

Meeting of the Federal Open Market Committee June 25-26, 2002 Presentation Materials -- Text Version

[Presentation Materials \(3.15 MB PDF\)](#)

Pages 130 to 179 of Transcript

Appendix 1: Materials used by Mr. Kos

Page 1

Top panel

Title: Rates Implied by Eurodollar Futures Curve Comparison of March 19, May 6, & June 24, 2002

Series: Eurodollar futures contracts

Horizon: September 2002 - December 2004

Description: The rates implied by eurodollar futures contracts over the time period declined from March 19, 2002 to May 6, 2002 to June 24, 2002.

Source: Bloomberg

Middle panel

Title: Eurodollar Deposit Futures Implied Volatility (December contract)

Series: Eurodollar deposit futures implied volatility

Horizon: March 1, 2002 to June 24, 2002

Description: Between March and June 2002, implied volatility on the December eurodollar deposit futures contract rose.

Source: Bloomberg

Bottom-left panel

Title: 2-Year Treasury Yield

Series: 2-year Treasury yield

Horizon: March 1, 2002 - June 24, 2002

Description: After an initial increase in March, yields declined over the period on the 2-year Treasury note.

Source: Bloomberg

Bottom-right panel

Title: 10-Year Treasury Yield

Series: 10-year Treasury yield

Horizon: March 1, 2002 - June 24, 2002

Description: After an initial increase in March, yields declined over the period on the 10-year Treasury note.

Source: Bloomberg

Page 2

Top panel

Title: U.S. Dollar Versus Selected Foreign Currencies

Series: U.S. dollar exchange rate versus the Japanese Yen, Canadian dollar, Swiss franc, British pound, euro dollar, and Australian dollar

Horizon: March 1, 2002 - June 24, 2002

Description: The exchange value of the dollar weakened against the aforementioned currencies over the period.

Source: Bloomberg

Middle panel

Title: 1-month Euro-Dollar and Dollar-Yen Exchange Rate Option Implied Volatility

Series: euro-dollar and dollar-yen 1-month implied volatility

Horizon: March 1, 2002 to June 24, 2002

Description: Implied volatility on 1-month dollar-yen options trended higher, while 1-month implied volatility on euro-dollar trended lower in April and rose in late May and June.

Source: Bloomberg

Bottom panel

Title: Global 10-yr. Government Bond Yields

Series: 10-year government yields from Japan, the U.S., Germany, the U.K., France, Spain, Italy, Canada, Sweden, Australia, and New Zealand

Horizon: June 24, 2002

Description: Ten year government yields generally between 4.80 and 5.40 percent, with Japan much lower and Australia and New Zealand higher.

Source: Bloomberg

Page 3

Top panel

Title: Domestic Equities

Series: The Dow, S&P 500, and Nasdaq indices

Horizon: March 1, 2002 - June 24, 2002

Description: Equity indices prices declined over the period.

Source: Bloomberg

Middle panel

Title: S&P 100 Volatility Index (VIX)

Series: The VIX index

Horizon: March 1, 2002 - June 24, 2002

Description: Volatility on the S&P 100 index rises, mostly after May.

Source: Bloomberg

Bottom panel

Title: International Equities

Series: The Mexican Bolsa, U.K. FTSE, Japanese Nikkei, Swiss Market Index, German DAX

Horizon: March 1, 2002 - June 24, 2002

Description: International equity indices fall following the May 7, 2002 FOMC meeting.

Source: Bloomberg

Page 4

Top-left panel

Title: Domestic Credit Spreads to Comparable Treasuries

Series: Spread between the 10-year Fannie Mae Benchmark yield and 10-year U.S. Treasury yield, spread between the 10-year U.S. interest rate swap rate and 10-year U.S. Treasury yield

Horizon: March 1, 2002 - June 24, 2002

Description: Both the yield on the 10-year Fannie Mae benchmark security and the rate on 10-year U.S. interest rate swaps decline in mid-April and remain stable over the remainder of the period.

Source: Bloomberg

Top-right panel

Title: Domestic Credit Spreads to Comparable Treasuries

Series: Spread between the A-1 Industrial Corporate yield and 10-year U.S. Treasury yield, spread between the 30-year Fannie Mae Current Coupon MBS to 30-year U.S. Treasury bond yield.

Horizon: March 1, 2002 - June 24, 2002

Description: The spreads decline following the April 23, 2002 downgrade to WorldCom, and widen following the May 29, 2002 downgrade to AT&T.

Source: Bloomberg

Bottom panel

Title: U.S. Corporate High Yield, EMBI+ and the Brazilian Sub-Component

Series: Brazilian sub-component of the JPMorgan EMBI+ index (sovereign spread), JPMorgan EMBI+ index (sovereign spread), and Merrill Lynch high yield index (sovereign spread).

Horizon: March 1, 2002 - June 24, 2002

Description: Spreads on the Brazilian sub-component widen the most, with the overall JPMorgan EMBI+ sovereign spread and Merrill Lynch high yield spread widening to a less extent.

Source: Bloomberg

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Top panel

Title: Currency Component of M1 (excludes vault cash) Seasonally Adjusted

Series: currency component of M1, current estimates, and estimates as of the May FOMC meeting.

Horizon: December 2001 - December 2002

Description: Currency grew from December 2001 to May 2002, and is forecasted to grow through the end of 2002.

Bottom panel

Title: Total Outright Purchases and Net Soma Expansion

Series: SOMA portfolio purchases to offset redemptions, net portfolio expansion

Horizon: 1996 - 2002

Description: The SOMA portfolio was forecasted to increase over \$60 billion in 2002.

Appendix 2: Materials used by Mr. Rolnick

Slide 1

Are Phillips Curves Useful for Forecasting Inflation? 40 years of debate

June 25, 2002

FOMC

Arthur J. Rolnick

Slide 2

1. The Phillips Curve has not been stable.
2. Unemployment is not useful for predicting inflation.
3. In the long run, money growth is a reliable predictor of inflation.

Slide 3

The Phillips Curve: The U.S. Experience 1960-2000

Slide 4

There was a clear negative relationship in 1959-69...

Chart. A scatterplot with a trendline. The x-axis is labeled Unemployment. The y-axis is labeled Inflation. The trendline has negative slope, approximately -1.28. Approximate values for the data points are as follows.

Unemployment	Inflation
3.40	5.47
3.40	5.06
3.43	5.50
3.53	5.17
3.57	4.89
3.57	4.88
3.57	4.67
3.70	3.18
3.73	4.35
3.77	2.93
3.80	4.18

Unemployment	Inflation
3.83	4.26
3.83	3.90
3.83	2.96
3.87	3.10
3.90	4.47
4.10	3.36
4.37	3.18
4.67	2.54
4.90	2.18
4.97	2.02
5.00	1.87
5.10	1.46
5.13	1.22
5.20	1.83
5.23	1.12
5.27	1.59
5.47	1.67
5.50	1.68
5.53	1.44
5.53	1.03
5.53	1.01
5.57	1.41
5.57	0.96
5.60	1.45
5.63	1.05
5.73	1.47
5.77	1.34
5.83	1.14
6.20	1.32
6.27	1.03
6.77	1.33
6.80	1.42
7.00	1.37

Slide 5

...But it disappeared in 1970-2000...

Chart. A scatterplot with a trendline. The x-axis is labeled Unemployment. The y-axis is labeled Inflation. The trendline has positive slope, approximately 0.16. Approximate values for the data points are as follows.

Unemployment	Inflation
3.97	1.84

Unemployment	Inflation
4.00	2.22
4.03	2.26
4.07	2.31
4.10	2.40
4.17	4.95
4.23	2.37
4.27	2.00
4.30	2.23
4.43	1.39
4.43	1.50
4.53	1.36
4.63	1.31
4.67	1.13
4.77	4.92
4.77	9.96
4.80	9.11
4.87	1.23
4.93	7.34
4.93	8.00
5.00	1.16
5.13	10.46
5.17	5.11
5.20	3.56
5.20	9.55
5.23	1.39
5.23	3.72
5.23	3.95
5.27	1.88
5.30	4.12
5.33	1.83
5.33	3.52
5.33	3.69
5.37	6.76
5.37	4.07
5.47	1.97
5.47	3.54
5.47	3.96
5.50	2.06
5.53	1.94
5.57	1.86
5.57	5.90
5.63	2.09
5.63	8.37
5.67	1.90

Unemployment	Inflation
5.67	1.93
5.70	3.39
5.70	4.00
5.70	5.06
5.70	8.58
5.77	4.06
5.83	3.59
5.83	4.63
5.87	8.64
5.87	8.68
5.90	3.90
5.90	8.33
5.93	4.30
5.93	4.59
5.97	9.26
6.00	2.08
6.00	3.62
6.00	7.93
6.03	3.86
6.03	8.31
6.13	3.06
6.20	2.22
6.27	3.21
6.30	9.60
6.33	7.58
6.57	2.25
6.60	2.67
6.60	2.93
6.60	7.20
6.63	2.04
6.67	7.17
6.80	2.14
6.83	2.51
6.83	3.17
6.87	2.18
6.90	7.19
6.97	3.04
7.03	2.15
7.03	2.67
7.07	1.99
7.10	2.27
7.13	2.08
7.13	6.66
7.17	2.92

Unemployment	Inflation
7.20	2.22
7.23	2.28
7.30	2.09
7.30	2.93
7.33	9.19
7.37	2.34
7.37	2.39
7.40	5.86
7.40	6.38
7.40	8.07
7.43	2.91
7.43	3.24
7.43	6.89
7.50	6.37
7.57	6.40
7.60	2.32
7.63	2.44
7.67	8.88
7.73	6.23
7.73	5.78
7.77	6.47
7.87	3.36
8.23	5.09
8.27	6.01
8.30	5.27
8.47	5.24
8.53	3.48
8.83	4.45
8.87	5.62
9.37	3.65
9.43	4.06
9.90	3.55
10.13	3.72
10.37	3.81
10.67	3.38

Slide 6

A new Phillips Curve emerged in 1970-84...

Unemployment and *Changes* in Inflation

Chart. A scatterplot with a trendline. The x-axis is labeled Unemployment. The y-axis is labeled Changes in Inflation. The trendline has negative slope, approximately -0.69. The trendline intersects the horizontal line $y = 0$ at approximately $x = 6.72$; the intersection is labeled NAIRU,

Non-Accelerating Inflation Rate of Unemployment. Approximate values for the plotted points are as follows.

