	130235	-121	-1.1	-0.2	99.0	-0.4	-4.7	-1.5
	Mar	137348	-60	-0.5	0.9	130084	-151	-1.4	-0.3	99.0	0.0	0.0	-1.5
	Apr	137687	339	3.0	1.1	130062	-22	-0.2	-0.3	98.8	-0.2	-2.4	-1.5
	May	137487	-200	-1.7	0.7	129992	-70	-0.6	-0.3	98.7	-0.1	-1.2	-1.5
	Jun	137738	251	2.2	1.0	129962	-30	-0.3	-0.3	98.7	0.0	0.0	-1.7

		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
1998		4.5	2918.226			4.9	105.622			5.6	4.78	5.26
1999		4.2	3161.948			8.4	110.131			4.3	4.64	5.64
2000		4.0	3374.243			6.7	115.252			4.7	5.82	6.03
2001		4.8	3471.756			2.9	111.229			-3.5	3.39	5.02
2002		5.8	3582.000			3.2	110.381			-0.8	1.60	4.61
2001	1	4.2	856.706	0.8	3.0	2.2	113.631	-1.6	-6.1	-0.2	4.82	5.05
	2	4.5	863.764	0.8	3.3	3.1	111.847	-1.6	-6.1	-3.4	3.66	5.27
	3	4.8	862.246	-0.2	-0.7	1.7	110.542	-1.2	-4.6	-4.6	3.17	4.98
	4	5.6	889.040	3.1	13.0	4.6	108.895	-1.5	-5.8	-5.7	1.91	4.77
2002	1	5.6	879.850	-1.0	-4.1	2.7	109.268	0.3	1.4	-3.8	1.72	5.08
	2	5.8	889.336	1.1	4.4	3.0	110.459	1.1	4.4	-1.2	1.72	5.10
	3	5.8	905.833	1.9	7.6	5.1	111.375	0.8	3.4	0.8	1.64	4.26
	4	5.9	906.981	0.1	0.5	2.0	110.422	-0.9	-3.4	1.4	1.33	4.01
2003	1	5.8	919.353	1.4	5.6	4.5	110.499	0.1	0.3	1.1	1.16	3.92
	2	6.2									1.04	3.62
2001	Jun	4.6	287.792	-0.4	-5.0	2.8	111.145	-0.6	-7.3	-4.4	3.49	5.28
	Jul	4.6	288.146	0.1	1.5	2.4	110.996	-0.1	-1.6	-4.3	3.51	5.24
	Aug	4.9	289.550	0.5	6.0	3.1	110.696	-0.3	-3.2	-4.3	3.36	4.97
	Sep	5.0	284.550	-1.7	-18.9	-0.2	109.933	-0.7	-8.0	-5.3	2.64	4.73
	Oct	5.4	301.990	6.1	104.2	6.4	109.512	-0.4	-4.5	-5.3	2.16	4.57
	Nov	5.6	293.741	-2.7	-28.3	3.8	108.845	-0.6	-7.1	-5.8	1.87	4.65
	Dec	5.8	293.309	-0.1	-1.8	3.4	108.327	-0.5	-5.6	-5.9	1.69	5.09
2002	Jan	5.6	292.393	-0.3	-3.7	2.1	108.967	0.6	7.3	-4.6	1.65	5.04
	Feb	5.6	293.878	0.5	6.3	2.7	109.197	0.2	2.6	-3.9	1.73	4.91
	Mar	5.7	293.579	-0.1	-1.2	3.3	109.641	0.4	5.0	-3.0	1.79	5.28
	Apr	5.9	297.827	1.4	18.8	3.8	110.113	0.4	5.3	-2.2	1.72	5.21
	May	5.8	293.814	-1.3	-15.0	1.7	110.447	0.3	3.7	-1.3	1.73	5.16
	Jun	5.8	297.695	1.3	17.1	3.4	110.818	0.3	4.1	-0.3	1.70	4.93
	Jul	5.8	302.350	1.6	20.5	4.9	111.577	0.7	8.5	0.5	1.68	4.65
	Aug	5.8	304.269	0.6	7.9	5.1	111.305	-0.2	-2.9	0.6	1.62	4.26
	Sep	5.7	299.214	-1.7	-18.2	5.2	111.242	-0.1	-0.7	1.2	1.63	3.87
	Oct	5.8	299.458	0.1	1.0	-0.8	110.580	-0.6	-6.9	1.0	1.58	3.94
	Nov	5.9	301.707	0.8	9.4	2.7	110.797	0.2	2.4	1.8	1.23	4.05
	Dec	6.0	305.816	1.4	17.6	4.3	109.889	-0.8	-9.4	1.4	1.19	4.03
2003	Jan	5.7	307.045	0.4	4.9	5.0	110.670	0.7	8.9	1.6	1.17	4.05
	Feb	5.8	302.741	-1.4	-15.6	3.0	110.735	0.1	0.7	1.4	1.17	3.90
	Mar	5.8	309.567	2.3	30.7	5.4	110.092	-0.6	-6.7	0.4	1.13	3.81
	Apr	6.0	308.624	-0.3	-3.6	3.6	109.441	-0.6	-6.9	-0.6	1.13	3.96
	May	6.1	308.779	0.1	0.6	5.1	109.583	0.1	1.6	-0.8	1.07	3.57
	Jun	6.4									0.92	3.33

