



## Foreign Exchange Rates Are Predictable!

Modern economic theory of foreign exchange rates stipulates that the Deutsche mark/U.S. dollar rate, for example, is equal to discounted future fundamentals—e.g., aggregate income, interest rates, and monetary aggregates—in both the United States and Germany. A substantial portion of the variation in these fundamental macroeconomic variables is predictable across time; therefore, fundamentals should provide important information about future movements in exchange rates. In an influential paper, Meese and Rogoff (1983), however, find that a simple random walk model, in which the forecasted value is the most recent realization, outperforms various forecasting models, including those using economic fundamentals as predictors.<sup>1</sup>

Meese and Rogoff's result has inspired numerous empirical investigations of exchange rate predictability, and their conclusion has proven to be strikingly robust after 20 years of fresh data and intensive academic research. In light of seemingly compelling evidence, some recent authors argue that exchange rates are indeed unpredictable—possibly because some shocks have a permanent effect on economic fundamentals. In particular, if people discount the future very little relative to the present, then exchange rates could follow a process close to a random walk.

Other economists, however, argue that exchange rates are predictable and that existing empirical studies suffer from various misspecifications. For example, some crucial fundamental determinants of exchange rates may have been omitted. Also, many macroeconomic variables are subject to periodic revisions; therefore, the current vintage data, which have been commonly used in the literature, do not contain the same information as that available to investors at the time of forecast. To address these issues, Guo and Savickas (2005) propose using financial variables, which are broad measures of business conditions and never revised, to predict exchange rates.<sup>2</sup>

Guo and Savickas find that a measure of U.S. aggregate idiosyncratic volatility (IV) is a strong predictor of the exchange rates of the U.S. dollar against major foreign currencies, especially at relatively long horizons. An idiosyncratic shock to a stock is the part of the stock return that is not explained by asset pricing models. To measure IV, Guo and Savickas first estimate idiosyncratic shocks to all (U.S.) common stocks included in the CRSP (Center for Research in Security Prices) database; they then aggregate the realized variance of idiosyncratic shocks across stocks using the share of market capitalization as the weight.

The accompanying chart plots IV from the last quarter of each year (in natural logarithms, solid line) along with one-year-ahead changes (December 31 to December 31 of the following

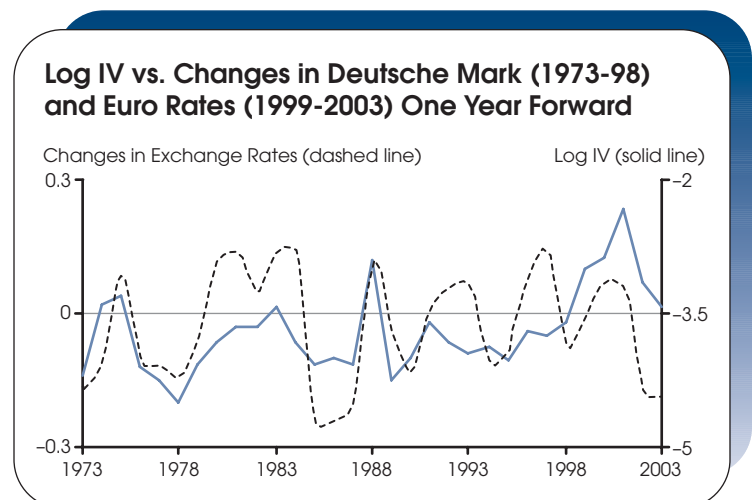
year, dashed line) in the Deutsche mark/U.S. dollar rate over the period 1973 to 1998 and the Euro/U.S. dollar rate over the period 1999 to 2003. The chart reveals a strong positive relation between IV and changes in the price of the U.S. dollar over the next year. For example, recent depreciation of the U.S. dollar was preceded by a sharp decline in IV in the year 2001. Overall, IV accounts for more than 30 percent of the variation of the Deutsche mark/U.S. dollar rate; IV also outperforms the random walk model in out-of-sample forecasting.

The forecasting power of IV is consistent with economic theory. In particular, many early authors have argued that IV is a proxy for the dispersion of shocks across different sectors; and a high level of dispersion induces costly sectoral resource reallocation, which reduces output and employment. Indeed, Guo and Savickas show that IV is a strong predictor of GDP growth, fixed private business investment, and unemployment rates. Moreover, they find that a measure of aggregate IV constructed using German stock price data is also positively related to future dollar prices of the Deutsche mark. Therefore, although we cannot completely rule out the possibility of data mining, the forecasting power of IV appears to provide support for the conjecture that economic fundamentals are important determinants of foreign exchange rates.

—Hui Guo

<sup>1</sup> Meese, Richard A. and Rogoff, Kenneth. "Empirical Exchange Rate Models of the Seventies: Do They Fit Out of Sample?" *Journal of International Economics*, February 1983, 14(1), pp. 3-24.

<sup>2</sup> Guo, Hui and Savickas, Robert. "Foreign Exchange Rates Don't Follow a Random Walk." Working Paper 2005-025A, Federal Reserve Bank of St. Louis, April 2005.



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

# Contents

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## Page

3	Economy at a Glance
4	Output and Growth
7	Interest Rates
8	Inflation and Prices
10	Labor Markets
12	Consumer Spending
14	Investment Spending
16	Government Revenues, Spending, and Debt
18	International Trade
20	Productivity and Profits
22	Quick Reference Tables
27	Notes and Sources

## Conventions used in this publication:

1. Shaded areas indicate recessions, as determined by the National Bureau of Economic Research.
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:

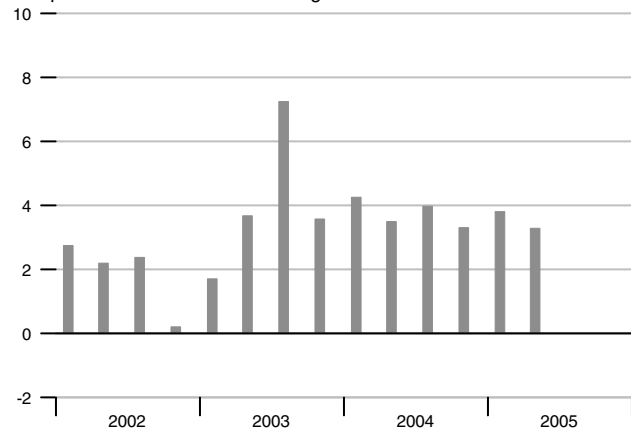
Editor, *National Economic Trends*  
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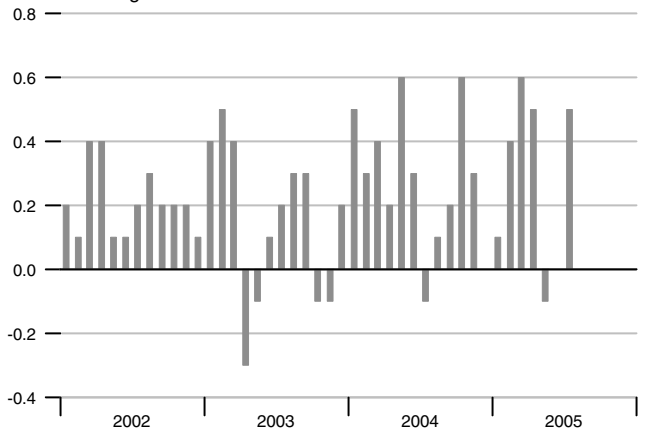
### Real GDP Growth

Compounded annual rates of change



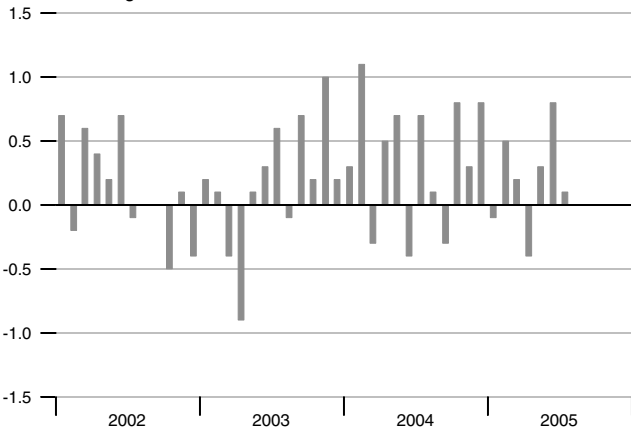
### Consumer Price Index

Percent change



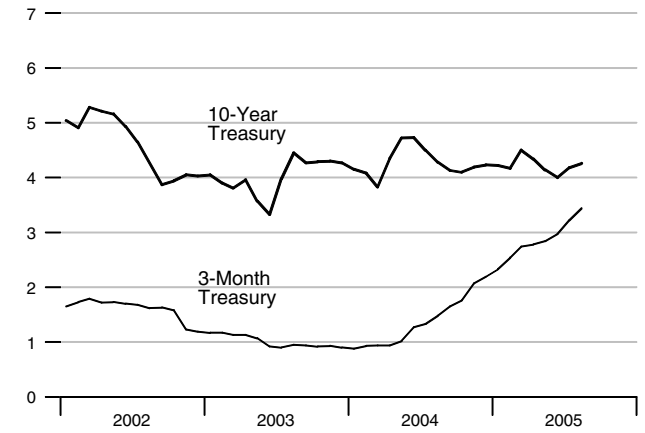
### Industrial Production

Percent change



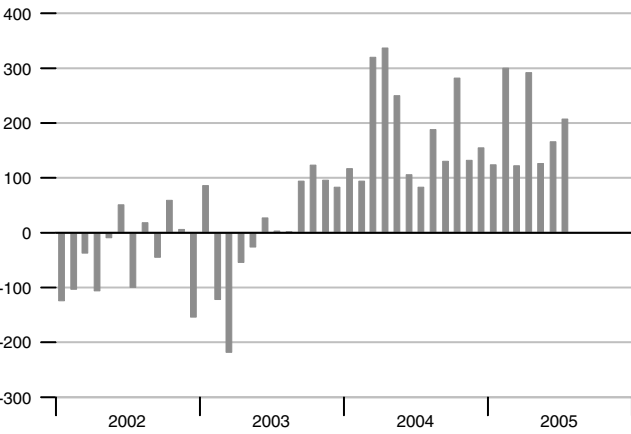
### Interest Rates

Percent



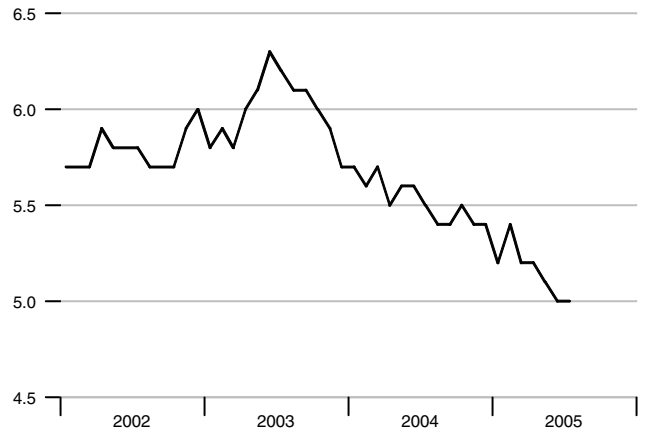
### Change in Nonfarm Payrolls

Thousands



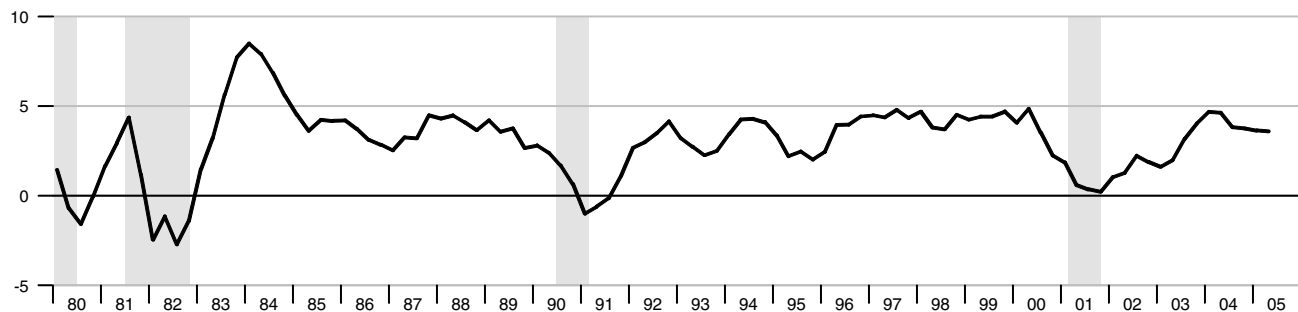
### Unemployment Rate

Percent of labor force



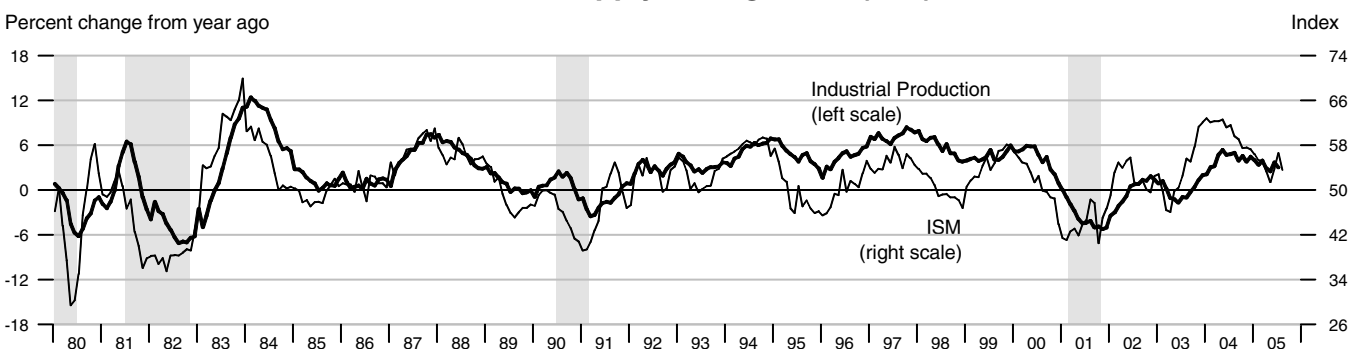
### Real Gross Domestic Product

Percent change from year ago



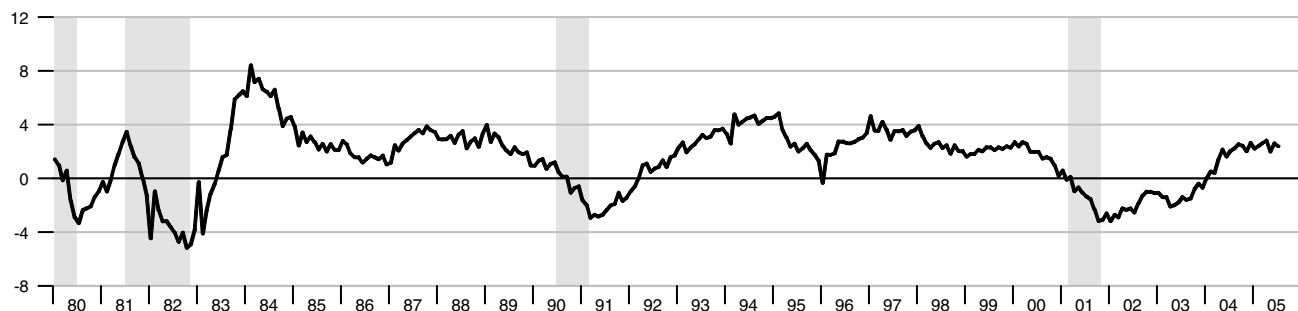
### Industrial Production and Institute for Supply Management (ISM) Indexes