Unemployment	Changes in Inflation
4.17	-0.52
4.77	3.20
4.77	-0.58
4.80	3.21
4.93	3.28
4.93	2.94
5.13	3.12
5.17	0.23
5.20	1.55
5.37	2.46
5.57	2.04
5.63	-0.74
5.70	1.16
5.70	0.65
5.77	-0.54
5.83	-0.26
5.87	1.06
5.87	0.37
5.90	1.17
5.90	-1.02
5.93	-0.33
5.93	-0.36
5.97	0.93
6.00	1.26
6.03	1.12
6.03	-1.25
6.30	0.96
6.33	1.21
6.60	-2.76
6.67	0.70
6.90	0.96
7.13	0.27
7.33	0.61
7.40	-1.19
7.40	-2.80
7.40	-3.02
7.43	-2.70
7.50	0.58
7.57	0.78
7.67	0.20
7.73	0.98
7.73	-0.23

Unemployment	Changes in Inflation
7.77	1.20
8.23	-2.98
8.27	-4.45
8.30	-1.93
8.47	-3.13
8.53	0.10
8.83	-2.44
8.87	-3.93
9.37	0.10
9.43	-2.32
9.90	-2.31
10.13	-0.34
10.37	-0.64
10.67	-1.71

Slide 7

...But the new Phillips Curve became less visible (1984-2000)...

Chart. A scatterplot with a trendline. The x-axis is labeled Unemployment. The y-axis is labeled Changes in Inflation. The trendline has negative slope, approximately -0.17. Approximate values for the plotted points are as follows.

Unemployment	Changes in Inflation
3.97	-0.57
4.00	-0.01
4.03	0.27
4.07	-0.05
4.10	0.90
4.23	1.00
4.27	0.68
4.30	0.85
4.43	0.38
4.43	0.23
4.53	0.14
4.63	-0.08
4.67	-0.71
4.87	-0.65
5.00	-0.90
5.20	-0.43
5.23	0.41
5.23	-0.23
5.23	-0.55
5.27	-0.06

Unemployment	Changes in Inflation
5.30	0.56
5.33	-0.02
5.33	-0.03
5.33	-0.08
5.37	0.56
5.47	0.75
5.47	-0.08
5.47	-0.28
5.50	0.16
5.53	-0.03
5.57	-0.23
5.63	0.05
5.67	-0.14
5.67	-0.32
5.70	1.07
5.70	-0.56
5.83	0.42
6.00	0.58
6.00	-0.07
6.13	-1.01
6.20	0.23
6.27	0.29
6.57	0.17
6.60	0.26
6.60	-1.45
6.63	-0.36
6.80	-0.30
6.83	1.02
6.83	-1.18
6.87	-1.21
6.97	0.82
7.03	0.39
7.03	-0.78
7.07	-0.32
7.10	-0.79
7.13	-0.26
7.17	0.83
7.20	-0.69
7.23	-1.08
7.30	-0.55
7.30	-1.15
7.37	0.12
7.37	-0.33
7.43	-0.49

Unemployment	Changes in Inflation
7.43	-0.74
7.60	-0.19
7.63	0.26
7.87	-0.45

Slide 8

1. The Phillips Curve has not been stable.

Slide 9

Some economists still insist that unemployment can predict inflation.

The test: Can NAIRU-based models forecast better than a naive model?

Slide 10

The Naive Model

Inflation over the next period is predicted to be equal to inflation over the previous period

Slide 11

Title: NAIRU-based Board Staff Model has not forecasted better than the Naive Model

Series: Three alternative forecasts of CPI inflation over the next four quarters. The forecast labeled "NAIRU-based Board Staff Model" are CPI forecasts drawn from past issues of the Federal Reserve Staff's Greenbook. The forecast labeled "Philadelphia Fed Survey of Professional Forecasters" are the CPI forecasts from the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters. These historical forecasts are available at [Short-Term and Long-Term Inflation Forecasts: Survey of Professional Forecasters](#). The forecast labeled "Naive Model" is equal to CPI inflation over the previous four quarters.

Horizon: 1984:Q1 - 2000:Q2

Description: This chart provides a visual comparison of the history of these three alternative CPI inflation forecasts.

Slide 12

Evaluating Forecasting Models

- A better forecasting model has smaller average forecasting error
- The measure of success: $\frac{\text{Average Error of NAIRU Model}}{\text{Average Error of Naive Model}}$
- NAIRU wins if the the measure is less than one

Slide 13

Title: A large class of NAIRU-based models have not forecasted better than the Naive Model

Series: Ratios of Root Mean Squared Forecast Error of NAIRU-based Model to the Root Mean Squared Forecast Error of a Naive Model

Horizon: Forecasts from 1984-1999

Description: This chart summarizes results on forecasts comparisons published in Andrew Atkeson and Lee Ohanian's (2001) article "[Are Phillips Curves Useful for Forecasting Inflation \(1.00 MB PDF\)](#)" Federal Reserve Bank of Minneapolis Quarterly Review vol. 25, no. 1, Winter, pp. 2-11. The numbers plotted in this chart are the three numbers in the second column of numbers (labeled "Maximum") in the table titled "Why Use the NAIRU Phillips Curve?" in that article.

Slide 14

2. Unemployment is not useful for predicting inflation.

Slide 15

**The Quantity Theory:
International Evidence for 94 Countries
1960-1990**

Slide 16

Money growth and inflation are highly correlated over the long-term
(Approximately 25 year averages)

Chart. A scatterplot with points clustered around a dashed line with slope = 1. The x-axis is labeled Money (M2) growth (percent). The y-axis is labeled Inflation rate (percent). Approximate values for the plotted points are as follows.

Money (M2) growth (percent)	Inflation rate (percent)
7.24	3.89
7.56	4.92
8.25	4.84
8.70	3.36
9.30	4.52
9.53	7.06
9.59	3.48
10.03	3.72
10.06	7.16
10.13	6.49
10.30	6.79
10.32	4.32
10.50	5.40
10.57	10.06
10.80	5.05
10.88	6.78
10.96	6.60
11.03	8.29
11.03	4.17
11.12	4.50
11.34	9.51
11.50	6.73
11.82	8.72

Money (M2) growth (percent)	Inflation rate (percent)
11.86	6.31
12.05	5.79
12.05	6.00
12.18	5.80
12.22	8.16
12.51	7.34
12.53	5.34
12.62	5.56
12.63	7.42
12.64	8.42
12.64	9.20
12.76	7.65
12.79	3.27
12.79	9.53
12.89	7.87
12.92	7.33
12.97	6.60
13.15	4.48
13.32	8.53
13.41	8.28
13.42	8.68
13.44	5.58
13.72	8.53
13.74	3.62
13.78	7.36
13.81	7.71
13.91	7.57
13.94	5.46
14.03	8.60
14.11	8.48
14.22	7.35
14.28	9.05
14.30	8.09
14.54	8.82
14.67	7.24
14.84	10.22
15.00	9.50
15.46	11.17
15.73	12.89
15.84	6.71
15.95	9.82
15.99	12.18
16.05	5.28
16.05	8.66

Money (M2) growth (percent)	Inflation rate (percent)
16.08	12.31
16.12	10.03
16.42	10.94
16.69	14.64
16.76	8.20
16.83	8.55
16.96	12.60
16.97	8.21
17.02	10.62
17.14	9.49
17.32	9.82
17.57	12.53
17.88	11.38
18.07	12.70
18.10	11.88
18.27	10.93
18.46	4.75
18.94	17.66
19.60	10.15
19.76	8.21
20.24	12.22
20.76	13.70
20.83	11.72
21.41	15.75
21.56	10.43
22.25	17.31
24.80	24.98
25.12	10.70
26.25	28.49
27.55	22.80
29.63	22.88
29.64	22.69
31.42	13.40
37.40	35.40
38.09	30.38
40.48	17.02
41.62	34.13
45.61	35.37
47.72	45.02
47.92	52.36
48.52	54.10
52.44	42.26
82.03	80.76

Slide 17

3. In the long run, money growth is a reliable predictor of inflation.

Appendix 3: Materials used by Mr. Roberts and Mr. Lebow

Material for Board Staff Presentation on Explaining Low Inflation Since the Mid-1990s

Division of Research and Statistics

June 25, 2002

Exhibit 1

Overview

Top-left panel

Unemployment Rate

Percent

	Unemployment Rate
1990:Q1	5.3000
1990:Q2	5.3000
1990:Q3	5.7000
1990:Q4	6.1000
1991:Q1	6.6000
1991:Q2	6.8000
1991:Q3	6.9000
1991:Q4	7.1000
1992:Q1	7.4000
1992:Q2	7.6000
1992:Q3	7.6000
1992:Q4	7.4000
1993:Q1	7.2000
1993:Q2	7.1000
1993:Q3	6.8000
1993:Q4	6.6000
1994:Q1	6.6000
1994:Q2	6.2000
1994:Q3	6.0000
1994:Q4	5.6000
1995:Q1	5.5000
1995:Q2	5.7000
1995:Q3	5.7000
1995:Q4	5.6000
1996:Q1	5.5000
1996:Q2	5.5000

	Unemployment Rate
1996:Q3	5.3000
1996:Q4	5.3000
1997:Q1	5.2000
1997:Q2	5.0000
1997:Q3	4.9000
1997:Q4	4.7000
1998:Q1	4.6000
1998:Q2	4.4000
1998:Q3	4.5000
1998:Q4	4.4000
1999:Q1	4.3000
1999:Q2	4.3000
1999:Q3	4.2000
1999:Q4	4.1000
2000:Q1	4.0000
2000:Q2	4.0000
2000:Q3	4.1000
2000:Q4	4.0000
2001:Q1	4.2000
2001:Q2	4.5000
2001:Q3	4.8000
2001:Q4	5.6000
2002:Q1	5.6000

Top-right panel
Core PCE Prices

Four-quarter percent change

	Core PCE Prices
1990:Q1	3.8015
1990:Q2	4.2535
1990:Q3	4.6284
1990:Q4	4.5030
1991:Q1	4.6172
1991:Q2	4.1654
1991:Q3	3.9470
1991:Q4	3.9242
1992:Q1	3.9421
1992:Q2	3.8302
1992:Q3	3.4369
1992:Q4	3.2873
1993:Q1	2.7916
1993:Q2	2.7340
1993:Q3	2.6566

	Core PCE Prices
1993:Q4	2.3997
1994:Q1	2.1197
1994:Q2	2.0555
1994:Q3	2.3858
1994:Q4	2.2673
1995:Q1	2.5889
1995:Q2	2.5271
1995:Q3	2.2762
1995:Q4	2.2739
1996:Q1	2.0387
1996:Q2	1.8695
1996:Q3	1.7390
1996:Q4	1.8341
1997:Q1	1.9658
1997:Q2	2.1088
1997:Q3	1.9768
1997:Q4	1.7276
1998:Q1	1.5449
1998:Q2	1.3899
1998:Q3	1.5214
1998:Q4	1.5763
1999:Q1	1.5253
1999:Q2	1.4174
1999:Q3	1.4089
1999:Q4	1.4845
2000:Q1	1.8451
2000:Q2	1.9684
2000:Q3	1.9913
2000:Q4	1.9258
2001:Q1	1.8531
2001:Q2	1.5868
2001:Q3	1.2942
2001:Q4	1.5996
2002:Q1	1.1992

Middle panel

Questions

- Have changes been occurring in the economy, over time, that have altered the inflation process?
- Why did inflation remain so low in the late 1990s when unemployment was also low?
- Can the recent good performance be repeated in coming years?

