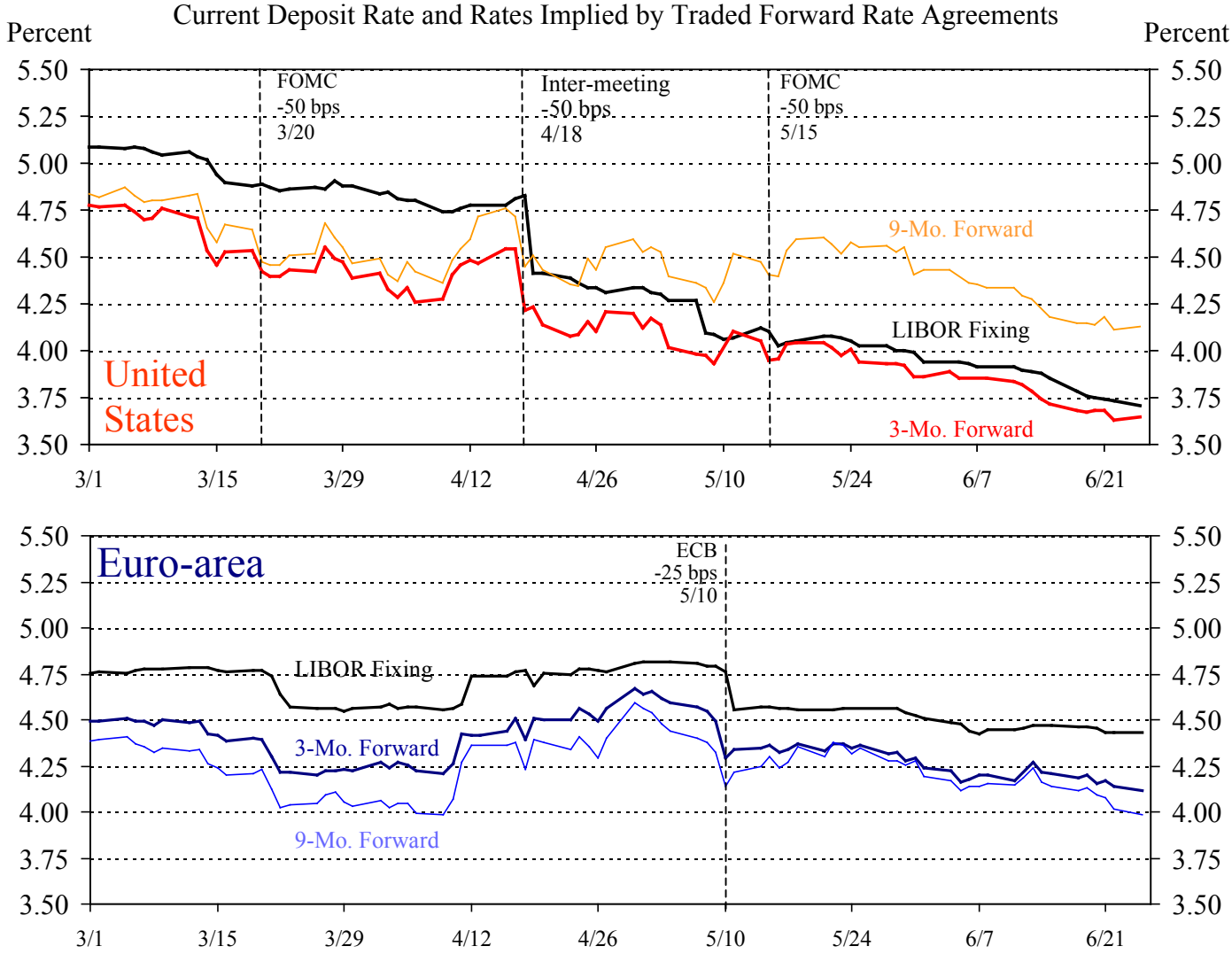
APPENDIX 1

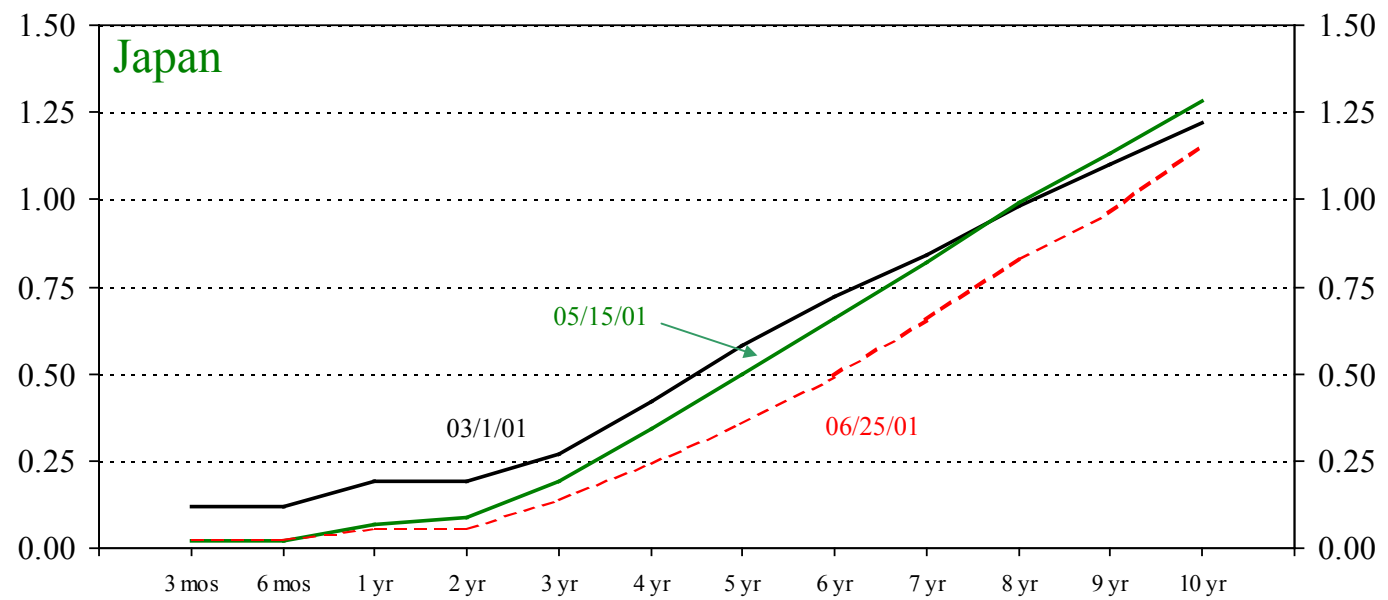
Charts used by Mr. Kos.

3-Month Deposit Rates
March 1, 2001 - June 25, 2001

Current Deposit Rate and Rates Implied by Traded Forward Rate Agreements

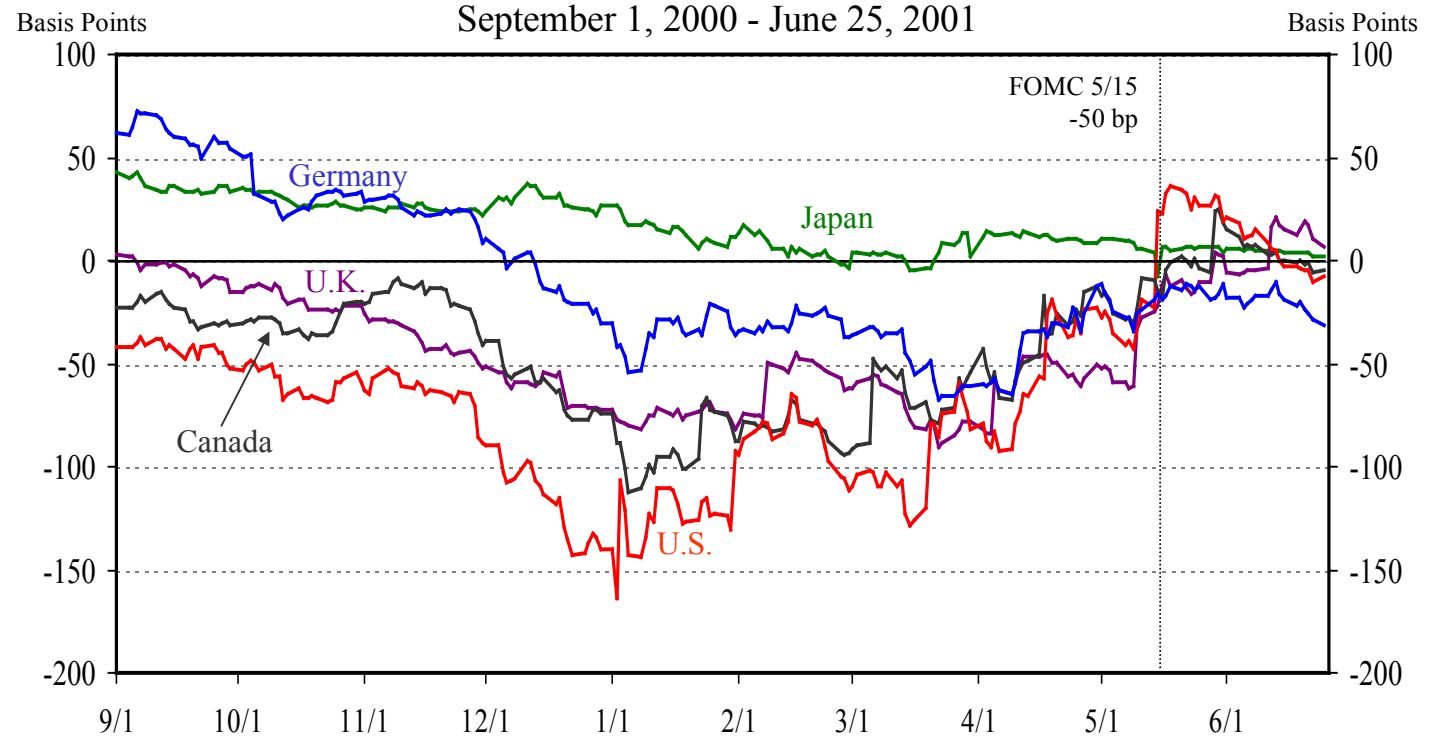


Japanese Government Yield Curve



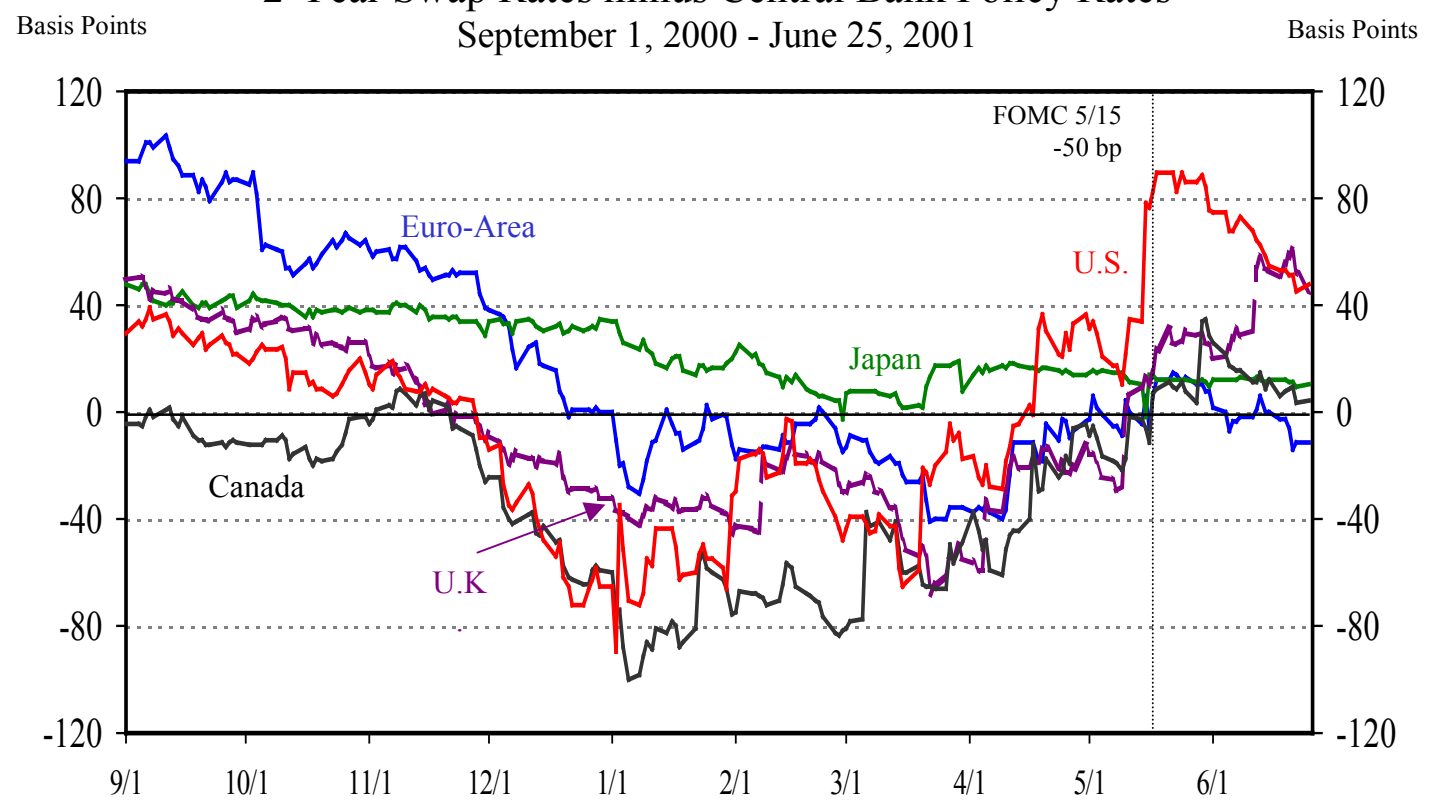
2-Year Government Yields minus Central Bank Policy Rates

September 1, 2000 - June 25, 2001



2-Year Swap Rates minus Central Bank Policy Rates

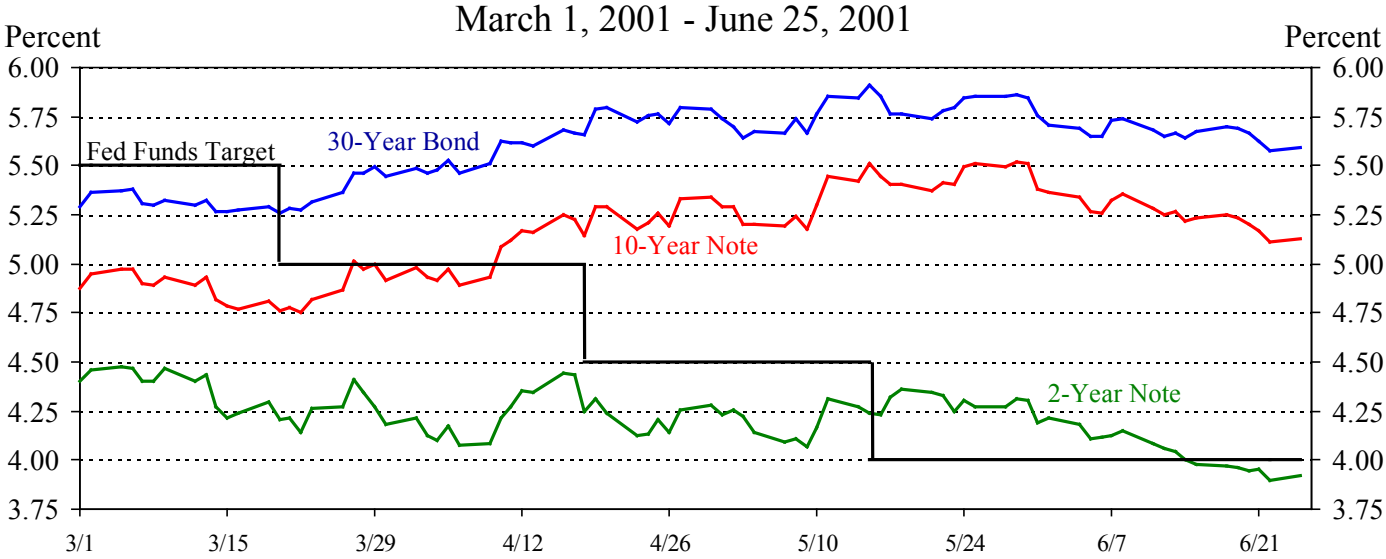
September 1, 2000 - June 25, 2001



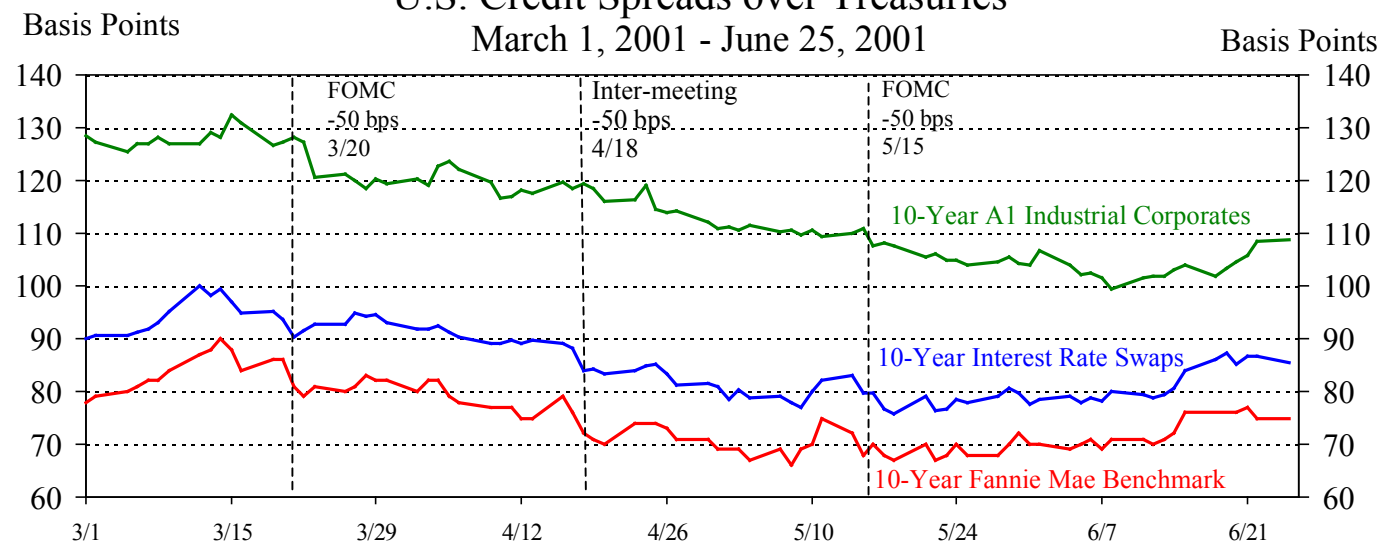
Policy Rates:
US: Federal Funds Rate (O/N), Euro area: Main refinancing rate (2-week), Japan: Overnight Call Rate, U.K.: Base Rate (O/N repo), Canada: Overnight Target (midpoint of bank rate and discount rate)

Source: Bloomberg

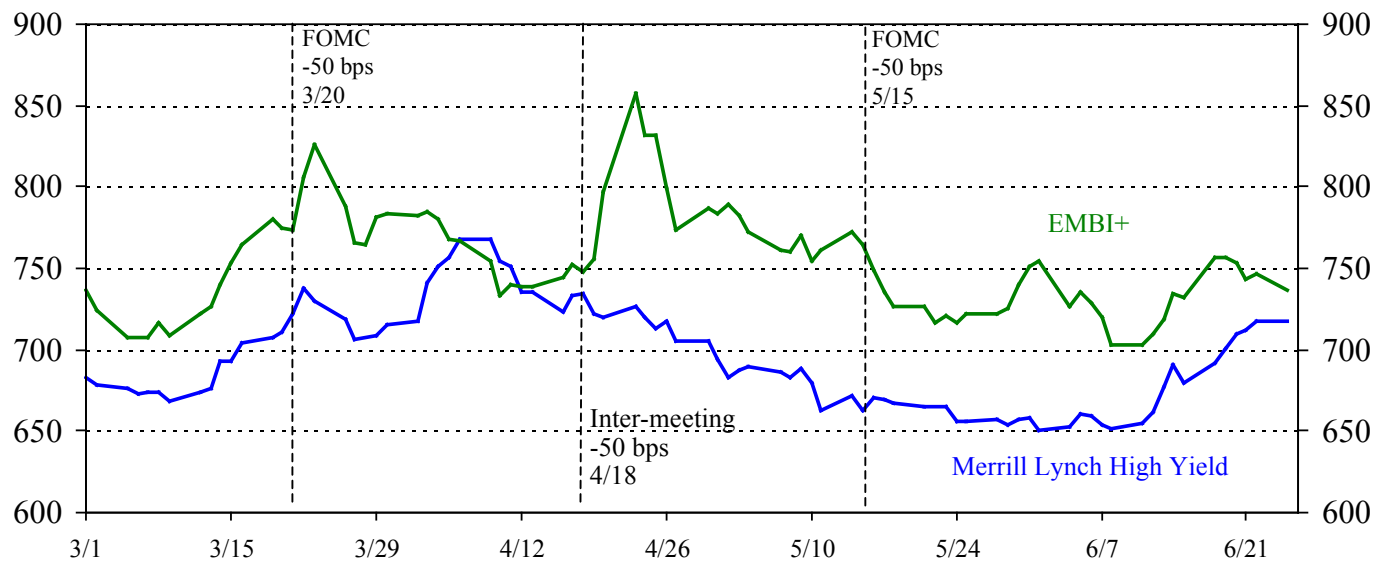
U.S. Treasury Yields
March 1, 2001 - June 25, 2001