		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
1998		163.0			1.5		173.4			2.3		130.7			-0.9
1999		166.6			2.2		177.0			2.1		133.0			1.8
2000		172.2			3.4		181.3			2.4		138.0			3.7
2001		177.1			2.8		186.1			2.7		140.7			2.0
2002		179.9			1.6		190.4			2.3		138.9			-1.3
2001	1	175.9	0.9	3.8	3.4	3.8	184.3	0.7	2.9	2.7	2.9	141.7	1.3	5.4	4.0
	2	177.3	0.8	3.2	3.4	3.5	185.5	0.6	2.6	2.6	2.8	142.0	0.2	0.8	3.4
	3	177.7	0.2	1.0	2.7	2.7	186.7	0.7	2.7	2.7	2.7	140.7	-0.9	-3.5	1.6
	4	177.4	-0.2	-0.6	1.8	1.8	188.0	0.7	2.7	2.7	2.7	138.4	-1.7	-6.6	-1.1
2002	1	178.0	0.3	1.3	1.2	1.3	189.0	0.5	2.1	2.5	2.1	138.3	-0.0	-0.1	-2.4
	2	179.5	0.9	3.5	1.3	2.4	190.0	0.5	2.1	2.4	2.1	138.7	0.2	1.0	-2.3
	3	180.5	0.5	2.2	1.6	2.3	191.0	0.5	2.2	2.3	2.2	138.7	0.0	0.2	-1.4
	4	181.4	0.5	2.0	2.2	2.2	191.8	0.4	1.8	2.1	2.1	139.7	0.7	2.8	1.0
2003	1	183.1	1.0	3.9	2.9	3.9	192.4	0.3	1.3	1.8	1.3	143.1	2.4	10.1	3.4
2001	May	177.4	0.5	6.3	3.6	3.9	185.4	0.2	2.0	2.6	2.8	142.3	0.2	2.6	3.8
	Jun	177.9	0.3	3.4	3.3	3.8	186.0	0.3	4.0	2.7	3.0	141.7	-0.4	-4.9	2.6
	Jul	177.5	-0.2	-2.7	2.8	2.9	186.4	0.2	2.6	2.7	2.9	140.2	-1.1	-12.0	1.4
	Aug	177.5	0.0	0.0	2.8	2.5	186.7	0.2	1.9	2.6	2.8	140.7	0.4	4.4	2.0
	Sep	178.1	0.3	4.1	2.6	2.7	187.1	0.2	2.6	2.6	2.8	141.3	0.4	5.2	1.6
	Oct	177.6	-0.3	-3.3	2.1	2.1	187.4	0.2	1.9	2.6	2.7	139.1	-1.6	-17.2	-0.3
	Nov	177.4	-0.1	-1.3	1.8	1.8	188.1	0.4	4.6	2.7	2.9	138.3	-0.6	-6.7	-1.2
	Dec	177.3	-0.1	-0.7	1.5	1.5	188.4	0.2	1.9	2.8	2.8	137.7	-0.4	-5.1	-1.7
2002	Jan	177.6	0.2	2.0	1.1	2.0	188.7	0.2	1.9	2.6	1.9	137.7	0.0	0.0	-2.8
	Feb	177.9	0.2	2.0	1.1	2.0	189.0	0.2	1.9	2.6	1.9	138.1	0.3	3.5	-2.7
	Mar	178.5	0.3	4.1	1.4	2.7	189.2	0.1	1.3	2.4	1.7	139.2	0.8	10.0	-1.6
	Apr	179.3	0.4	5.5	1.6	3.4	189.7	0.3	3.2	2.5	2.1	139.0	-0.1	-1.7	-2.1
	May	179.5	0.1	1.3	1.2	3.0	190.0	0.2	1.9	2.5	2.1	138.4	-0.4	-5.1	-2.7
	Jun	179.8	0.2	2.0	1.1	2.8	190.2	0.1	1.3	2.3	1.9	138.6	0.1	1.7	-2.2
	Jul	180.1	0.2	2.0	1.5	2.7	190.5	0.2	1.9	2.2	1.9	138.6	0.0	0.0	-1.1
	Aug	180.5	0.2	2.7	1.7	2.7	191.1	0.3	3.8	2.4	2.2	138.6	0.0	0.0	-1.5
	Sep	180.9	0.2	2.7	1.6	2.7	191.4	0.2	1.9	2.3	2.1	139.0	0.3	3.5	-1.6
	Oct	181.2	0.2	2.0	2.0	2.6	191.6	0.1	1.3	2.2	2.0	140.1	0.8	9.9	0.7
	Nov	181.4	0.1	1.3	2.3	2.5	191.8	0.1	1.3	2.0	2.0	139.7	-0.3	-3.4	1.0
	Dec	181.6	0.1	1.3	2.4	2.4	192.1	0.2	1.9	2.0	2.0	139.3	-0.3	-3.4	1.2
2003	Jan	182.2	0.3	4.0	2.6	4.0	192.3	0.1	1.3	1.9	1.3	141.2	1.4	17.7	2.5
	Feb	183.3	0.6	7.5	3.0	5.7	192.5	0.1	1.3	1.9	1.3	143.0	1.3	16.4	3.5
	Mar	183.9	0.3	4.0	3.0	5.2	192.5	0.0	0.0	1.7	0.8	145.1	1.5	19.1	4.2
	Apr	183.3	-0.3	-3.8	2.2	2.8	192.5	0.0	0.0	1.5	0.6	142.3	-1.9	-20.9	2.4
	May	183.3	0.0	0.0	2.1	2.3	193.0	0.3	3.2	1.6	1.1	141.9	-0.3	-3.3	2.5