Bottom panel

Three key factors

1. <i>Changes in monetary policy</i>	A relatively small part of the recent story.
2. <i>The pickup of productivity growth</i>	Our main explanation for the late 1990s; effects should diminish over time.
3. <i>Labor market developments</i>	Also important; effects likely to persist.

Exhibit 2

The FRB/US Model of Inflation Dynamics

Top panel

- $\pi_t = \beta\pi_{t-1} + (1-\beta)\pi_t^e - \gamma(U_t - U^n) + \text{relative price shocks} + \text{unit labor costs}$
 - π = rate of price inflation
 - π^e = expected rate of price inflation
 - U = unemployment rate
 - U^n = natural rate of unemployment
 - β, γ = coefficients
- π^e reflects knowledge of the structure of the economy, including the conduct of monetary policy.
- How do our factors fit in this model?
 - Changes in the conduct of monetary policy alter the influence of U on π^e .
 - Changes in labor productivity growth affect inflation through unit labor costs.
 - Labor market developments shift U^n
- Movements of $(U - U^n)$ explain about 20 percent of the variation of year-to-year changes in inflation.

Exhibit 3

Monetary Policy

Top panel

Change in Core PCE Inflation vs. Unemployment

Top-left and top-right panels

Each panel presents a scatter plot with the four-quarter moving average of the unemployment rate plotted along the horizontal axis and the four-quarter change in the four-quarter percent change in the price index for personal consumption expenditures other than food and energy plotted along the vertical axis. In addition, each panel presents a regression line based on an OLS regression where the plotted change in inflation is the variable to be explained and the moving average of the unemployment rate is the explanatory variable. The panel on the left covers the period 1960 to 1983; the panel on the right, 1984 to 2001. The slope of the regression line in the earlier period (plotted on the left) is less than that for the latter period (plotted on the right). The plotted data points broadly follow this pattern. However, the data are much more dispersed around the regression line in the earlier period. In particular, the data on the change in inflation covers nearly the entire plotted vertical range (from -4 to +5), whereas the range of the data in the plot to the right is considerably narrower, running from -2 to +1.

Bottom panel

- Since the early 1980s, monetary policy has moved more aggressively to stabilize the economy than in the 1960s and 1970s.
- In FRB/US, such a change reduces the sensitivity of inflation to unemployment.
 - Attars the formation of inflation expectations.
 - Low unemployment is no longer as strong a signal of higher future inflation.
 - Sensitivity reduced by about a third.
- So, low unemployment in the late 1990s induced less deterioration in inflation expectations. and thus in actual inflation.
- But policymakers cannot "exploit" this lower sensitivity.
 - A reversion to a less-aggressive policy would alter how expectations are formed.

Exhibit 4 Productivity

Top panel

- Hourly compensation responds only gradually when productivity accelerates.
 - Costs of acquiring and processing information.
- Unit labor costs rise less rapidly, helping hold down inflation.
 - A lower unemployment rate is consistent with stable inflation.
- Effect may be long-lived but not permanent.
- Effect worked in the opposite direction in the 1970s.

Middle panel

Estimated Effect of Productivity on Hourly Compensation

Estimated effect of productivity on hourly compensation. The period covered is from 1963 to early 2002, and the data are in percent. The panel presents two series. The staff estimate of structural productivity growth fluctuates between 2½ percent and 3½ percent from 1963 through 1973, moves down to around 1 to 1½ percent from 1974 through 1992, and then gradually rises to greater than 3 percent in 1999 and 2000 before falling back to 2½ percent in 2001 and early 2002. The second series is an estimate of the contribution of this structural productivity series to the growth in hourly compensation and looks like a smoothed and somewhat lagged version of the productivity series: It declines gradually from 3 percent in the mid-1960s to about 1½ percent by 1983, remains near that level until 1994, and then moves up gradually to 2½ percent by 2000.

Bottom-left panel

Estimated Effect on the Stable-Inflation Unemployment Rate

The panel presents the estimated effect of productivity growth on the stable-inflation unemployment rate, along with a 70 percent confidence interval around that estimate. The period covered is from 1963 to early 2002, and the data are in percentage points. The estimated effect moves up from zero in 1973 to 1 percent by 1976; gradually moves back down to zero by about 1984 and stays around zero through 1993; declines and reaches below -1 percent from 1998 to 2000; and then moves back to zero by late 2001. The width of the 70 percent confidence interval varies somewhat over time but generally averages between ¼ and ½ percentage point both above and below the estimated effect.

Bottom-right panel

Caveats

- Uncertain speed of adjustment

- Results sensitive to measure of structural productivity

Exhibit 5

Labor Market Developments and the Natural Rate of Unemployment

Top panel

Impact on the Natural Rate of Unemployment In Recent Years

Lower natural rate

1. Incarceration
2. Disability insurance
3. Help supply
4. Worker insecurity
5. The Internet

Neutral effect

1. Minimum wage
2. Unemployment insurance
3. Demographics

Higher natural rate

1. Welfare reform

Middle panel

Factors pushing natural rate lower

Middle-left panel

Percent of population

	Disability insurance recipients	Help supply employment	Incarceration
1963	0.667258	NA	NA
1964	0.710555	NA	NA
1965	0.773107	NA	NA
1966	0.844952	NA	NA
1967	0.903779	NA	NA
1968	0.964295	NA	NA
1969	1.019155	NA	NA
1970	1.070478	NA	NA
1971	1.158071	NA	NA
1972	1.262241	NA	NA
1973	1.360536	NA	NA
1974	1.478687	NA	NA
1975	1.612612	NA	NA
1976	1.696862	NA	NA
1977	1.769693	NA	NA

	Disability insurance recipients	Help supply employment	Incarceration
1978	1.764301	NA	NA
1979	1.729218	NA	NA
1980	1.695018	NA	0.298603
1981	1.622275	NA	0.325329
1982	1.500636	0.240352	0.353027
1983	1.462021	0.278113	0.368489
1984	1.460142	0.361427	0.383970
1985	1.477154	0.407316	0.413793
1986	1.500769	0.460429	0.440474
1987	1.516453	0.538652	0.467424
1988	1.525161	0.606898	0.512683
1989	1.544939	0.648933	0.575744
1990	1.591275	0.680951	0.607014
1991	1.672058	0.664115	0.637959
1992	1.797255	0.731369	0.671266
1993	1.912099	0.857274	0.702649
1994	2.013420	1.025560	0.750202
1995	2.104758	1.101116	0.797344
1996	2.182683	1.171025	0.819198
1997	2.220074	1.308827	0.858702
1998	2.289237	1.426198	0.885326
1999	2.352336	1.566547	0.912645
2000	2.405310	1.664815	0.922325
2001	NA	1.455590	NA

NA not applicable [Return to table](#)

Middle-right panel

Index

	ISR employment insecurity index
1979	17.00000
1980	12.00000
1981	12.00000
1982	14.00000
1983	13.00000
1984	21.00000
1985	24.00000
1986	19.00000
1987	20.00000
1988	22.00000
1989	21.00000
1990	20.00000

	ISR employment insecurity index
1991	25.00000
1992	31.00000
1993	38.00000
1994	44.00000
1995	46.00000
1996	46.00000
1997	44.00000
1998	37.00000
1999	33.00000
2000	32.00000
2001	35.00000

Bottom-left panel

Factor pushing natural rate higher

Percent of population

	Families on welfare
1963	0.764066
1964	0.788293
1965	0.812953
1966	0.837875
1967	0.921867
1968	1.049684
1969	1.241151
1970	1.583187
1971	1.941265
1972	2.099700
1973	2.123828
1974	2.135185
1975	2.266544
1976	2.274380
1977	2.237819
1978	2.157763
1979	2.113532
1980	2.201183
1981	2.241015
1982	2.041229
1983	2.097776
1984	2.088515
1985	2.057863
1986	2.069946
1987	2.055193
1988	2.020005

	Families on welfare
1989	2.026763
1990	2.143644
1991	2.353585
1992	2.502784
1993	2.571980
1994	2.556881
1995	2.409255
1996	2.206839
1997	1.841887
1998	1.486263
1999	1.244404
2000	1.056511
2001	0.992737

Bottom-right panel

On balance:

- Demographics aside, the natural rate may be about 1/2 percentage point lower than in the mid-1980s.
- One reason we don't favor a larger number:
Errors in hourly compensation models have not been large, on average, in recent years.

Exhibit 6

Accounting for Inflation since 1995

(based on dynamic simulations of the FRB/US price-wage sector)

Top-left panel

Core PCE Inflation

Four-quarter percent change

	Actual	Simulation including all three factors	Simulation excluding all three factors
1990:Q1	3.8015	ND	ND
1990:Q2	4.2535	ND	ND
1990:Q3	4.6284	ND	ND
1990:Q4	4.5030	ND	ND
1991:Q1	4.6172	ND	ND
1991:Q2	4.1654	ND	ND
1991:Q3	3.9470	ND	ND
1991:Q4	3.9242	ND	ND
1992:Q1	3.9421	ND	ND
1992:Q2	3.8302	ND	ND
1992:Q3	3.4369	ND	ND
1992:Q4	3.2873	ND	ND
1993:Q1	2.7916	ND	ND

	Actual	Simulation including all three factors	Simulation excluding all three factors
1993:Q2	2.7340	ND	ND
1993:Q3	2.6566	ND	ND
1993:Q4	2.3997	ND	ND
1994:Q1	2.1197	ND	ND
1994:Q2	2.0555	ND	ND
1994:Q3	2.3858	ND	ND
1994:Q4	2.2673	ND	ND
1995:Q1	2.5889	2.6116	2.6285
1995:Q2	2.5271	2.5720	2.6171
1995:Q3	2.2762	2.2775	2.3460
1995:Q4	2.2739	2.4443	2.5432
1996:Q1	2.0387	2.2792	2.4033
1996:Q2	1.8695	2.1515	2.3061
1996:Q3	1.7390	2.1825	2.3968
1996:Q4	1.8341	2.2801	2.5781
1997:Q1	1.9658	1.8415	2.2154
1997:Q2	2.1088	1.8207	2.2895
1997:Q3	1.9768	1.6096	2.1911
1997:Q4	1.7276	1.0356	1.7429
1998:Q1	1.5449	1.2678	2.1492
1998:Q2	1.3899	1.0107	2.0745
1998:Q3	1.5214	0.8570	2.1169
1998:Q4	1.5763	1.0709	2.4984
1999:Q1	1.5253	0.7579	2.3500
1999:Q2	1.4174	0.6955	2.4490
1999:Q3	1.4089	0.8347	2.7332
1999:Q4	1.4845	0.8087	2.8901
2000:Q1	1.8451	1.1053	3.3720
2000:Q2	1.9684	1.3002	3.7599
2000:Q3	1.9913	1.4057	4.0606
2000:Q4	1.9258	1.3837	4.1991
2001:Q1	1.8531	1.4898	4.4490
2001:Q2	1.5868	1.4713	4.5110
2001:Q3	1.2942	1.4343	4.5119
2001:Q4	1.5996	1.8079	4.8763
2002:Q1	1.1983	1.4831	4.4697

Top-right panel

Contributions to the 2002:Q1 Difference Between the Two Simulations (percent)

Productivity acceleration	63
Labor market developments	25
Change in monetary policy	12

Middle panel

The role of pricing power

- Firms appear to lack "pricing power" in the low-inflation economy.
- This perception may be a natural consequence of accelerating productivity:
 - Innovation may create winners and losers; the losers "lack pricing power."
 - A productivity acceleration causes profit share to rise and then decline.
- Greater competition -- from globalization, deregulation, and the low-inflation environment -- may also have reduced pricing power.
 - Reduced pricing power may spur firms to seek new technologies.