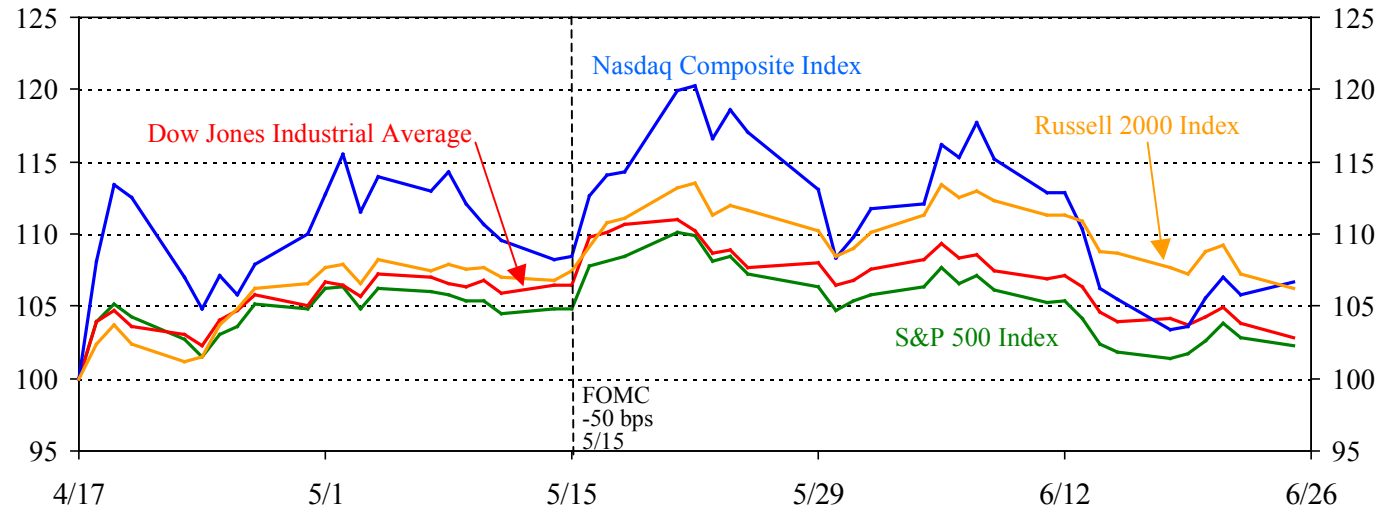
U.S. Credit Spreads over Treasuries
March 1, 2001 - June 25, 2001



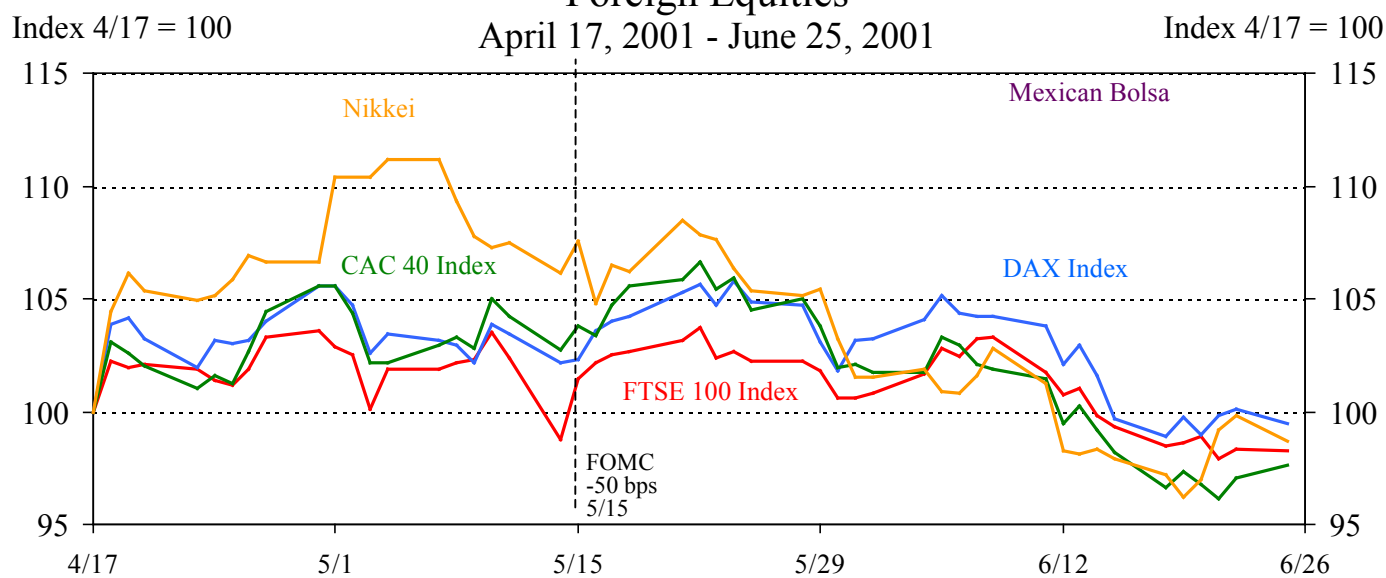
High Yield and EMBI+ Spreads over Treasuries
March 1, 2001 - June 25, 2001



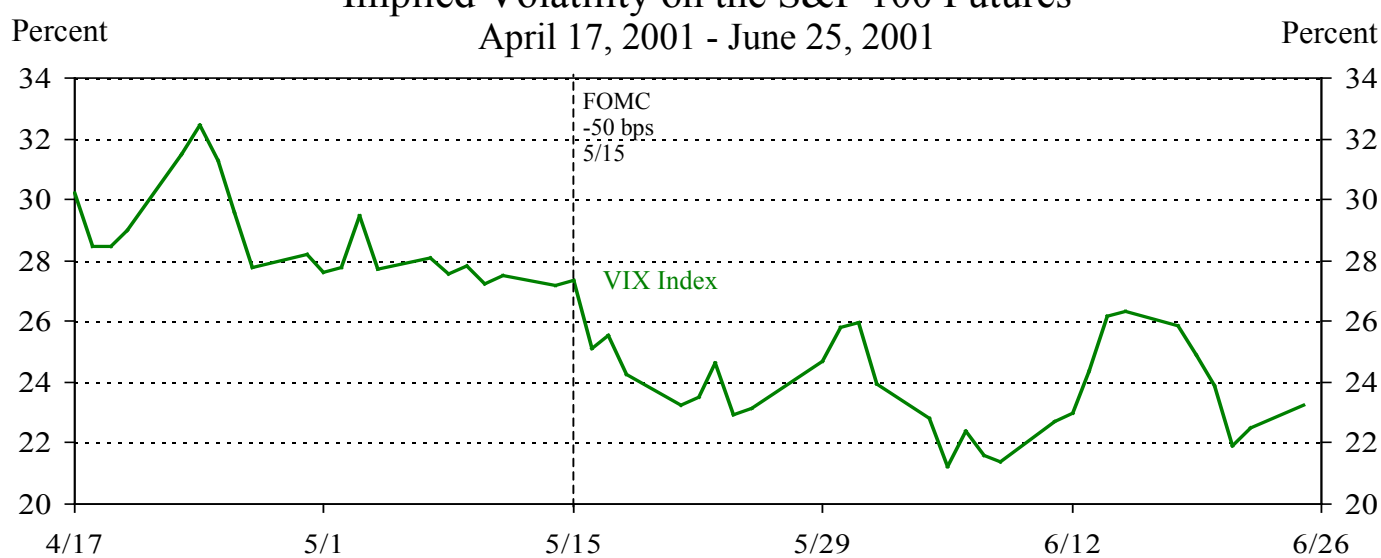
U.S. Equities
April 17, 2001 - June 25, 2001



Foreign Equities
April 17, 2001 - June 25, 2001



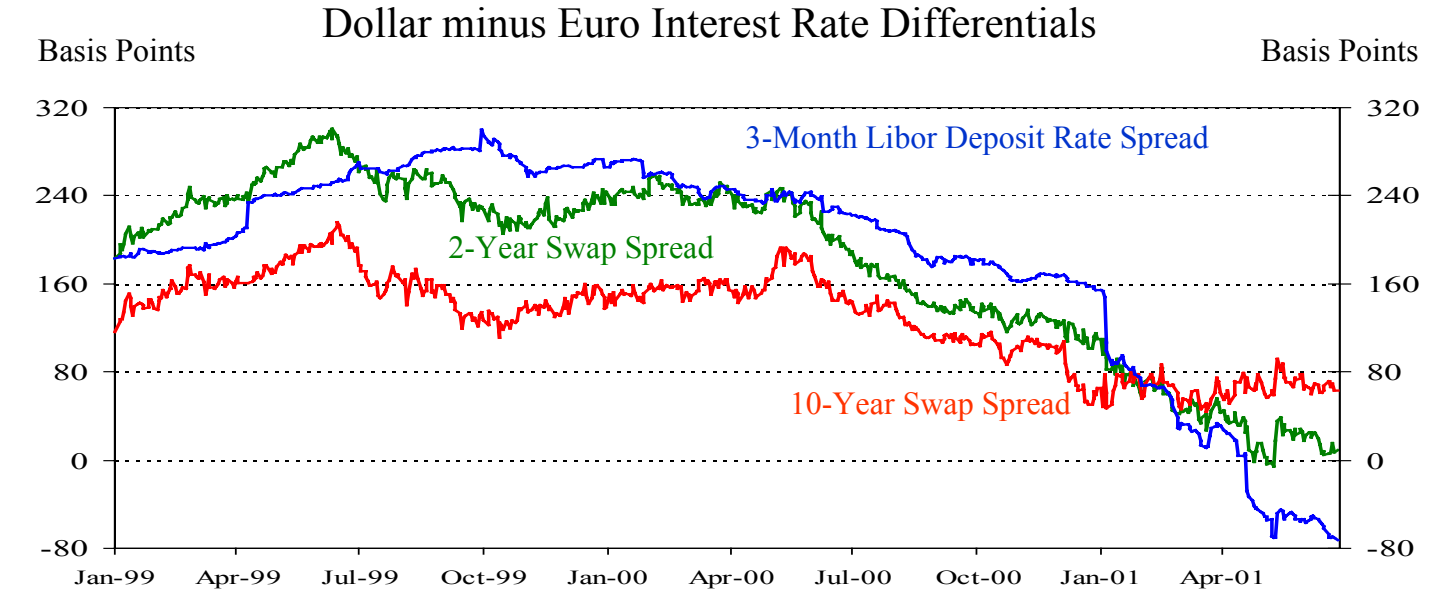
Implied Volatility on the S&P 100 Futures
April 17, 2001 - June 25, 2001



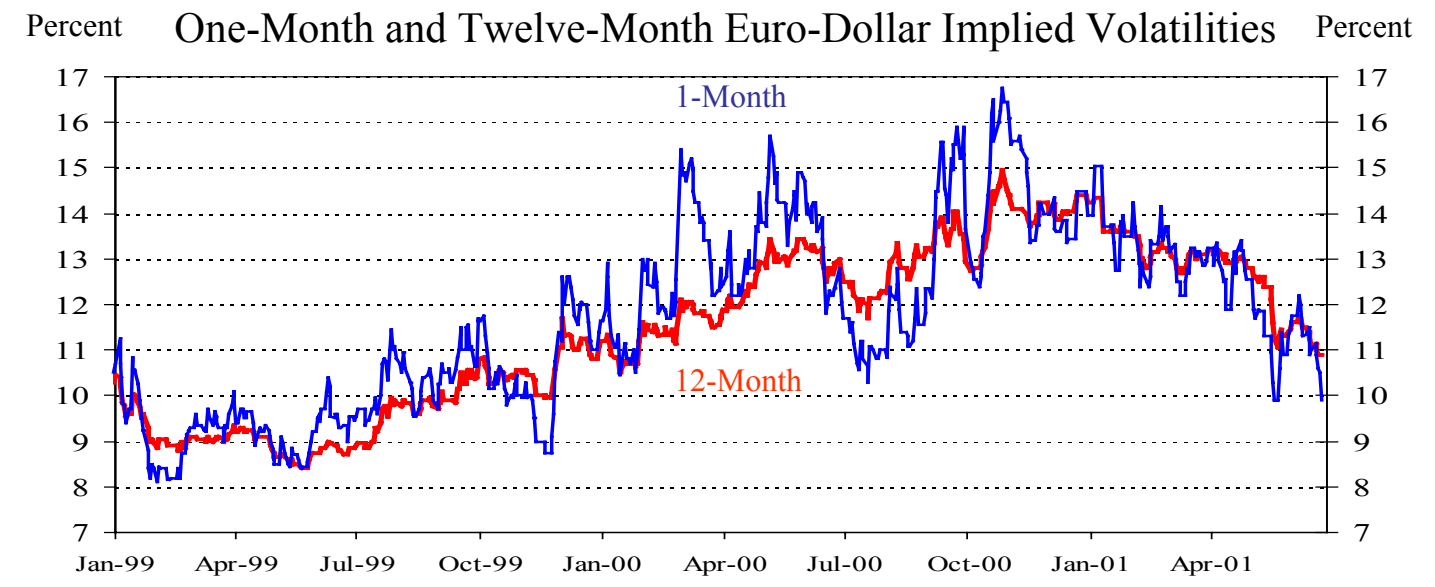
January 1, 1999 to June 25, 2001

Euro-Dollar Exchange Rate

Dollar minus Euro Interest Rate Differentials

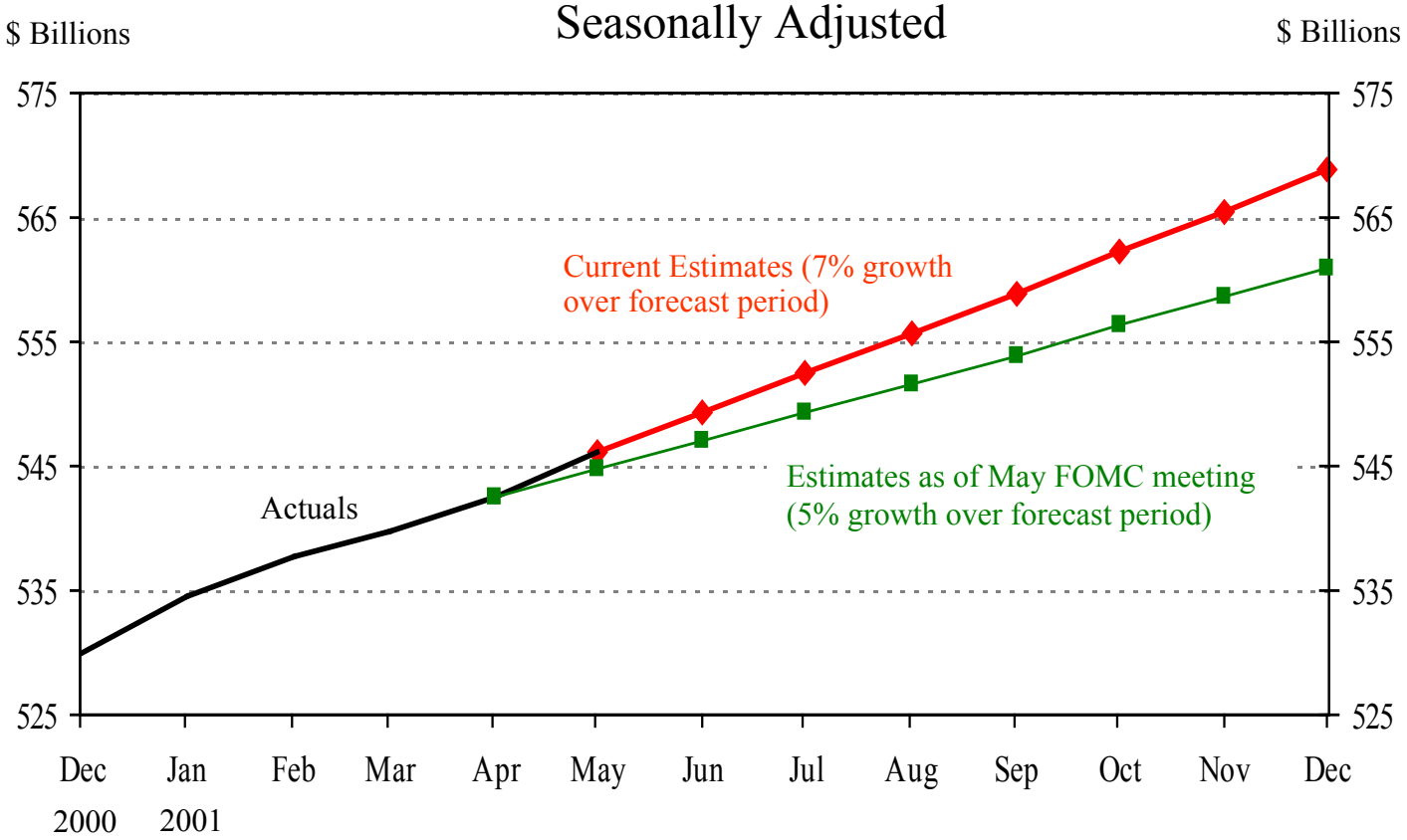


One-Month and Twelve-Month Euro-Dollar Implied Volatilities

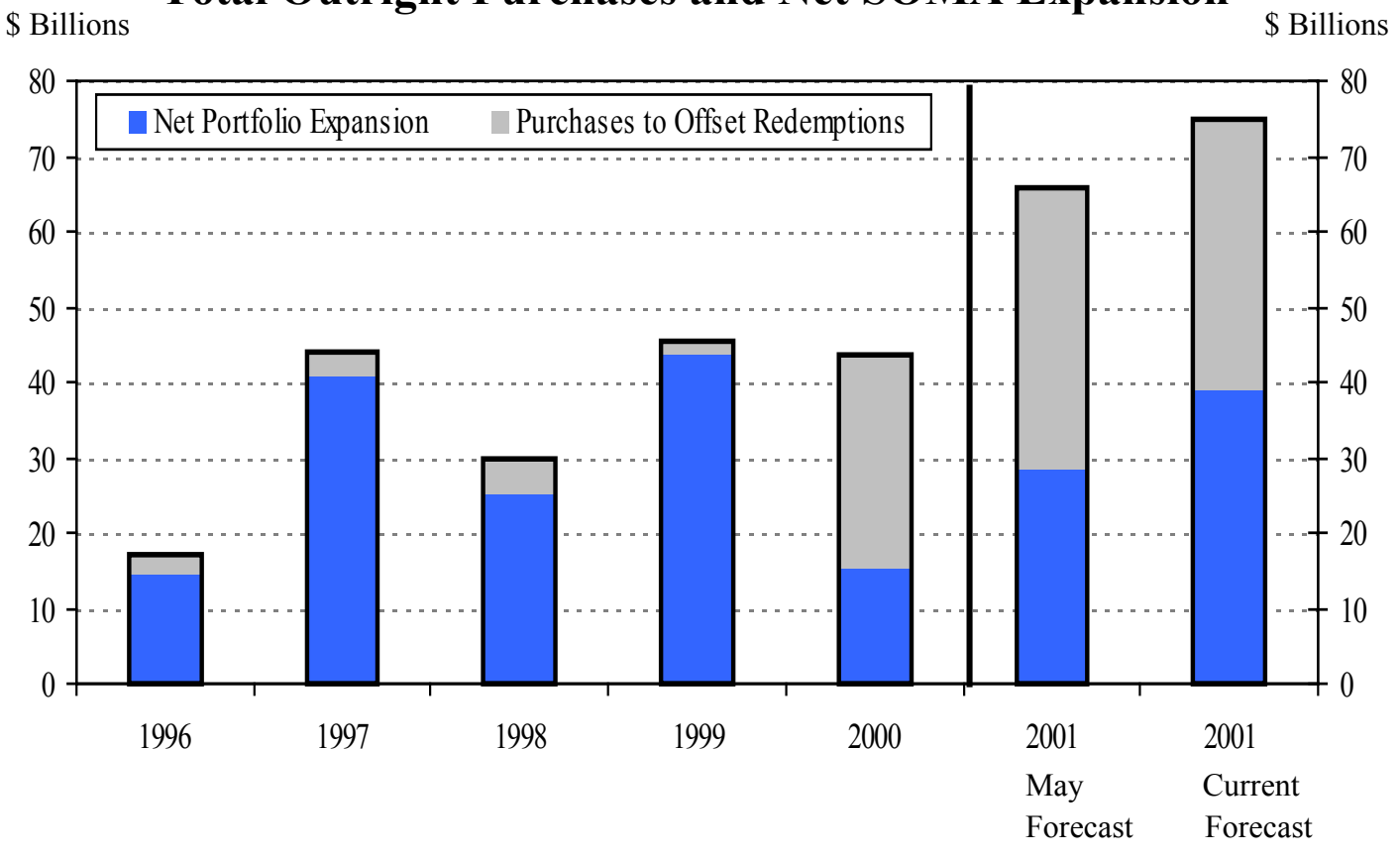


Currency Component of M1 (excludes vault cash)

Seasonally Adjusted



Total Outright Purchases and Net SOMA Expansion



APPENDIX 2

Charts used by Messrs. Sichel, Struckmeyer, Fuhrer, and Steindel.