Notes

Pages 4, 5: **Final Sales** is gross domestic product (GDP) minus change in private inventories. **Advance, Preliminary, and Final 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 1996 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. The 30-year constant maturity series was discontinued by the Treasury Department as of Feb. 18, 2002. **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 May 2003 **Employment Situation**, the establishment survey data for employment, hours, and earnings have been converted from the 1987 SIC system to the 2002 NAICS system. All published NAICS-based labor series have been revised back to at least 1990. For more information see <http://www.bls.gov/ces/>. **Nonfarm Payroll Employment** is counted in a survey of about 400,000 establishments (Current Employment Survey). 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 ($\pm 290,000$) 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/.

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.

Pages 14, 15: Overall **Gross Saving** includes government saving, which is the sum of the government surplus and capital consumption (see notes for pp. 16-17). **Net Foreign Investment (NFI)** is U.S. investment abroad minus foreign investment in the U.S. Aside from a statistical discrepancy, NFI also equals the difference between gross domestic investment and saving. The comprehensive revision introduced the **Equipment & Software** component of business investment.

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 76 percent of the value of GDP in 1996, 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.

NOTE: Several measures of economic activity are now based on the 2002 North American Industry Classification System (NAICS), which replaces the 1987 Standard Industry Classification (SIC) system. These include establishment survey data for employment, earnings, and hours; retail sales; manufacturers' orders, shipments, and inventories, and the business inventory-to-sales ratio.

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.

The Conference Board

Help-wanted advertising index.

Organization for Economic Cooperation and Development (OECD)

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