Bottom panel

Looking ahead

- If *monetary policy* remains aggressive, the smaller sensitivity of inflation to unemployment should continue.
- The *productivity effect* will fade, but may persist a while longer.
- *Labor market developments* should have a durable effect.

Appendix 4: Materials used by Mr. Stockton, Mr. Oliner, and Ms. Johnson

Material for Staff Presentation on the Economic Outlook

June 25, 2002

Chart 1

Forecast Overview

Top-left panel

Real GDP

(Percent change, annual rate)

	2002	
	Q1	Q2
Current	5.7	2.0
(June GB)	5.5	1.8

Top-right panel

Real GDP and Final Sales

Four-quarter percent change

	Real GDP	Real GDP-Forecast	Final Sales	Final Sales-Forecast
1997:Q1	4.43	ND	3.87	ND
1997:Q2	4.22	ND	3.47	ND

	Real GDP	Real GDP-Forecast	Final Sales	Final Sales-Forecast
1997:Q3	4.78	ND	4.78	ND
1997:Q4	4.31	ND	3.91	ND
1998:Q1	4.74	ND	4.02	ND
1998:Q2	3.82	ND	4.40	ND
1998:Q3	3.80	ND	3.55	ND
1998:Q4	4.77	ND	4.66	ND
1999:Q1	4.02	ND	4.40	ND
1999:Q2	3.89	ND	4.02	ND
1999:Q3	4.02	ND	4.38	ND
1999:Q4	4.41	ND	4.28	ND
2000:Q1	4.23	ND	4.74	ND
2000:Q2	5.22	ND	4.73	ND
2000:Q3	4.38	ND	4.26	ND
2000:Q4	2.81	ND	3.35	ND
2001:Q1	2.55	ND	3.16	ND
2001:Q2	1.22	ND	2.36	ND
2001:Q3	0.54	ND	1.64	ND
2001:Q4	0.48	ND	1.99	ND
2002:Q1	1.52	1.50	1.49	1.50
2002:Q2	ND	1.88	ND	1.47
2002:Q3	ND	3.07	ND	2.20
2002:Q4	ND	3.54	ND	2.13
2003:Q1	ND	3.16	ND	2.45
2003:Q2	ND	3.73	ND	3.14
2003:Q3	ND	3.94	ND	3.48
2003:Q4	ND	4.10	ND	3.63

ND no data [Return to table](#)

Middle-left panel Unemployment Rate

Percent

	Unemployment Rate	Forecast
1997:Q1	5.20	ND
1997:Q2	5.00	ND
1997:Q3	4.90	ND
1997:Q4	4.70	ND
1998:Q1	4.60	ND
1998:Q2	4.40	ND
1998:Q3	4.50	ND
1998:Q4	4.40	ND
1999:Q1	4.30	ND

	Unemployment Rate	Forecast
1999:Q2	4.30	ND
1999:Q3	4.20	ND
1999:Q4	4.10	ND
2000:Q1	4.00	ND
2000:Q2	4.00	ND
2000:Q3	4.10	ND
2000:Q4	4.00	ND
2001:Q1	4.20	ND
2001:Q2	4.50	ND
2001:Q3	4.80	ND
2001:Q4	5.60	ND
2002:Q1	5.60	5.60
2002:Q2	ND	5.94
2002:Q3	ND	6.02
2002:Q4	ND	5.89
2003:Q1	ND	5.86
2003:Q2	ND	5.72
2003:Q3	ND	5.58
2003:Q4	ND	5.50

Middle-right panel
Total and Core PCE Inflation

Four-quarter percent change

	Total	Total-Forecast	Core	Core-Forecast
1997:Q1	2.35	ND	1.97	ND
1997:Q2	1.99	ND	2.11	ND
1997:Q3	1.90	ND	1.98	ND
1997:Q4	1.54	ND	1.73	ND
1998:Q1	1.08	ND	1.54	ND
1998:Q2	1.04	ND	1.39	ND
1998:Q3	1.07	ND	1.52	ND
1998:Q4	1.09	ND	1.58	ND
1999:Q1	1.27	ND	1.53	ND
1999:Q2	1.53	ND	1.42	ND
1999:Q3	1.75	ND	1.41	ND
1999:Q4	2.01	ND	1.48	ND
2000:Q1	2.67	ND	1.85	ND
2000:Q2	2.69	ND	1.97	ND
2000:Q3	2.73	ND	1.99	ND
2000:Q4	2.61	ND	1.93	ND
2001:Q1	2.41	ND	1.85	ND
2001:Q2	2.22	ND	1.59	ND

	Total	Total-Forecast	Core	Core-Forecast
2001:Q3	1.56	ND	1.29	ND
2001:Q4	1.28	ND	1.60	ND
2002:Q1	0.67	0.67	1.20	1.20
2002:Q2	ND	0.96	ND	1.47
2002:Q3	ND	1.33	ND	1.71
2002:Q4	ND	1.48	ND	1.37
2003:Q1	ND	1.65	ND	1.48
2003:Q2	ND	1.36	ND	1.39
2003:Q3	ND	1.39	ND	1.37
2003:Q4	ND	1.36	ND	1.36

Bottom-left panel Staff Projection

Percent change

		Q4/Q4	
		2002	2003
Real GDP	June	3.5	4.1
	<i>(Jan.)</i>	2.7	3.6
Unemployment Rate	June	5.9	5.7
	<i>(Jan.)</i>	6.0	5.9
PCE Prices	June	1.5	1.4
	<i>(Jan.)</i>	1.3	1.2

Bottom-right panel Revision to Projection since January

Percentage points, Q4/Q4

	2002
Real GDP	.8
<i>Contributions:</i>	
Household Spending	.5
Business Fixed Investment	.4
Government	.0
Net Exports	.1
Inventories	-.2

Chart 2 Near-term Indicators

Top-left panel Manufacturing Industrial Production

(Average monthly percent change)

	Percent
2000	0.09
2001:H1	-0.58
2001:H2	-0.40
2002:Q1	0.46
Apr 2002	0.16
May 2002	0.22

Top-right panel

IP-based Days' Supply of Inventories*

Days

	3-month moving average	monthly
Jan 1997	57.14	56.97
Feb 1997	57.00	56.88
Mar 1997	56.93	56.94
Apr 1997	57.02	57.24
May 1997	56.98	56.76
Jun 1997	57.11	57.32
Jul 1997	56.88	56.57
Aug 1997	56.69	56.19
Sep 1997	56.30	56.15
Oct 1997	56.25	56.40
Nov 1997	56.15	55.91
Dec 1997	56.02	55.76
Jan 1998	55.96	56.23
Feb 1998	56.16	56.50
Mar 1998	56.36	56.35
Apr 1998	56.33	56.14
May 1998	56.16	55.99
Jun 1998	55.98	55.80
Jul 1998	56.24	56.92
Aug 1998	56.25	56.04
Sep 1998	56.39	56.21
Oct 1998	56.15	56.22
Nov 1998	56.28	56.41
Dec 1998	56.10	55.67
Jan 1999	55.99	55.90
Feb 1999	55.64	55.33
Mar 1999	55.65	55.71
Apr 1999	55.64	55.88
May 1999	55.64	55.32
Jun 1999	55.40	55.00

	3-month moving average	monthly
Jul 1999	55.24	55.41
Aug 1999	55.22	55.25
Sep 1999	55.43	55.61
Oct 1999	55.27	54.95
Nov 1999	55.30	55.34
Dec 1999	54.93	54.50
Jan 2000	54.99	55.14
Feb 2000	54.81	54.79
Mar 2000	54.83	54.57
Apr 2000	54.62	54.50
May 2000	54.38	54.08
Jun 2000	54.44	54.75
Jul 2000	54.67	55.17
Aug 2000	55.17	55.57
Sep 2000	55.12	54.61
Oct 2000	55.03	54.91
Nov 2000	55.02	55.54
Dec 2000	55.33	55.55
Jan 2001	55.56	55.59
Feb 2001	55.41	55.09
Mar 2001	55.17	54.83
Apr 2001	55.10	55.37
May 2001	55.22	55.45
Jun 2001	55.33	55.17
Jul 2001	55.30	55.27
Aug 2001	55.32	55.53
Sep 2001	55.45	55.55
Oct 2001	54.85	53.47
Nov 2001	54.46	54.38
Dec 2001	54.37	55.27
Jan 2002	54.70	54.46
Feb 2002	54.54	53.90
Mar 2002	53.95	53.49
Apr 2002	53.70	53.71
May 2002	53.60	53.59
Jun 2002	53.68	53.75

*Manufacturing [Return to text](#)

Middle-left panel
ISM New Orders Index

Diffusion Index, monthly

	Percent
--	----------------

	Percent
Jul 1997	61.30
Aug 1997	60.20
Sep 1997	55.20
Oct 1997	60.80
Nov 1997	57.10
Dec 1997	57.00
Jan 1998	57.00
Feb 1998	55.00
Mar 1998	55.20
Apr 1998	55.80
May 1998	51.50
Jun 1998	50.60
Jul 1998	52.00
Aug 1998	50.70
Sep 1998	48.50
Oct 1998	47.60
Nov 1998	47.60
Dec 1998	49.70
Jan 1999	52.00
Feb 1999	55.80
Mar 1999	56.70
Apr 1999	54.40
May 1999	58.40
Jun 1999	60.10
Jul 1999	54.40
Aug 1999	57.30
Sep 1999	62.00
Oct 1999	60.50
Nov 1999	61.60
Dec 1999	60.50
Jan 2000	60.50
Feb 2000	60.10
Mar 2000	57.00
Apr 2000	55.60
May 2000	52.30
Jun 2000	50.40
Jul 2000	50.60
Aug 2000	50.00
Sep 2000	47.80
Oct 2000	47.70
Nov 2000	47.90
Dec 2000	42.90
Jan 2001	38.20
Feb 2001	41.30