STRICTLY CONFIDENTIAL (FR) CLASS II-FOMC

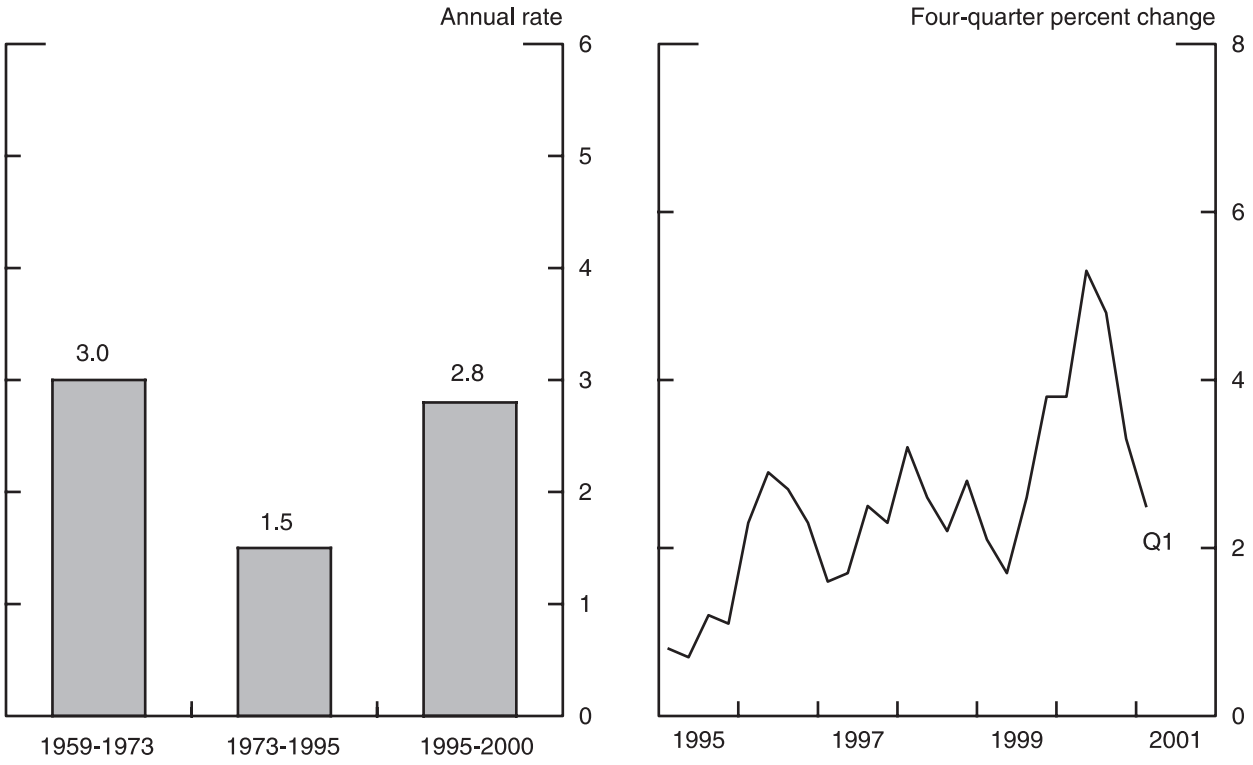
Material for

Staff Briefings on Productivity Developments

June 26, 2001

Chart 1

Labor Productivity, Nonfarm Business



Key Issues

- What are the sources of the pickup during 1995-2000?
- What is the role of information technology?
- How much of recent productivity growth is cyclical and how much is structural?
- Given today's economic situation, what is the outlook for structural productivity and potential output?

Chart 2

Growth Accounting

Decomposition of Output and Labor Productivity Growth

(1) $\dot{Q}_t = s_t \dot{K}_t + (1 - s_t)\dot{L}_t + \dot{MFP}_t$ — Output Growth Equation

(2) $\dot{LP}_t = s_t(\dot{K}_t - \dot{L}_t) + \dot{MFP}_t$ — Labor Productivity Growth Equation

$= s_t(Capital\ Deepening)_t + \dot{MFP}_t$

Q	=	Output
K	=	Capital services
L	=	Hours
MFP	=	Multifactor productivity
s	=	Income share of capital
LP	=	Output per hour

Strengths and Weaknesses of Growth Accounting

Strengths

- Based on microeconomic theory of the firm, applied to the overall economy.
- Straightforward and intuitive.
- Can help to identify the sources of growth in a period of structural change.

Weaknesses

- Requires several strong assumptions.
- Heavy data requirements.
- Ignores the costs of adjusting capital stocks, and supply shocks may cause the model to go off track.

Chart 3

Empirical Implementation of Growth Accounting

Data and Concepts

- Use MFP dataset from BLS that extends to 1999.
- BLS uses annual data for output, hours, labor composition, and capital services to calculate MFP as a residual.
- We extend the MFP data to 2000 using published data on output and hours and our own estimate of capital services.
- We interpolate annuals to estimate quarterly figures.

Capital Services

- Capital services growth is a weighted average of growth in individual capital stocks.

$$\dot{K}_t = \sum_i w_{it} \dot{K}_{it}$$

- Weights reflect the marginal product, or relative efficiency, of a particular asset.

Decomposition of Labor Productivity Growth, Nonfarm Business

(percent change, annual rate)

	1973-95	1995-2000	Acceleration
1. Labor productivity	1.5	2.8	1.3
Contributions of:			
2. Capital deepening	.7	1.2	.5
3. IT	.4	1.2	.7
4. Non-IT	.3	.1	-.2
5. Labor composition	.3	.3	.0
6. MFP	.5	1.2	.7
7. Computer and related semiconductor production	.2	.5	.3
8. Other	.3	.7	.4

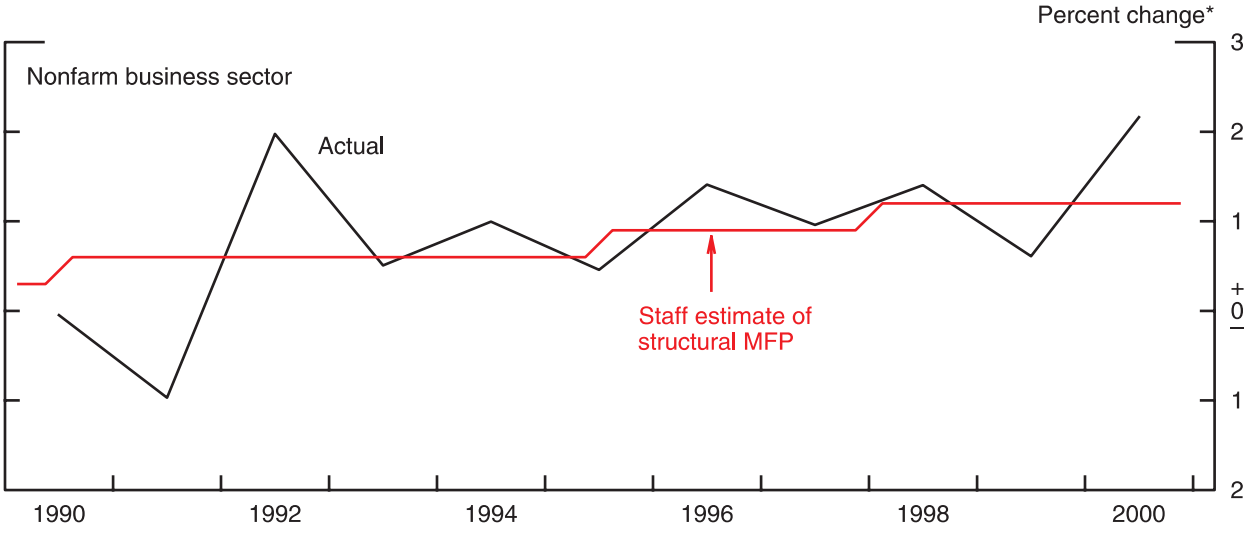
Note. Rows and columns may not sum due to rounding.

Chart 4

Estimating Structural Productivity Growth

- The growth of labor productivity is procyclical. It rises rapidly during the recovery phase of the business cycle, slows down in the expansion phase, and declines during recessions.
- For our medium- to long-run analysis, we define **structural productivity growth** as the component of productivity growth that can be sustained over a complete business cycle.
- We do not distinguish between actual and structural growth in capital services.
- Initial estimates of structural MFP growth are generated using several econometric models.
- These estimates are refined using other information about technological developments and supply shocks that influence the choice of production technologies.

Multifactor Productivity



*Based on annual average data.

Structural Productivity Growth
(percent change, annual rate)

	1973-95	1995-2000	1998	1999	2000
1. Structural Productivity	1.4	2.7	2.9	3.1	3.2
Contributions of:					
2. Capital deepening	.6	1.3	1.4	1.6	1.7
3. Labor composition	.3	.3	.3	.3	.3
4. MFP	.6	1.1	1.2	1.2	1.2

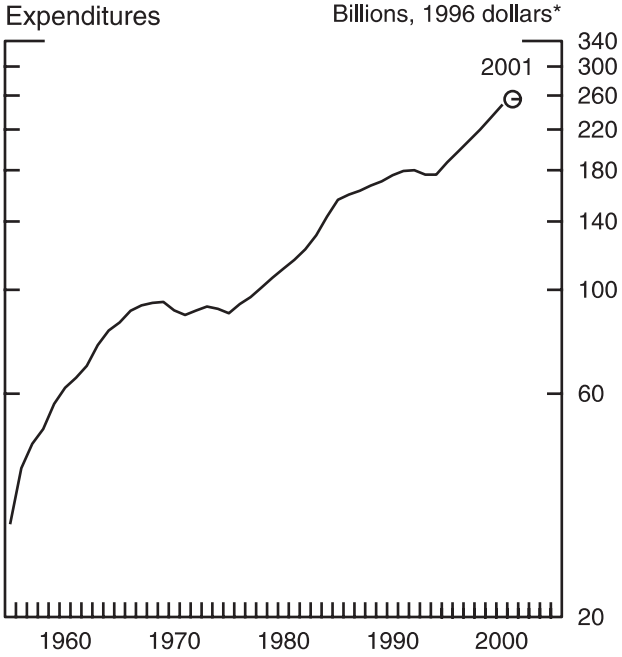
Chart 5

Potential GDP

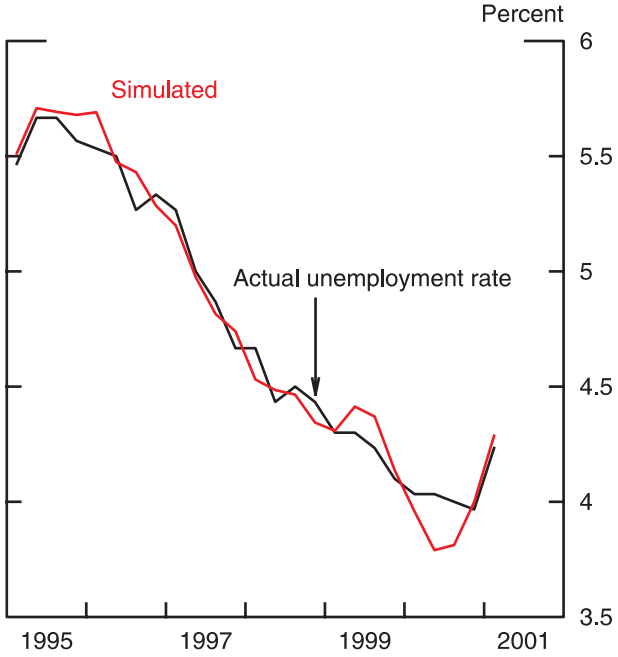
(percent change, annual rate)

	1973-95	1995-2000	2000	2001	2002
1. **Potential GDP**	2.9	3.8	4.3	3.4	3.4
2. Potential labor hours	1.6	1.1	1.1	.9	.9
3. Population	1.4	1.0	1.1	1.1	1.1
4. Labor force participation	.4	.0	.0	.0	.0
5. Employment rate	.0	.1	.0	-.2	-.2
6. Workweek	-.2	.0	.0	.0	.0
7. Structural Labor Productivity	1.4	2.7	3.2	2.5	2.5
8. Capital deepening	.6	1.3	1.7	1.0	1.0
9. Labor composition	.3	.3	.3	.3	.3
10. MFP	.6	1.1	1.2	1.2	1.2
11. Technical factors	-.1	.0	.0	.0	.0
Memo:					
12. NAIRU	5.8	5.0	4.8	5.0	5.2

Research and Development Expenditures



Okun's Law

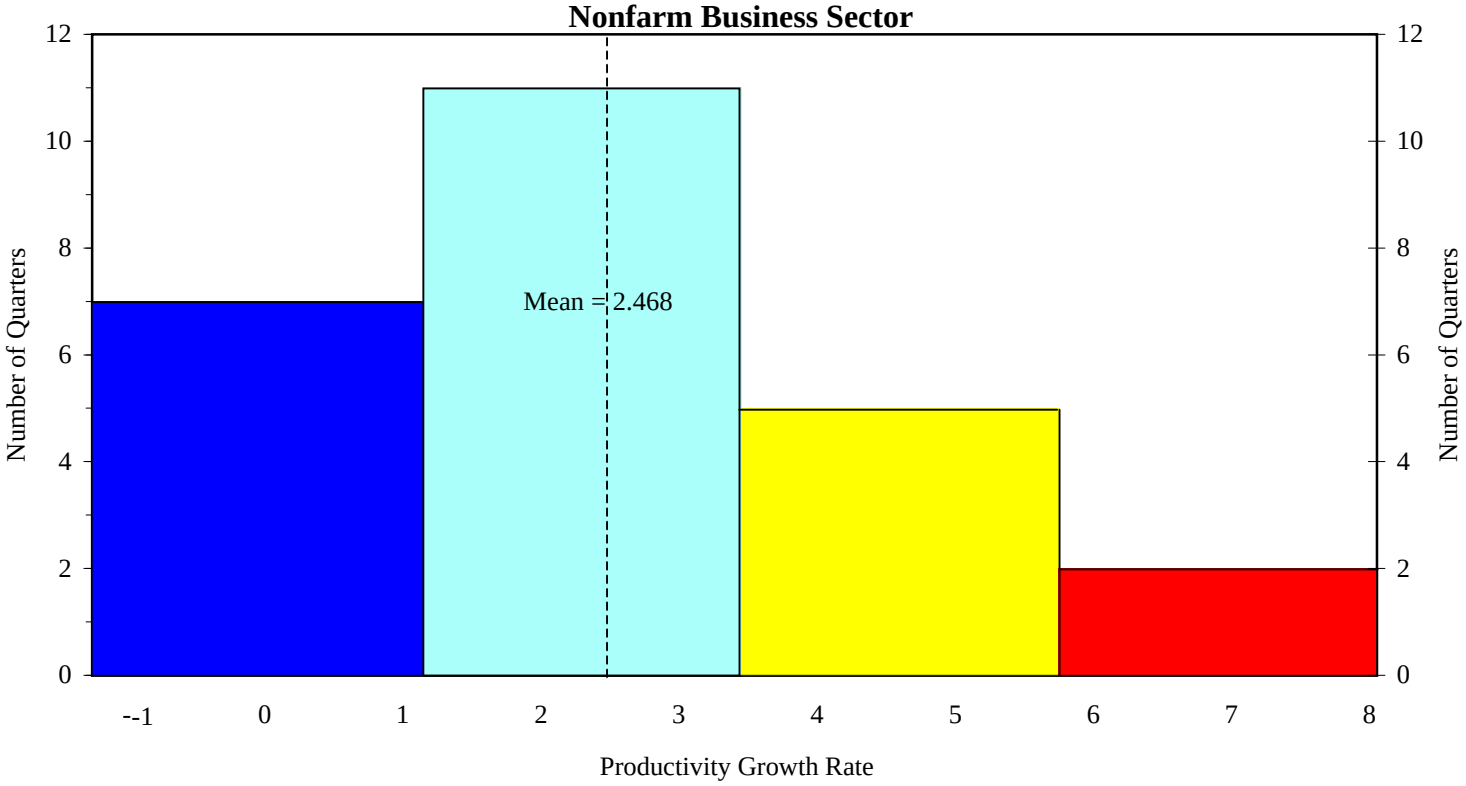


Source: NSF and Battelle Institute.
*Ratio scale

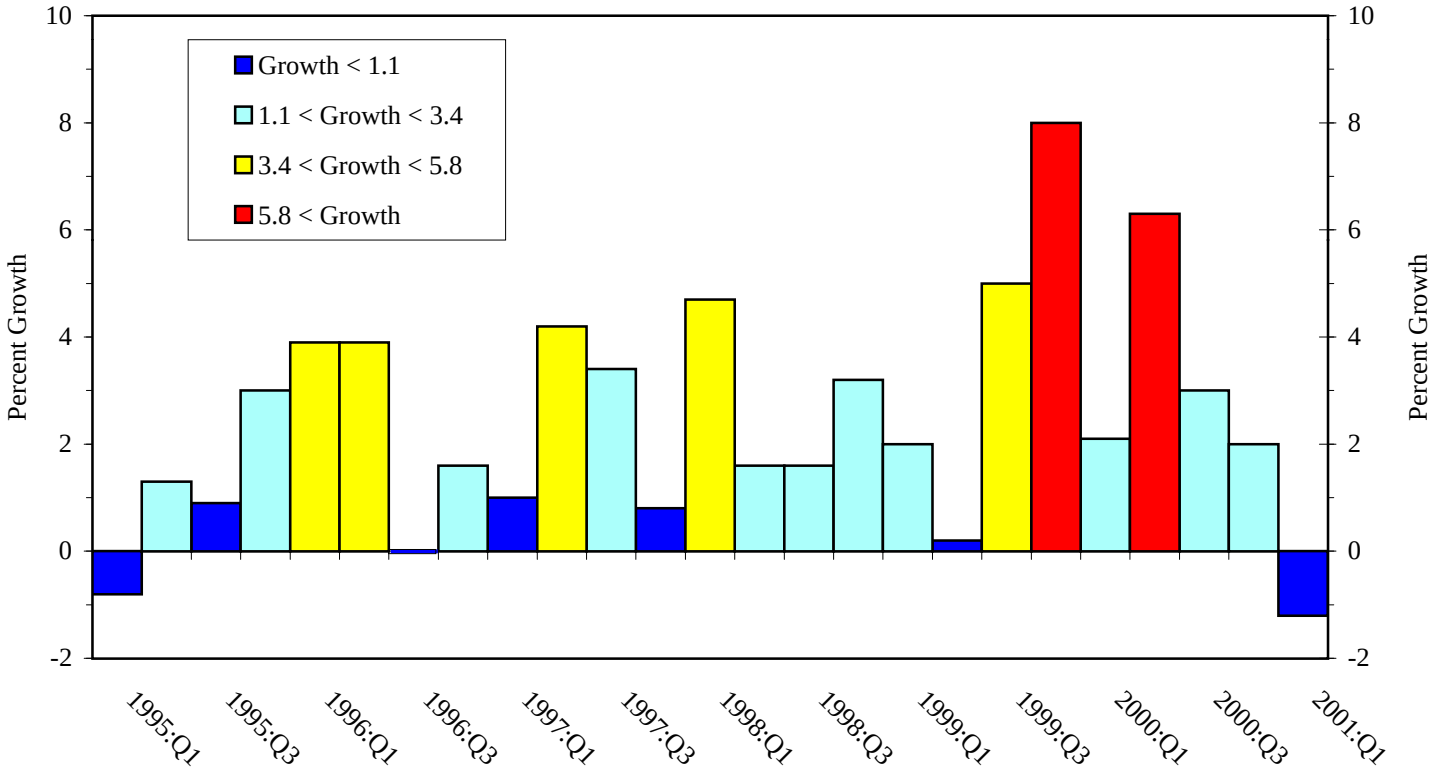
Figure 1

Distribution of Quarterly Productivity Growth Rates 1995 – 2001:Q1,

Nonfarm Business Sector



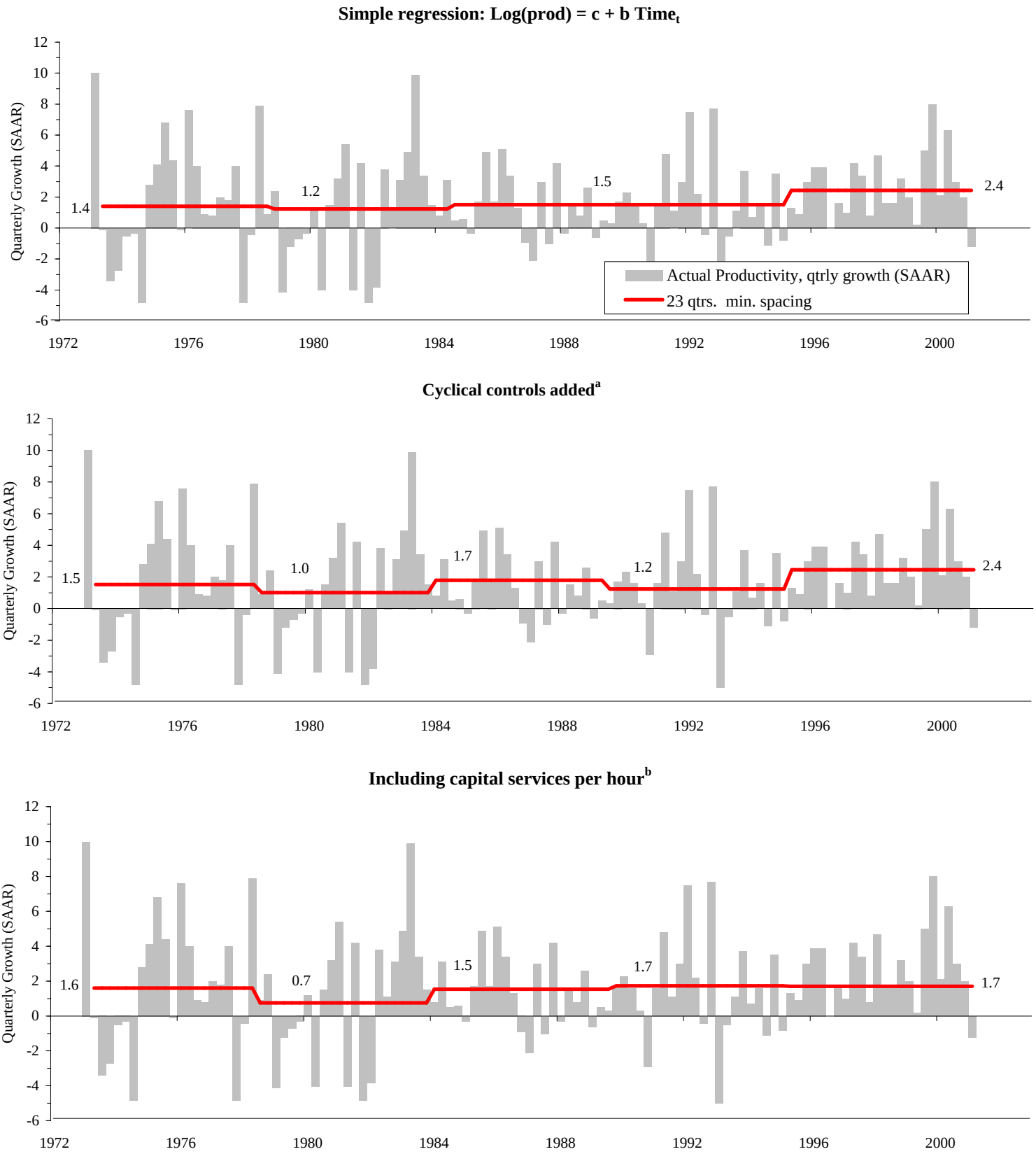
Quarterly Growth of Nonfarm Business Sector Productivity, 1995 – 2001:Q1



Source: U.S. Bureau of Labor Statistics: Nonfarm Business Sector, Output per Hour (SAAR, percent change).