Percent change from year ago



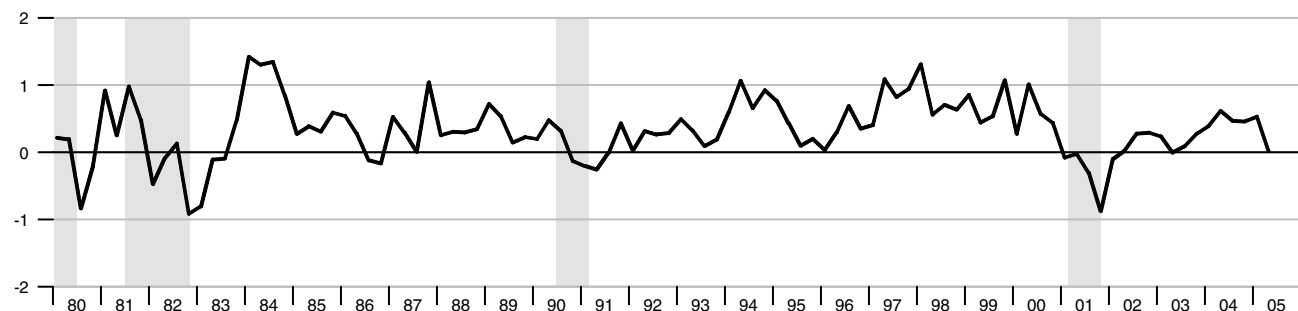
### Aggregate Private Nonfarm Hours

Percent change from year ago

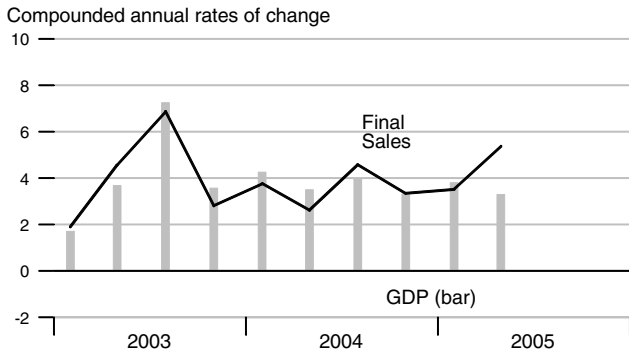


### Real Change in Private Inventories

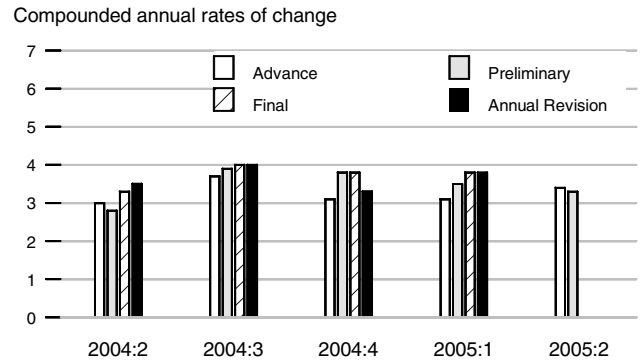
Percent of GDP



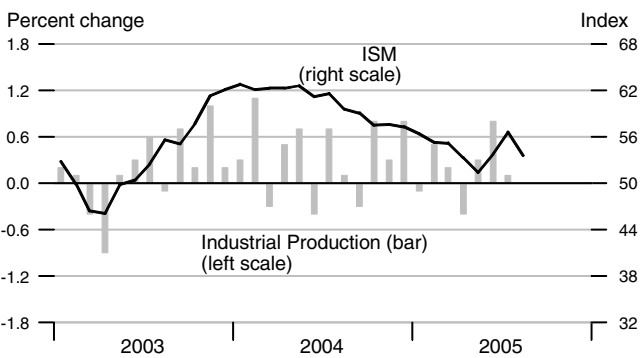
### Real Final Sales and GDP



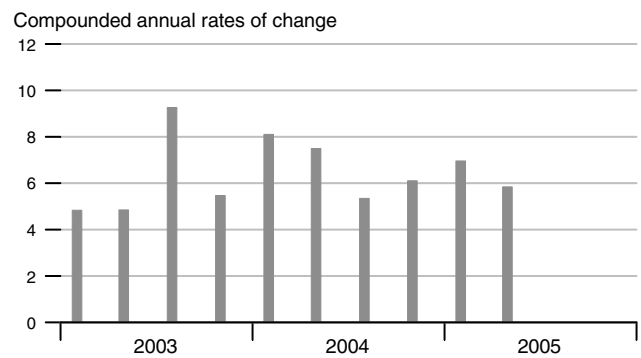
### Real GDP Revisions



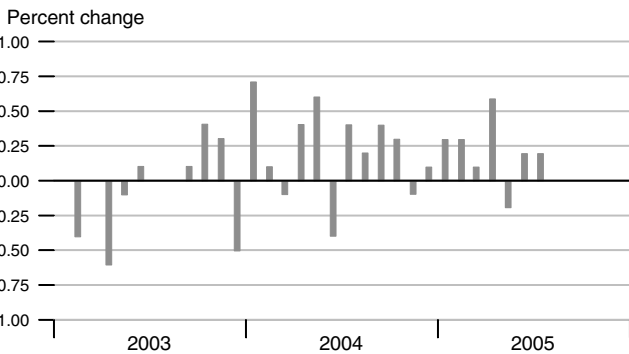
### Industrial Production and ISM Index



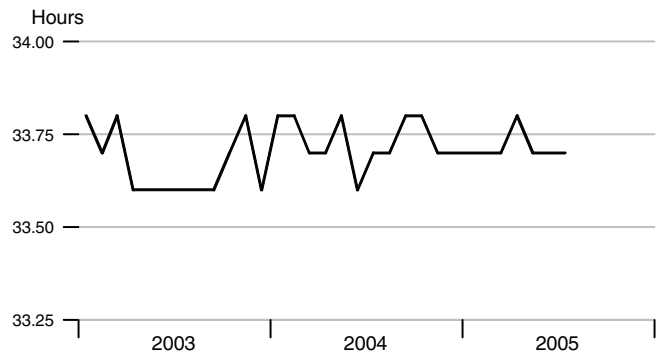
### Nominal Gross Domestic Product



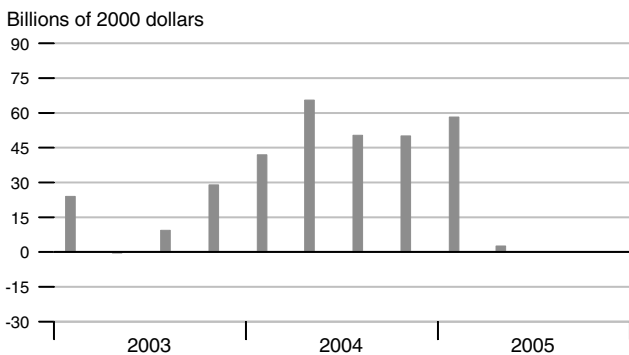
### Aggregate Private Nonfarm Hours



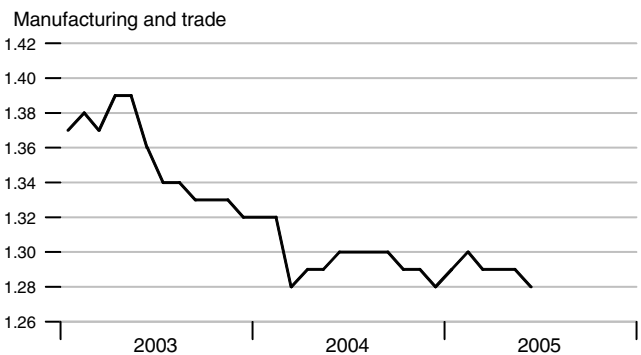
### Average Weekly Private Nonfarm Hours



### Real Change in Private Inventories

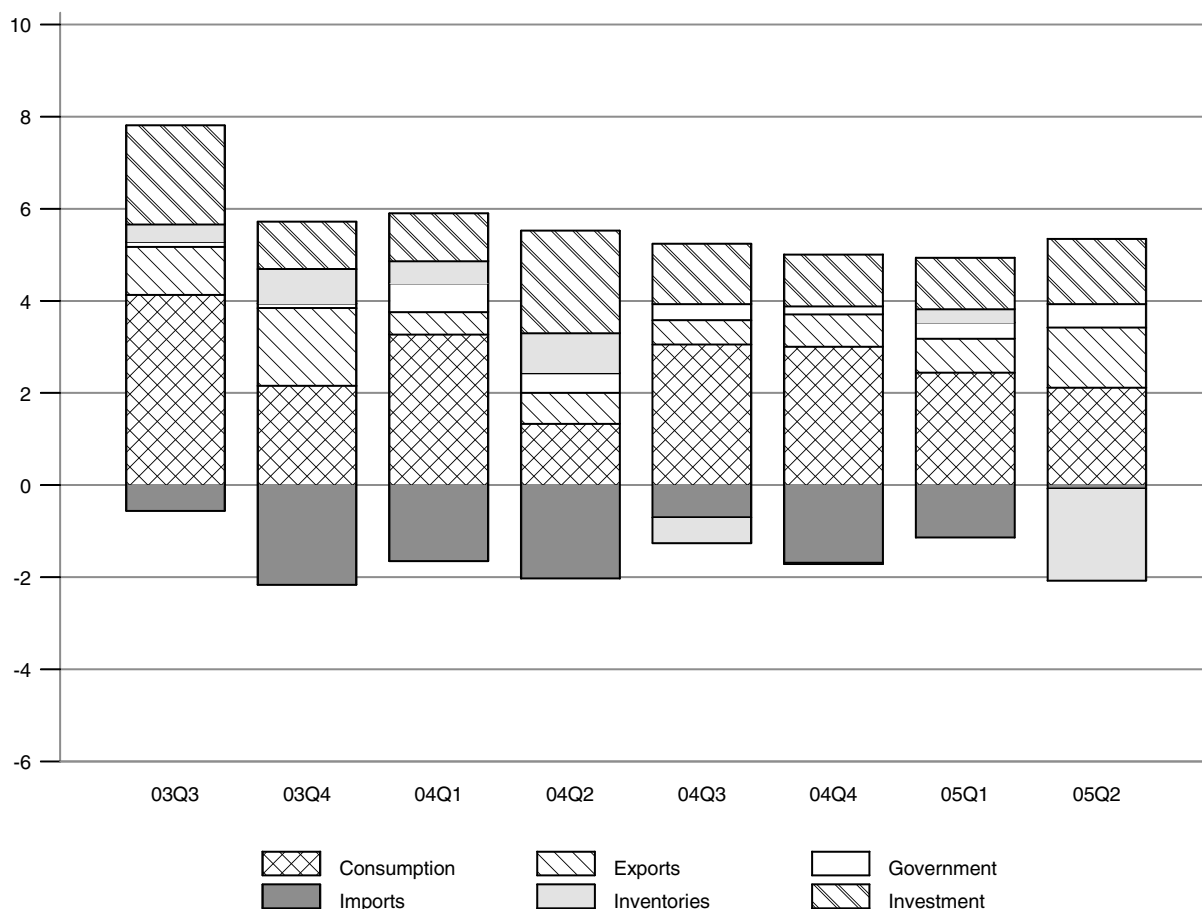


### Inventory-Sales Ratio



### Contribution of Components to Real GDP Growth

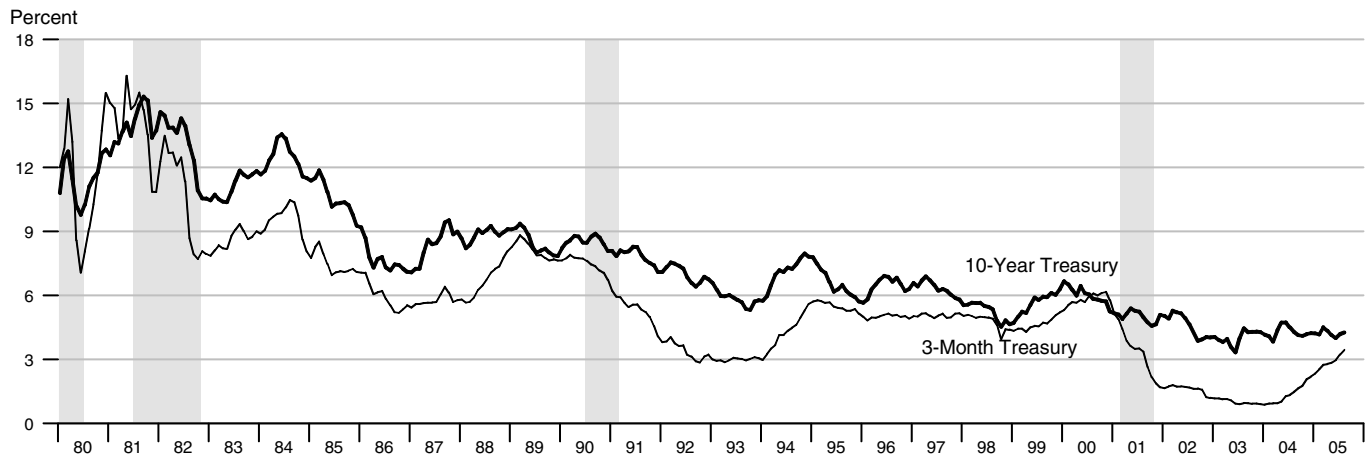
Percentage points at compounded annual rates



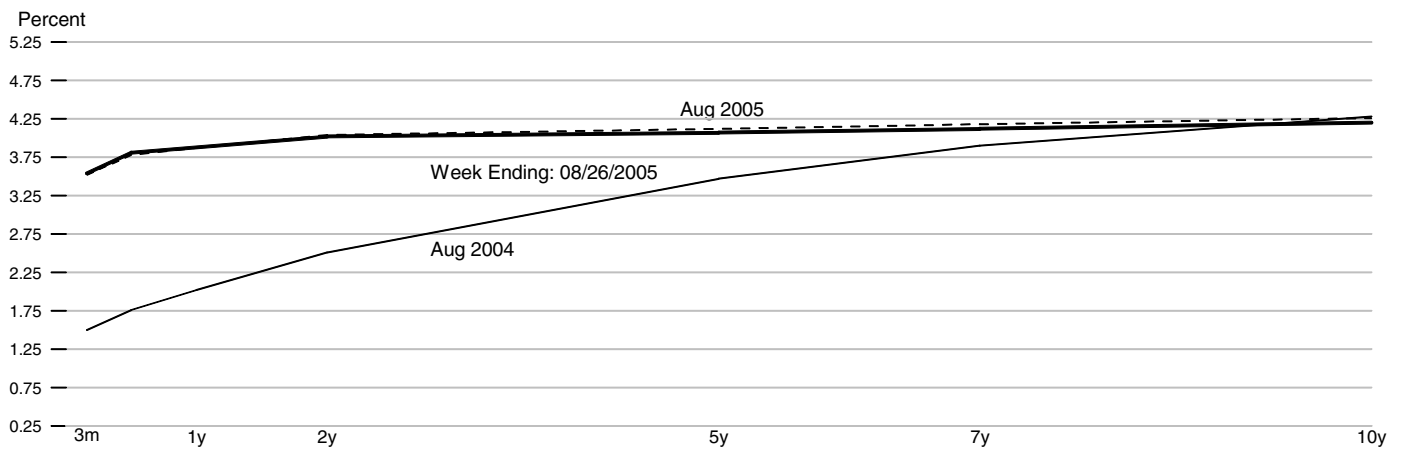
### Contributions to Real GDP Growth Rate

	2003		2004				2005	
	3rd	4th	1st	2nd	3rd	4th	1st	2nd
<b>Final Sales</b>	6.87	2.82	3.77	2.63	4.53	3.33	3.51	5.28
<b>Consumption</b>	4.13	2.15	3.27	1.33	3.05	3.01	2.44	2.12
<b>Fixed Investment</b>	2.15	1.03	1.04	2.22	1.31	1.13	1.12	1.42
Nonresidential	1.08	0.43	0.76	1.29	1.15	1.04	0.58	0.86
Residential	1.07	0.59	0.28	0.93	0.15	0.09	0.54	0.56
Federal	-0.14	0.21	0.71	0.22	0.25	-0.04	0.17	0.11
<b>Government</b>	0.11	0.10	0.62	0.43	0.35	0.17	0.35	0.51
State and Local	0.25	-0.11	-0.09	0.21	0.10	0.21	0.19	0.40
Imports	-0.56	-2.16	-1.65	-2.03	-0.70	-1.68	-1.14	-0.08
<b>Change in Inventory</b>	0.38	0.75	0.48	0.87	-0.56	-0.03	0.29	-1.99
Exports	1.04	1.69	0.49	0.67	0.53	0.70	0.74	1.30
<b>Net Exports</b>	0.48	-0.47	-1.16	-1.37	-0.17	-0.98	-0.40	1.22
<b>Residual</b>	-0.07	0.05	0.04	0.05	-0.07	-0.08	0.00	-0.01
<b>Real GDP Growth</b>	7.25	3.57	4.25	3.50	3.97	3.30	3.80	3.29