	Percent
Mar 2001	42.70
Apr 2001	45.50
May 2001	45.70
Jun 2001	47.90
Jul 2001	47.30
Aug 2001	53.10
Sep 2001	49.00
Oct 2001	38.00
Nov 2001	48.40
Dec 2001	55.50
Jan 2002	55.30
Feb 2002	62.80
Mar 2002	65.30
Apr 2002	59.00
May 2002	63.10

Middle-right panel

Private Nonfarm Payroll Employment

Average monthly change, thousands

	Change
2000	137.83
2001:H1	-76.00
2001:H2	-239.33
2002:Q1	-87.67
Apr 2002	18.00
May 2002	27.00

Bottom-left panel

Real Personal Consumption Expenditures

Real Personal Consumption Expenditures

Billions of chained (1996) dollars

	PCE
Jul 1997	5453.97
Aug 1997	5464.91
Sep 1997	5467.32
Oct 1997	5484.81
Nov 1997	5506.55
Dec 1997	5530.01
Jan 1998	5537.61
Feb 1998	5582.23
Mar 1998	5608.94

	PCE
Apr 1998	5615.96
May 1998	5671.58
Jun 1998	5692.95
Jul 1998	5689.39
Aug 1998	5711.91
Sep 1998	5739.93
Oct 1998	5759.84
Nov 1998	5777.22
Dec 1998	5816.98
Jan 1999	5809.17
Feb 1999	5853.38
Mar 1999	5899.36
Apr 1999	5924.55
May 1999	5920.16
Jun 1999	5963.63
Jul 1999	5983.48
Aug 1999	6005.16
Sep 1999	6011.44
Oct 1999	6041.67
Nov 1999	6067.75
Dec 1999	6141.44
Jan 2000	6132.95
Feb 2000	6176.01
Mar 2000	6206.17
Apr 2000	6210.10
May 2000	6230.48
Jun 2000	6238.33
Jul 2000	6262.79
Aug 2000	6286.88
Sep 2000	6326.69
Oct 2000	6324.23
Nov 2000	6339.36
Dec 2000	6359.69
Jan 2001	6381.53
Feb 2001	6383.62
Mar 2001	6400.28
Apr 2001	6410.18
May 2001	6428.77
Jun 2001	6446.31
Jul 2001	6466.16
Aug 2001	6471.93
Sep 2001	6393.42
Oct 2001	6542.42
Nov 2001	6530.64

	PCE
Dec 2001	6547.82
Jan 2002	6563.21
Feb 2002	6604.43
Mar 2002	6608.60
Apr 2002	6621.82
May 2002	6605.08

Real Personal Consumption Expenditures

Billions of chained (1996) dollars

	Quarterly average	Staff estimate
1997:Q1	5350.66	ND
1997:Q2	5375.68	ND
1997:Q3	5462.07	ND
1997:Q4	5507.13	ND
1998:Q1	5576.26	ND
1998:Q2	5660.17	ND
1998:Q3	5713.74	ND
1998:Q4	5784.68	ND
1999:Q1	5853.97	ND
1999:Q2	5936.11	ND
1999:Q3	6000.03	ND
1999:Q4	6083.62	ND
2000:Q1	6171.71	ND
2000:Q2	6226.30	ND
2000:Q3	6292.12	ND
2000:Q4	6341.09	ND
2001:Q1	6388.47	ND
2001:Q2	6428.42	ND
2001:Q3	6443.83	ND
2001:Q4	6540.29	ND
2002:Q1	6592.08	ND
2002:Q2	ND	6620.41

Bottom-right panel

Housing Starts

Millions of units, annual rate; Monthly

	Single-family	Multifamily	Total
Jul 1997	1.13	1.44	2.57
Aug 1997	1.10	1.39	2.49
Sep 1997	1.21	1.55	2.75
Oct 1997	1.13	1.52	2.65
Nov 1997	1.15	1.51	2.66

	Single-family	Multifamily	Total
Dec 1997	1.15	1.57	2.72
Jan 1998	1.23	1.53	2.75
Feb 1998	1.24	1.58	2.82
Mar 1998	1.22	1.57	2.79
Apr 1998	1.23	1.54	2.77
May 1998	1.21	1.54	2.75
Jun 1998	1.28	1.64	2.92
Jul 1998	1.30	1.70	3.00
Aug 1998	1.27	1.61	2.89
Sep 1998	1.26	1.58	2.84
Oct 1998	1.30	1.72	3.01
Nov 1998	1.38	1.66	3.04
Dec 1998	1.41	1.79	3.20
Jan 1999	1.35	1.75	3.10
Feb 1999	1.32	1.67	2.99
Mar 1999	1.35	1.71	3.06
Apr 1999	1.22	1.55	2.77
May 1999	1.31	1.61	2.92
Jun 1999	1.27	1.56	2.83
Jul 1999	1.31	1.67	2.98
Aug 1999	1.27	1.65	2.91
Sep 1999	1.29	1.64	2.92
Oct 1999	1.31	1.61	2.92
Nov 1999	1.32	1.65	2.97
Dec 1999	1.38	1.71	3.08
Jan 2000	1.27	1.64	2.90
Feb 2000	1.26	1.74	2.99
Mar 2000	1.31	1.60	2.92
Apr 2000	1.28	1.63	2.90
May 2000	1.23	1.58	2.81
Jun 2000	1.20	1.56	2.76
Jul 2000	1.14	1.46	2.61
Aug 2000	1.23	1.54	2.77
Sep 2000	1.20	1.51	2.70
Oct 2000	1.24	1.55	2.78
Nov 2000	1.21	1.55	2.76
Dec 2000	1.23	1.53	2.76
Jan 2001	1.31	1.63	2.93
Feb 2001	1.27	1.61	2.87
Mar 2001	1.22	1.60	2.82
Apr 2001	1.30	1.64	2.94
May 2001	1.28	1.60	2.89
Jun 2001	1.29	1.63	2.93
Jul 2001	1.29	1.66	2.96

	Single-family	Multifamily	Total
Aug 2001	1.27	1.56	2.84
Sep 2001	1.26	1.58	2.85
Oct 2001	1.24	1.53	2.77
Nov 2001	1.24	1.60	2.85
Dec 2001	1.29	1.58	2.88
Jan 2002	1.34	1.71	3.06
Feb 2002	1.47	1.79	3.26
Mar 2002	1.30	1.68	2.97
Apr 2002	1.27	1.55	2.82
May 2002	1.39	1.73	3.12

Chart 3 The Policy Setting

Top-left panel
Estimated Equilibrium Real Federal Funds Rate

Top-right panel
The Federal Funds Rate

Percent

	June GB - Staff	Jan. GB - Staff
2002:Q1	ND	1.75
2002:Q2	1.75	1.75
2002:Q3	1.75	1.75
2002:Q4	1.75	2.00
2003:Q1	1.90	2.25
2003:Q2	2.50	2.50
2003:Q3	3.00	2.75
2003:Q4	3.50	3.00

Percent

	Day of June GB - Market	Day of Jan. GB - Market
15-Jan-2002	ND	1.71
16-Jan-2002	ND	1.71
17-Jan-2002	ND	1.71
18-Jan-2002	ND	1.71
19-Jan-2002	ND	1.71
20-Jan-2002	ND	1.71
21-Jan-2002	ND	1.71
22-Jan-2002	ND	1.71
23-Jan-2002	ND	1.70

	Day of June GB - Market	Day of Jan. GB - Market
24-Jan-2002	ND	1.70
25-Jan-2002	ND	1.70
26-Jan-2002	ND	1.70
27-Jan-2002	ND	1.70
28-Jan-2002	ND	1.70
29-Jan-2002	ND	1.70
30-Jan-2002	ND	1.70
31-Jan-2002	ND	1.70
1-Feb-2002	ND	1.70
2-Feb-2002	ND	1.70
3-Feb-2002	ND	1.70
4-Feb-2002	ND	1.70
5-Feb-2002	ND	1.70
6-Feb-2002	ND	1.70
7-Feb-2002	ND	1.70
8-Feb-2002	ND	1.69
9-Feb-2002	ND	1.69
10-Feb-2002	ND	1.69
11-Feb-2002	ND	1.69
12-Feb-2002	ND	1.69
13-Feb-2002	ND	1.69
14-Feb-2002	ND	1.69
15-Feb-2002	ND	1.69
16-Feb-2002	ND	1.69
17-Feb-2002	ND	1.69
18-Feb-2002	ND	1.69
19-Feb-2002	ND	1.69
20-Feb-2002	ND	1.69
21-Feb-2002	ND	1.69
22-Feb-2002	ND	1.68
23-Feb-2002	ND	1.68
24-Feb-2002	ND	1.68
25-Feb-2002	ND	1.68
26-Feb-2002	ND	1.68
27-Feb-2002	ND	1.68
28-Feb-2002	ND	1.68
1-Mar-2002	ND	1.68
2-Mar-2002	ND	1.68
3-Mar-2002	ND	1.68
4-Mar-2002	ND	1.68
5-Mar-2002	ND	1.68
6-Mar-2002	ND	1.68
7-Mar-2002	ND	1.68
8-Mar-2002	ND	1.67

	Day of June GB - Market	Day of Jan. GB - Market
9-Mar-2002	ND	1.67
10-Mar-2002	ND	1.67
11-Mar-2002	ND	1.67
12-Mar-2002	ND	1.67
13-Mar-2002	ND	1.67
14-Mar-2002	ND	1.67
15-Mar-2002	ND	1.67
16-Mar-2002	ND	1.67
17-Mar-2002	ND	1.67
18-Mar-2002	ND	1.67
19-Mar-2002	ND	1.67
20-Mar-2002	ND	1.67
21-Mar-2002	ND	1.67
22-Mar-2002	ND	1.67
23-Mar-2002	ND	1.67
24-Mar-2002	ND	1.67
25-Mar-2002	ND	1.67
26-Mar-2002	ND	1.67
27-Mar-2002	ND	1.66
28-Mar-2002	ND	1.66
29-Mar-2002	ND	1.66
30-Mar-2002	ND	1.66
31-Mar-2002	ND	1.66
1-Apr-2002	ND	1.66
2-Apr-2002	ND	1.66
3-Apr-2002	ND	1.66
4-Apr-2002	ND	1.66
5-Apr-2002	ND	1.66
6-Apr-2002	ND	1.66
7-Apr-2002	ND	1.66
8-Apr-2002	ND	1.66
9-Apr-2002	ND	1.66
10-Apr-2002	ND	1.66
11-Apr-2002	ND	1.66
12-Apr-2002	ND	1.66
13-Apr-2002	ND	1.66
14-Apr-2002	ND	1.66
15-Apr-2002	ND	1.66
16-Apr-2002	ND	1.66
17-Apr-2002	ND	1.66
18-Apr-2002	ND	1.66
19-Apr-2002	ND	1.65
20-Apr-2002	ND	1.65
21-Apr-2002	ND	1.65