Figure 2

Results of Multiple Breakpoint Tests for Shifts in Trend Productivity Growth



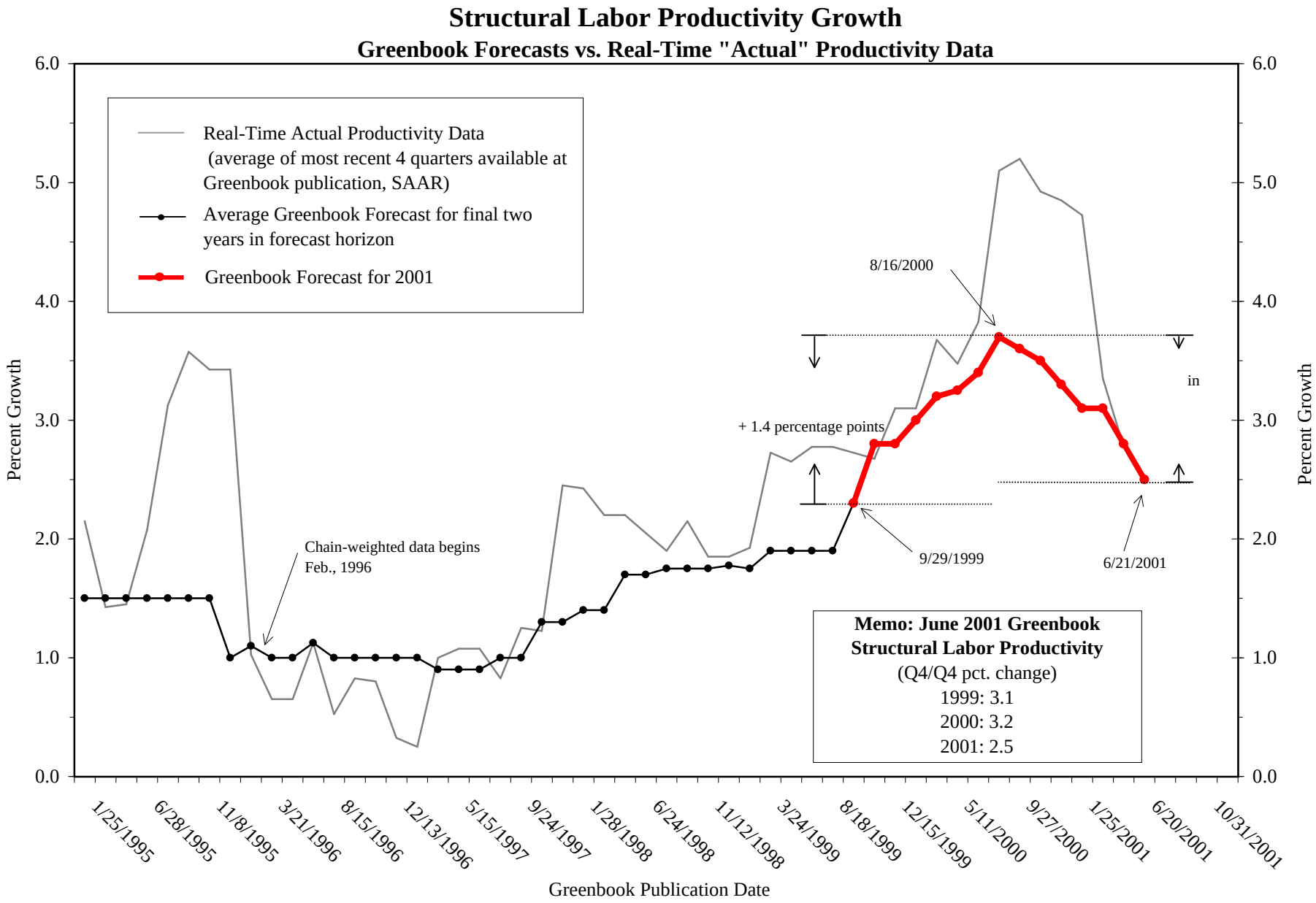
a Cyclical regressors include the growth rate in real GDP and the civilian unemployment rate.

b Capital services per hour are log-detrended interpolated values of the BLS annual series. An HP-filtered series yields nearly identical breakpoints and estimated trend rates of growth.

Note: Minimum spacing between breakpoints is 23 quarters (20% of sample).

Source: U.S. Bureau of Labor Statistics: Nonfarm Business Sector, Output per Hour (quarter-to-quarter percent change, SAAR).

Figure 3



Source: Federal Reserve Board of Governors: Greenbook, Part 1; Nonfarm Business Sector, Output per Hour. Real-time data series is actual output

Table 1

Productivity Trends, 1960-2000

	1960-1966	1967-1973	1974-1995	1996-2000
Labor Productivity Growth:				
Nonfarm Business	3.4	2.6	1.4	2.8
Nonfinancial Corporations	2.9	1.9	1.5	3.1
Manufacturing	2.7	3.0	2.7	4.9
Multifactor Productivity Growth				
BLS Estimates (Nonfarm Business):	2.5	1.6	0.4	1.1
Jorgenson-Stiroh Estimates (Private Economy):	1.4	0.9	0.3	1.0 (1996-1999)

Table 2

Comments on Trend Productivity from Reports of the Council of Economic Advisors

"…the trend rate of increase in output per man-hour in the total economy is just over 2 ½ percent per year." 1967, p. 44.

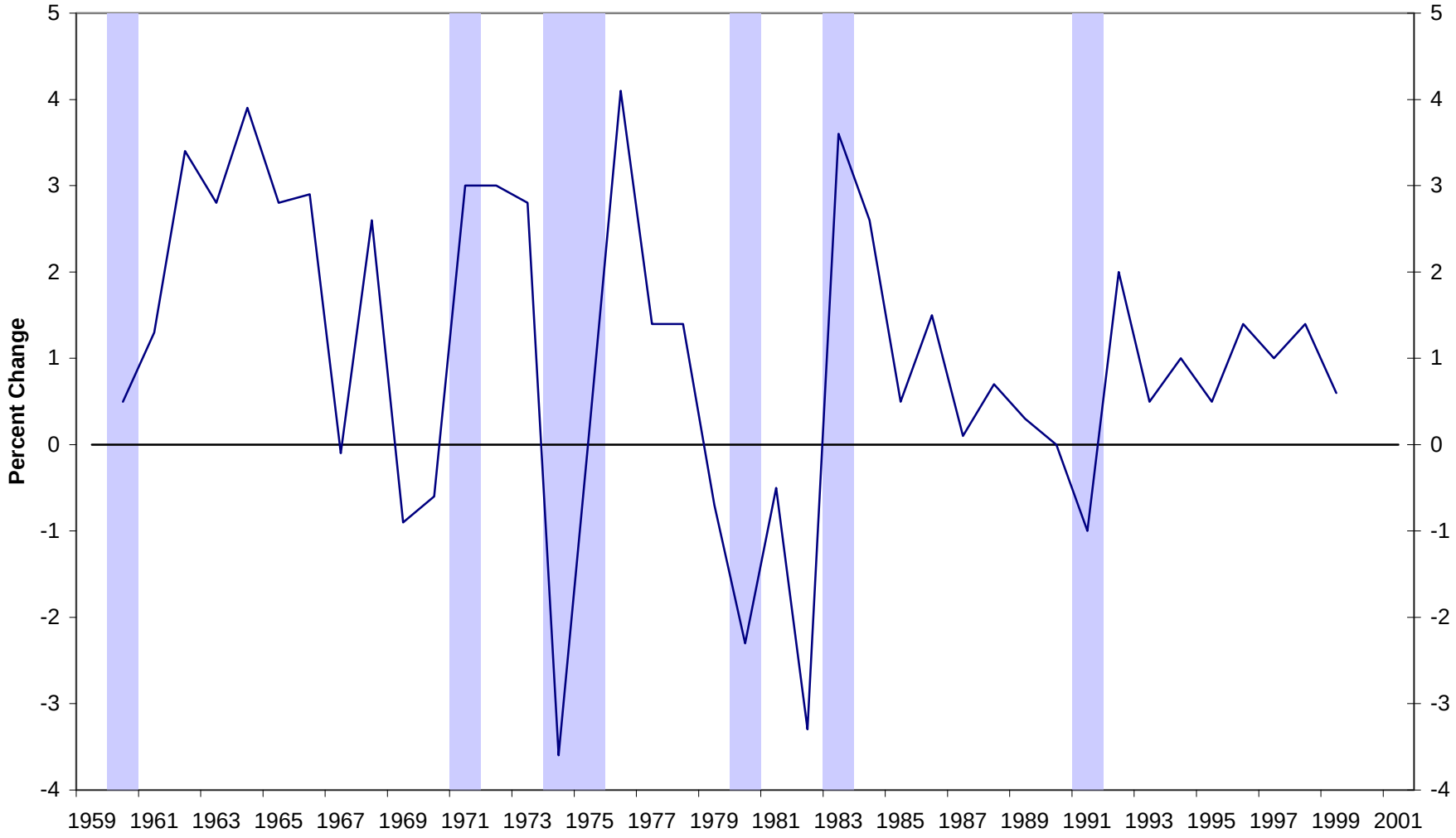
"…the trend rate of increase in output per man-hour in the total economy—private and public—is just over 2 ½ percent a year." 1968, p. 68.

"…the trend rate of increase in aggregate productivity—private and public—has been about 2 ½ percent per year." 1969, p. 66.

"In the private sector of the economy, [potential] output per man-hour is estimated to grow [from 1970 to 1975] by about 3.1 percent per year…" 1970, p.84

"The principal element in this computation [of the gross national product available] is an assumed 3-percent trend rate of increase of productivity (output per labor-hour) in the private economy." 1971, p. 94.

Chart 1
Multifactor Productivity of Nonfarm Business



Source: Bureau of Labor Statistics.

Chart 2
Nonfarm Productivity Growth: Actual and Forecast

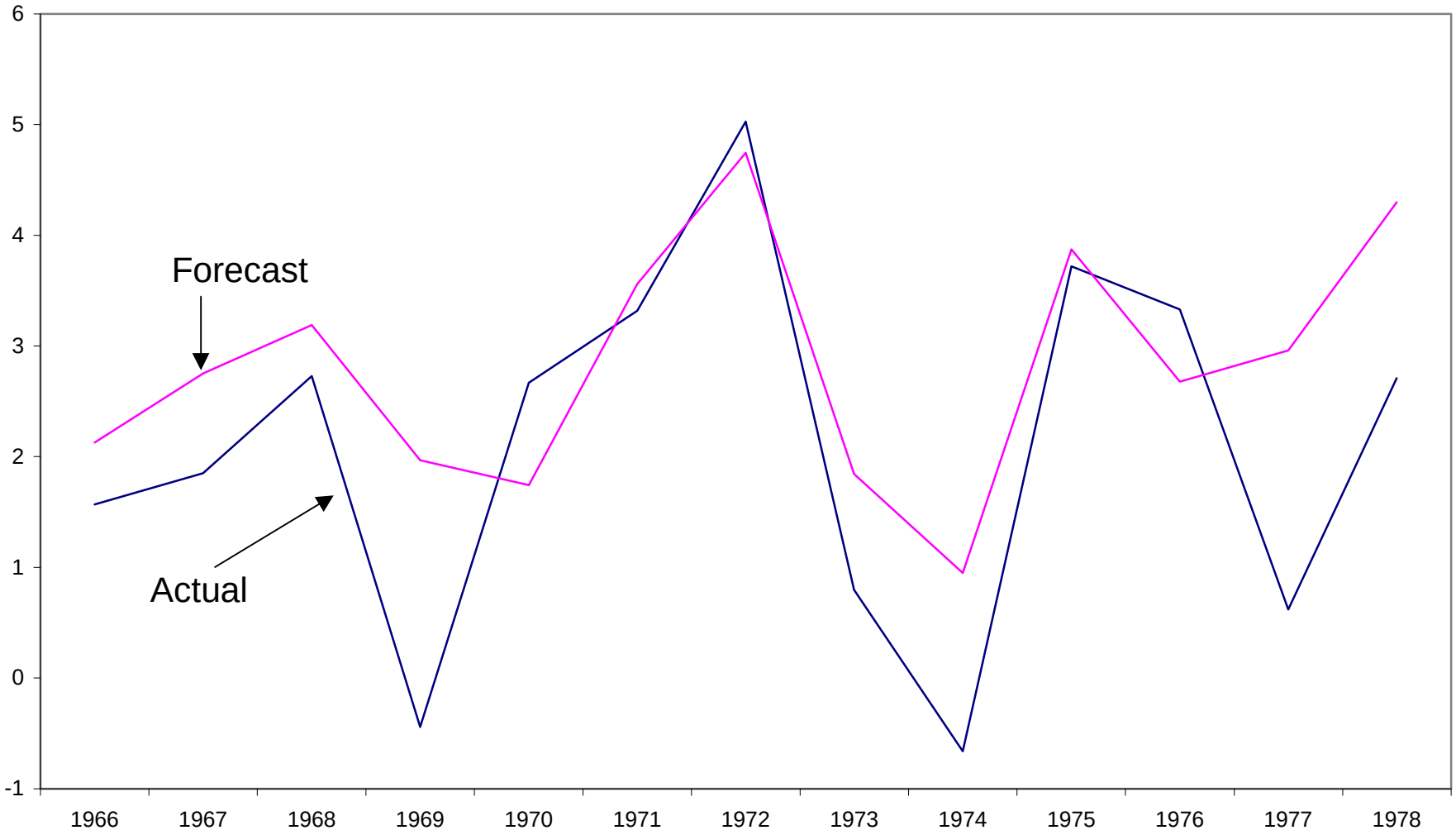


Chart 3
Nonfinancial Corporate Profits as a Percentage of Sector Gross Product

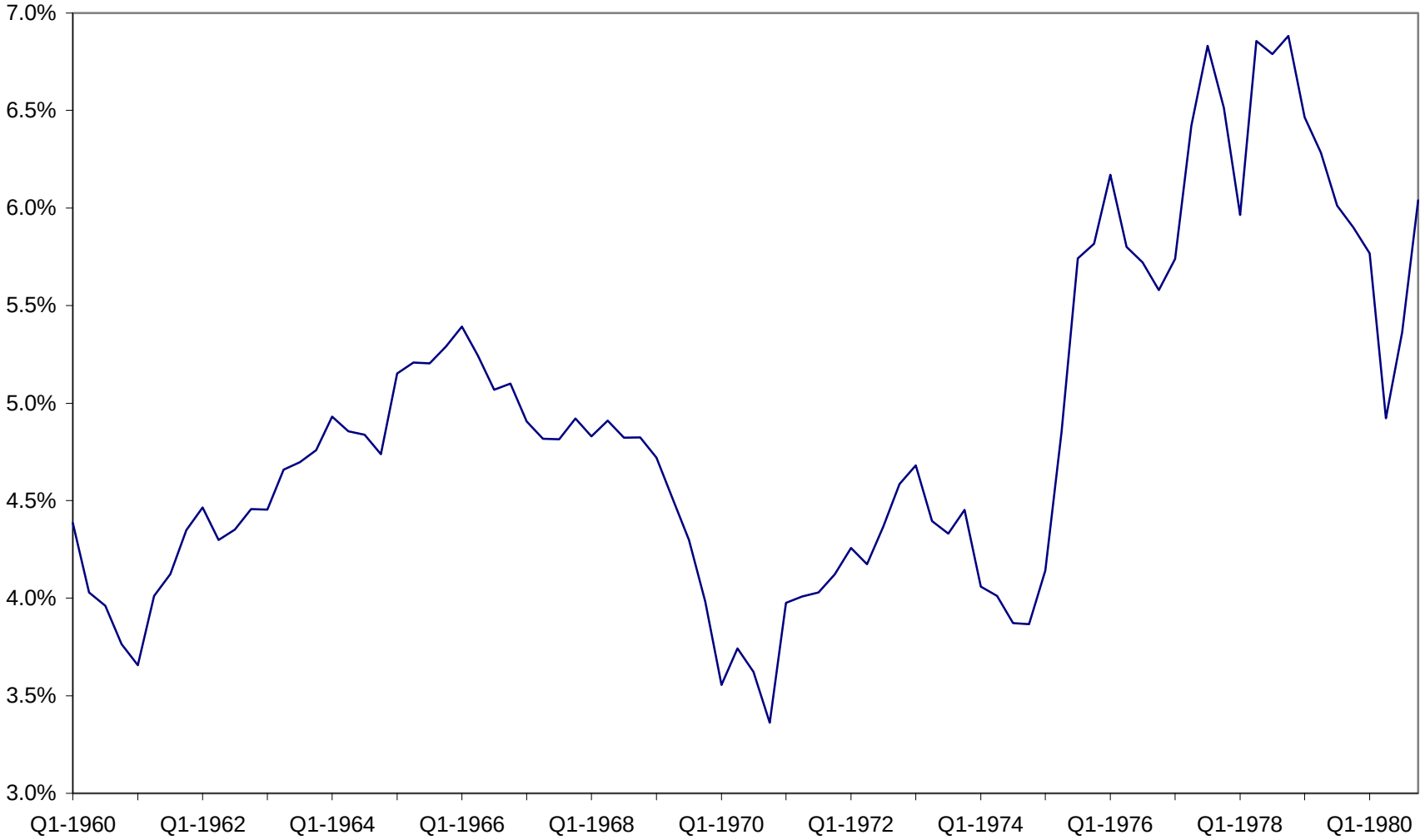
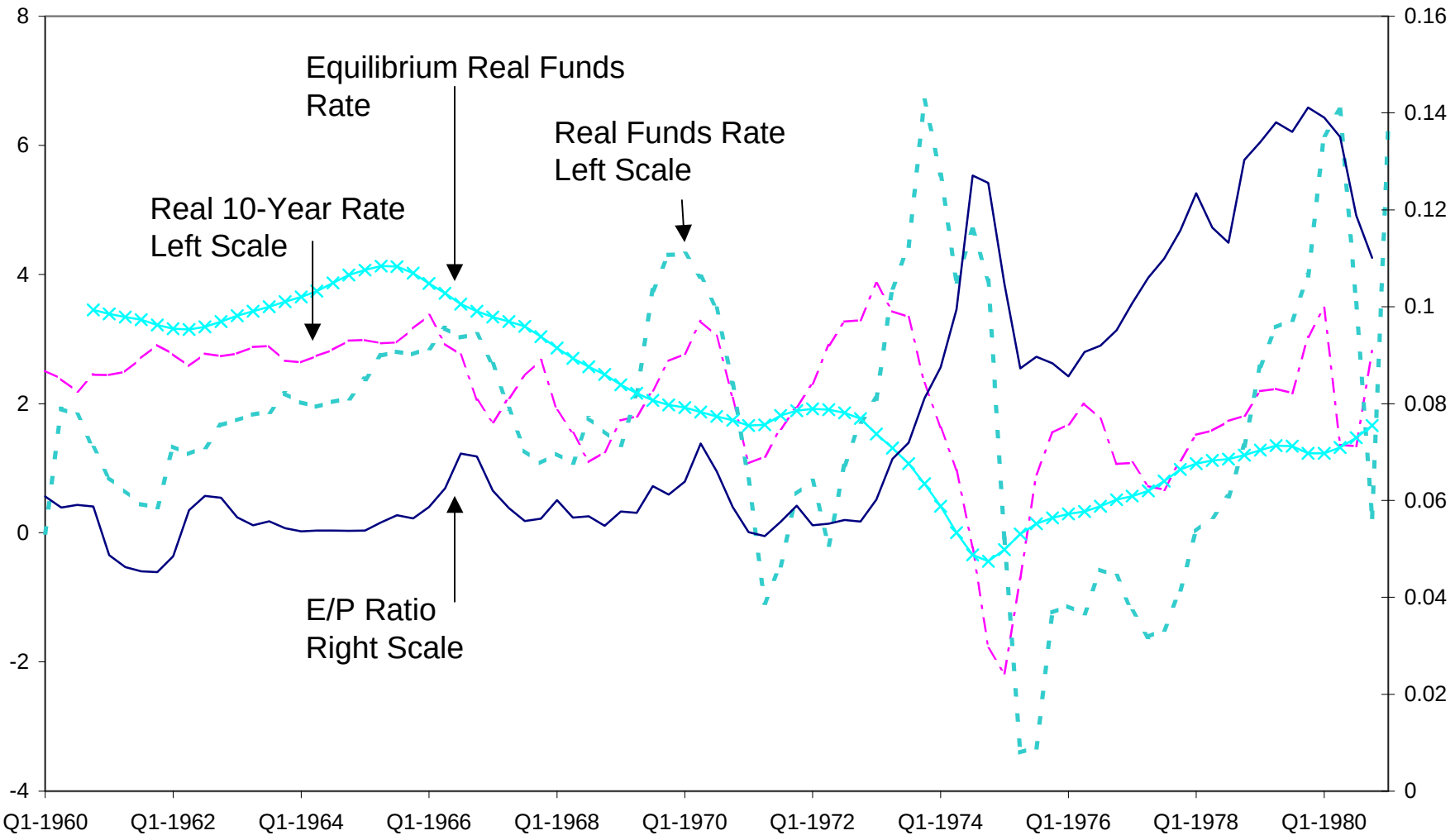


Chart 4
Real Interest Rates and the S&P Earnings/Price Ratio



Note: Real rates are nominal rates less four quarter growth in the core PCE price index. Equilibrium real funds rate estimated by Board staff using statistical filter.