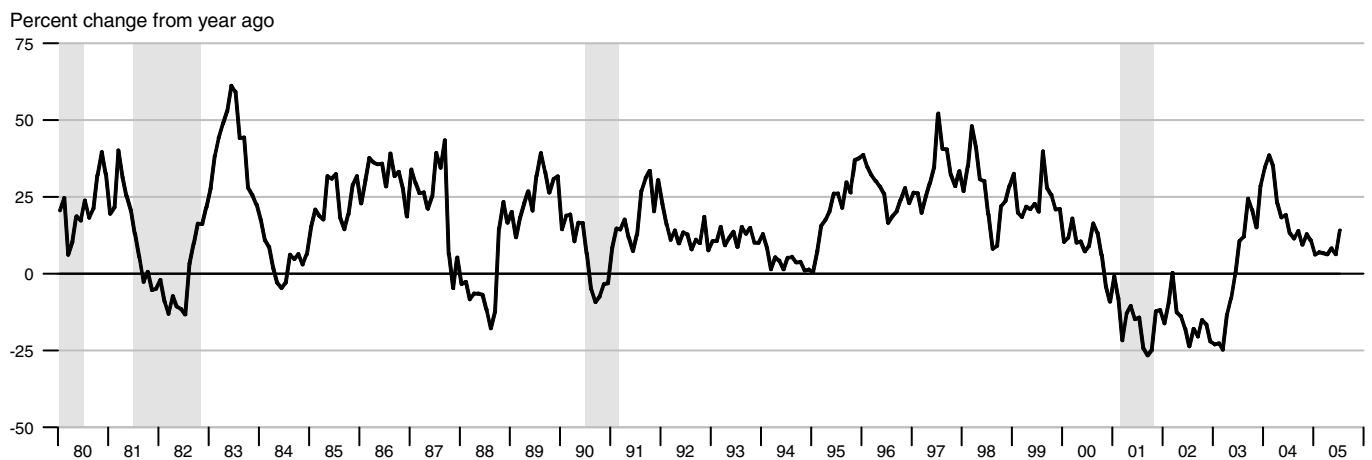
### Interest Rates



### Treasury Yield Curve

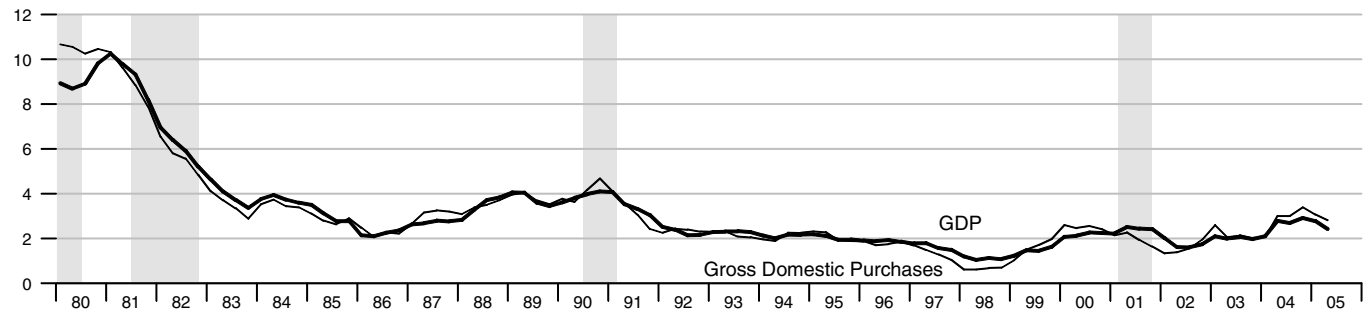


### Standard and Poor's 500 Index with Reinvested Dividends



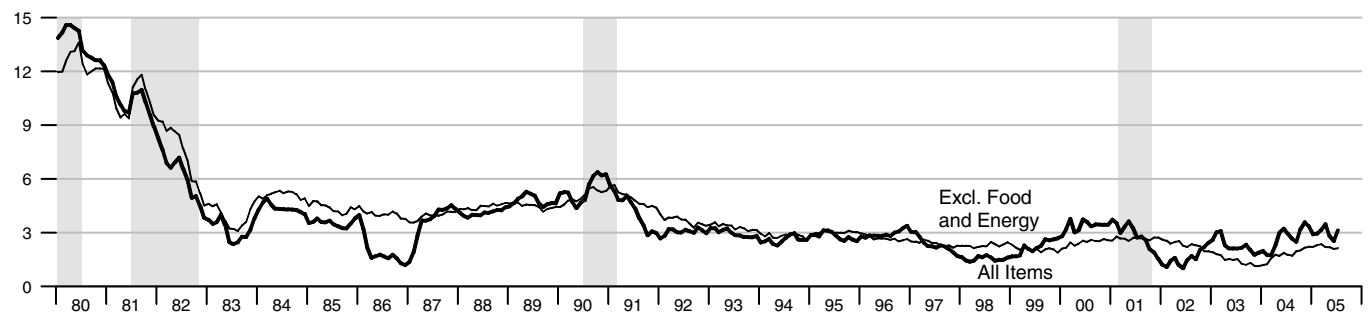
**NIPA Chain Price Indexes**

Percent change from year ago



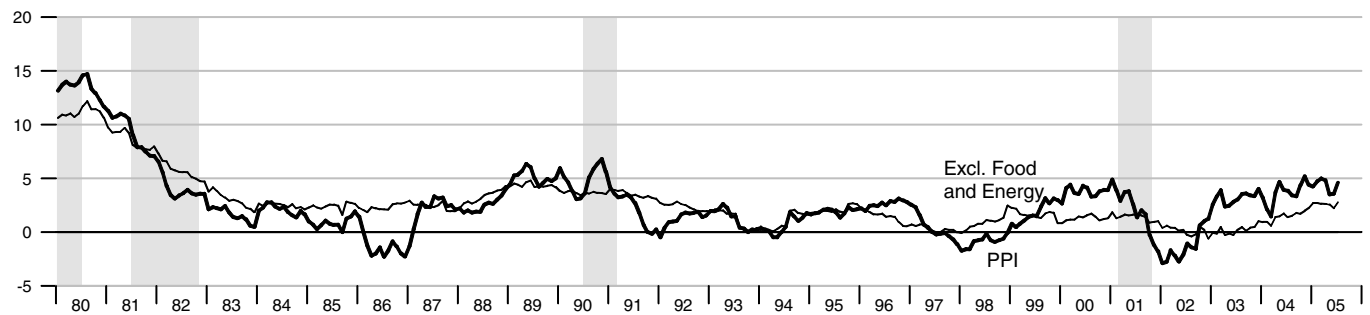
**Consumer Price Index**

Percent change from year ago



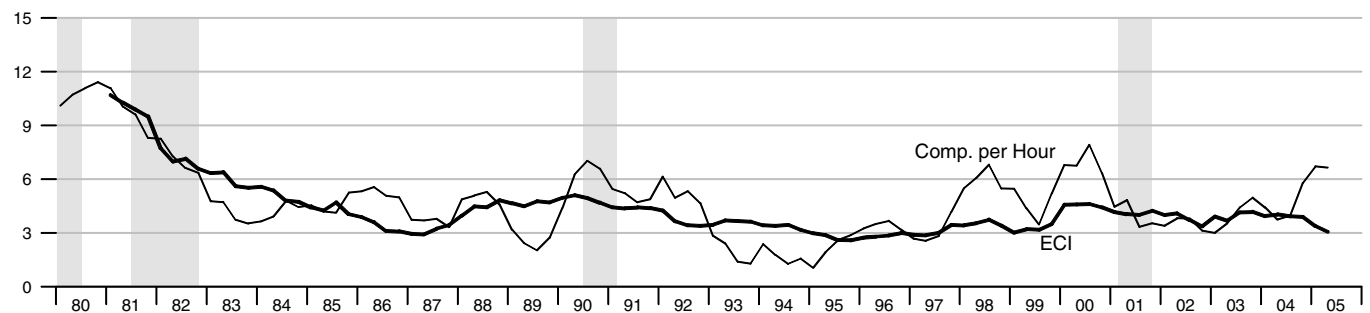
**Producer Price Index, Finished Goods**

Percent change from year ago



**Employment Cost Index and Compensation per Hour**

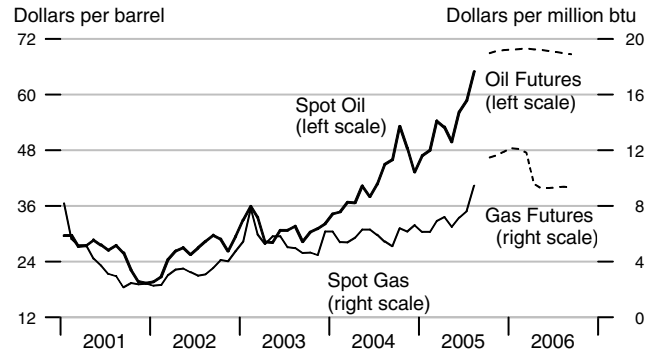
Percent change from year ago



### NIPA Chain Price Indexes

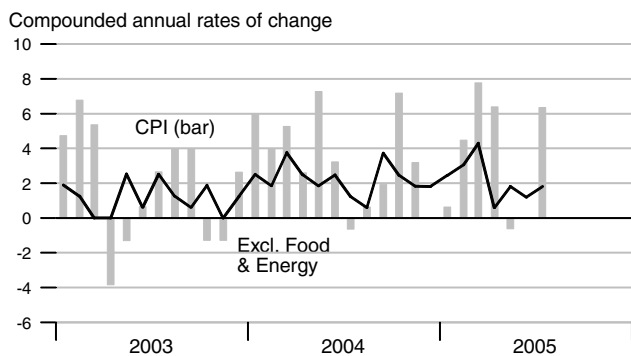


### Oil & Natural Gas Prices: Spot & Futures

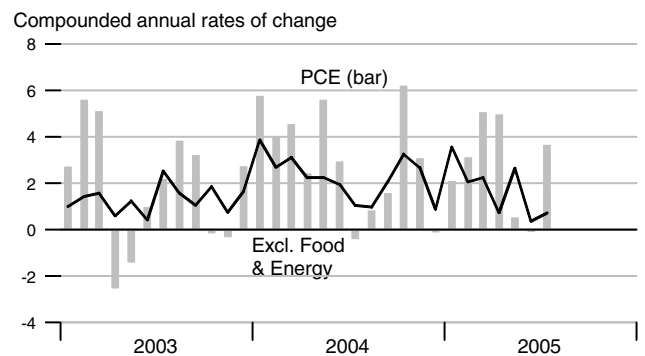


Note: Futures prices as of 08/31/2005.

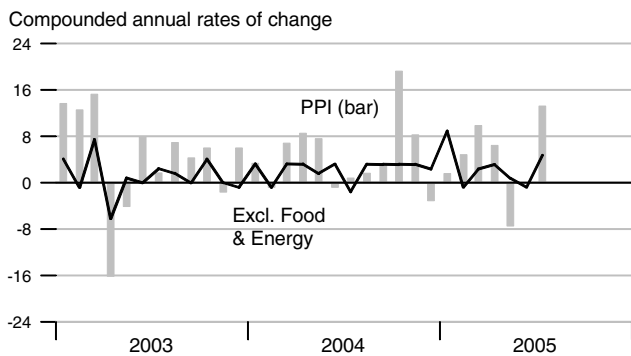
### Consumer Price Index



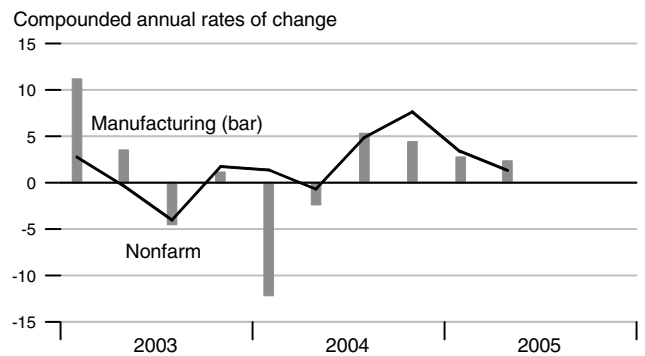
### Consumption Chain Price Index



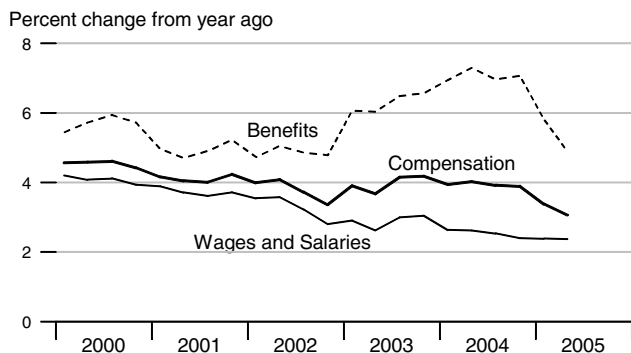
### Producer Price Index, Finished Goods



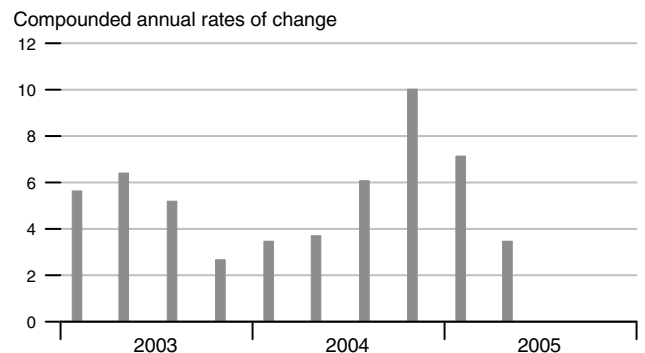
### Unit Labor Cost



### Employment Cost Index

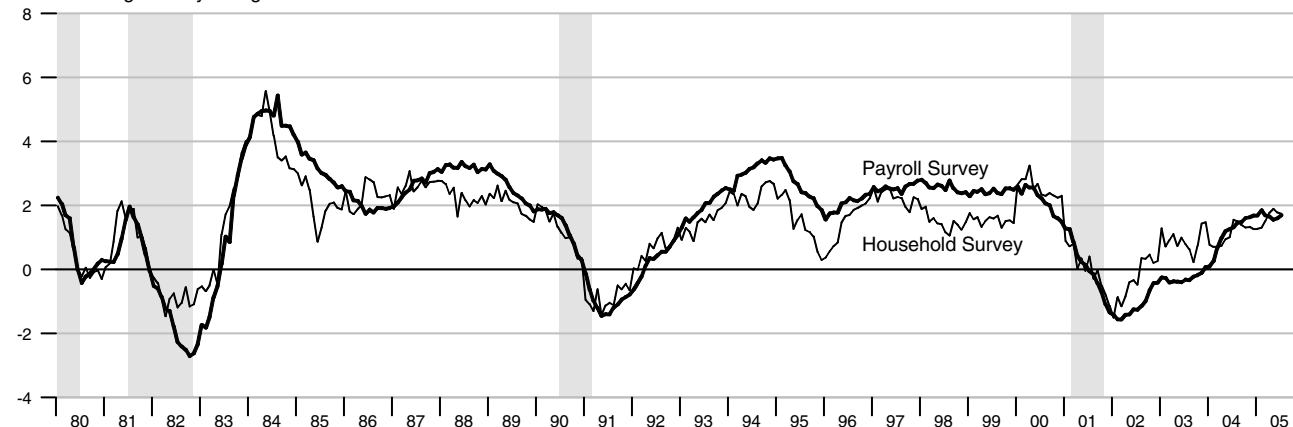


### Compensation per Hour



### Employment

Percent change from year ago

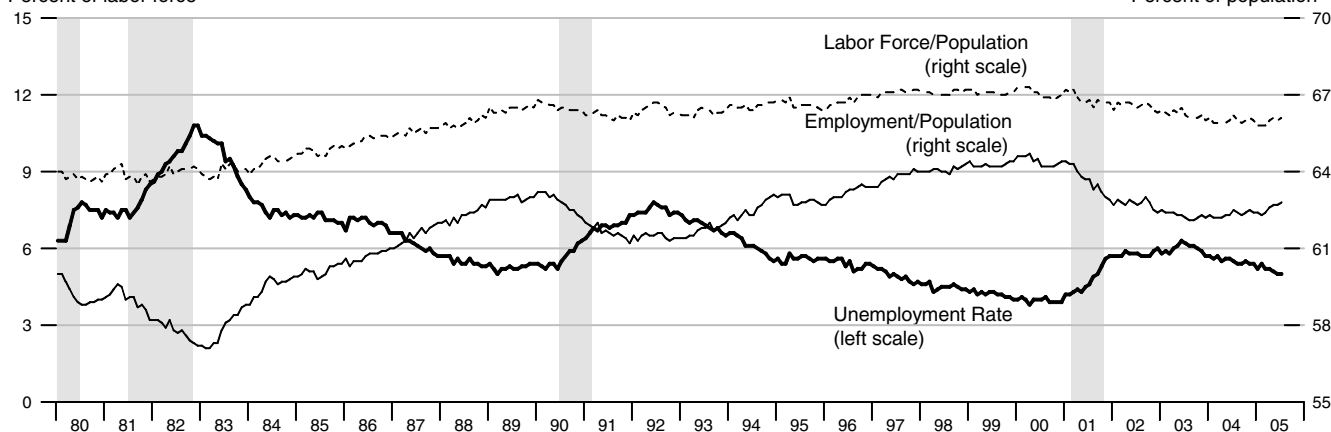


See the Notes section at the end of this publication for the Feb. 7, 2003, revisions to the Household Survey, and the June 6, 2003, revisions to the Establishment Survey.