	Day of June GB - Market	Day of Jan. GB - Market
22-Apr-2002	ND	1.65
23-Apr-2002	ND	1.65
24-Apr-2002	ND	1.65
25-Apr-2002	ND	1.65
26-Apr-2002	ND	1.65
27-Apr-2002	ND	1.65
28-Apr-2002	ND	1.65
29-Apr-2002	ND	1.65
30-Apr-2002	ND	1.65
1-May-2002	ND	1.69
2-May-2002	ND	1.69
3-May-2002	ND	1.70
4-May-2002	ND	1.70
5-May-2002	ND	1.70
6-May-2002	ND	1.71
7-May-2002	ND	1.71
8-May-2002	ND	1.72
9-May-2002	ND	1.72
10-May-2002	ND	1.72
11-May-2002	ND	1.73
12-May-2002	ND	1.73
13-May-2002	ND	1.73
14-May-2002	ND	1.74
15-May-2002	ND	1.74
16-May-2002	ND	1.74
17-May-2002	ND	1.75
18-May-2002	ND	1.75
19-May-2002	ND	1.75
20-May-2002	ND	1.76
21-May-2002	ND	1.76
22-May-2002	ND	1.77
23-May-2002	ND	1.77
24-May-2002	ND	1.77
25-May-2002	ND	1.78
26-May-2002	ND	1.78
27-May-2002	ND	1.78
28-May-2002	ND	1.79
29-May-2002	ND	1.79
30-May-2002	ND	1.79
31-May-2002	ND	1.80
1-Jun-2002	ND	1.80
2-Jun-2002	ND	1.80
3-Jun-2002	ND	1.81
4-Jun-2002	ND	1.81

	Day of June GB - Market	Day of Jan. GB - Market
5-Jun-2002	ND	1.82
6-Jun-2002	ND	1.82
7-Jun-2002	ND	1.82
8-Jun-2002	ND	1.83
9-Jun-2002	ND	1.83
10-Jun-2002	ND	1.83
11-Jun-2002	ND	1.84
12-Jun-2002	ND	1.84
13-Jun-2002	ND	1.84
14-Jun-2002	ND	1.85
15-Jun-2002	ND	1.85
16-Jun-2002	ND	1.86
17-Jun-2002	1.76	1.86
18-Jun-2002	ND	1.86
19-Jun-2002	ND	1.87
20-Jun-2002	ND	1.87
21-Jun-2002	ND	1.87
22-Jun-2002	ND	1.88
23-Jun-2002	ND	1.88
24-Jun-2002	ND	1.88
25-Jun-2002	ND	1.89
26-Jun-2002	ND	1.89
27-Jun-2002	ND	1.89
28-Jun-2002	ND	1.90
29-Jun-2002	ND	1.90
30-Jun-2002	ND	1.91
1-Jul-2002	ND	1.91
2-Jul-2002	ND	1.91
3-Jul-2002	ND	1.92
4-Jul-2002	ND	1.92
5-Jul-2002	ND	1.92
6-Jul-2002	ND	1.93
7-Jul-2002	ND	1.93
8-Jul-2002	ND	1.93
9-Jul-2002	ND	1.94
10-Jul-2002	ND	1.94
11-Jul-2002	ND	1.94
12-Jul-2002	ND	1.95
13-Jul-2002	0.58	1.95
14-Jul-2002	0.58	1.96
15-Jul-2002	0.58	1.96
16-Jul-2002	ND	1.96
17-Jul-2002	ND	1.97
18-Jul-2002	ND	1.97

	Day of June GB - Market	Day of Jan. GB - Market
19-Jul-2002	ND	1.97
20-Jul-2002	ND	1.98
21-Jul-2002	ND	1.98
22-Jul-2002	ND	1.98
23-Jul-2002	ND	1.99
24-Jul-2002	ND	1.99
25-Jul-2002	ND	1.99
26-Jul-2002	ND	2.00
27-Jul-2002	ND	2.00
28-Jul-2002	ND	2.01
29-Jul-2002	ND	2.01
30-Jul-2002	ND	2.01
31-Jul-2002	ND	2.02
1-Aug-2002	ND	2.02
2-Aug-2002	ND	2.03
3-Aug-2002	ND	2.03
4-Aug-2002	ND	2.04
5-Aug-2002	ND	2.04
6-Aug-2002	ND	2.05
7-Aug-2002	ND	2.05
8-Aug-2002	ND	2.06
9-Aug-2002	ND	2.06
10-Aug-2002	ND	2.07
11-Aug-2002	ND	2.07
12-Aug-2002	ND	2.08
13-Aug-2002	ND	2.08
14-Aug-2002	ND	2.09
15-Aug-2002	1.75	2.09
16-Aug-2002	ND	2.10
17-Aug-2002	ND	2.10
18-Aug-2002	ND	2.11
19-Aug-2002	ND	2.11
20-Aug-2002	ND	2.12
21-Aug-2002	ND	2.12
22-Aug-2002	ND	2.13
23-Aug-2002	ND	2.13
24-Aug-2002	ND	2.14
25-Aug-2002	ND	2.15
26-Aug-2002	ND	2.15
27-Aug-2002	ND	2.16
28-Aug-2002	ND	2.16
29-Aug-2002	ND	2.17
30-Aug-2002	ND	2.17
31-Aug-2002	ND	2.18

	Day of June GB - Market	Day of Jan. GB - Market
1-Sep-2002	ND	2.18
2-Sep-2002	ND	2.19
3-Sep-2002	ND	2.19
4-Sep-2002	ND	2.20
5-Sep-2002	ND	2.20
6-Sep-2002	ND	2.21
7-Sep-2002	ND	2.21
8-Sep-2002	ND	2.22
9-Sep-2002	ND	2.22
10-Sep-2002	ND	2.23
11-Sep-2002	ND	2.23
12-Sep-2002	ND	2.24
13-Sep-2002	ND	2.24
14-Sep-2002	ND	2.25
15-Sep-2002	ND	2.25
16-Sep-2002	ND	2.26
17-Sep-2002	ND	2.27
18-Sep-2002	ND	2.27
19-Sep-2002	ND	2.28
20-Sep-2002	ND	2.28
21-Sep-2002	ND	2.29
22-Sep-2002	ND	2.29
23-Sep-2002	ND	2.30
24-Sep-2002	ND	2.30
25-Sep-2002	ND	2.31
26-Sep-2002	ND	2.31
27-Sep-2002	ND	2.32
28-Sep-2002	ND	2.32
29-Sep-2002	ND	2.33
30-Sep-2002	ND	2.33
1-Oct-2002	ND	2.34
2-Oct-2002	ND	2.34
3-Oct-2002	ND	2.35
4-Oct-2002	ND	2.35
5-Oct-2002	ND	2.36
6-Oct-2002	ND	2.36
7-Oct-2002	ND	2.37
8-Oct-2002	ND	2.37
9-Oct-2002	ND	2.38
10-Oct-2002	ND	2.39
11-Oct-2002	ND	2.39
12-Oct-2002	ND	2.40
13-Oct-2002	ND	2.40
14-Oct-2002	ND	2.41

	Day of June GB - Market	Day of Jan. GB - Market
15-Oct-2002	ND	2.41
16-Oct-2002	ND	2.42
17-Oct-2002	ND	2.42
18-Oct-2002	ND	2.43
19-Oct-2002	ND	2.43
20-Oct-2002	ND	2.44
21-Oct-2002	ND	2.44
22-Oct-2002	ND	2.45
23-Oct-2002	ND	2.45
24-Oct-2002	ND	2.46
25-Oct-2002	ND	2.46
26-Oct-2002	ND	2.47
27-Oct-2002	ND	2.47
28-Oct-2002	ND	2.48
29-Oct-2002	ND	2.48
30-Oct-2002	ND	2.49
31-Oct-2002	ND	2.49
1-Nov-2002	1.85	2.50
2-Nov-2002	ND	2.51
3-Nov-2002	ND	2.51
4-Nov-2002	ND	2.52
5-Nov-2002	ND	2.52
6-Nov-2002	ND	2.53
7-Nov-2002	ND	2.53
8-Nov-2002	ND	2.54
9-Nov-2002	ND	2.54
10-Nov-2002	ND	2.55
11-Nov-2002	ND	2.55
12-Nov-2002	ND	2.56
13-Nov-2002	ND	2.56
14-Nov-2002	ND	2.57
15-Nov-2002	ND	2.57
16-Nov-2002	ND	2.58
17-Nov-2002	ND	2.58
18-Nov-2002	ND	2.59
19-Nov-2002	ND	2.59
20-Nov-2002	ND	2.60
21-Nov-2002	ND	2.60
22-Nov-2002	ND	2.61
23-Nov-2002	ND	2.61
24-Nov-2002	ND	2.62
25-Nov-2002	ND	2.62
26-Nov-2002	ND	2.63
27-Nov-2002	ND	2.63

	Day of June GB - Market	Day of Jan. GB - Market
28-Nov-2002	ND	2.64
29-Nov-2002	ND	2.64
30-Nov-2002	ND	2.65
1-Dec-2002	ND	2.65
2-Dec-2002	ND	2.66
3-Dec-2002	ND	2.66
4-Dec-2002	ND	2.67
5-Dec-2002	ND	2.67
6-Dec-2002	ND	2.68
7-Dec-2002	ND	2.68
8-Dec-2002	ND	2.69
9-Dec-2002	ND	2.69
10-Dec-2002	ND	2.70
11-Dec-2002	ND	2.70
12-Dec-2002	ND	2.71
13-Dec-2002	ND	2.71
14-Dec-2002	ND	2.72
15-Dec-2002	ND	2.72
16-Dec-2002	ND	2.73
17-Dec-2002	ND	2.74
18-Dec-2002	ND	2.74
19-Dec-2002	ND	2.75
20-Dec-2002	ND	2.75
21-Dec-2002	ND	2.76
22-Dec-2002	ND	2.76
23-Dec-2002	ND	2.77
24-Dec-2002	ND	2.77
25-Dec-2002	ND	2.78
26-Dec-2002	ND	2.78
27-Dec-2002	ND	2.79
28-Dec-2002	ND	2.79
29-Dec-2002	ND	2.80
30-Dec-2002	ND	2.80
31-Dec-2002	ND	2.81
1-Jan-2003	ND	2.81
2-Jan-2003	ND	2.82
3-Jan-2003	ND	2.82
4-Jan-2003	ND	2.83
5-Jan-2003	ND	2.83
6-Jan-2003	ND	2.84
7-Jan-2003	ND	2.84
8-Jan-2003	ND	2.85
9-Jan-2003	ND	2.85
10-Jan-2003	ND	2.86