APPENDIX 3

Charts used by Mr. Stockton, Mr. Wilcox, and Ms. Johnson.

STRICTLY CONFIDENTIAL (FR) CLASS II-FOMC

Material for

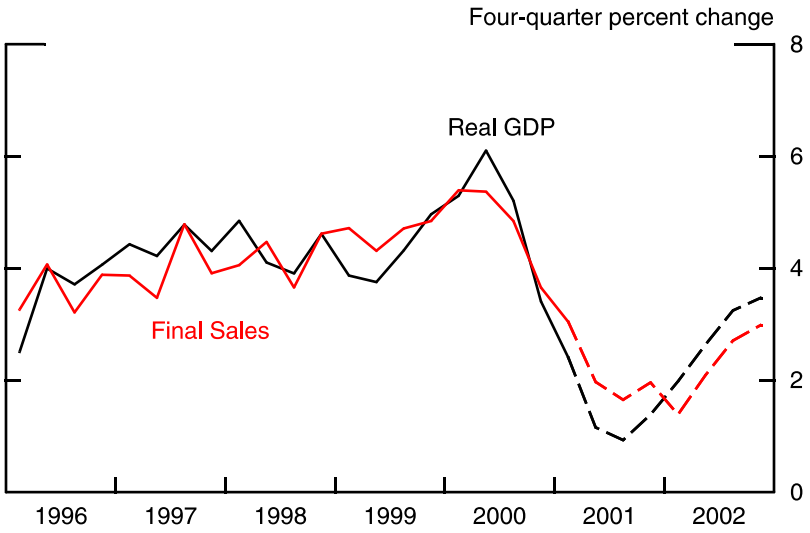
Staff Presentation on the Economic Outlook

June 26, 2001

Chart 1

Forecast Overview

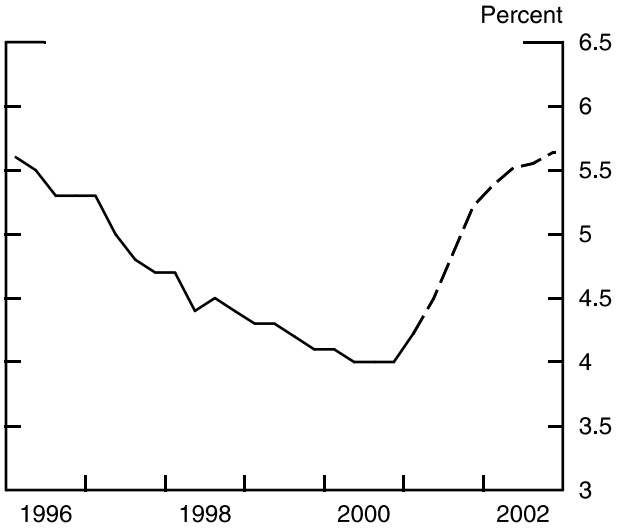
Real GDP and Final Sales



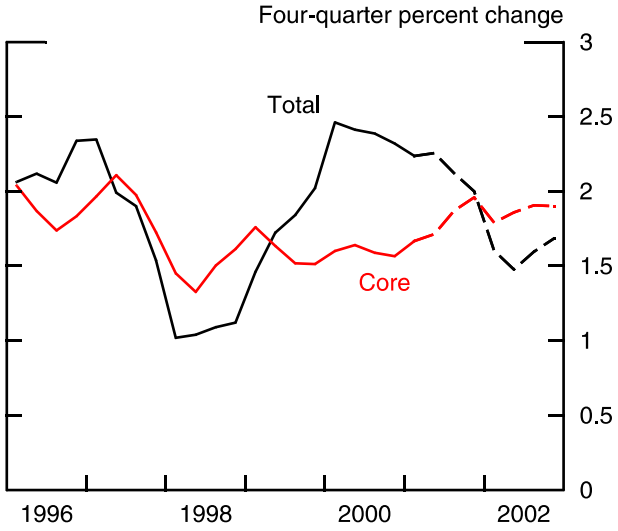
Percent change, annual rate

	Real GDP
2001 Q1	.8
(June GB)	*(1.2)*
2001 Q2	.6
(June GB)	*(.6)*
2001 Q4/Q4	1.4
(June GB)	*(1.5)*

Unemployment Rate



Total and Core PCE Price Inflation



Revision to Blue Chip

Percent change

		Q4/Q4 2001	Q4/Q4 2002
GDP	June	1.8	3.4
	(Jan.)	*(2.7)*	*(3.5)*
CPI	June	3.0	2.5
	(Jan.)	*(2.4)*	*(2.5)*

Revision to Staff Projection

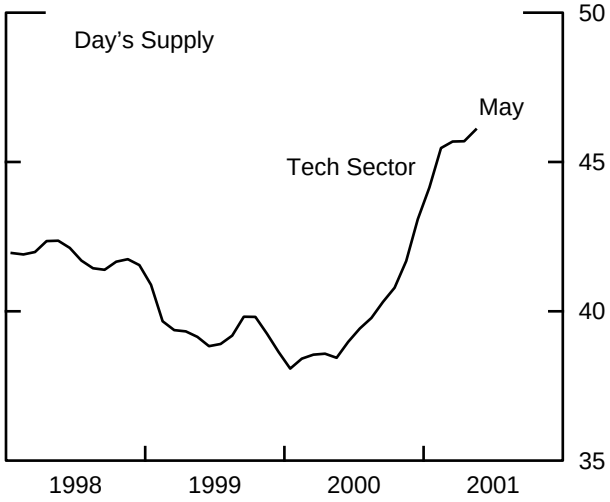
Percent change

		Q4/Q4 2001	Q4/Q4 2002
GDP	June	1.4	3.5
	(Jan.)	*1.8*	*3.8*
CPI	June	2.6	2.0
	(Jan.)	*2.3*	*2.0*

Chart 2

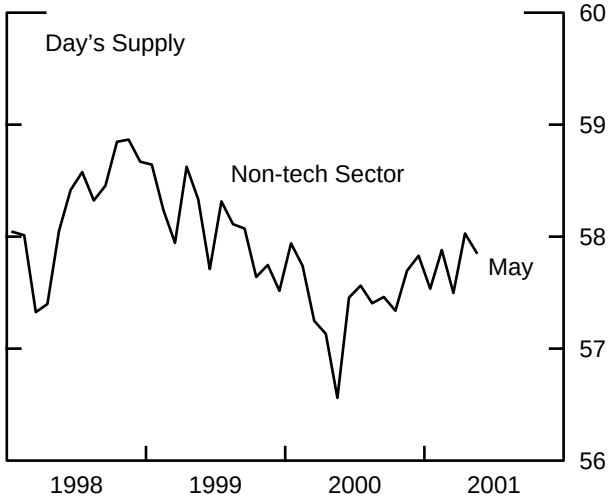
Near-term Dynamics and the Industrial Sector

Inventory-Sales Ratio*



*Industrial Production system.

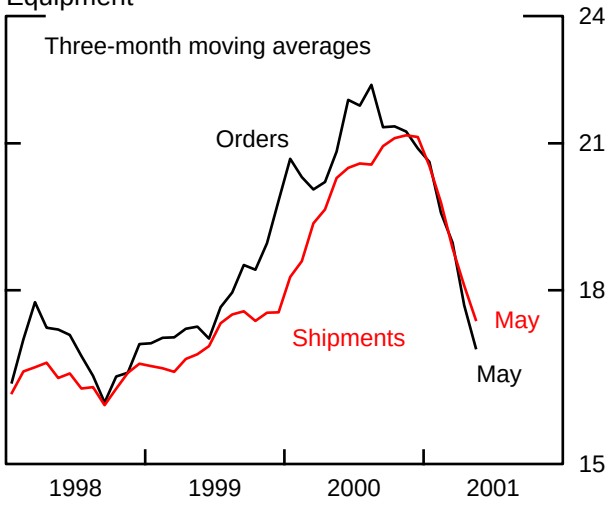
Inventory-Sales Ratio*



*Industrial Production system, excludes transportation.

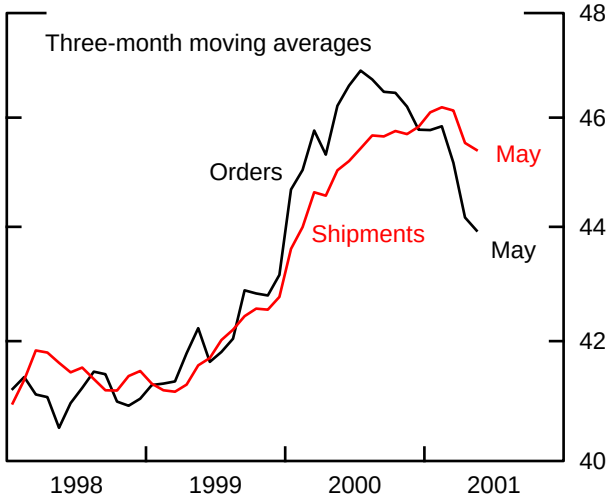
Computers and Communication Equipment

Billions of dollars, ratio scale



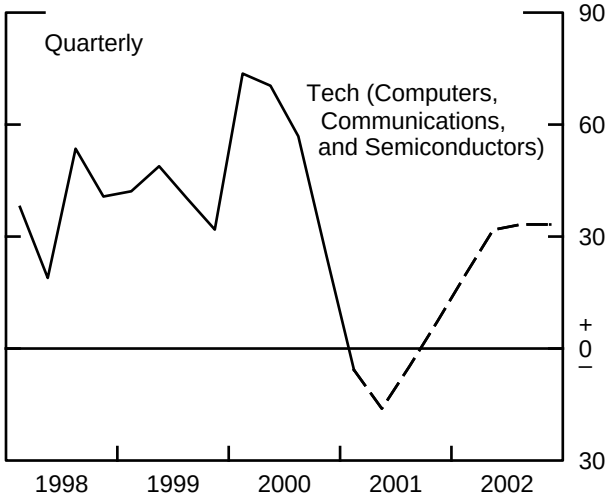
Other Equipment (ex. aircraft)

Billions of dollars, ratio scale



Manufacturing Industrial Production

Percent change, annual rate



Manufacturing Industrial Production

Percent change, annual rate

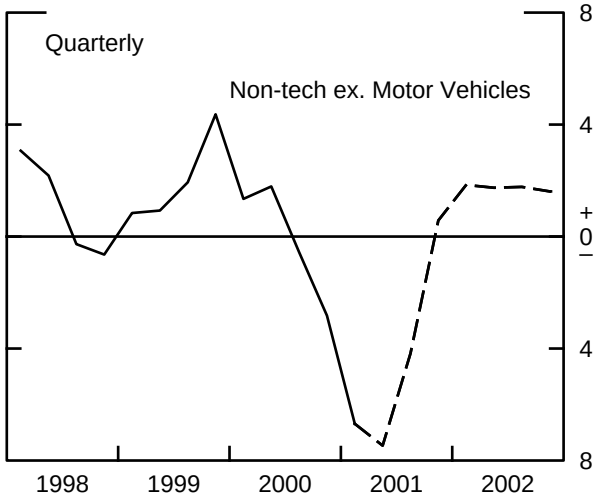


Chart 3

Near-term Developments

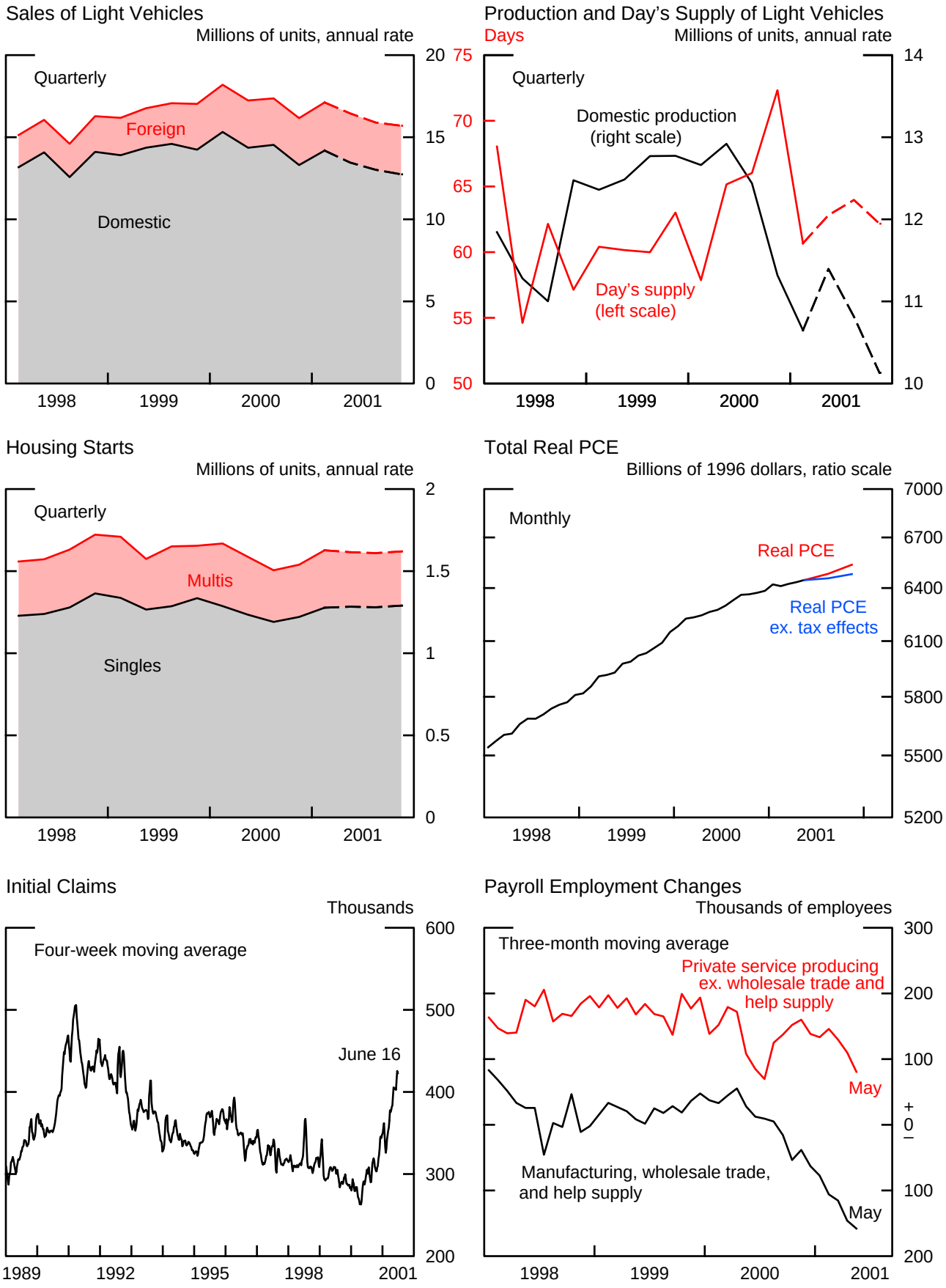
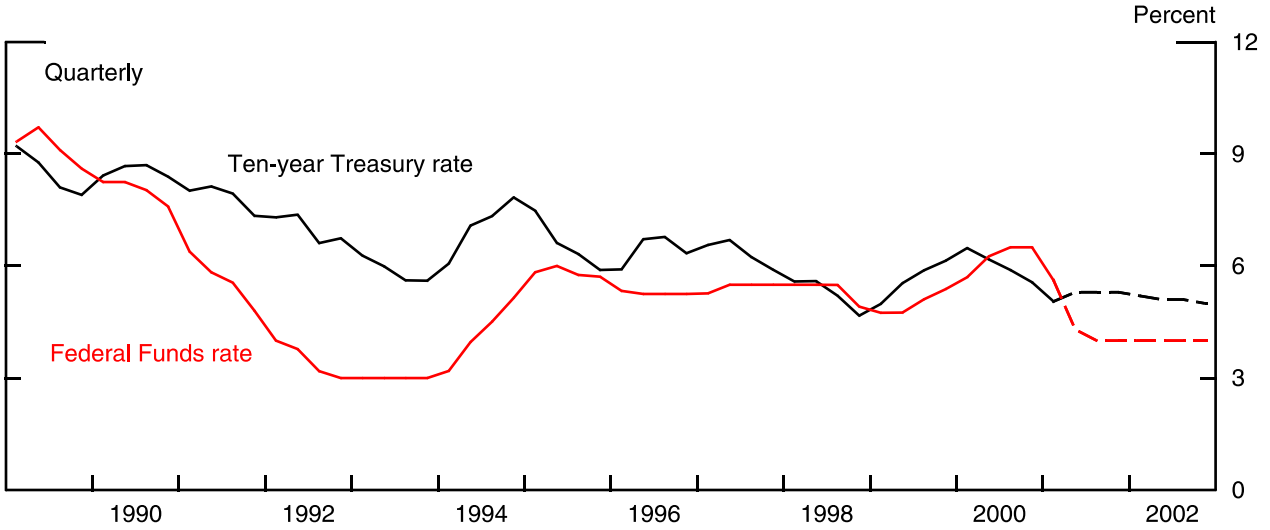


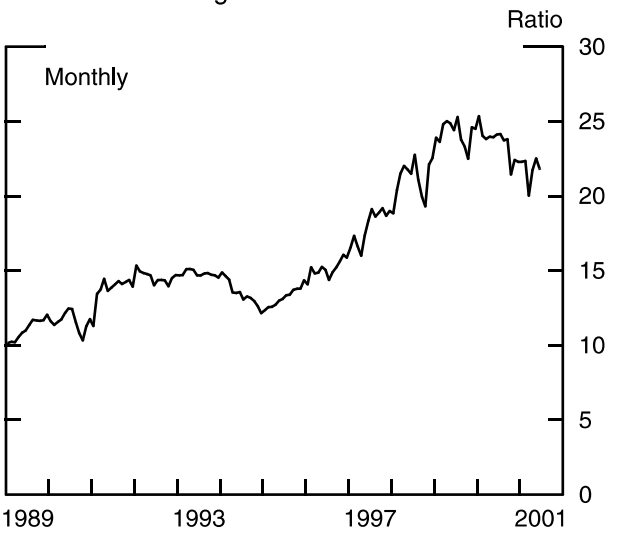
Chart 4

Financial Conditions

Ten-year Treasury Rate and Federal Funds Rate

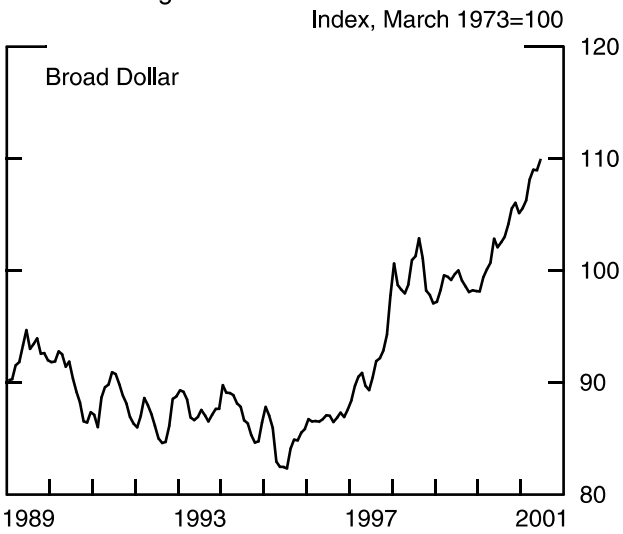


S&P Price-Earnings Ratio

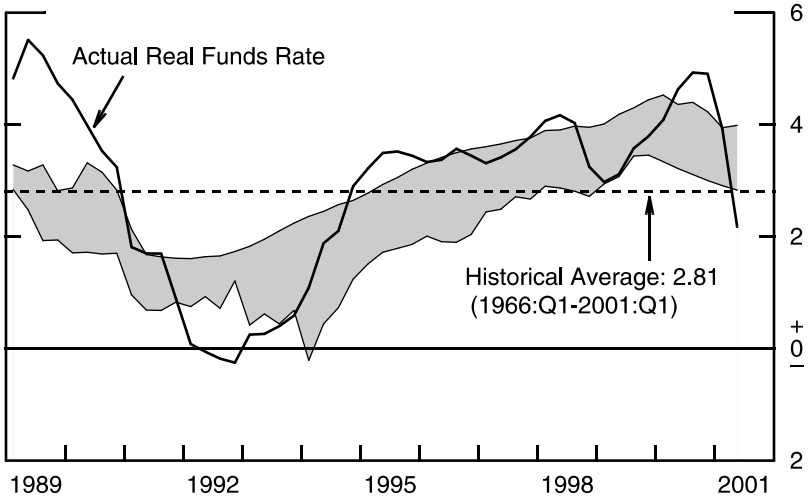


Note. Using expected earnings for 12 months ahead.
Source. I/B/E/S.