### Unemployment, Labor Force Participation, and Employment Rates

Percent of labor force

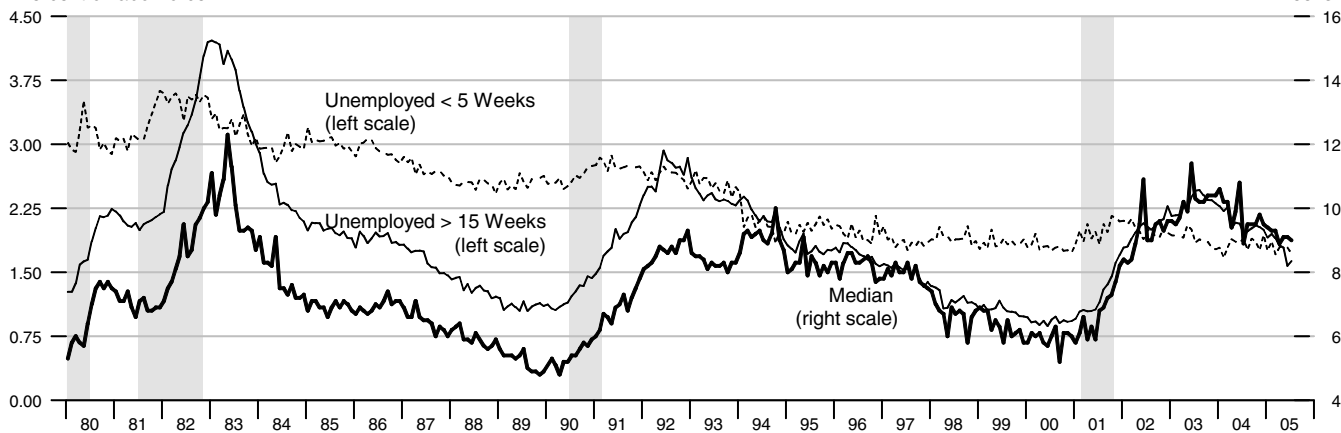
Percent of population



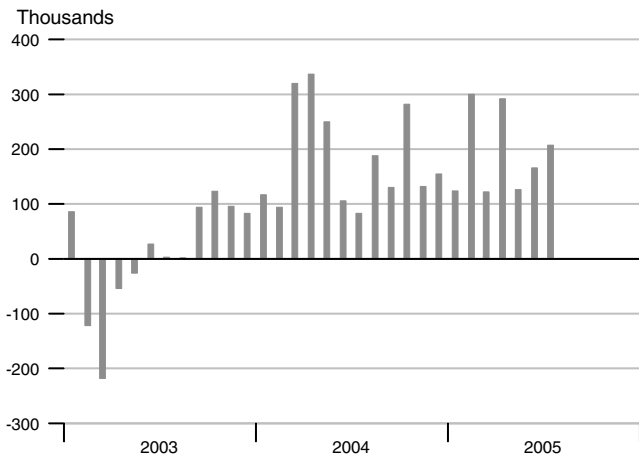
### Duration of Unemployment

Percent of labor force

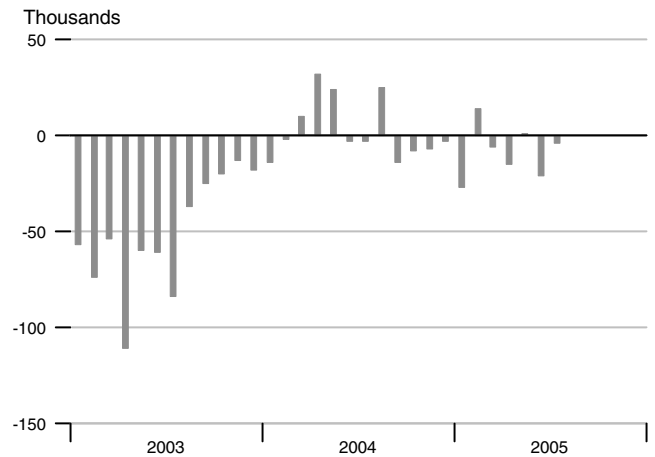
Weeks



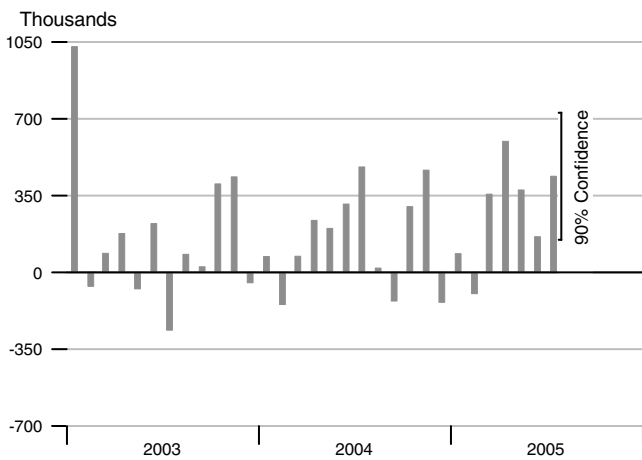
### Change in Nonfarm Payrolls



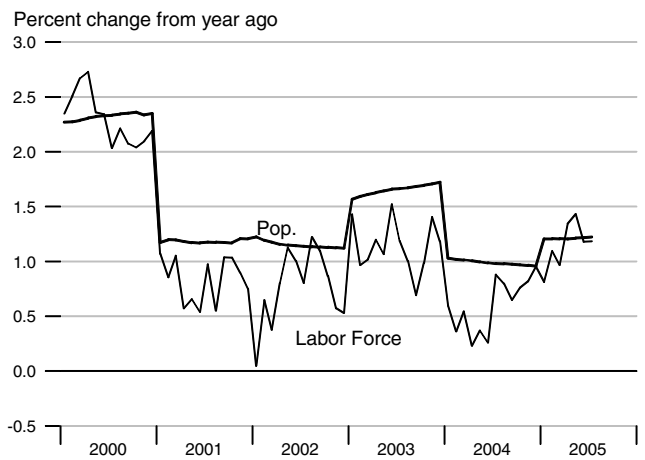
### Change in Manufacturing Payrolls



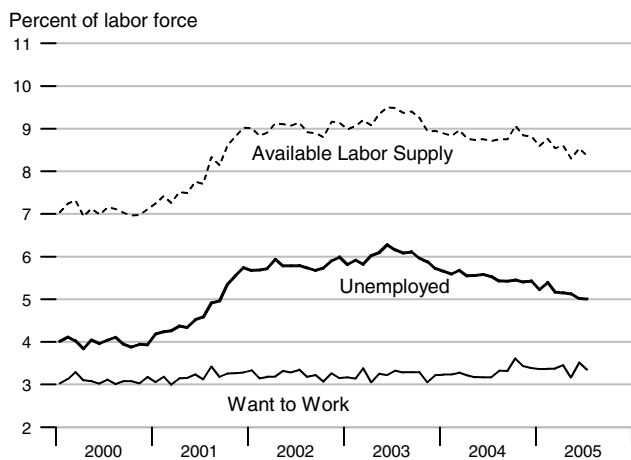
### Change in Household Employment



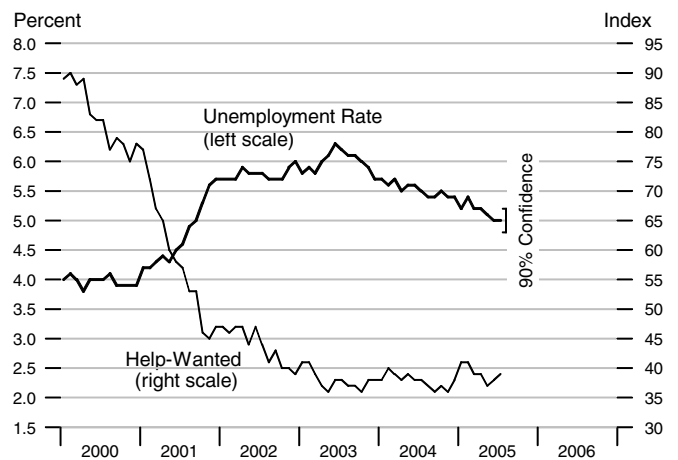
### Labor Force and Population



### Available Labor Supply and Components

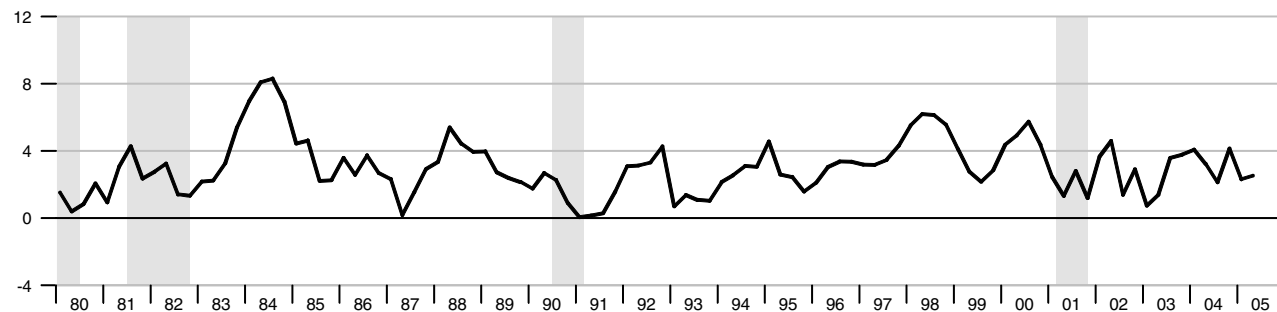


### Unemployment Rate & Help-Wanted Index



### Real Disposable Personal Income

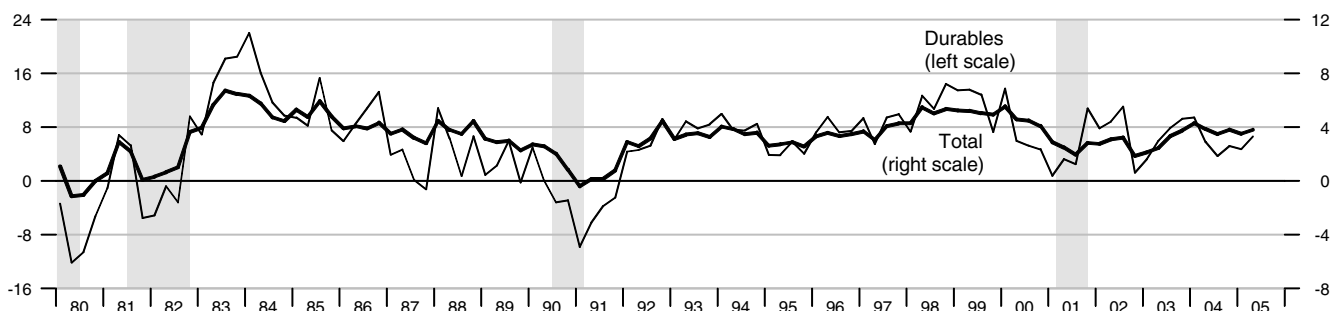
Percent change from year ago, quarterly data



### 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

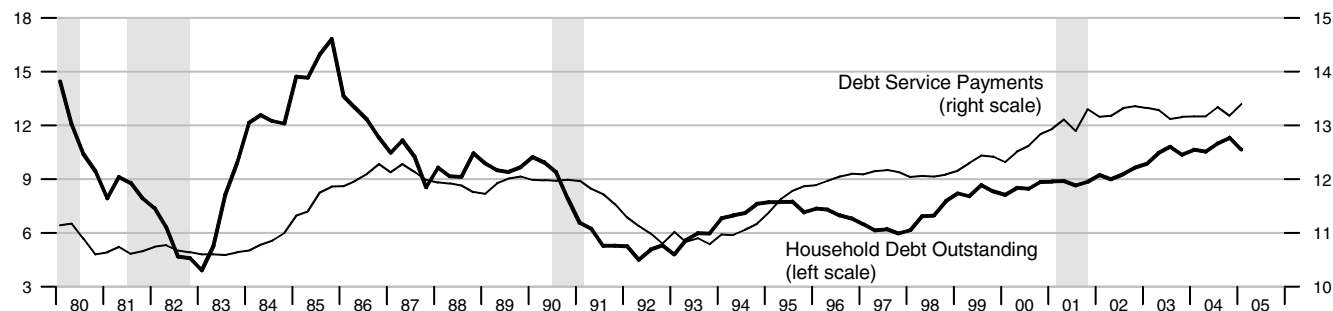


\*Data from Jan. 1992 to the present are on a NAICS basis; data prior to Jan. 1992 are on an SIC basis and are not strictly comparable (see End Note).

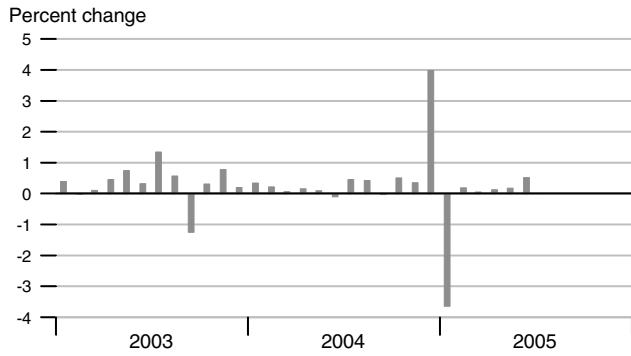
### Debt Service Payments and Household Debt Outstanding

Percent change from year ago, quarterly data

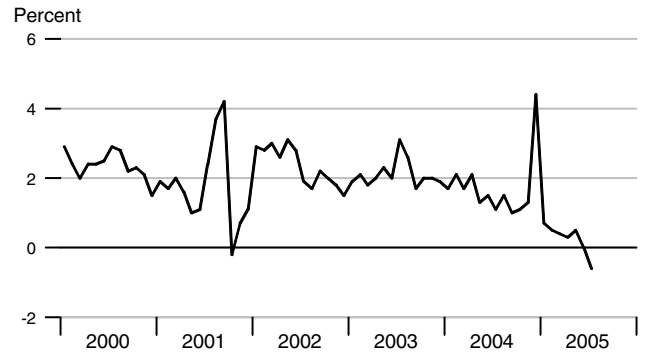
Percent of disposable personal income



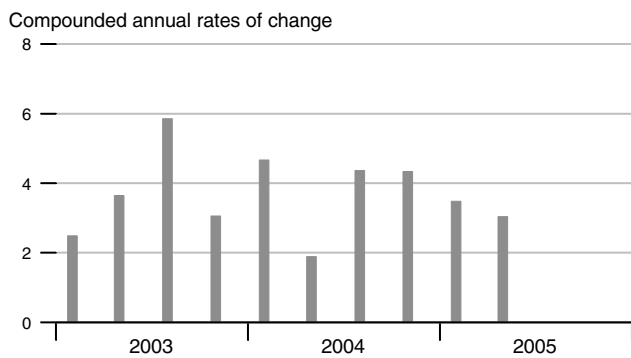
### Real Disposable Personal Income



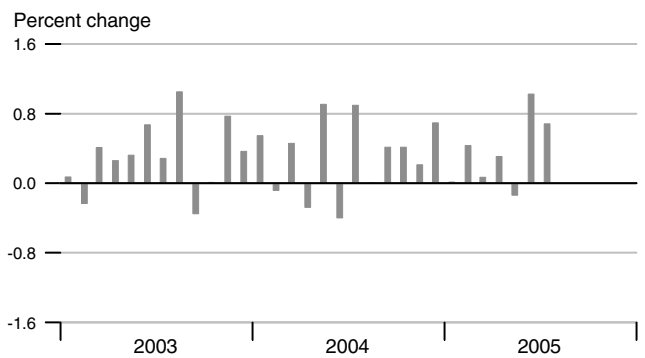
### Personal Saving Rate



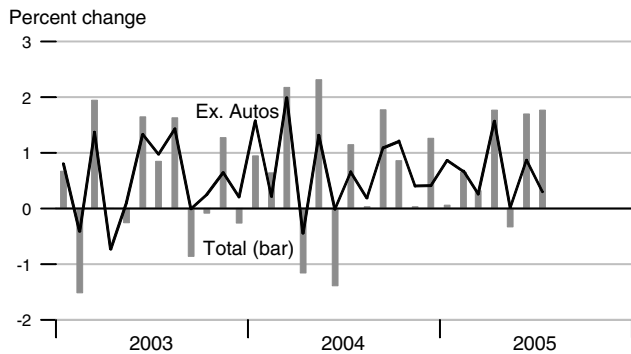
### Real Consumption



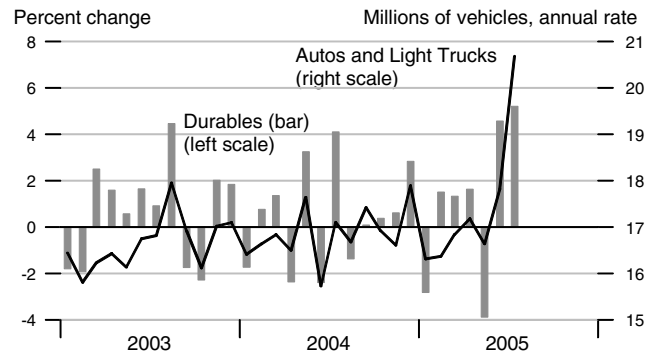
### Real Consumption



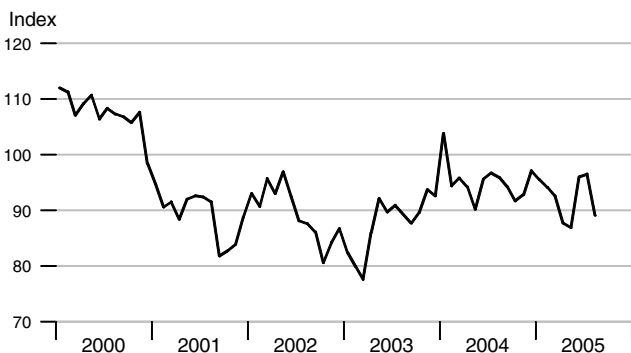
### Retail & Food Services



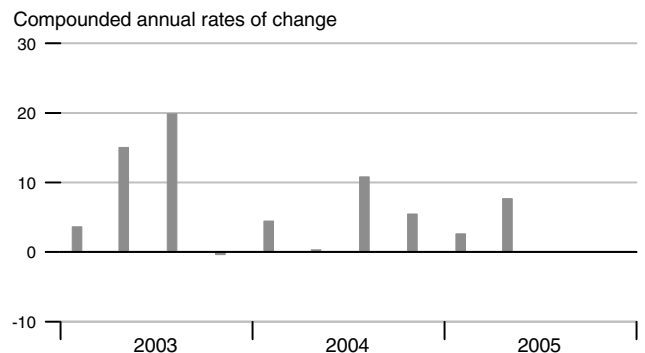
### Real Durables Consumption & Vehicle Sales