	Day of June GB - Market	Day of Jan. GB - Market
11-Jan-2003	ND	2.86
12-Jan-2003	ND	2.87
13-Jan-2003	ND	2.87
14-Jan-2003	ND	2.88
15-Jan-2003	ND	2.88
16-Jan-2003	ND	2.89
17-Jan-2003	ND	2.89
18-Jan-2003	ND	2.90
19-Jan-2003	ND	2.90
20-Jan-2003	ND	2.91
21-Jan-2003	ND	2.91
22-Jan-2003	ND	2.92
23-Jan-2003	ND	2.92
24-Jan-2003	ND	2.93
25-Jan-2003	ND	2.93
26-Jan-2003	ND	2.94
27-Jan-2003	ND	2.94
28-Jan-2003	ND	2.95
29-Jan-2003	ND	2.95
30-Jan-2003	ND	2.96
31-Jan-2003	ND	2.97
1-Feb-2003	0.70	2.97
2-Feb-2003	0.70	2.98
3-Feb-2003	0.70	2.99
4-Feb-2003	ND	2.99
5-Feb-2003	ND	3.00
6-Feb-2003	ND	3.01
7-Feb-2003	ND	3.02
8-Feb-2003	ND	3.02
9-Feb-2003	ND	3.03
10-Feb-2003	ND	3.04
11-Feb-2003	ND	3.05
12-Feb-2003	ND	3.05
13-Feb-2003	ND	3.06
14-Feb-2003	ND	3.07
15-Feb-2003	ND	3.08
16-Feb-2003	ND	3.08
17-Feb-2003	ND	3.09
18-Feb-2003	ND	3.10
19-Feb-2003	ND	3.11
20-Feb-2003	ND	3.11
21-Feb-2003	ND	3.12
22-Feb-2003	ND	3.13
23-Feb-2003	ND	3.14

	Day of June GB - Market	Day of Jan. GB - Market
24-Feb-2003	ND	3.14
25-Feb-2003	ND	3.15
26-Feb-2003	ND	3.16
27-Feb-2003	ND	3.17
28-Feb-2003	ND	3.17
1-Mar-2003	ND	3.18
2-Mar-2003	ND	3.19
3-Mar-2003	ND	3.20
4-Mar-2003	ND	3.20
5-Mar-2003	ND	3.21
6-Mar-2003	ND	3.22
7-Mar-2003	ND	3.23
8-Mar-2003	ND	3.23
9-Mar-2003	ND	3.24
10-Mar-2003	ND	3.25
11-Mar-2003	ND	3.26
12-Mar-2003	ND	3.26
13-Mar-2003	ND	3.27
14-Mar-2003	ND	3.28
15-Mar-2003	ND	3.29
16-Mar-2003	ND	3.29
17-Mar-2003	ND	3.30
18-Mar-2003	ND	3.31
19-Mar-2003	ND	3.32
20-Mar-2003	ND	3.32
21-Mar-2003	ND	3.33
22-Mar-2003	ND	3.34
23-Mar-2003	ND	3.35
24-Mar-2003	ND	3.35
25-Mar-2003	ND	3.36
26-Mar-2003	ND	3.37
27-Mar-2003	ND	3.38
28-Mar-2003	ND	3.38
29-Mar-2003	ND	3.39
30-Mar-2003	ND	3.40
31-Mar-2003	ND	3.41
1-Apr-2003	ND	3.41
2-Apr-2003	ND	3.42
3-Apr-2003	ND	3.43
4-Apr-2003	ND	3.44
5-Apr-2003	ND	3.44
6-Apr-2003	ND	3.45
7-Apr-2003	ND	3.46
8-Apr-2003	ND	3.47

	Day of June GB - Market	Day of Jan. GB - Market
9-Apr-2003	ND	3.47
10-Apr-2003	ND	3.48
11-Apr-2003	ND	3.49
12-Apr-2003	ND	3.50
13-Apr-2003	ND	3.50
14-Apr-2003	ND	3.51
15-Apr-2003	ND	3.52
16-Apr-2003	ND	3.53
17-Apr-2003	ND	3.53
18-Apr-2003	ND	3.54
19-Apr-2003	ND	3.55
20-Apr-2003	ND	3.56
21-Apr-2003	ND	3.56
22-Apr-2003	ND	3.57
23-Apr-2003	ND	3.58
24-Apr-2003	ND	3.59
25-Apr-2003	ND	3.59
26-Apr-2003	ND	3.60
27-Apr-2003	ND	3.61
28-Apr-2003	ND	3.62
29-Apr-2003	ND	3.62
30-Apr-2003	ND	3.63
1-May-2003	2.67	3.64
2-May-2003	ND	3.65
3-May-2003	ND	3.65
4-May-2003	ND	3.66
5-May-2003	ND	3.66
6-May-2003	ND	3.67
7-May-2003	ND	3.67
8-May-2003	ND	3.68
9-May-2003	ND	3.69
10-May-2003	ND	3.69
11-May-2003	ND	3.70
12-May-2003	ND	3.70
13-May-2003	ND	3.71
14-May-2003	ND	3.71
15-May-2003	ND	3.72
16-May-2003	ND	3.73
17-May-2003	ND	3.73
18-May-2003	ND	3.74
19-May-2003	ND	3.74
20-May-2003	ND	3.75
21-May-2003	ND	3.76
22-May-2003	ND	3.76

	Day of June GB - Market	Day of Jan. GB - Market
23-May-2003	ND	3.77
24-May-2003	ND	3.77
25-May-2003	ND	3.78
26-May-2003	ND	3.78
27-May-2003	ND	3.79
28-May-2003	ND	3.80
29-May-2003	ND	3.80
30-May-2003	ND	3.81
31-May-2003	ND	3.81
1-Jun-2003	ND	3.82
2-Jun-2003	ND	3.82
3-Jun-2003	ND	3.83
4-Jun-2003	ND	3.84
5-Jun-2003	ND	3.84
6-Jun-2003	ND	3.85
7-Jun-2003	ND	3.85
8-Jun-2003	ND	3.86
9-Jun-2003	ND	3.86
10-Jun-2003	ND	3.87
11-Jun-2003	ND	3.88
12-Jun-2003	ND	3.88
13-Jun-2003	ND	3.89
14-Jun-2003	ND	3.89
15-Jun-2003	ND	3.90
16-Jun-2003	ND	3.91
17-Jun-2003	ND	3.91
18-Jun-2003	ND	3.92
19-Jun-2003	ND	3.92
20-Jun-2003	ND	3.93
21-Jun-2003	ND	3.93
22-Jun-2003	ND	3.94
23-Jun-2003	ND	3.95
24-Jun-2003	ND	3.95
25-Jun-2003	ND	3.96
26-Jun-2003	ND	3.96
27-Jun-2003	ND	3.97
28-Jun-2003	ND	3.97
29-Jun-2003	ND	3.98
30-Jun-2003	ND	3.99
1-Jul-2003	ND	3.99
2-Jul-2003	ND	4.00
3-Jul-2003	ND	4.00
4-Jul-2003	ND	4.01
5-Jul-2003	ND	4.01

	Day of June GB - Market	Day of Jan. GB - Market
6-Jul-2003	ND	4.02
7-Jul-2003	ND	4.03
8-Jul-2003	ND	4.03
9-Jul-2003	ND	4.04
10-Jul-2003	ND	4.04
11-Jul-2003	ND	4.05
12-Jul-2003	ND	4.05
13-Jul-2003	ND	4.06
14-Jul-2003	ND	4.07
15-Jul-2003	ND	4.07
16-Jul-2003	ND	4.08
17-Jul-2003	ND	4.08
18-Jul-2003	ND	4.09
19-Jul-2003	ND	4.10
20-Jul-2003	ND	4.10
21-Jul-2003	ND	4.11
22-Jul-2003	ND	4.11
23-Jul-2003	ND	4.12
24-Jul-2003	ND	4.12
25-Jul-2003	ND	4.13
26-Jul-2003	ND	4.14
27-Jul-2003	ND	4.14
28-Jul-2003	ND	4.15
29-Jul-2003	ND	4.15
30-Jul-2003	ND	4.16
31-Jul-2003	ND	4.16
1-Aug-2003	3.23	4.17
2-Aug-2003	ND	4.17
3-Aug-2003	ND	4.18
4-Aug-2003	ND	4.18
5-Aug-2003	ND	4.19
6-Aug-2003	ND	4.19
7-Aug-2003	ND	4.20
8-Aug-2003	ND	4.20
9-Aug-2003	ND	4.20
10-Aug-2003	ND	4.21
11-Aug-2003	ND	4.21
12-Aug-2003	ND	4.22
13-Aug-2003	ND	4.22
14-Aug-2003	ND	4.23
15-Aug-2003	ND	4.23
16-Aug-2003	ND	4.23
17-Aug-2003	ND	4.24
18-Aug-2003	ND	4.24

	Day of June GB - Market	Day of Jan. GB - Market
19-Aug-2003	ND	4.25
20-Aug-2003	ND	4.25
21-Aug-2003	ND	4.25
22-Aug-2003	ND	4.26
23-Aug-2003	ND	4.26
24-Aug-2003	ND	4.27
25-Aug-2003	ND	4.27
26-Aug-2003	ND	4.28
27-Aug-2003	ND	4.28
28-Aug-2003	ND	4.28
29-Aug-2003	ND	4.29
30-Aug-2003	ND	4.29
31-Aug-2003	ND	4.30
1-Sep-2003	ND	4.30
2-Sep-2003	ND	4.31
3-Sep-2003	ND	4.31
4-Sep-2003	ND	4.31
5-Sep-2003	ND	4.32
6-Sep-2003	ND	4.32
7-Sep-2003	ND	4.33
8-Sep-2003	ND	4.33
9-Sep-2003	ND	4.34
10-Sep-2003	ND	4.34
11-Sep-2003	ND	4.34
12-Sep-2003	ND	4.35
13-Sep-2003	ND	4.35
14-Sep-2003	ND	4.36
15-Sep-2003	ND	4.36
16-Sep-2003	ND	4.36
17-Sep-2003	ND	4.37
18-Sep-2003	ND	4.37
19-Sep-2003	ND	4.38
20-Sep-2003	ND	4.38
21-Sep-2003	ND	4.39
22-Sep-2003	ND	4.39
23-Sep-2003	ND	4.39
24-Sep-2003	ND	4.40
25-Sep-2003	ND	4.40
26-Sep-2003	ND	4.41
27-Sep-2003	ND	4.41
28-Sep-2003	ND	4.42
29-Sep-2003	ND	4.42
30-Sep-2003	ND	4.42
1-Oct-2003	ND	4.43