Real Exchange Value of the Dollar



Equilibrium and Actual Real Interest Rate



Note. Shaded region represents range of estimated equilibrium real funds rate.

Revision of Equilibrium Real Rate* Percentage points

2000:Q2 to 2001:Q2

1.	Total revision	-1.2
2.	Equity premium	-0.5
3.	Exchange rate	-0.1
4.	Trend growth	-0.5
5.	Other	-0.1

*FRB/US measure.

Chart 5

Fiscal Policy

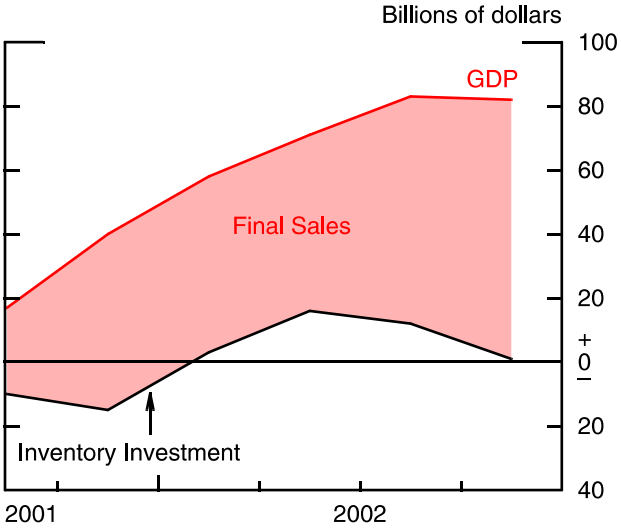
Key Elements of Tax Cut

- Tax rebate of $38 billion to be paid July through September.
- "Permanent" tax reduction of $3 billion in FY2001.
- "Permanent" tax reduction of $71 billion in FY2002.

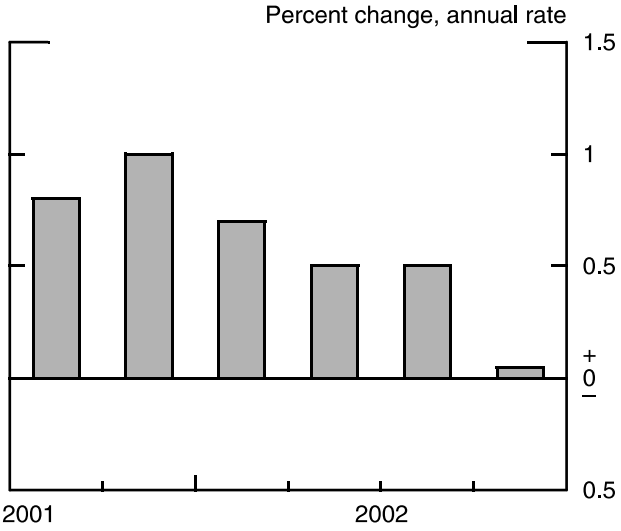
Key Assumptions

- For some households, consumption tracks cash flow.
- Other households very gradually spend rebates and adjust spending slowly to higher after-tax income.
- Initially, spending increase is partly offset by drawdown of inventories.

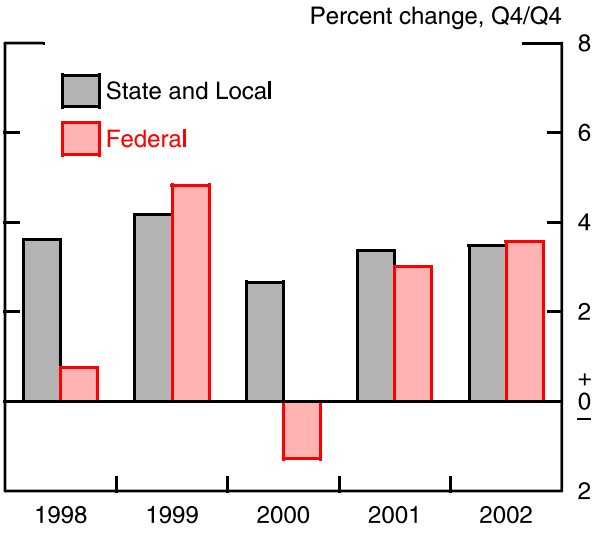
Contribution of Tax Cut to Level of Real GDP



Contribution of Tax Cut to Growth of Real GDP



Real Government Purchases



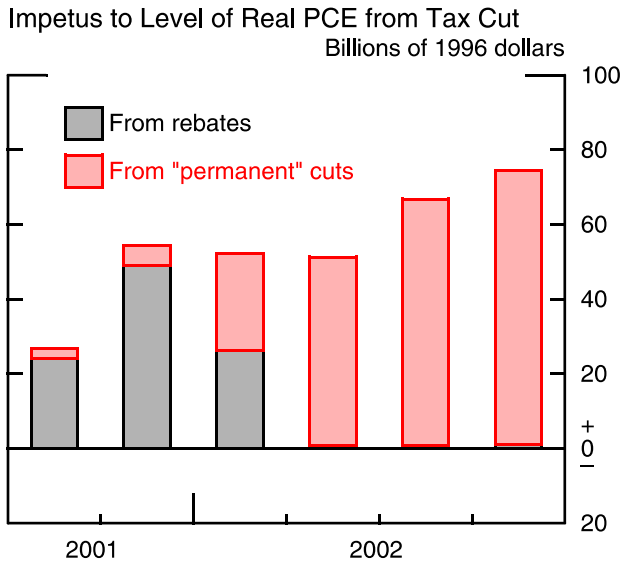
Federal Budget Surplus

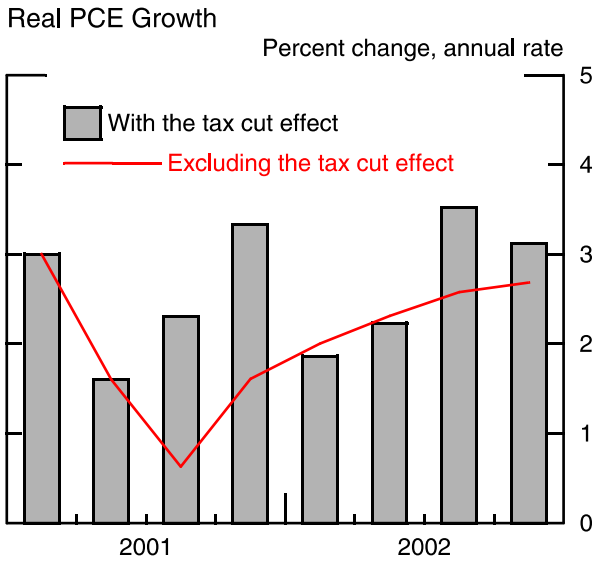
Billions of dollars

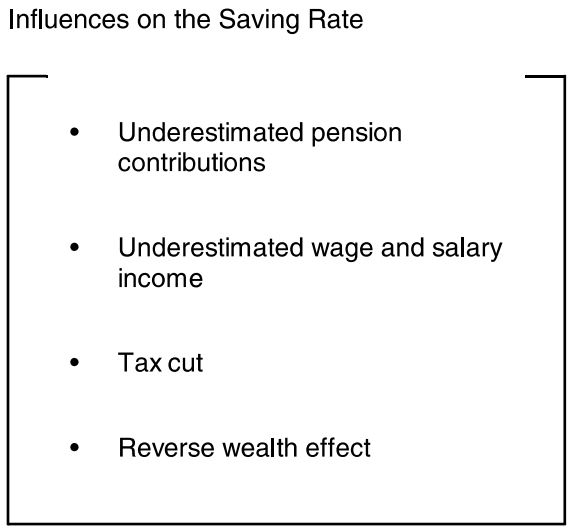
	FY2001	FY2002
Unified	185	214
On-budget	21	40

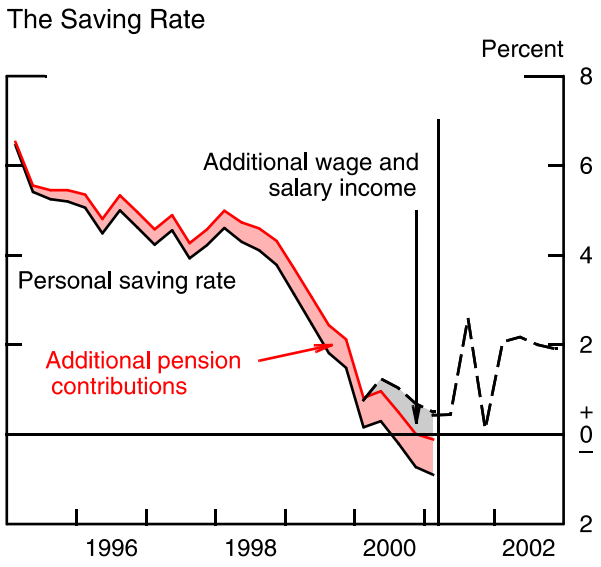
Chart 6

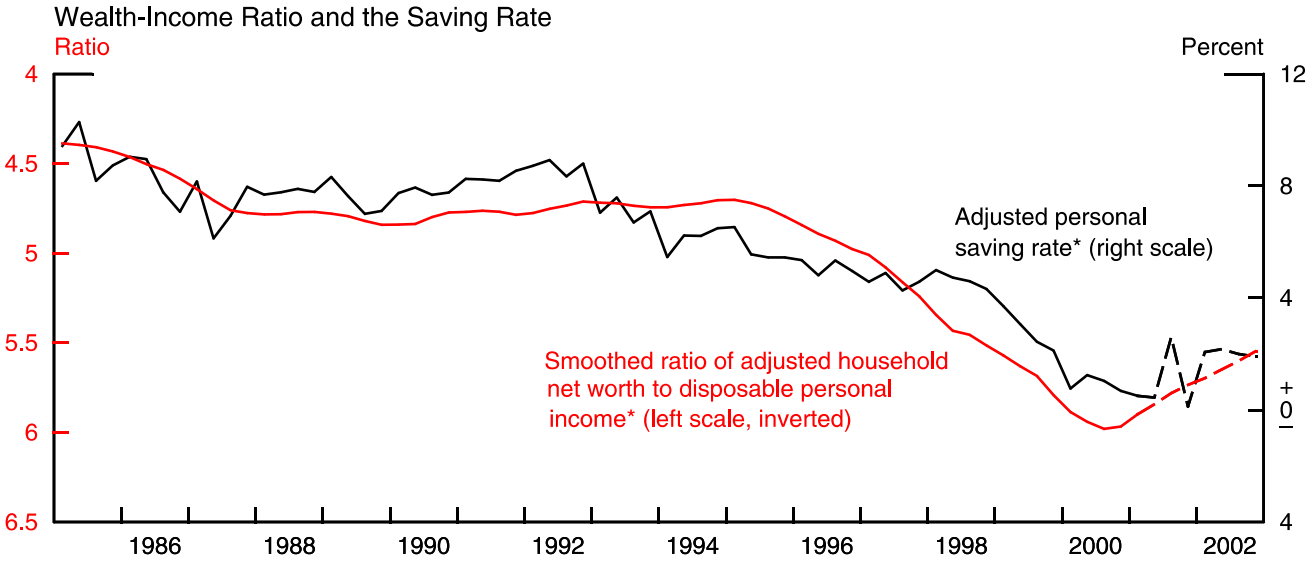
The Household Sector









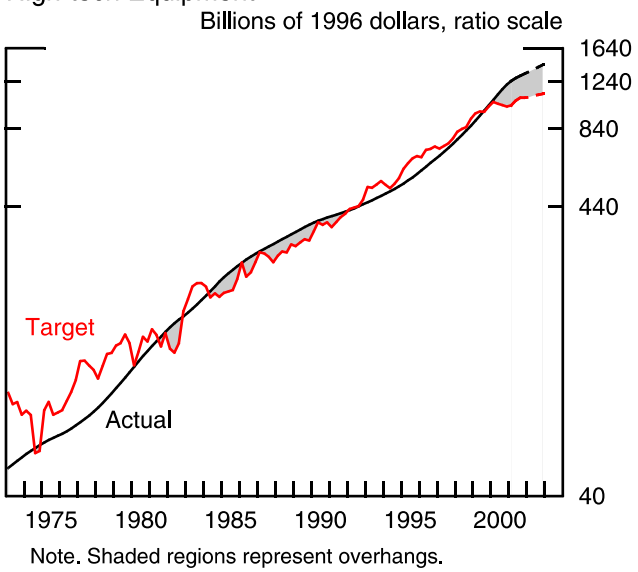


*Adjusted for additional pension contributions and wage and salary income.

Chart 7

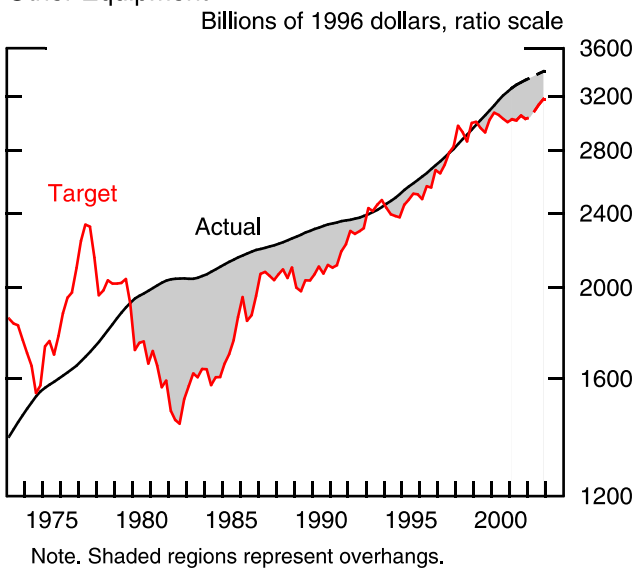
Is There A Capital Overhang?

High-tech Equipment



Note. Shaded regions represent overhangs.

Other Equipment

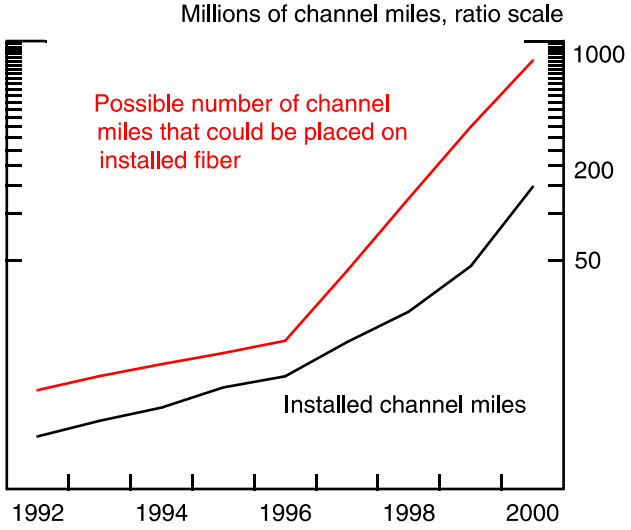


Note. Shaded regions represent overhangs.

Network-type Markets

- Network-type markets tend to tip toward one provider.
- Each competitor has a strong incentive to invest aggressively.
- If several firms aim to serve most of the market, a capital overhang is almost sure to result.

Capacity of the Long-Haul Fiber Optic Network



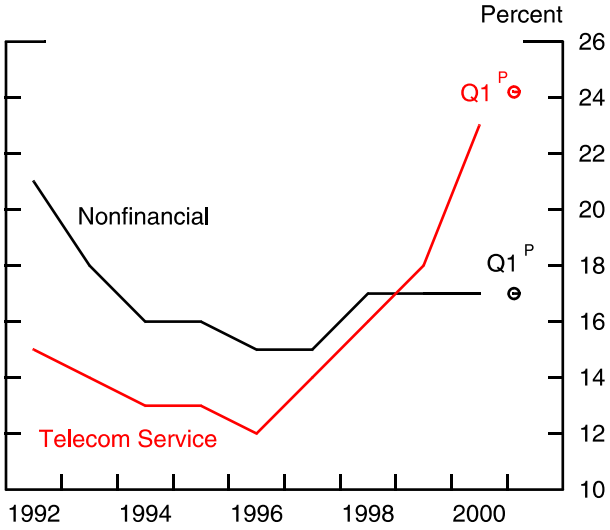
Key Conclusions of the Staff Study

- There is an overhang today.
- The overhang disproportionately involves high-tech equipment.
- For most firms, financial factors are not a major drag on investment.
- Implications for monetary policy:
  - » only a moderately negative influence on the outlook.
  - » not likely to impair the effectiveness of monetary policy.

Chart 8

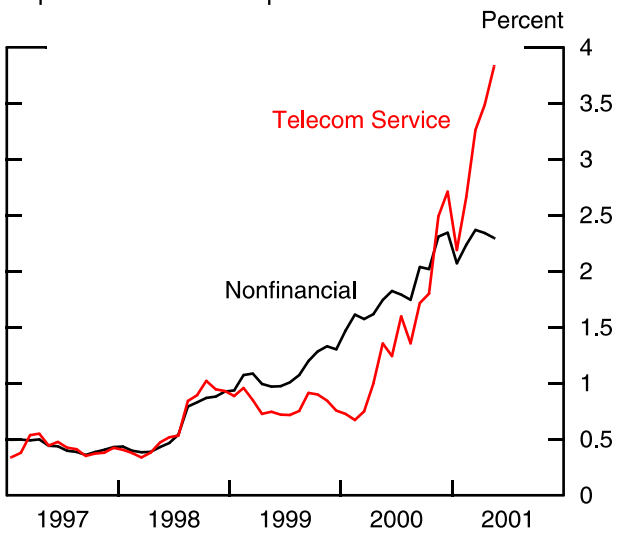
The Outlook for Business Investment

Interest Expense to Cash Flow*



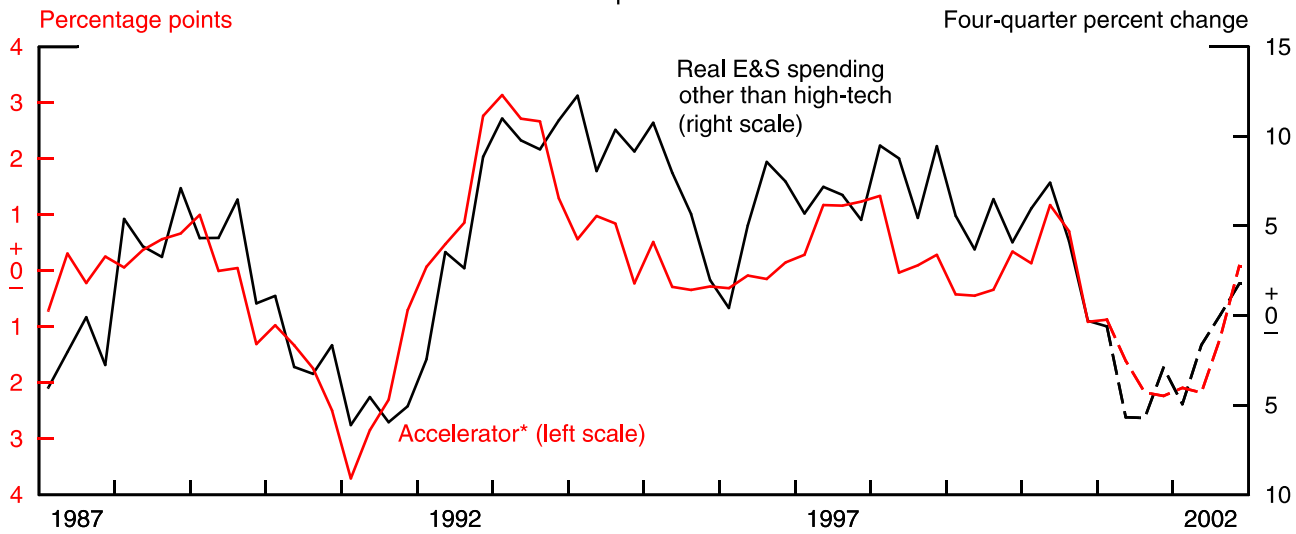
Source: Compustat.
*Operating income before depreciation.

Expected Default Frequencies



Source: KMV Corporation.

Investment and the Acceleration of Business Output



*The accelerator is the eight-quarter percent change in business output less the year-earlier eight-quarter percent change.