### Consumer Sentiment (U. of Michigan)

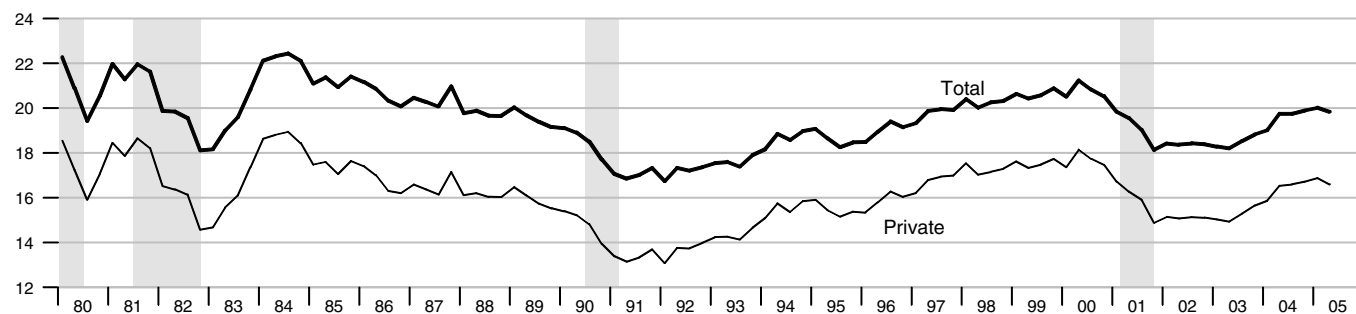


### Real Durables Consumption



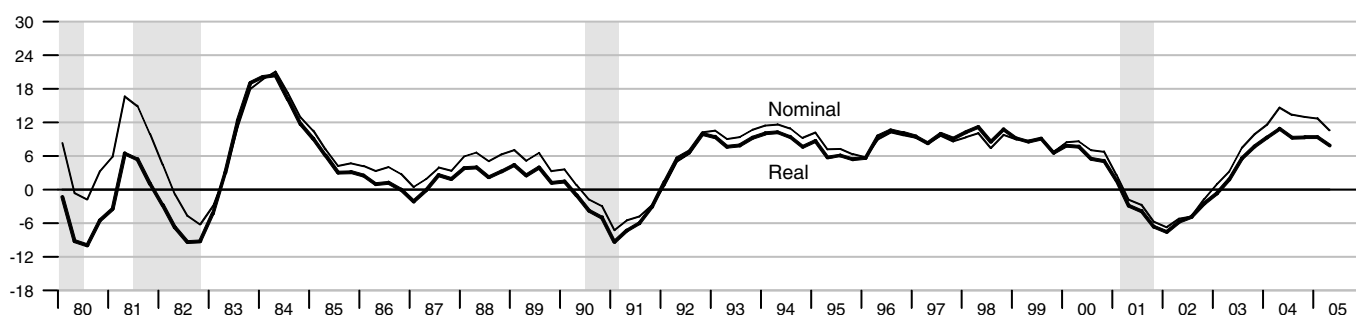
### Investment

Percent of nominal GDP



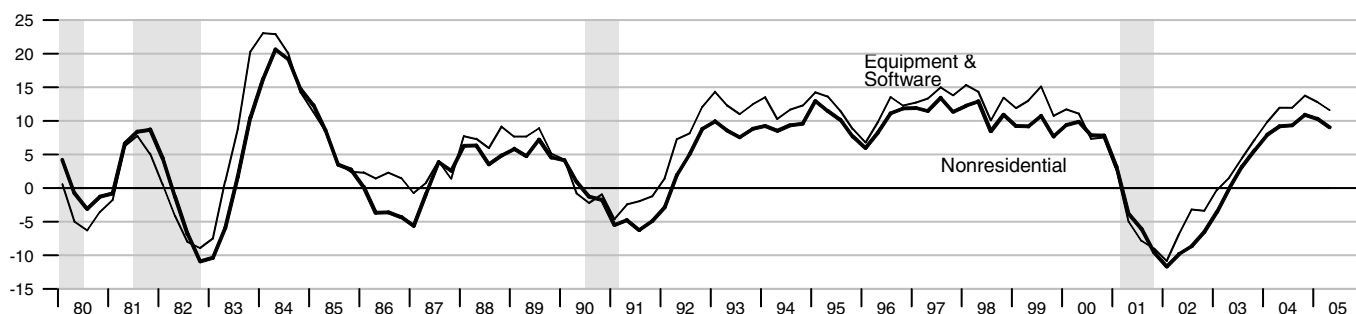
### Private Fixed Investment

Percent change from year ago



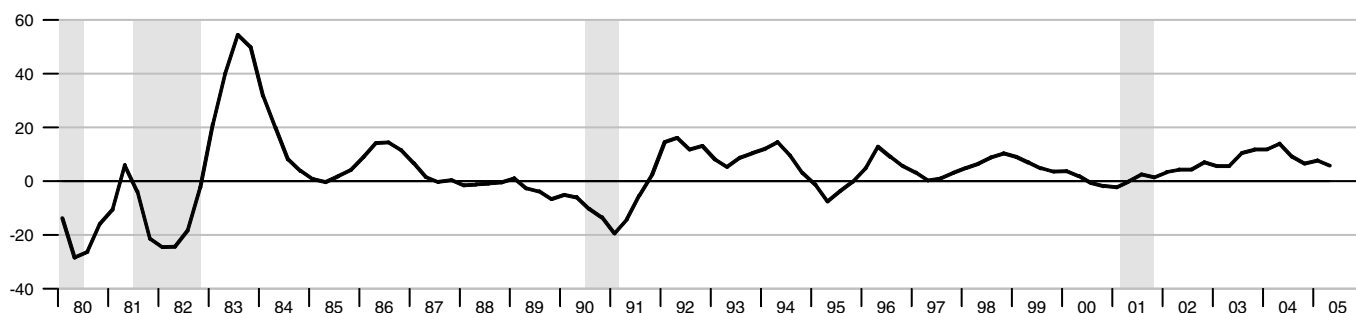
### Real Nonresidential Fixed and Equipment & Software Investment

Percent change from year ago

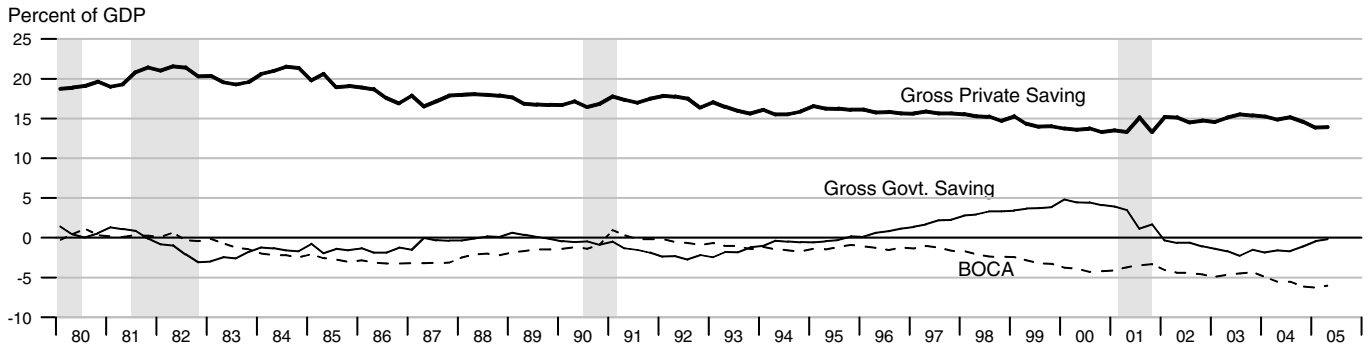


### Real Residential Fixed Investment

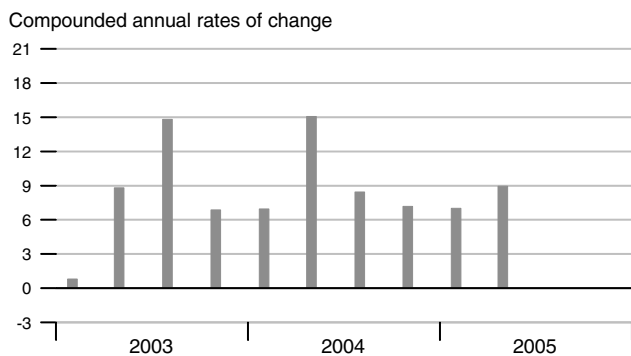
Percent change from year ago



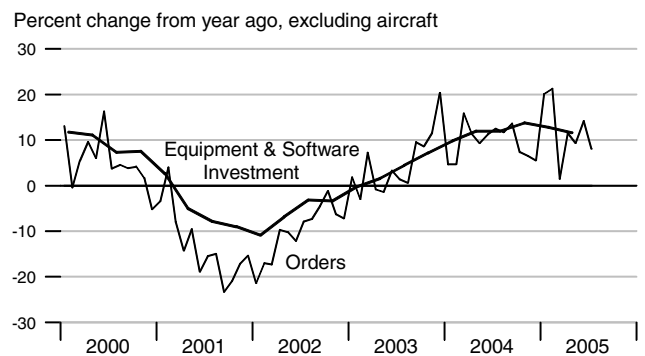
### Gross Saving Rates and Balance on Current Account (NIPA)



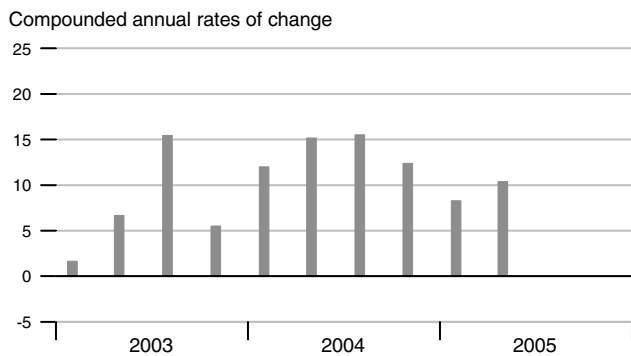
### Real Private Fixed Investment



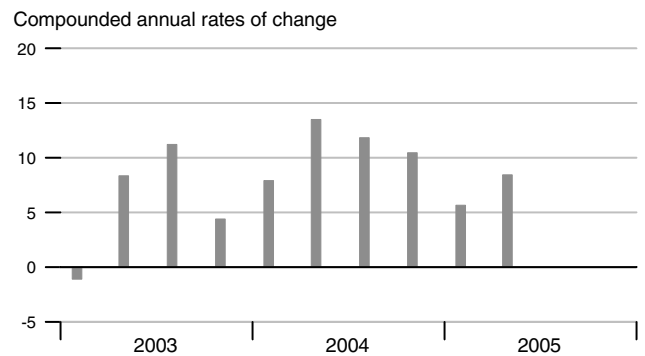
### Nondefense Capital Goods Orders



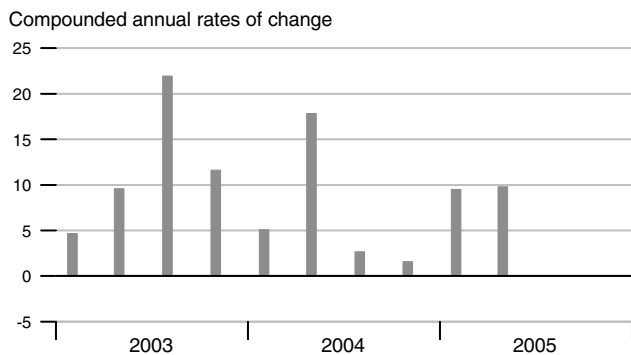
### Real Equipment & Software Investment



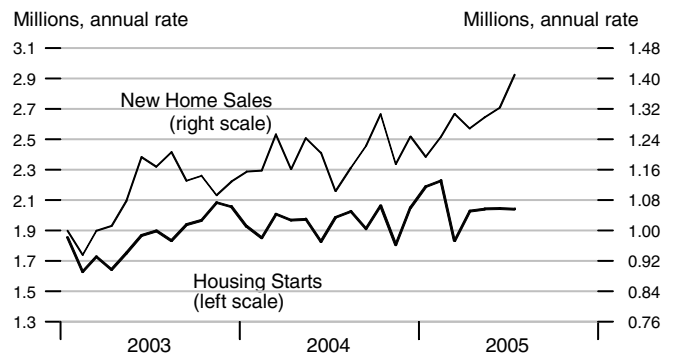
### Real Nonresidential Fixed Investment



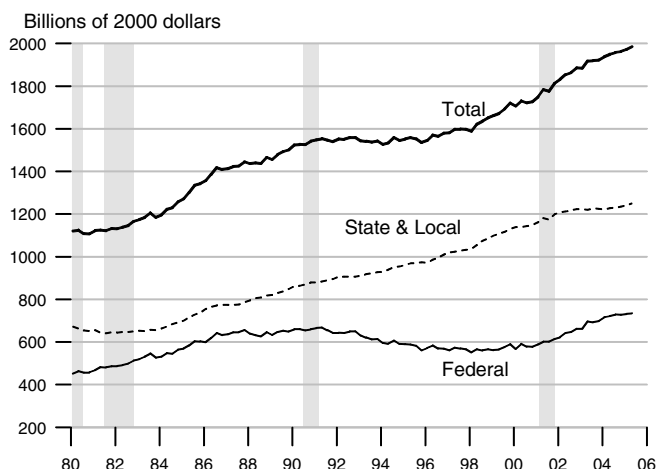
### Real Residential Fixed Investment



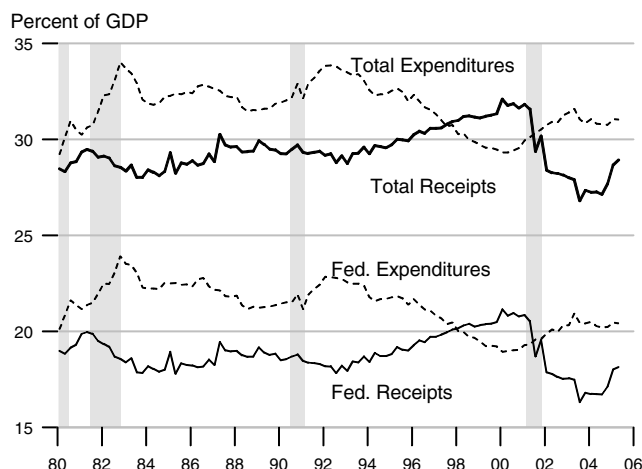
### Housing Starts and New Home Sales



**Govt. Consumption and Investment**



**Govt. Current Receipts and Expenditures**



**Government Budgets**

Billions of dollars

**National Income Accounts**

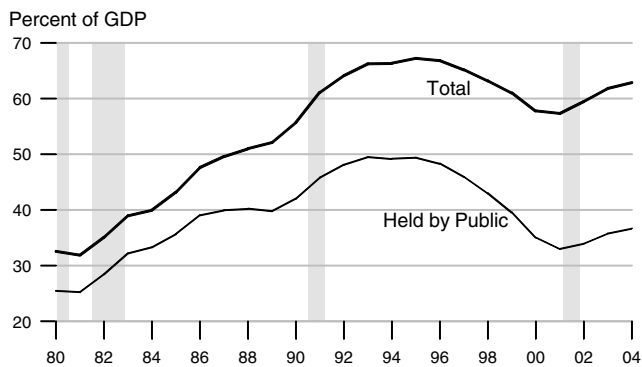
Calendar Years

**Unified Budget**

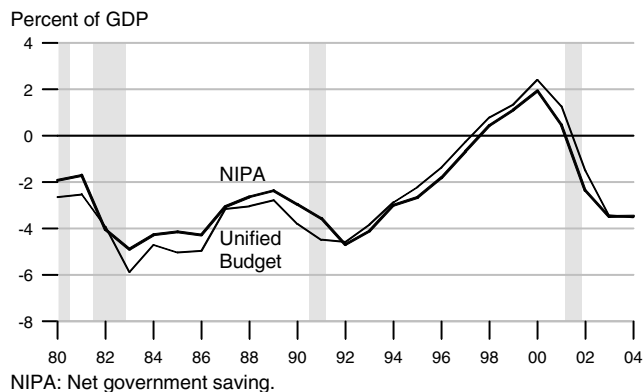
Fiscal Years

	State and Local			Federal			Federal		
	Receipts	Expenditures	Surplus or Deficit (-)	Receipts	Expenditures	Surplus or Deficit (-)	Receipts	Outlays	Surplus or Deficit (-)
1991	789.2	793.3	-4.1	1101.3	1315.0	-213.7	1055.0	1324.3	-269.3
1992	845.7	845.0	0.7	1147.2	1444.6	-297.4	1091.3	1381.6	-290.3
1993	886.9	886.0	0.9	1222.5	1496.0	-273.5	1154.4	1409.5	-255.1
1994	942.9	932.4	10.5	1320.8	1533.1	-212.3	1258.6	1461.9	-203.2
1995	990.2	978.2	12.0	1406.5	1603.5	-197.0	1351.8	1515.8	-164.0
1996	1043.3	1017.5	25.8	1524.0	1665.8	-141.8	1453.1	1560.5	-107.5
1997	1097.4	1058.3	39.1	1653.1	1708.9	-55.8	1579.3	1601.2	-21.9
1998	1163.2	1111.2	52.0	1773.8	1734.9	38.9	1721.8	1652.6	69.2
1999	1236.7	1186.3	50.4	1891.2	1787.6	103.6	1827.5	1701.9	125.5
2000	1319.5	1269.5	50.0	2053.8	1864.4	189.4	2025.2	1789.1	236.2
2001	1373.0	1368.2	4.8	2016.2	1969.5	46.7	1991.2	1863.0	128.2
2002	1410.1	1444.3	-34.2	1853.2	2101.1	-247.9	1853.2	2011.0	-157.8
2003	1488.6	1512.4	-23.8	1868.6	2251.4	-382.8	1782.3	2159.9	-377.6
2004	1581.7	1587.5	-5.8	1974.8	2381.3	-406.5	1880.1	2292.2	-412.1
2003Q2	1474.6	1500.7	-26.1	1896.3	2270.1	-373.8	527.7	545.9	-18.3
2003Q3	1507.6	1521.4	-13.8	1808.9	2265.1	-456.2	429.5	533.8	-104.3
2003Q4	1539.0	1526.5	12.5	1887.9	2292.9	-405.0	440.8	570.9	-130.2
2004Q1	1546.8	1553.2	-6.4	1917.8	2347.2	-429.4	409.6	580.8	-171.2
2004Q2	1579.7	1581.3	-1.6	1951.4	2364.9	-413.5	549.9	575.7	-25.8
2004Q3	1574.5	1593.8	-19.3	1975.4	2387.0	-411.6	479.5	565.2	-85.7
2004Q4	1625.7	1621.7	4.0	2054.6	2426.2	-371.6	487.2	605.2	-118.1
2005Q1	1656.7	1649.4	7.3	2196.6	2494.9	-298.3	451.8	628.4	-176.6
2005Q2	1694.2	1673.5	20.7	2244.1	2525.0	-280.9	665.2	620.3	44.8

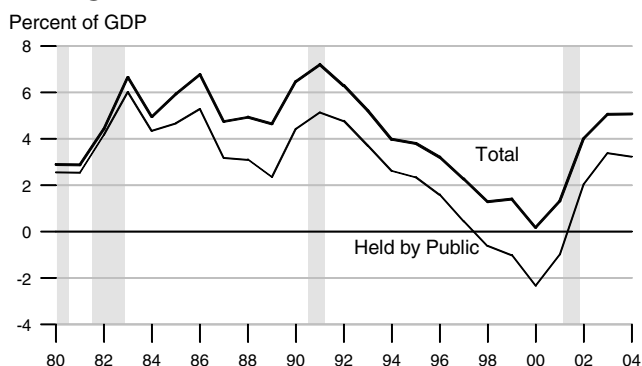
### Federal Debt



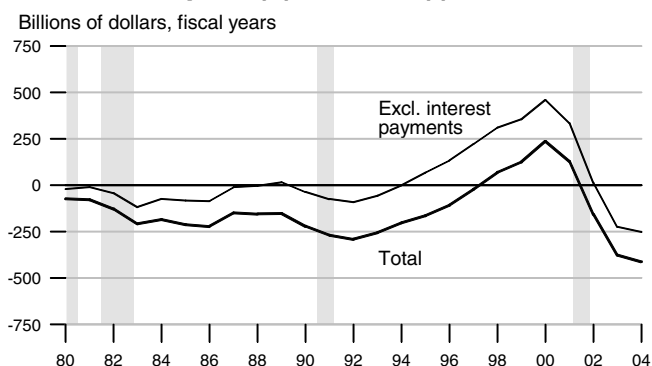
### Federal Surplus (+) / Deficit (-)



### Change in Federal Debt



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

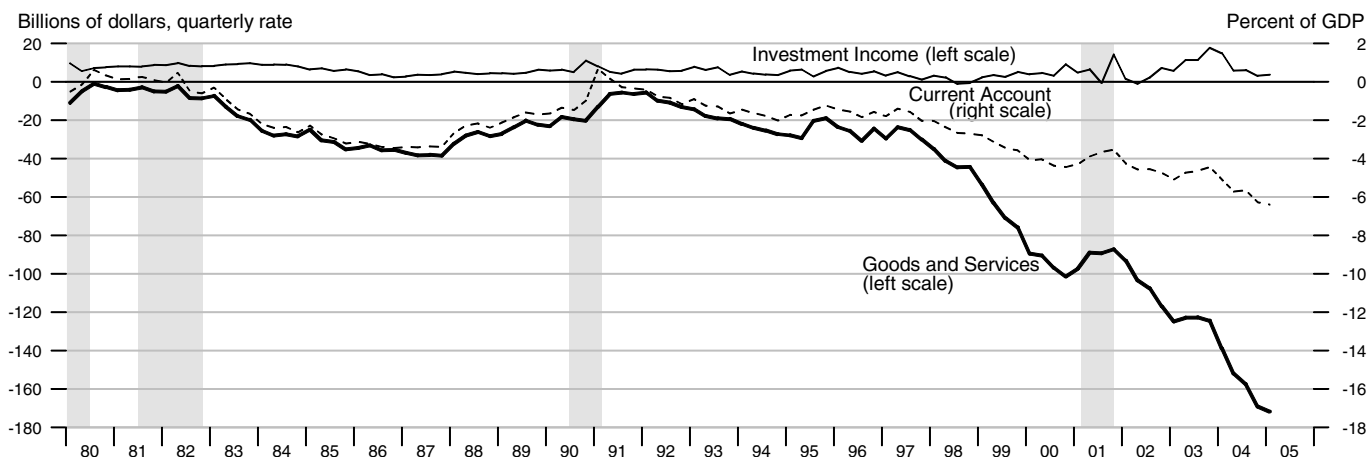


### Federal Government Debt

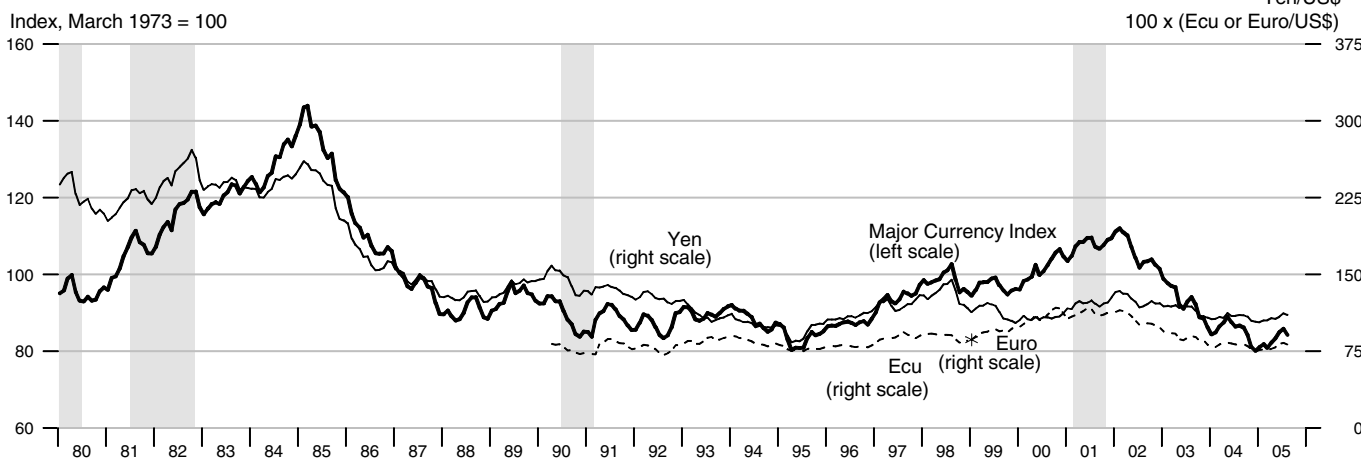
Billions of dollars, end of month or fiscal year  
Excludes Agency-issued debt

	Total Public Debt	Held by Agencies and Trusts	Held by Public		Held by Private Investors	
			Total	Federal Reserve Banks	Total	Foreign and International
2002	6228.2	2675.7	3552.6	604.2	2924.8	1200.8
2003	6783.2	2859.3	3923.9	656.1	3268.0	1458.5
2004	7379.1	3075.7	4303.4	700.3	3607.0	1884.4
2002 March	6006.0	2562.4	3443.7	575.4	2849.2	1067.1
June	6126.5	2662.9	3463.5	590.7	2849.8	1135.4
September	6228.2	2675.7	3552.6	604.2	2924.8	1200.8
December	6405.7	2758.3	3647.4	629.4	3018.5	1246.8
2003 March	6460.8	2750.0	3710.8	641.5	3069.9	1285.9
June	6670.1	2853.8	3816.3	652.1	3164.7	1382.8
September	6783.2	2859.3	3923.9	656.1	3268.0	1458.5
December	6998.0	2954.5	4044.1	666.7	3377.9	1537.6
2004 March	7131.1	2954.4	4176.7	674.1	3502.8	1681.7
June	7274.3	3055.6	4218.7	687.4	3531.5	1827.9
September	7379.1	3075.7	4303.4	700.3	3607.0	1884.4
December	7596.1	3189.1	4407.1	717.8	3667.1	1944.2
2005 March	7776.9	3204.5	4572.4	717.3	3855.4	2037.0

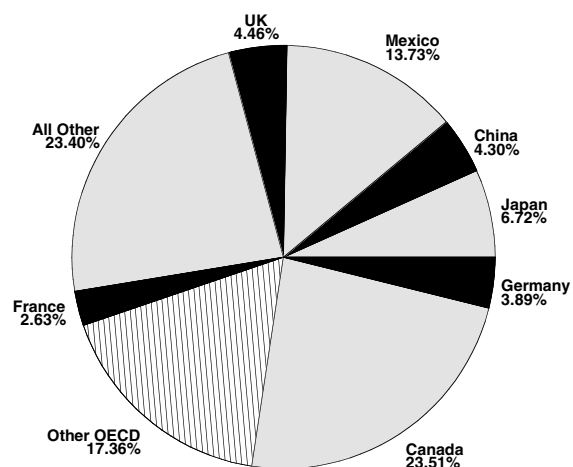
### Current Account, Trade and Investment Income Balances



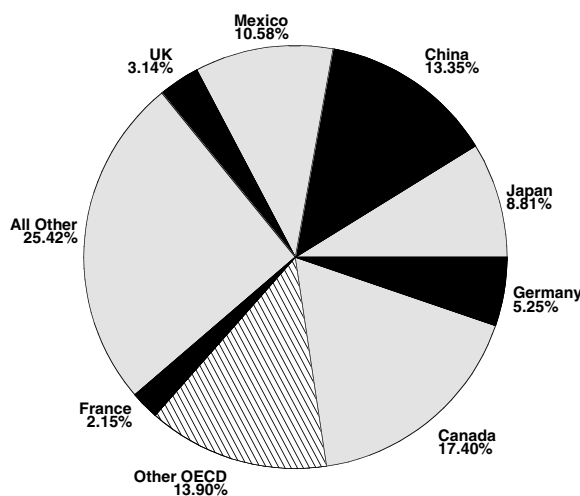
### Exchange Rates



### Goods Export Shares, 2004



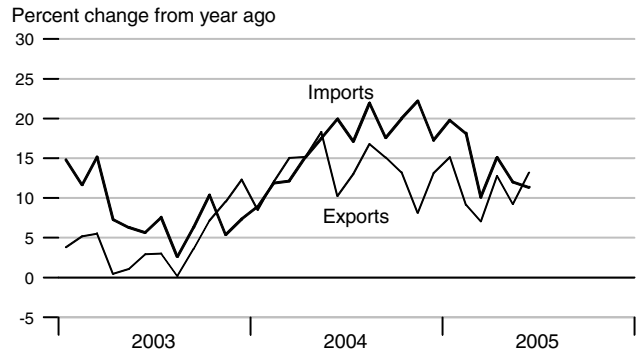
### Goods Import Shares, 2004



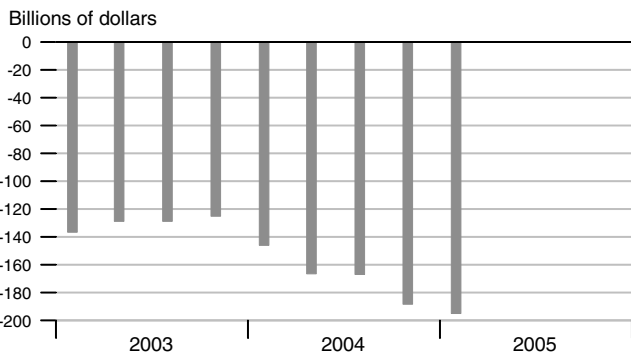
### Trade Balance



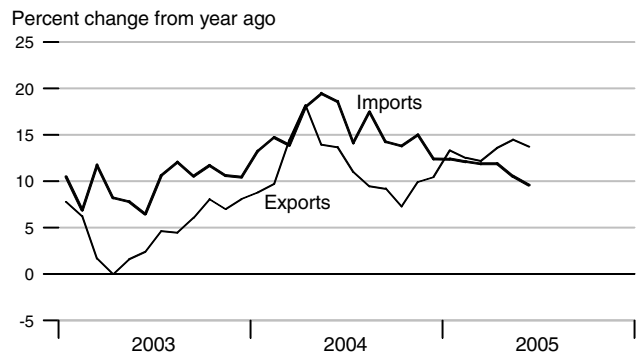
### Goods Trade



### Current Account Balance



### Services Trade



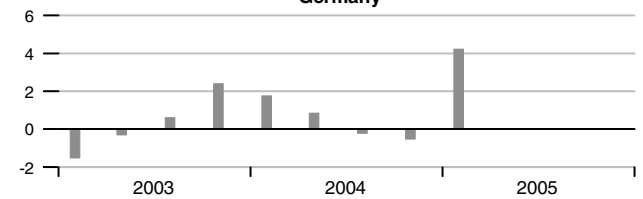
### Real GDP Growth of Major Trading Partners