Composition of Nonresidential Investment

	Percent
Drilling and Mining	11.0
Utilities	9.1
Other	79.9

Investment in Nonresidential Structures

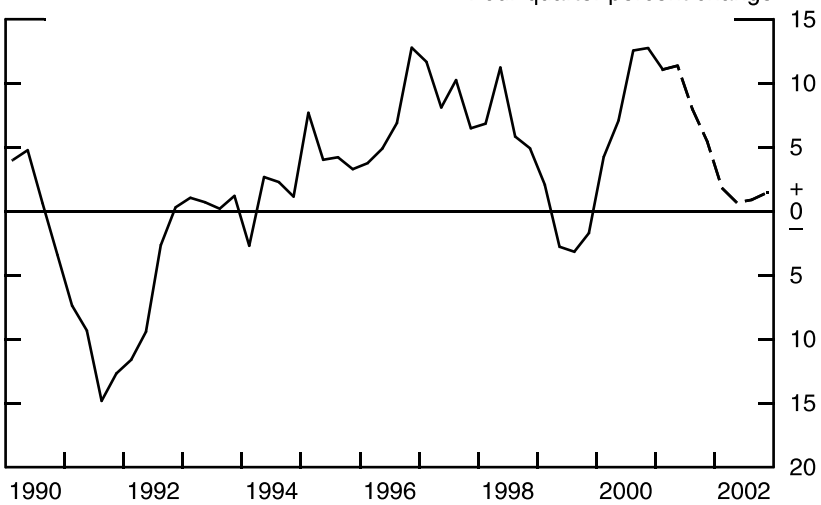


Chart 9

Outlook for Inflation

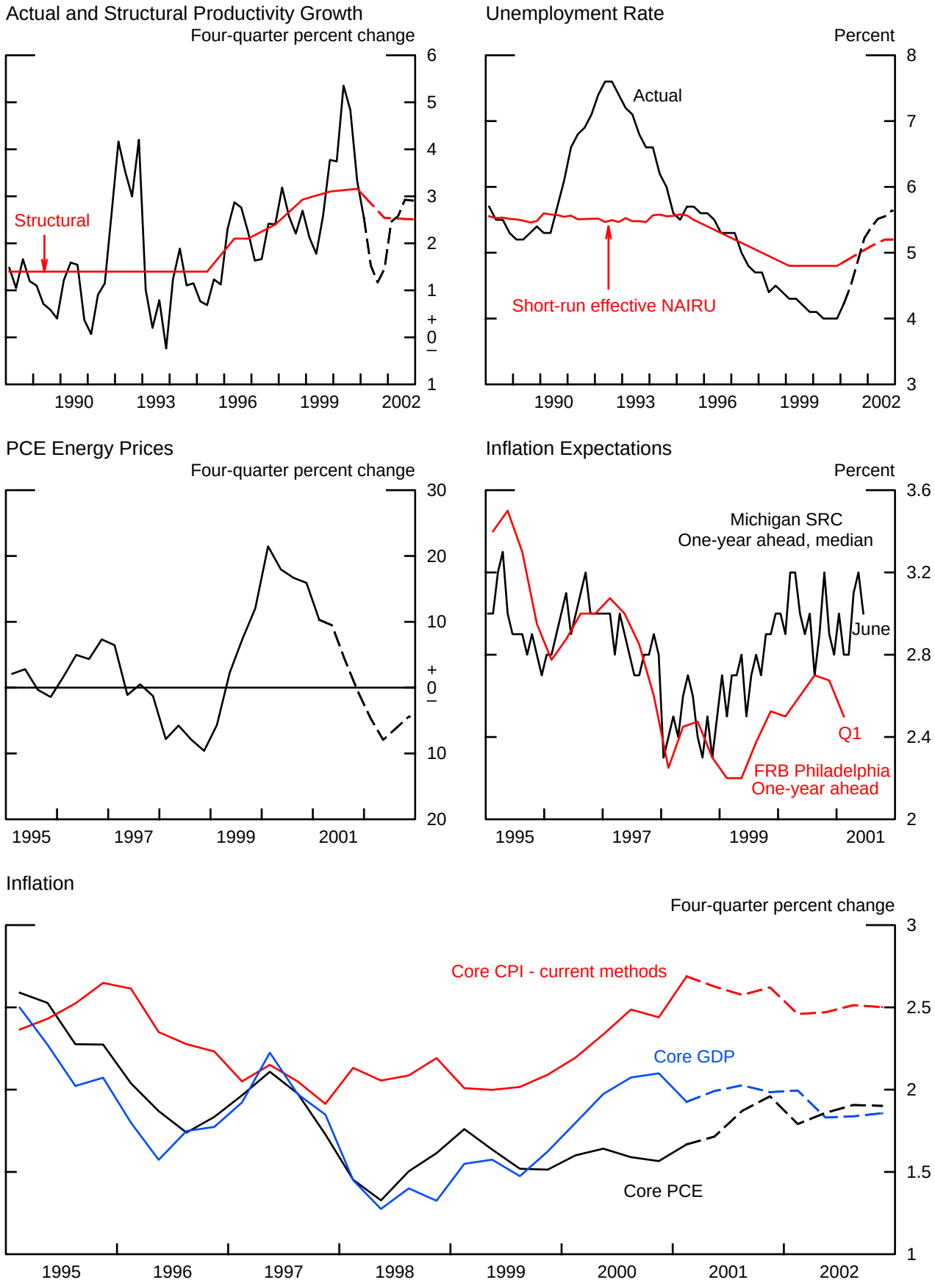
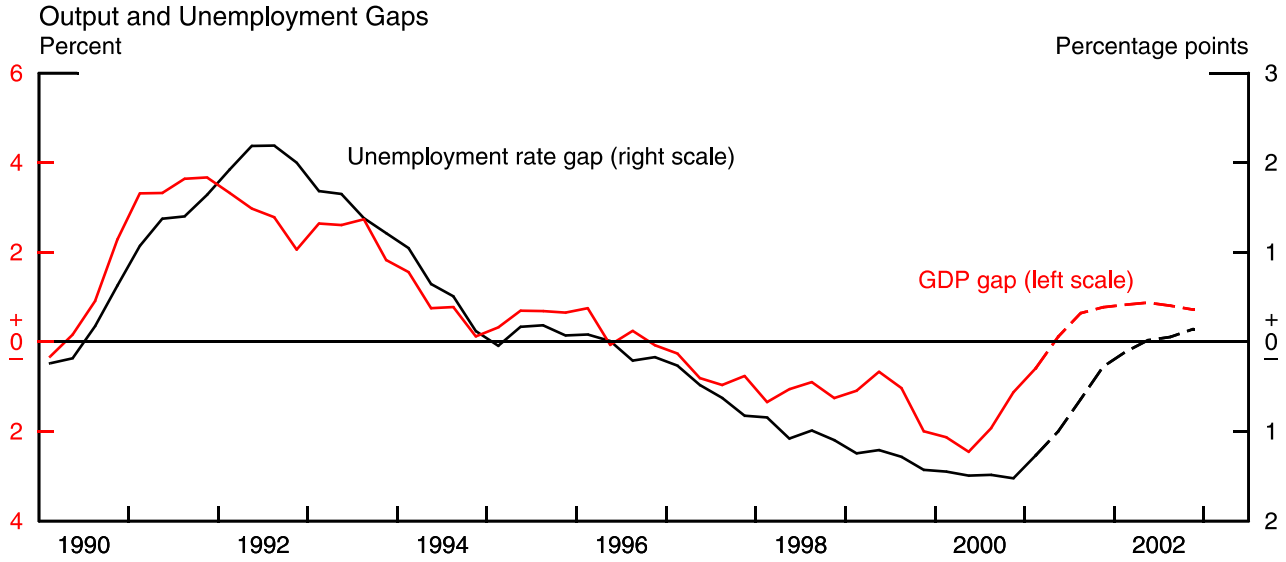
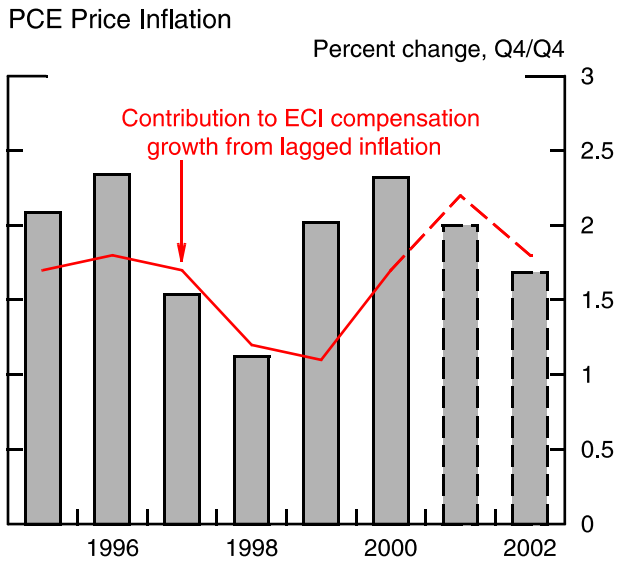
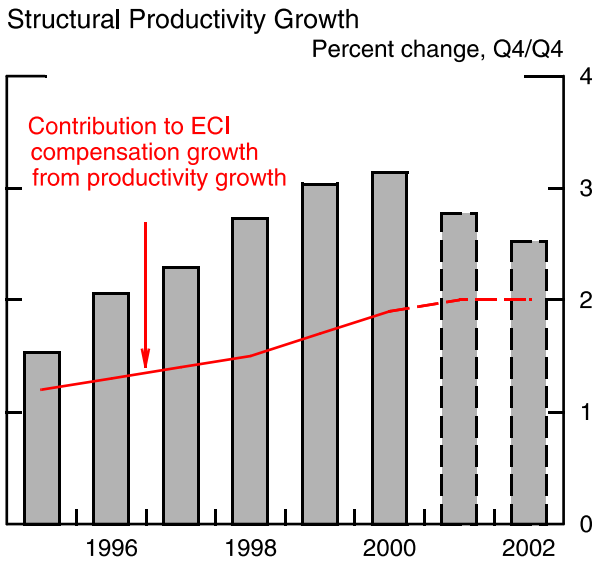


Chart 10

The Labor Market







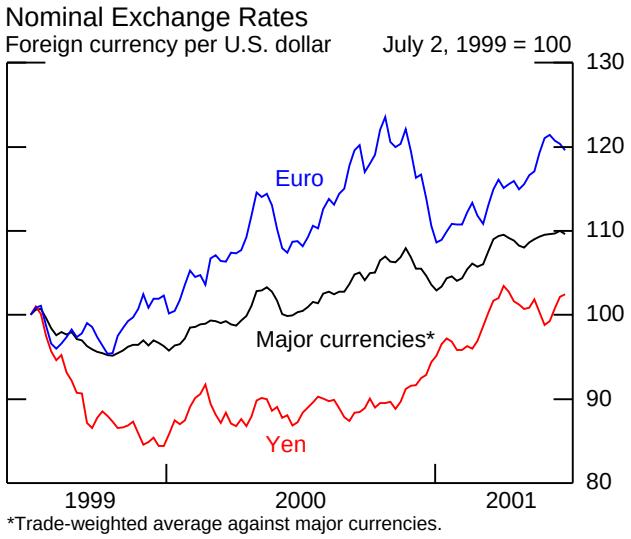
ECI Inflation
(Four-quarter percent changes)

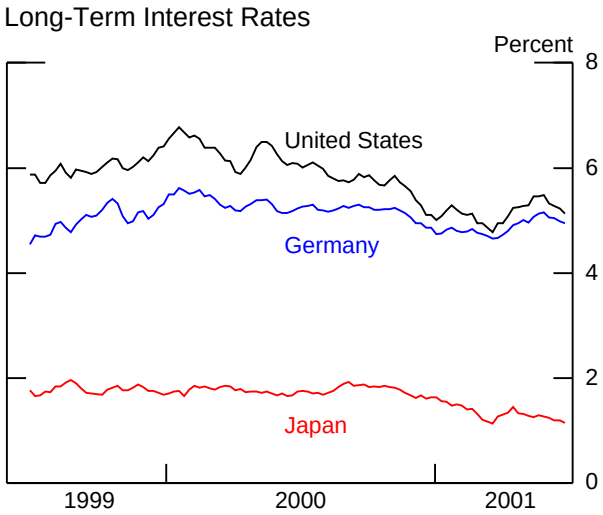
	1999	2000	2001	2002
ECI, compensation	**3.4**	**4.4**	**4.4**	**3.9**
Contribution of:				
Resource utilization	0.5	0.6	-0.1	-0.2
Lagged inflation	1.1	1.7	2.2	1.8
Productivity	1.7	1.9	2.0	2.0
Health insurance	0.1	0.2	0.3	0.3

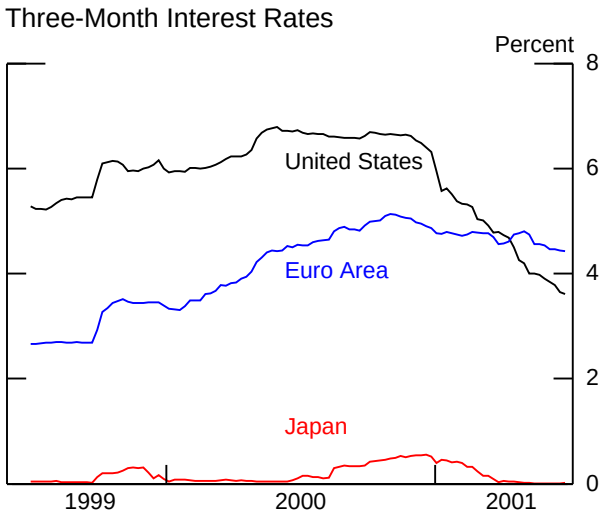
Chart 11

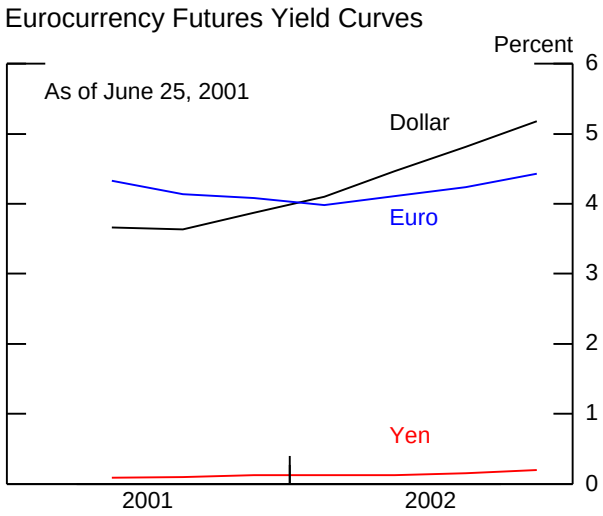
Exchange Rates and Interest Rates

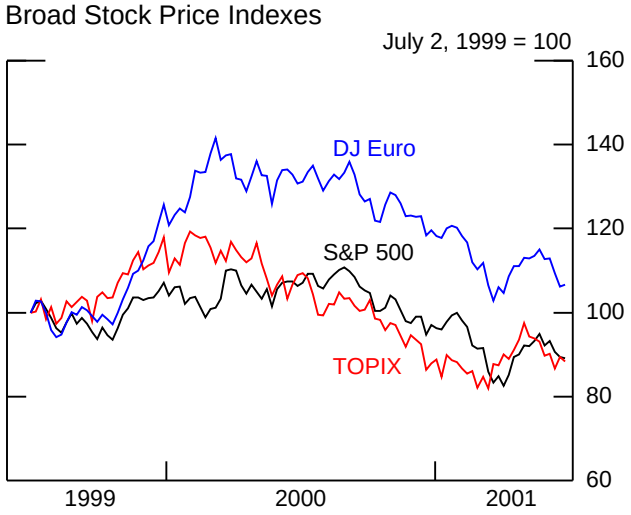
(Weekly data)











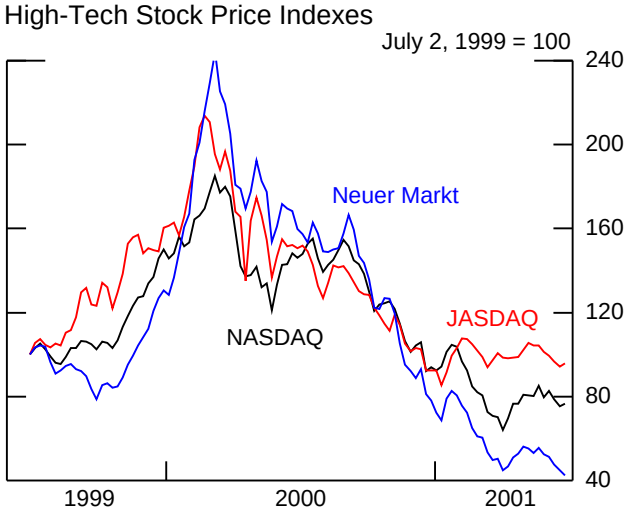


Chart 12

Trade Developments

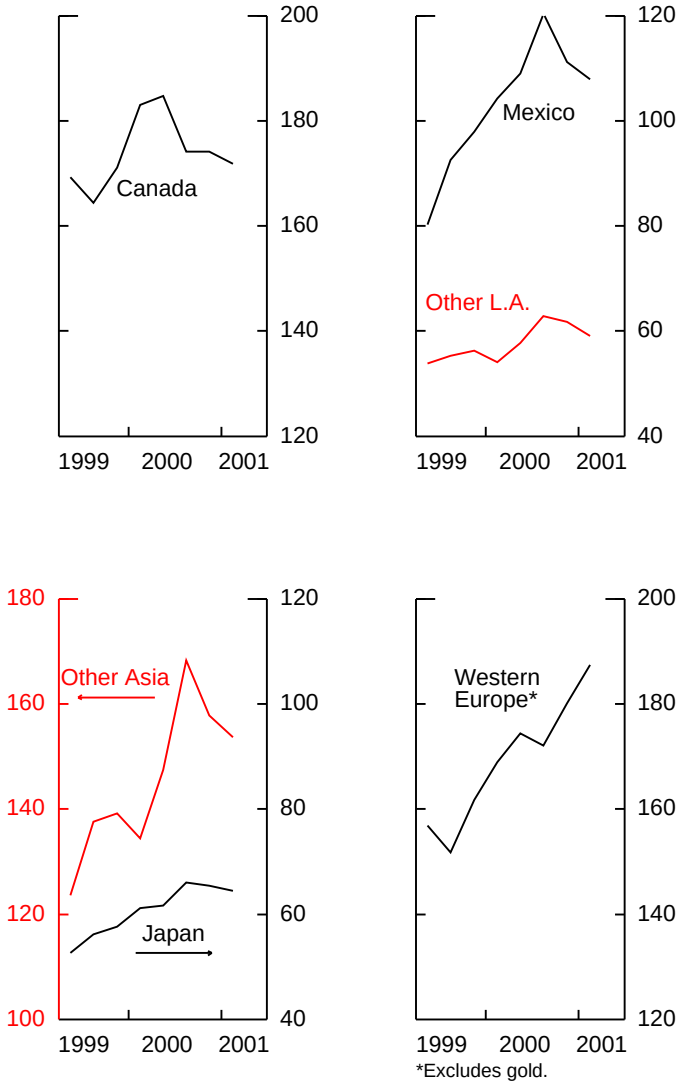
Recent Developments: Exports and Imports

Change in billions of dollars, SAAR

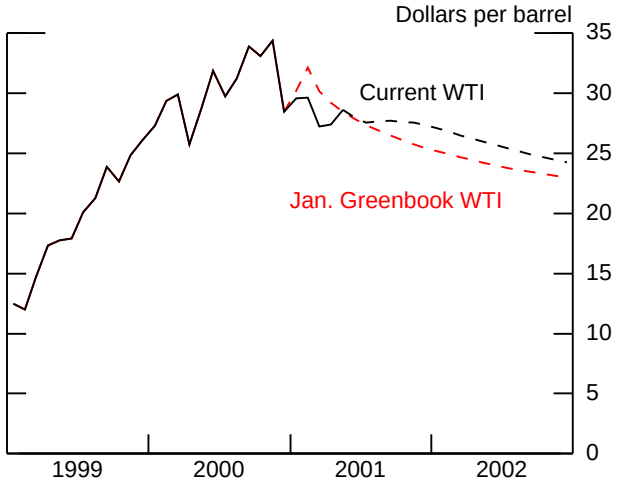
	Q4-Q1	Mar-Apr
1. Goods Exports	-5.2	-21.1
2. Capital goods	1.5	-17.6
of which:		
3. Computers and semi.	-5.4	-8.6
4. Automotive	-5.5	0.4
5. Consumer goods	3.3	0.7
6. Other	-4.5	-4.6
7. Services	1.8	-0.5
8. Total Goods and Services	-3.3	-21.6
9. Good Imports	-29.2	-32.5
10. Oil	-10.1	5.9
11. Capital goods	-11.7	-33.2
of which:		
12. Computers and semi.	-8.6	-13.7
13. Automotive	-6.1	7.7
14. Consumer goods	-0.9	-14.3
15. Other	-0.4	1.4
16. Services	4.7	0.1
17. Total Goods and Services	-24.4	-32.4

Goods Exports by Region

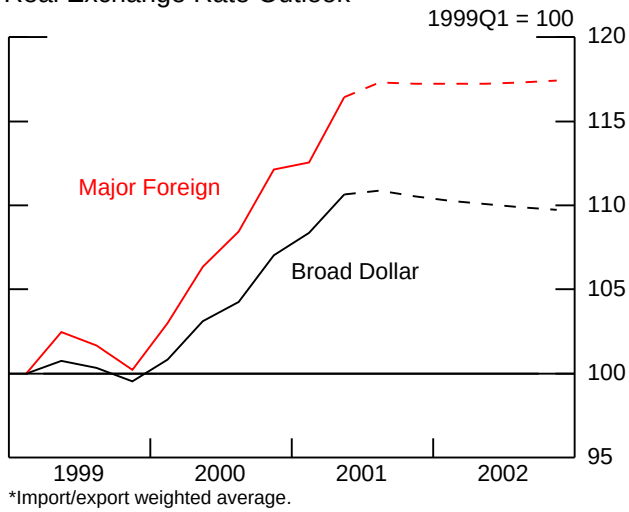
Billions of dollars, SAAR



Oil Prices



Real Exchange Rate Outlook*

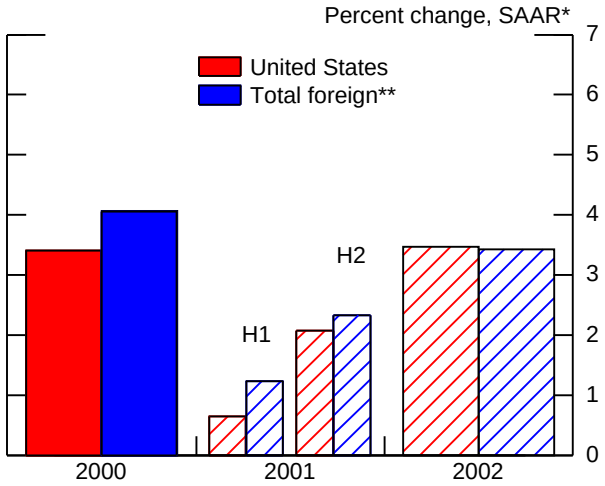


*Import/export weighted average.