Compounded annual rates of change

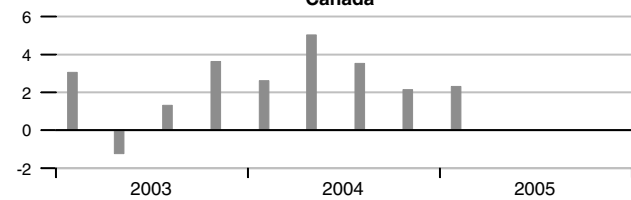
#### United Kingdom



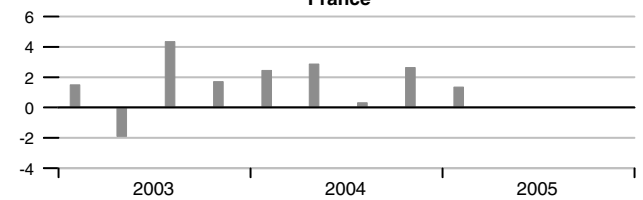
#### Germany



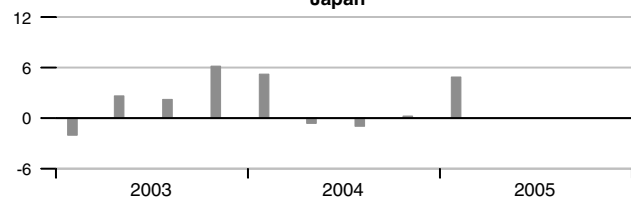
#### Canada



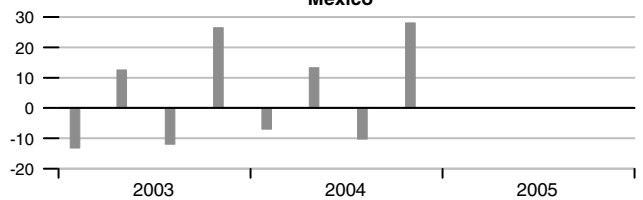
#### France



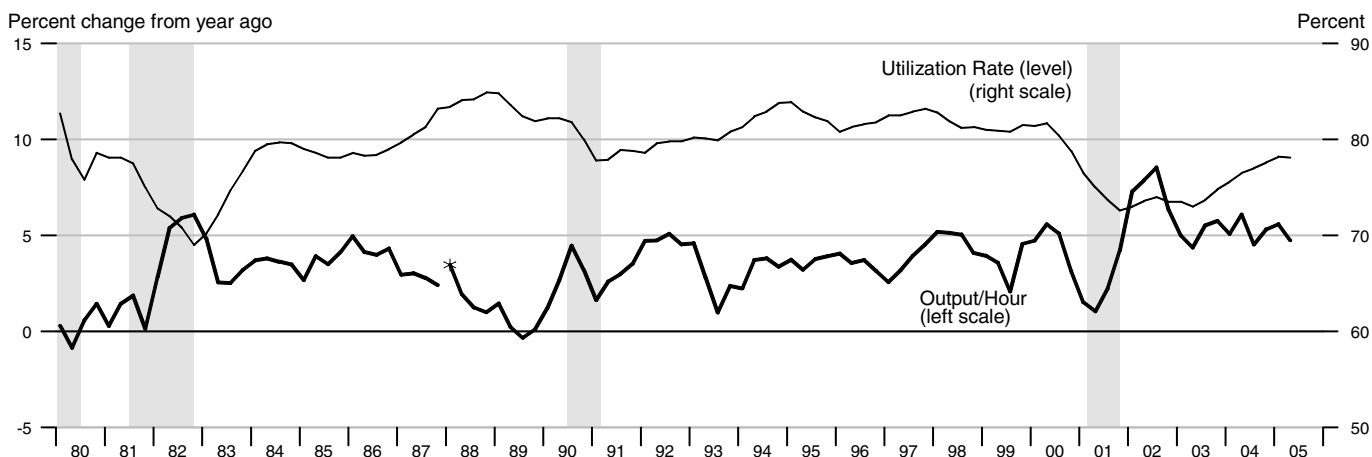
#### Japan



#### Mexico

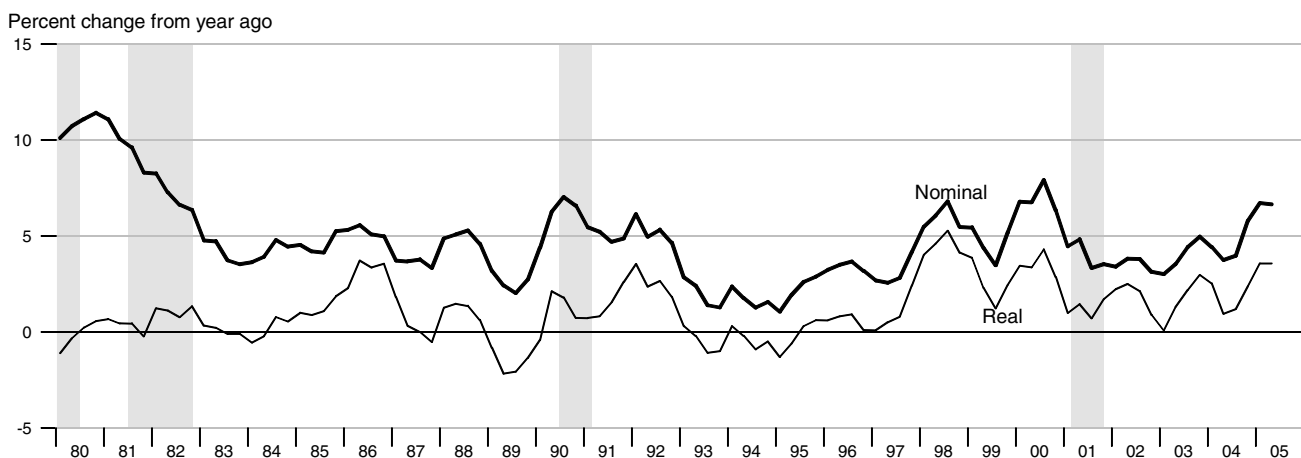


### Output per Hour and Capacity Utilization, Manufacturing

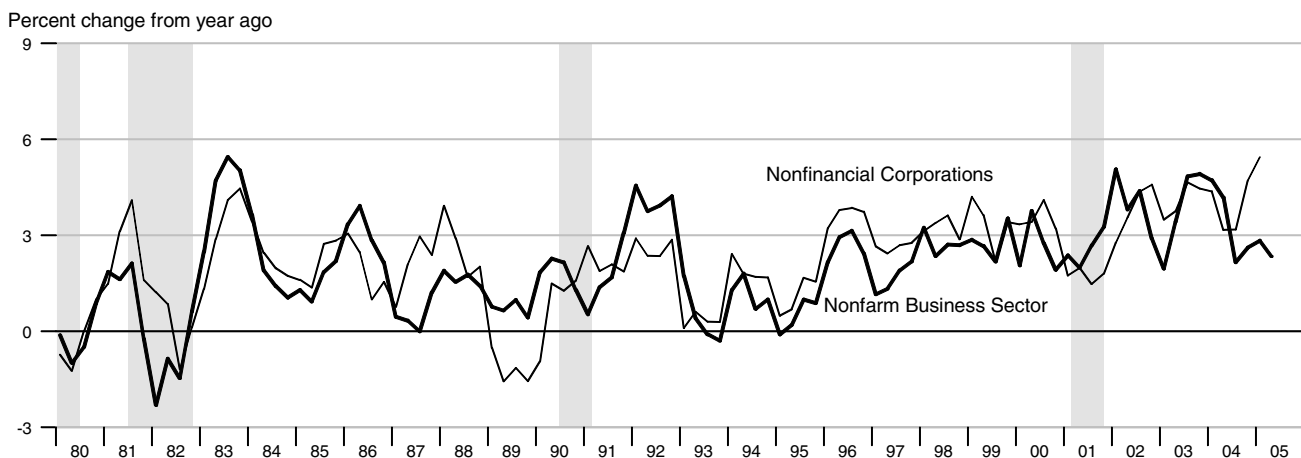


\*Data from 1987 to the present are on a NAICS basis; data prior to 1987 are on an SIC basis and are not strictly comparable (see End Note).

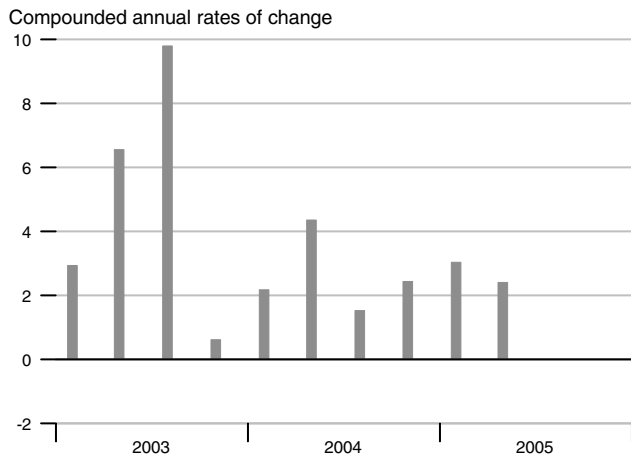
### Nonfarm Compensation per Hour



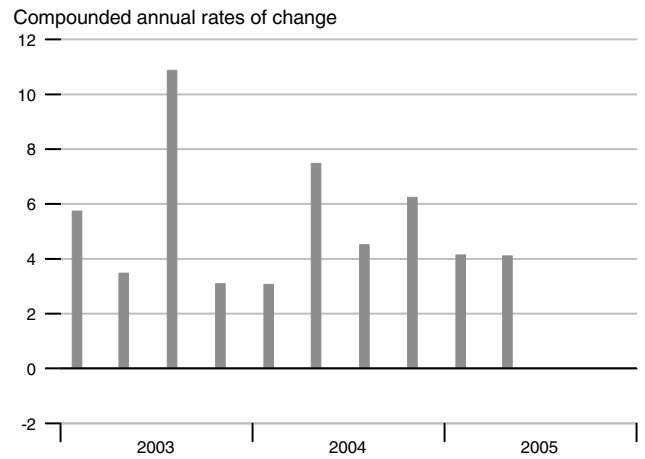
### Output per Hour, Nonfarm Business and Nonfinancial Corporations



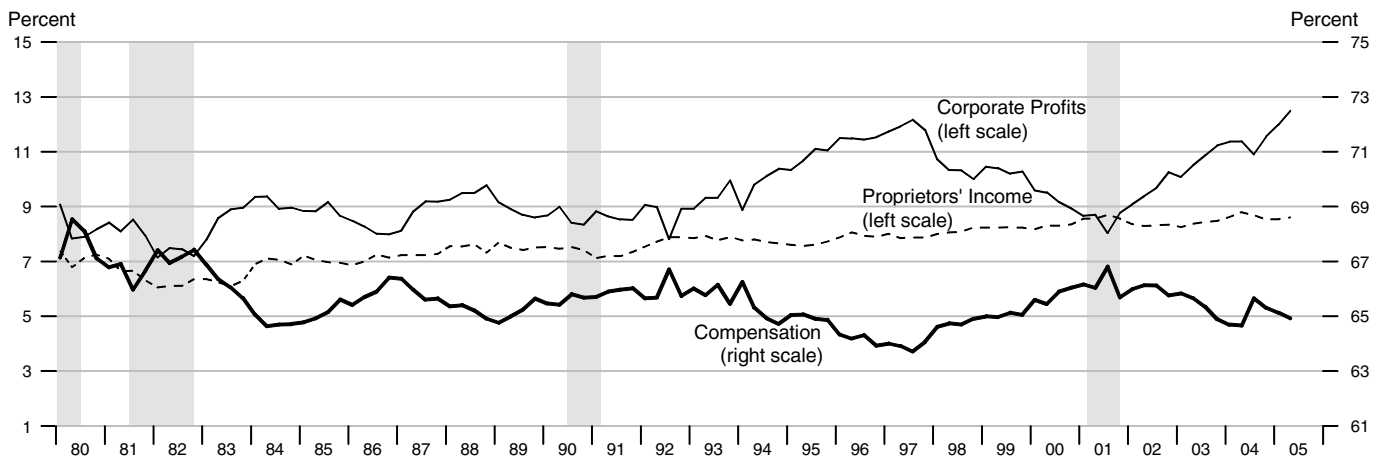
### Nonfarm Output per Hour



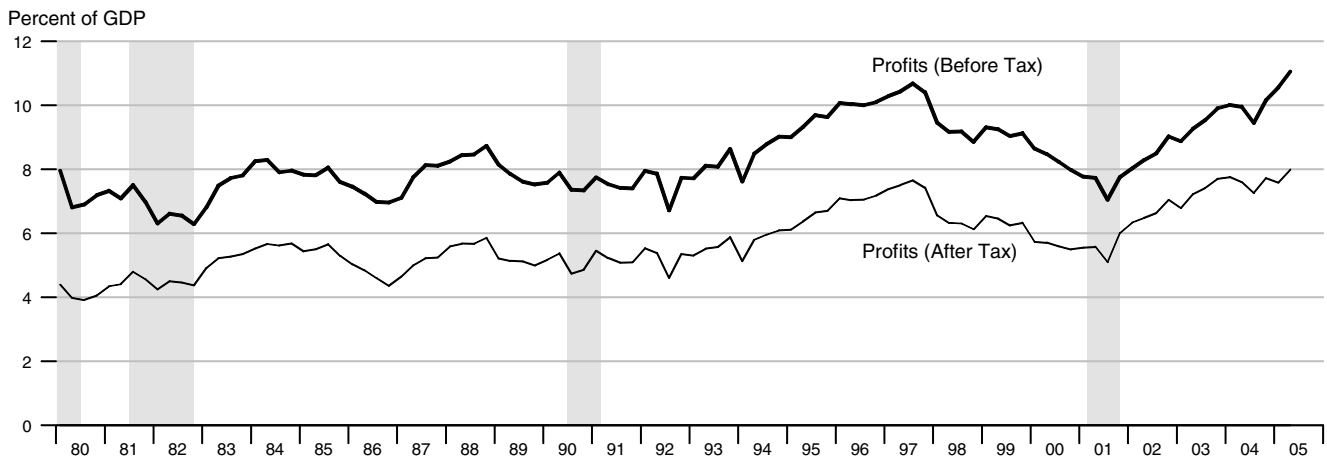
### Manufacturing Output per Hour



### Selected Component Shares of National Income



### Corporate Profits





	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
2001	102.402		2.4	155.0		4.1	151.4		3.7	163.8		5.0
2002	104.193		1.7	160.9		3.8	156.4		3.3	171.7		4.9
2003	106.310		2.0	167.3		4.0	160.9		2.9	182.5		6.3
2004	109.102		2.6	173.9		3.9	165.0		2.5	195.4		7.1
2002 1	103.553	1.7	2.0	158.8	3.3	4.0	154.8	3.7	3.5	168.3	2.7	4.7
2	103.944	1.5	1.6	160.5	4.4	4.1	156.2	3.7	3.6	170.6	5.6	5.0
3	104.347	1.6	1.6	161.5	2.5	3.7	156.9	1.8	3.2	172.7	5.0	4.9
4	104.926	2.2	1.7	162.8	3.3	3.4	157.7	2.1	2.8	175.2	5.9	4.8
2003 1	105.724	3.1	2.1	165.0	5.5	3.9	159.3	4.1	2.9	178.5	7.7	6.1
2	106.019	1.1	2.0	166.4	3.4	3.7	160.3	2.5	2.6	180.9	5.5	6.0
3	106.500	1.8	2.1	168.2	4.4	4.1	161.6	3.3	3.0	183.9	6.8	6.5
4	106.996	1.9	2.0	169.6	3.4	4.2	162.5	2.2	3.0	186.7	6.2	6.6
2004 1	107.951	3.6	2.1	171.5	4.6	3.9	163.5	2.5	2.6	190.9	9.3	6.9
2	108.976	3.9	2.8	173.1	3.8	4.0	164.5	2.5	2.6	194.1	6.9	7.3
3	109.371	1.5	2.7	174.8	4.0	3.9	165.7	3.0	2.5	196.7	5.5	7.0
4	110.111	2.7	2.9	176.2	3.2	3.9	166.4	1.7	2.4	199.9	6.7	7.1
2005 1	110.950	3.1	2.8	177.3	2.5	3.4	167.4	2.4	2.4	202.0	4.3	5.8
2	111.618	2.4	2.4	178.4	2.5	3.1	168.4	2.4	2.4	203.6	3.2	4.9
	Exports			Imports			Nonfarm Output per Hour			Nonfarm Compensation per Hour		
	Billions of 2000 \$	Percent change		Billions of 2000 \$	Percent change		Index	Percent change		Index	Percent change	
		Annual rate	Year ago		Annual rate	Year ago		Annual rate	Year ago		Annual rate	Year ago
2001	1036.699		-5.4	1435.782		-2.7	118.5		2.5	139.3		4.0
2002	1013.293		-2.3	1484.629		3.4	123.3		4.1	144.2		3.5
2003	1031.207		1.8	1552.573		4.6	128.0		3.8	149.9		4.0
2004	1117.879		8.4	1719.187		10.7	132.3		3.4	156.7		4.5
2002 1	992.760	5.2	-9.5	1434.026	11.7	-4.1	122.5	6.8	5.1	142.7	6.1	3.4
2	1017.986	10.6	-4.0	1476.911	12.5	2.1	122.7	0.7	3.8	144.2	4.3	3.8
3	1025.243	2.9	1.6	1497.409	5.7	6.4	123.9	4.0	4.4	144.8	1.7	3.8
4	1017.174	-3.1	3.8	1530.186	9.0	9.7	124.0	0.3	2.9	145.0	0.6	3.1
2003 1	1009.709	-2.9	1.7	1520.372	-2.5	6.0	124.9	2.9	2.0	147.0	5.6	3.0
2	1004.457	-2.1	-1.3	1532.901	3.3	3.8	126.9	6.6	3.4	149.3	6.4	3.5
3	1032.248	11.5	0.7	1548.412	4.1	3.4	129.9	9.8	4.8	151.2	5.2	4.4
4	1078.445	19.1	6.0	1608.623	16.5	5.1	130.1	0.6	4.9	152.2	2.7	5.0
2004 1	1091.798	5.0	8.1	1654.829	12.0	8.8	130.8	2.2	4.7	153.5	3.5	4.4
2	1110.194	6.9	10.5	1711.867	14.5	11.7	132.2	4.4	4.2	154.9	3.7	3.8
3	1125.027	5.5	9.0	1731.480	4.7	11.8	132.7	1.5	2.2	157.2	6.1	4.0
4	1144.496	7.1	6.1	1778.556	11.3	10.6	133.5	2.4	2.6	161.0	10.0	5.8
2005 1	1165.293	7.5	6.7	1810.728	7.4	9.4	134.5	3.0	2.8	163.8	7.1	6.7
2	1201.909	13.2	8.3	1813.060	0.5	5.9	135.3	2.4	2.3	165.2	3.5	6.6

		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
2000		136901	3400		2.5	131792	2800		2.2	103.5			1.8
2001		136940	40		0.0	131833	41		0.0	102.1			-1.4
2002		136483	-458		-0.3	130345	-1487		-1.1	100.0			-2.0
2003		137734	1252		0.9	129999	-347		-0.3	98.6			-1.4
2004		139248	1513		1.1	131475	1476		1.1	100.3			1.7
2003	1	137415	773	2.3	1.0	130093	-169	-0.5	-0.3	99.0	-0.4	-1.7	-1.3
	2	137652	237	0.7	0.9	129845	-248	-0.8	-0.4	98.3	-0.8	-3.1	-2.0
	3	137574	-77	-0.2	0.5	129890	45	0.1	-0.3	98.3	0.1	0.3	-1.5
	4	138296	722	2.1	1.2	130168	278	0.9	-0.1	98.8	0.5	2.0	-0.6
2004	1	138408	112	0.3	0.7	130541	374	1.2	0.3	99.3	0.5	2.0	0.3
	2	138883	475	1.4	0.9	131325	784	2.4	1.1	100.0	0.6	2.6	1.7
	3	139608	725	2.1	1.5	131731	406	1.2	1.4	100.6	0.6	2.4	2.3
	4	140092	484	1.4	1.3	132302	571	1.7	1.6	101.2	0.6	2.4	2.4
2005	1	140295	203	0.6	1.4	132814	512	1.6	1.7	101.7	0.6	2.3	2.4
	2	141404	1109	3.2	1.8	133426	613	1.9	1.6	102.4	0.7	2.8	2.5
2003	Jul	137511	-264	-2.3	0.8	129857	3	0.0	-0.3	98.3	0.0	0.0	-1.4
	Aug	137593	82	0.7	0.6	129859	2	0.0	-0.3	98.3	0.0	0.0	-1.6
	Sep	137619	26	0.2	0.2	129953	94	0.9	-0.2	98.4	0.1	1.2	-1.5
	Oct	138022	403	3.6	0.7	130076	123	1.1	-0.2	98.8	0.4	5.0	-0.8
	Nov	138457	435	3.8	1.4	130172	96	0.9	-0.1	99.1	0.3	3.7	-0.4
	Dec	138409	-48	-0.4	1.5	130255	83	0.8	0.1	98.6	-0.5	-5.9	-0.7
2004	Jan	138481	72	0.6	0.8	130372	117	1.1	0.1	99.3	0.7	8.9	0.0
	Feb	138334	-147	-1.3	0.7	130466	94	0.9	0.3	99.4	0.1	1.2	0.5
	Mar	138408	74	0.6	0.7	130786	320	3.0	0.7	99.3	-0.1	-1.2	0.4
	Apr	138645	237	2.1	0.7	131123	337	3.1	1.0	99.7	0.4	4.9	1.4
	May	138846	201	1.8	0.9	131373	250	2.3	1.2	100.3	0.6	7.5	2.1
	Jun	139158	312	2.7	1.0	131479	106	1.0	1.3	99.9	-0.4	-4.7	1.6
	Jul	139639	481	4.2	1.5	131562	83	0.8	1.3	100.3	0.4	4.9	2.0
	Aug	139658	19	0.2	1.5	131750	188	1.7	1.5	100.5	0.2	2.4	2.2
	Sep	139527	-131	-1.1	1.4	131880	130	1.2	1.5	100.9	0.4	4.9	2.5
	Oct	139827	300	2.6	1.3	132162	282	2.6	1.6	101.2	0.3	3.6	2.4
	Nov	140293	466	4.1	1.3	132294	132	1.2	1.6	101.1	-0.1	-1.2	2.0
	Dec	140156	-137	-1.2	1.3	132449	155	1.4	1.7	101.2	0.1	1.2	2.6
2005	Jan	140241	85	0.7	1.3	132573	124	1.1	1.7	101.5	0.3	3.6	2.2
	Feb	140144	-97	-0.8	1.3	132873	300	2.7	1.8	101.8	0.3	3.6	2.4
	Mar	140501	357	3.1	1.5	132995	122	1.1	1.7	101.9	0.1	1.2	2.6
	Apr	141099	598	5.2	1.8	133287	292	2.7	1.7	102.5	0.6	7.3	2.8
	May	141475	376	3.2	1.9	133413	126	1.1	1.6	102.3	-0.2	-2.3	2.0
	Jun	141638	163	1.4	1.8	133579	166	1.5	1.6	102.5	0.2	2.4	2.6
	Jul	142076	438	3.8	1.7	133786	207	1.9	1.7	102.7	0.2	2.4	2.4

		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
2000		4.0	3284.226			6.6	115.380			4.3	5.82	6.03
2001		4.8	3388.094			3.2	111.266			-3.6	3.39	5.02
2002		5.8	3474.391			2.5	110.959			-0.3	1.60	4.61
2003		6.0	3623.849			4.3	110.932			-0.0	1.01	4.02
2004		5.5	3886.235			7.2	115.528			4.1	1.37	4.27
2003	1	5.8	884.854	0.9	3.8	3.3	110.825	-0.2	-0.7	0.8	1.16	3.92
	2	6.1	895.092	1.2	4.7	3.3	109.707	-1.0	-4.0	-1.3	1.04	3.62
	3	6.1	919.020	2.7	11.1	5.0	110.825	1.0	4.1	-0.7	0.93	4.23
	4	5.9	924.883	0.6	2.6	5.5	112.369	1.4	5.7	1.2	0.92	4.29
2004	1	5.7	946.761	2.4	9.8	7.0	113.920	1.4	5.6	2.8	0.92	4.02
	2	5.6	961.468	1.6	6.4	7.4	115.130	1.1	4.3	4.9	1.08	4.60
	3	5.4	976.751	1.6	6.5	6.3	115.893	0.7	2.7	4.6	1.49	4.30
	4	5.4	1001.255	2.5	10.4	8.3	117.168	1.1	4.5	4.3	2.01	4.17
2005	1	5.3	1015.851	1.5	6.0	7.3	118.217	0.9	3.6	3.8	2.54	4.30
	2	5.1	1041.815	2.6	10.6	8.4	118.625	0.3	1.4	3.0	2.86	4.16
2003	Aug	6.1	308.875	1.6	21.4	5.1	110.528	-0.1	-1.0	-1.0	0.95	4.45
	Sep	6.1	306.224	-0.9	-9.8	5.9	111.331	0.7	9.1	-0.3	0.94	4.27
	Oct	6.0	305.969	-0.1	-1.0	5.3	111.559	0.2	2.5	0.4	0.92	4.29
	Nov	5.9	309.864	1.3	16.4	6.2	112.657	1.0	12.5	1.3	0.93	4.30
	Dec	5.7	309.050	-0.3	-3.1	5.1	112.892	0.2	2.5	2.0	0.90	4.27
2004	Jan	5.7	311.973	0.9	12.0	5.4	113.223	0.3	3.6	2.1	0.88	4.15
	Feb	5.6	313.973	0.6	8.0	7.7	114.426	1.1	13.5	3.1	0.93	4.08
	Mar	5.7	320.815	2.2	29.5	7.9	114.110	-0.3	-3.3	3.2	0.94	3.83
	Apr	5.5	317.103	-1.2	-13.0	6.7	114.736	0.5	6.8	4.7	0.94	4.35
	May	5.6	324.439	2.3	31.6	9.4	115.534	0.7	8.7	5.4	1.02	4.72
	Jun	5.6	319.926	-1.4	-15.5	6.2	115.120	-0.4	-4.2	4.7	1.27	4.73
	Jul	5.5	323.604	1.1	14.7	6.5	115.930	0.7	8.8	4.8	1.33	4.50
	Aug	5.4	323.700	0.0	0.4	4.8	116.036	0.1	1.1	5.0	1.48	4.28
	Sep	5.4	329.447	1.8	23.5	7.6	115.714	-0.3	-3.3	3.9	1.65	4.13
	Oct	5.5	332.280	0.9	10.8	8.6	116.649	0.8	10.1	4.6	1.76	4.10
	Nov	5.4	332.392	0.0	0.4	7.3	116.948	0.3	3.1	3.8	2.07	4.19
	Dec	5.4	336.583	1.3	16.2	8.9	117.908	0.8	10.3	4.4	2.19	4.23
2005	Jan	5.2	336.785	0.1	0.7	8.0	117.753	-0.1	-1.6	4.0	2.33	4.22
	Feb	5.4	338.991	0.7	8.1	8.0	118.303	0.5	5.8	3.4	2.54	4.17
	Mar	5.2	340.075	0.3	3.9	6.0	118.595	0.2	3.0	3.9	2.74	4.50
	Apr	5.2	346.081	1.8	23.4	9.1	118.067	-0.4	-5.2	2.9	2.78	4.34
	May	5.1	344.933	-0.3	-3.9	6.3	118.427	0.3	3.7	2.5	2.84	4.14
	Jun	5.0	350.801	1.7	22.4	9.7	119.380	0.8	10.1	3.7	2.97	4.00
	Jul	5.0	357.013	1.8	23.4	10.3	119.444	0.1	0.6	3.0	3.22	4.18
	Aug										3.44	4.26

		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
2000		172.2			3.4		181.3			2.4		138.0			3.8
2001		177.1			2.8		186.1			2.7		140.7			1.9
2002		179.8			1.6		190.4			2.3		138.9			-1.3
2003		184.0			2.3		193.2			1.5		143.3			3.2
2004		188.9			2.7		196.6			1.8		148.5			3.6
2003	1	183.2	1.0	4.2	2.9	4.2	192.4	0.3	1.4	1.8	1.4	142.7	2.0	8.4	3.3
	2	183.4	0.1	0.4	2.2	2.3	192.8	0.2	0.8	1.5	1.1	142.2	-0.4	-1.5	2.5
	3	184.4	0.5	2.2	2.2	2.2	193.6	0.4	1.6	1.3	1.3	143.5	0.9	3.8	3.4
	4	184.8	0.2	0.9	1.9	1.9	194.1	0.3	1.0	1.2	1.2	144.9	1.0	4.0	3.6
2004	1	186.6	1.0	3.9	1.8	3.9	195.0	0.5	1.9	1.3	1.9	145.9	0.7	2.8	2.2
	2	188.6	1.1	4.4	2.8	4.2	196.2	0.6	2.6	1.8	2.2	148.0	1.4	5.8	4.1
	3	189.4	0.4	1.6	2.7	3.3	197.1	0.4	1.7	1.8	2.1	148.6	0.4	1.6	3.5
	4	191.0	0.9	3.6	3.4	3.4	198.2	0.6	2.3	2.1	2.1	151.6	2.1	8.5	4.6
2005	1	192.2	0.6	2.4	3.0	2.4	199.5	0.6	2.6	2.3	2.6	152.7	0.7	2.8	4.7
	2	194.1	1.0	4.2	2.9	3.3	200.5	0.5	2.0	2.2	2.3	153.8	0.7	3.0	4.0
2003	Jul	183.8	0.2	2.6	2.1	2.1	193.4	0.2	2.5	1.5	1.3	142.8	0.1	1.7	3.0
	Aug	184.4	0.3	4.0	2.2	2.3	193.6	0.1	1.2	1.3	1.3	143.6	0.6	6.9	3.5
	Sep	185.0	0.3	4.0	2.3	2.5	193.7	0.1	0.6	1.2	1.2	144.1	0.3	4.3	3.6
	Oct	184.8	-0.1	-1.3	2.0	2.1	194.0	0.2	1.9	1.3	1.3	144.8	0.5	6.0	3.4
	Nov	184.6	-0.1	-1.3	1.8	1.8	194.0	0.0	0.0	1.1	1.1	144.6	-0.1	-1.6	3.4
	Dec	185.0	0.2	2.6	1.9	1.9	194.2	0.1	1.2	1.1	1.1	145.3	0.5	6.0	4.0
2004	Jan	185.9	0.5	6.0	2.0	6.0	194.6	0.2	2.5	1.2	2.5	145.7	0.3	3.4	3.2
	Feb	186.5	0.3	3.9	1.7	5.0	194.9	0.2	1.9	1.2	2.2	145.6	-0.1	-0.8	2.1
	Mar	187.3	0.4	5.3	1.7	5.1	195.5	0.3	3.8	1.6	2.7	146.4	0.5	6.8	1.5
	Apr	187.7	0.2	2.6	2.3	4.4	195.9	0.2	2.5	1.8	2.6	147.4	0.7	8.5	3.7
	May	188.8	0.6	7.3	3.0	5.0	196.2	0.2	1.9	1.7	2.5	148.3	0.6	7.6	4.7
	Jun	189.3	0.3	3.2	3.2	4.7	196.6	0.2	2.5	1.9	2.5	148.2	-0.1	-0.8	3.9
	Jul	189.2	-0.1	-0.6	2.9	3.9	196.8	0.1	1.2	1.8	2.3	148.3	0.1	0.8	3.9
	Aug	189.3	0.1	0.6	2.7	3.5	196.9	0.1	0.6	1.7	2.1	148.5	0.1	1.6	3.4
	Sep	189.6	0.2	1.9	2.5	3.3	197.5	0.3	3.7	2.0	2.3	148.9	0.3	3.3	3.3
	Oct	190.7	0.6	7.2	3.2	3.7	197.9	0.2	2.5	2.0	2.3	151.1	1.5	19.2	4.4
	Nov	191.2	0.3	3.2	3.6	3.7	198.2	0.2	1.8	2.2	2.2	152.1	0.7	8.2	5.2
	Dec	191.2	0.0	0.0	3.4	3.4	198.5	0.2	1.8	2.2	2.2	151.7	-0.3	-3.1	4.4
2005	Jan	191.3	0.1	0.6	2.9	0.6	198.9	0.2	2.4	2.2	2.4	151.9	0.1	1.6	4.3
	Feb	192.0	0.4	4.5	2.9	2.5	199.4	0.3	3.1	2.3	2.8	152.5	0.4	4.8	4.7
	Mar	193.2	0.6	7.8	3.2	4.3	200.1	0.4	4.3	2.4	3.3	153.7	0.8	9.9	5.0
	Apr	194.2	0.5	6.4	3.5	4.8	200.2	0.0	0.6	2.2	2.6	154.5	0.5	6.4	4.8
	May	194.1	-0.1	-0.6	2.8	3.7	200.5	0.1	1.8	2.2	2.4	153.5	-0.6	-7.5	3.5
	Jun	194.1	0.0	0.0	2.5	3.1	200.7	0.1	1.2	2.1	2.2	153.5	0.0	0.0	3.6
	Jul	195.1	0.5	6.4	3.1	3.5	201.0	0.1	1.8	2.1	2.2	155.1	1.0	13.3	4.6

## 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 2000 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 ( $\pm 0.2$  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/](http://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.

*Page 15:* **Gross Private Saving** is the sum of personal saving, undistributed corporate profits with IVA and CCAdj (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 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:** Most 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.

## 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).