Chart 13

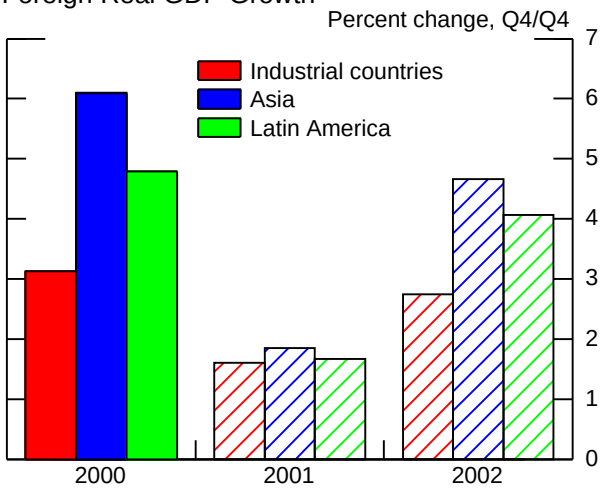
Foreign Outlook

Real GDP Growth



*Years are Q4/Q4; half years are Q2/Q4 or Q4/Q2.
**U.S. export weights.

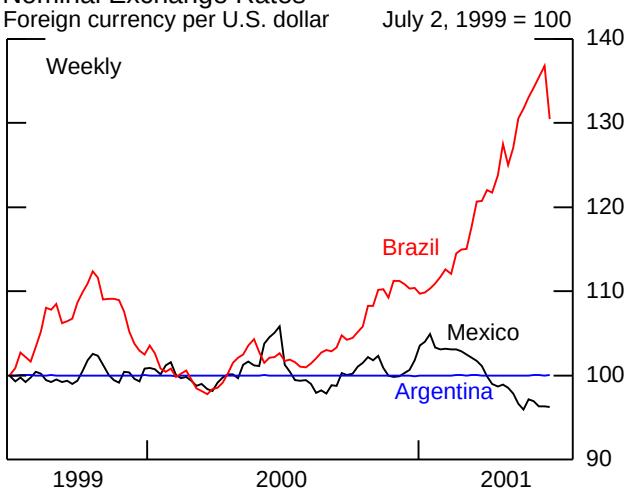
Foreign Real GDP Growth*



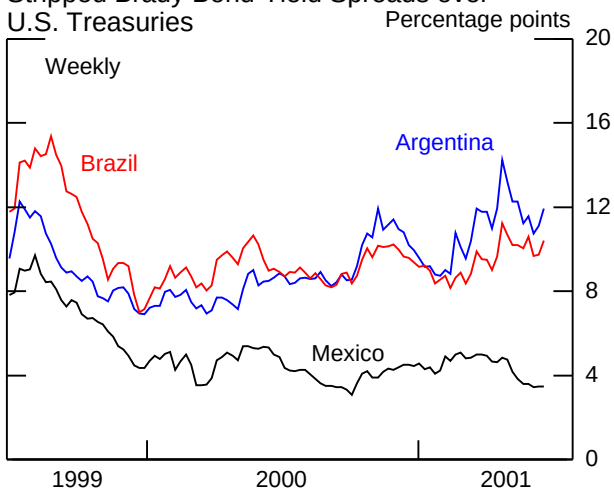
*U.S. export weights.

Latin America

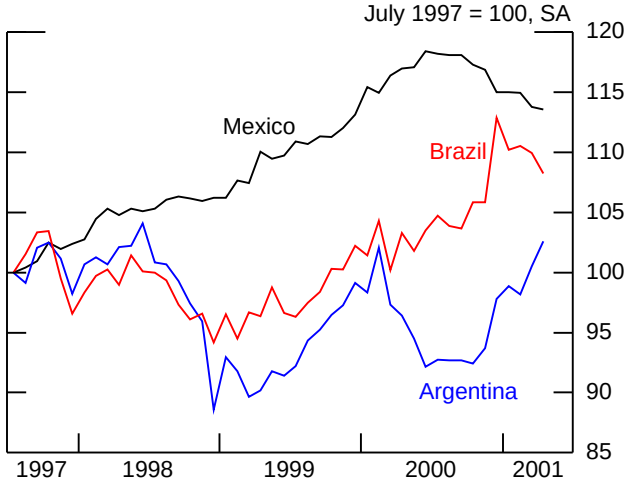
Nominal Exchange Rates
Foreign currency per U.S. dollar



Stripped Brady Bond Yield Spreads over U.S. Treasuries



Industrial Production



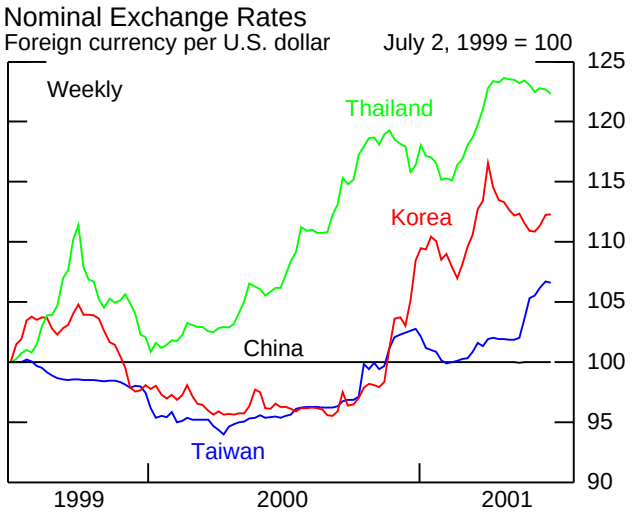
Real GDP Growth
Percent change, SAAR*

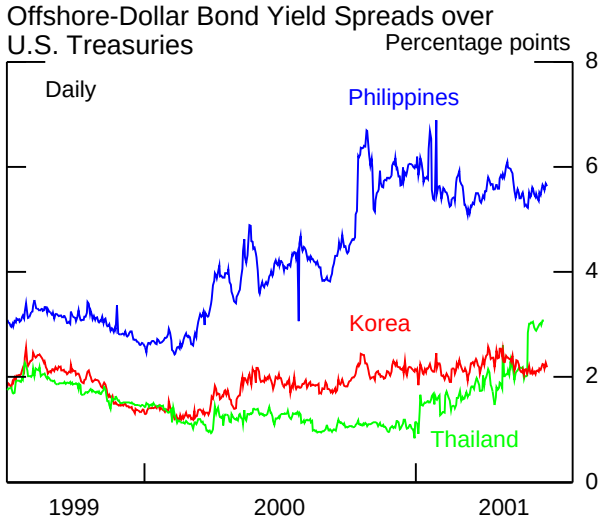
	2000	2001 H1	2001 H2	2002
1. Latin America**	4.8	0.4	2.9	4.1
of which:				
2. Mexico	5.2	0.1	3.1	4.4
3. Brazil	4.2	1.2	2.0	2.9
4. Argentina	-2.0	1.0	1.6	1.9

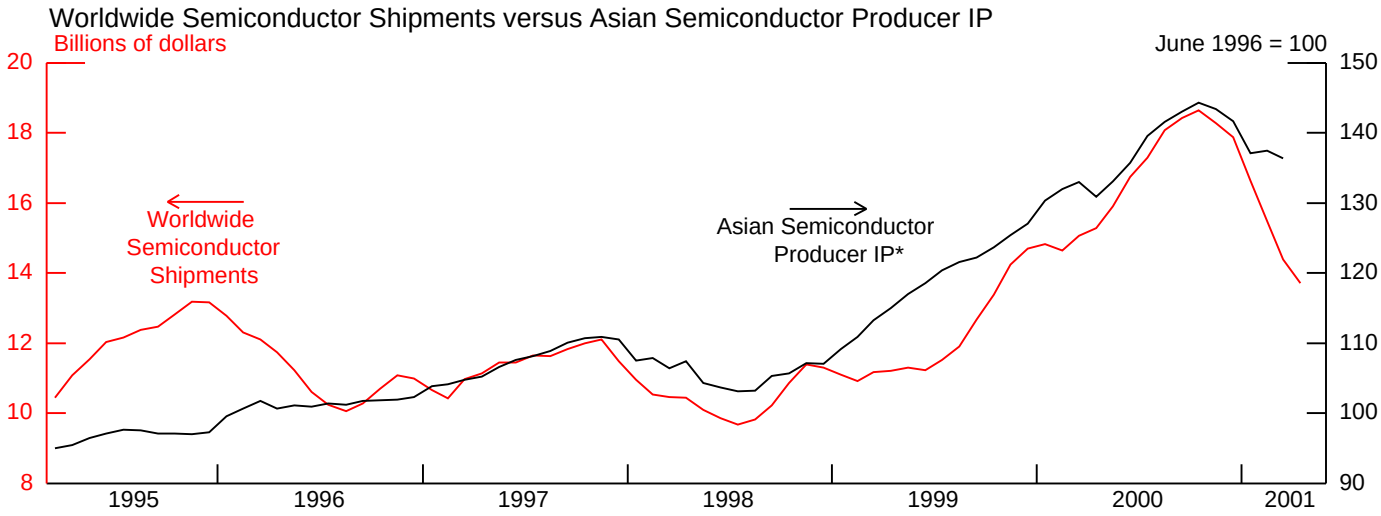
*Years are Q4/Q4; half years are Q2/Q4 or Q4/Q2.
**U.S. export weights.

Chart 14

Asia







*SA, 3-month moving average of Korean, Malaysian, Philippine, Singaporean, and Taiwanese IP weighted by shares of total U.S. exports.

Share of High-Tech Goods*

Percent

	in IP	in Total Exports**
1. Korea	12	31
2. Taiwan	18	31
3. Singapore	47	55
4. Malaysia	20	57
5. Philippines	11	57

*Includes semiconductors, computers and components, and telecommunications equipment and parts. Data for some countries include other electronic and electrical devices.

**Data are 1998-2000 average. Data for Singapore are for 2000 only.

Real GDP Growth

Percent change, SAAR*

	2000	2001 H1	2001 H2	2002
1. Developing Asia**	6.1	0.7	3.0	4.7
of which:				
2. China	7.4	7.0	7.5	7.6
3. Korea	5.2	1.6	2.5	4.2
4. Taiwan	4.1	-1.4	1.0	3.8
5. Singapore	11.0	-5.8	4.0	5.7
6. Hong Kong	6.6	1.2	1.7	4.0

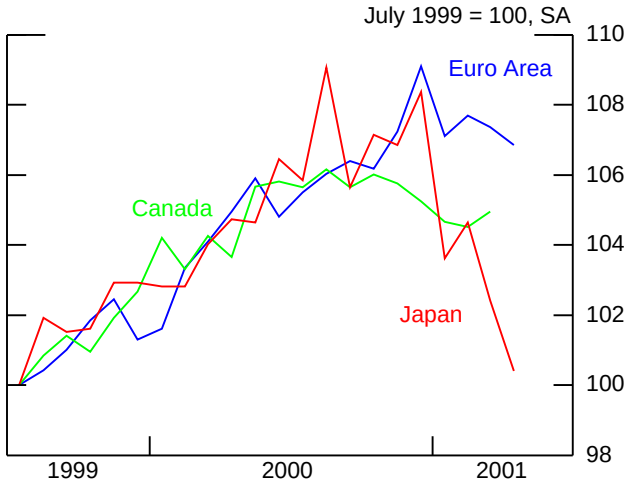
*Years are Q4/Q4; half years are Q2/Q4 or Q4/Q2.

**U.S. export weights.

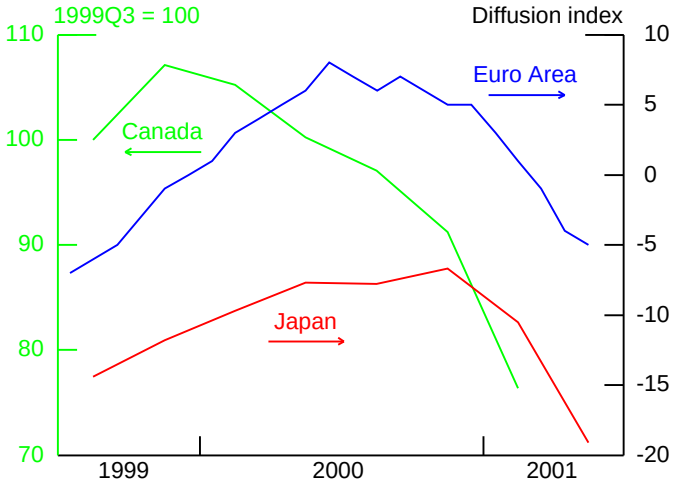
Chart 15

Industrial Countries

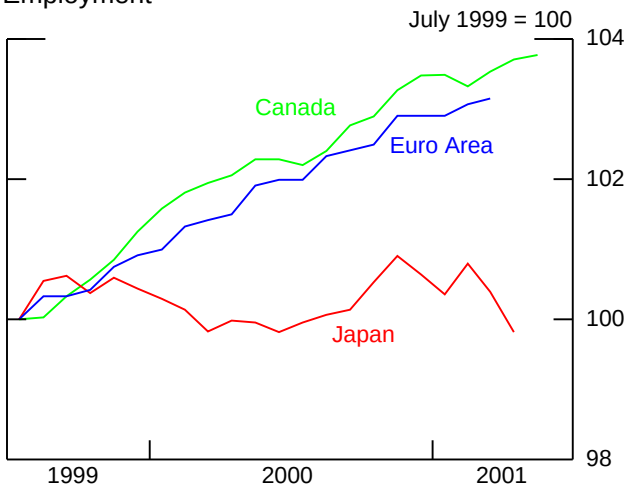
Industrial Production



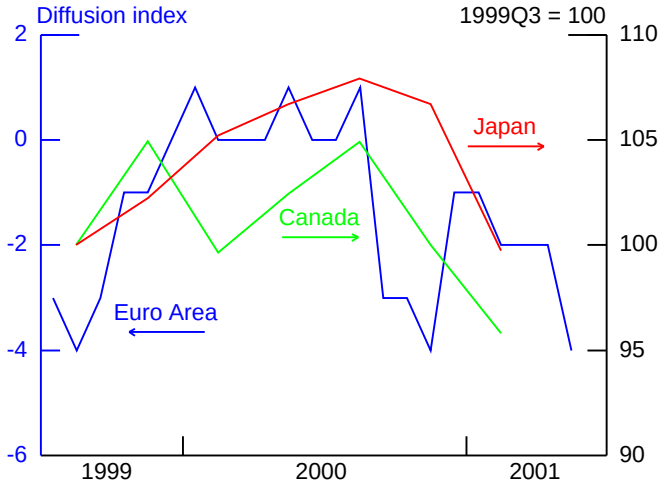
Business Confidence



Employment



Consumer Confidence



Real GDP Growth
Percent change, SAAR*

	2000	2001 H1	2001 H2	2002
1. Indust. countries**	3.1	1.4	1.8	2.7
of which:				
2. Japan	2.5	-1.0	-1.3	1.0
3. Euro Area	2.9	1.8	1.9	2.6
4. United Kingdom	2.6	1.6	2.4	2.6
5. Canada	3.5	1.9	2.4	3.1

*Years are Q4/Q4; half years are Q2/Q4 or Q4/Q2.
**U.S. export weights.

Real Domestic Demand Growth
Percent change, SAAR*

	2000	2001 H1	2001 H2	2002
1. Japan	2.5	-0.6	-1.4	0.9
2. Euro Area	2.3	0.8	2.0	2.5
3. United Kingdom	2.9	2.7	2.8	2.7
4. Canada	2.7	1.4	2.8	3.0

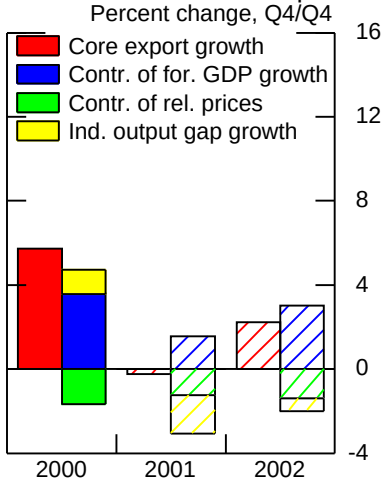
*Years are Q4/Q4; half years are Q2/Q4 or Q4/Q2.

Chart 16

External Sector

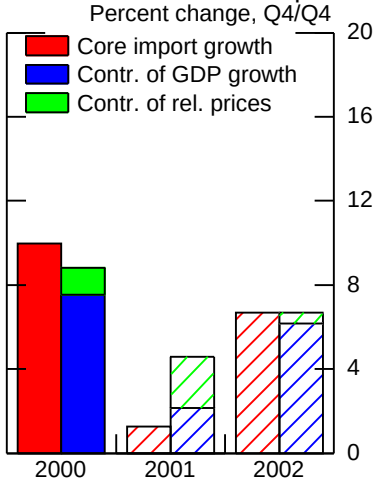
Determinants of Core Exports

Percent change, Q4/Q4



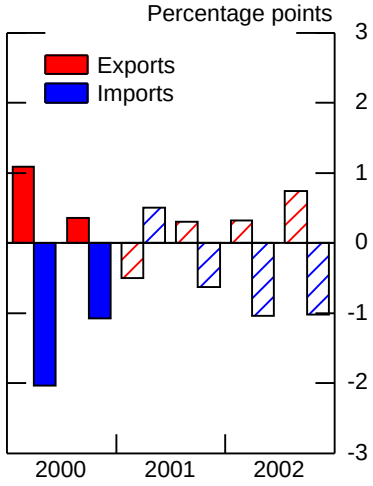
Determinants of Core Imports

Percent change, Q4/Q4



Contribution to U.S. GDP Growth

Percentage points



Real Export Growth

Percent change, Q4/Q4

	1999	2000	2001	2002
Growth of real exports				
1. G & S	**4.3**	**6.7**	**-0.9**	**5.1**
Percentage point contribution				
2. Services	0.1	0.8	0.3	1.6
3. Goods	4.2	5.9	-1.2	3.5
of which:				
4. Core*	2.3	3.6	-0.1	1.3

*Excludes computers and semiconductors.

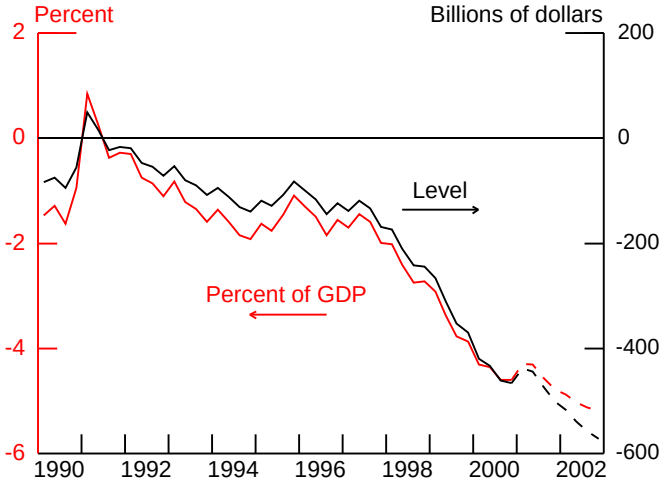
Real Import Growth

Percent change, Q4/Q4

	1999	2000	2001	2002
Growth of real imports				
1. G & S	**12.0**	**11.3**	**0.5**	**7.3**
Percentage point contribution				
2. Services	0.4	2.0	0.7	0.8
3. Goods	11.6	9.3	-0.2	6.5
of which:				
4. Core*	9.5	6.9	0.4	4.5

*Excludes computers, semiconductors, and oil.

Current Account



Capital Flows

Billions of dollars, AR

	2000	2001Q1
Official capital, net	36	17
of which: Japan	19	-11
Private capital, net	407	295
of which:		
For. purch. of U.S. sec.	433	591
of which: Treasuries	-53	2
U.S. purch. of for. sec.	-125	-114
For. D.I. in U.S.	288	168
U.S. D.I. abroad	-152	-144

ECONOMIC PROJECTIONS FOR 2001

	FOMC		
	Range	Central Tendency	Staff
	----------Percentage change, Q4 to Q4----------		
Nominal GDP	3¼ to 5	3½ to 4¼	3.6
February 2001	(3¾ to 5¼)	(4 to 5)	(3.8)
Real GDP	1 to 2	1¼ to 2	1.4
February 2001	(2 to 2¾)	(2 to 2½)	(1.8)
PCE Prices	2 to 3	2 to 2½	2.0
February 2001	(1¾ to 2½)	(1¾ to 2¼)	(1.8)
	----------Average level, Q4, percent----------		
Unemployment rate	4¾ to 5	4¾ to 5	5.2
February 2001	(4½ to 5)	(About 4½)	(5.2)

Central tendencies calculated by dropping high and low three from ranges.

ECONOMIC PROJECTIONS FOR 2002

	FOMC		
	Range	Central Tendency	Staff
	----------Percentage change, Q4 to Q4----------		
Nominal GDP	4½ to 6	5¼ to 5½	5.3
Real GDP	3 to 3½	3 to 3¼	3.5
PCE Prices	1½ to 3	2 to 2½	1.7
	----------Average level, Q4, percent----------		
Unemployment rate	4½ to 5½	4¾ to 5¼	5.6