	Day of June GB - Market	Day of Jan. GB - Market
2-Oct-2003	ND	4.43
3-Oct-2003	ND	4.44
4-Oct-2003	ND	4.44
5-Oct-2003	ND	4.45
6-Oct-2003	ND	4.45
7-Oct-2003	ND	4.45
8-Oct-2003	ND	4.46
9-Oct-2003	ND	4.46
10-Oct-2003	ND	4.47
11-Oct-2003	ND	4.47
12-Oct-2003	ND	4.48
13-Oct-2003	ND	4.48
14-Oct-2003	ND	4.48
15-Oct-2003	ND	4.49
16-Oct-2003	ND	4.49
17-Oct-2003	ND	4.50
18-Oct-2003	ND	4.50
19-Oct-2003	ND	4.50
20-Oct-2003	ND	4.51
21-Oct-2003	ND	4.51
22-Oct-2003	ND	4.52
23-Oct-2003	ND	4.52
24-Oct-2003	ND	4.53
25-Oct-2003	ND	4.53
26-Oct-2003	ND	4.53
27-Oct-2003	ND	4.54
28-Oct-2003	ND	4.54
29-Oct-2003	ND	4.55
30-Oct-2003	ND	4.55
31-Oct-2003	ND	4.56
1-Nov-2003	1.23	4.56
2-Nov-2003	1.23	4.56
3-Nov-2003	1.23	4.57
4-Nov-2003	ND	4.57
5-Nov-2003	ND	4.57
6-Nov-2003	ND	4.57
7-Nov-2003	ND	4.58
8-Nov-2003	ND	4.58
9-Nov-2003	ND	4.58
10-Nov-2003	ND	4.58
11-Nov-2003	ND	4.59
12-Nov-2003	ND	4.59
13-Nov-2003	ND	4.59
14-Nov-2003	ND	4.59

	Day of June GB - Market	Day of Jan. GB - Market
15-Nov-2003	ND	4.60
16-Nov-2003	ND	4.60
17-Nov-2003	ND	4.60
18-Nov-2003	ND	4.60
19-Nov-2003	ND	4.61
20-Nov-2003	ND	4.61
21-Nov-2003	ND	4.61
22-Nov-2003	ND	4.61
23-Nov-2003	ND	4.62
24-Nov-2003	ND	4.62
25-Nov-2003	ND	4.62
26-Nov-2003	ND	4.62
27-Nov-2003	ND	4.63
28-Nov-2003	ND	4.63
29-Nov-2003	ND	4.63
30-Nov-2003	ND	4.63
1-Dec-2003	ND	4.64
2-Dec-2003	ND	4.64
3-Dec-2003	ND	4.64
4-Dec-2003	ND	4.64
5-Dec-2003	ND	4.65
6-Dec-2003	ND	4.65
7-Dec-2003	ND	4.65
8-Dec-2003	ND	4.65
9-Dec-2003	ND	4.66
10-Dec-2003	ND	4.66
11-Dec-2003	ND	4.66
12-Dec-2003	ND	4.66
13-Dec-2003	ND	4.67
14-Dec-2003	ND	4.67
15-Dec-2003	ND	4.67
16-Dec-2003	ND	4.67

Middle-left panel
Wilshire 5000

Index; Quarterly

	Wilshire 5000	June GB
1998:Q1	9714.90	ND
1998:Q2	10529.21	ND
1998:Q3	10033.62	ND
1998:Q4	10231.39	ND
1999:Q1	11499.40	ND

	Wilshire 5000	June GB
1999:Q2	12145.75	ND
1999:Q3	12315.33	ND
1999:Q4	12756.19	ND
2000:Q1	13740.99	ND
2000:Q2	13373.21	ND
2000:Q3	13843.37	ND
2000:Q4	12607.99	ND
2001:Q1	11649.39	ND
2001:Q2	11415.97	ND
2001:Q3	10600.34	ND
2001:Q4	10349.82	ND
2002:Q1	10604.51	10575.00
2002:Q2	10150.00	10150.00
2002:Q3	ND	9700.00
2002:Q4	ND	9700.00
2003:Q1	ND	9850.00
2003:Q2	ND	10050.00
2003:Q3	ND	10250.00
2003:Q4	ND	10400.00

Middle-right panel

Exchange Value of the U.S. Dollar

Index, 1996=100

	Broad; quarterly	June GB
1998:Q1	114.15	ND
1998:Q2	114.01	ND
1998:Q3	116.80	ND
1998:Q4	112.42	ND
1999:Q1	113.30	ND
1999:Q2	114.16	ND
1999:Q3	113.67	ND
1999:Q4	112.82	ND
2000:Q1	114.00	ND
2000:Q2	116.64	ND
2000:Q3	117.88	ND
2000:Q4	120.96	ND
2001:Q1	122.52	ND
2001:Q2	124.97	ND
2001:Q3	124.40	ND
2001:Q4	125.12	ND
2002:Q1	127.15	ND
2002:Q2	125.42	125.42

	Broad; quarterly	June GB
2002:Q3	ND	123.98
2002:Q4	ND	123.33
2003:Q1	ND	122.80
2003:Q2	ND	122.38
2003:Q3	ND	121.96
2003:Q4	ND	121.56

Bottom-left panel

Fiscal Impetus

Percent of GDP; Annual

	Fiscal impetus	Forecast
1970	0.02	ND
1971	-0.25	ND
1972	1.00	ND
1973	-0.61	ND
1974	-0.06	ND
1975	0.75	ND
1976	0.19	ND
1977	0.22	ND
1978	0.44	ND
1979	0.08	ND
1980	0.07	ND
1981	-0.46	ND
1982	0.85	ND
1983	1.03	ND
1984	0.39	ND
1985	0.41	ND
1986	0.06	ND
1987	0.27	ND
1988	-0.13	ND
1989	-0.31	ND
1990	-0.25	ND
1991	-0.49	ND
1992	-0.28	ND
1993	-0.36	ND
1994	-0.46	ND
1995	-0.38	ND
1996	-0.17	ND
1997	-0.06	ND
1998	-0.01	ND
1999	0.29	ND
2000	0.10	ND

	Fiscal impetus	Forecast
2001	0.43	0.43
2002	ND	1.22
2003	ND	0.62

Note: As shown in the chart, shaded bars denote the recession periods of 1969:Q4-1970:Q4, 1973:Q4-1975:Q1, 1980:Q1-1980:Q3, 1981:Q3-1982:Q4, and 1990:Q3-1991:Q1, as defined by the National Bureau of Economic Research (NBER), and a vertical line indicates the NBER peak in March 2001 for the recession beginning in 2001:Q1.

Bottom-right panel Unified Budget Surplus

(Billions of dollars)

Fiscal year	Unified Budget Surplus
2000	236
2001	127
2002	-154
2003	-127

Chart 4 Financial Conditions: Corporate Sector

Top-left panel Corporate Bond Default Rate

Corporate Bond Default Rate. The period covered is from 1990 through May 2002. The data are percentage values showing the twelve-month moving average. A shaded bar denotes the recession period of 1990-1991, as defined by the National Bureau of Economic Research (NBER), and a vertical line indicates the NBER peak for the recession beginning in 2001:Q1. The series begins in 1990 at just above 1 percent. It enters the recession (1990:Q3-1991:Q1) at about 1.5 percent and exits the recession at about 2.5 percent. The series then decreases rapidly, falling to just above 0 percent at the start of 1993. The series fluctuates between just above 0 percent and just below 1 percent between 1993 and the start of 1999, when it begins rising. The series reaches 1 percent at the start of 2000 and rises to just above 1 percent as it enters the NBER recession peak of 2001:Q1. It then rises sharply to about 3 percent in May 2002.

Source. Moody's.

Top-right panel Real Debt Growth, Nonfinancial Corporations

Real Debt Growth, Nonfinancial Corporations.* The period covered is from 1970 through 2002:Q1. The data are percentage values showing the four-quarter percent change. A horizontal line is drawn at 0 percent. Five shaded bars denote the recession periods of 1969-1970, 1973-1975, 1980, 1981-1982, and 1990-1991, as defined by the National Bureau of Economic Research (NBER), and a vertical line indicates the NBER peak for the recession beginning in 2001:Q1. The series begins at about 6 percent in 1970:Q1, during the first recession (1969:Q4-1970:Q4), and exits the recession at about 5 percent. The series increases to enter the second recession (1973:Q4-1975:Q1) at about 10 percent; it then declines sharply to exit the recession at about negative 2 percent. The series increases

to enter the third recession (1980:Q1-1980:Q3) at about 6 percent and then decreases to exit the recession at about 0 percent. Next, the series increases to enter the fourth recession (1981:Q3-1982:Q4) at about 5 percent and remains at about that level throughout the recession. The series then begins to increase, hitting a peak of about 13 percent at the start of 1985 before gradually declining to about 0 percent at the start of the fifth recession (1990:Q3-1991:Q1). The series further declines before exiting the recession at about negative 5 percent. It rises to just above 10 percent in 1999, decreases to about 7 percent at the NBER peak in 2001:Q1, and further declines to about 4 percent in 2002:Q1.

*Growth of nominal debt less growth of the GDP chain-weight price index. [Return to text](#)

Middle-left panel

Interest Expense as a Share of Cash Flow, Speculative-grade Nonfinancial Firms

Interest Expense as a Share of Cash Flow, Speculative-grade Nonfinancial Firms. The period covered is from 1988 through 2002:Q1, and the data are percentage values that are annual for 1988-1997 and four-quarter moving averages thereafter. Data are plotted as two curves: The first is the 75th percentile, and the second is the median value. A shaded bar denotes the recession period of 1990-1991, as defined by the National Bureau of Economic Research (NBER), and a vertical line indicates the NBER peak for the recession beginning in 2001:Q1. The two series follow similar paths between 1988 and 2000: The 75th percentile curve fluctuates around 75 percent, and the median curve fluctuates around 50 percent. In 2000, the 75th percentile curve rises sharply and continues rising through the 2001:Q1 NBER recession peak. Conversely, in 2000, the median curve levels off and begins a gradual decline in 2001:Q1.

More specifically, the 75th percentile curve begins at about 75 percent in 1988, rises to about 85 percent as it enters the 1990:Q3-1991:Q1 recession, and exits the recession at about 80 percent. The series then gradually declines, reaching a low point of about 60 percent at the start of 1998. It increases sharply, reaching about 80 percent at the 2001:Q1 NBER peak, and further increases to about 85 percent before dropping to about 80 percent in 2002:Q1. The median series begins at just below 50 percent in 1988, rises to about 60 percent as it enters the 1990:Q3-1991:Q1 recession, and exits the recession at about 55 percent. The series then gradually declines, reaching a low of about 40 percent at the start of 1998. It gradually increases, reaching just below 50 percent at the 2001:Q1 NBER peak, and then decreases to reach about 45 percent in 2002:Q1.

Source. Compustat.

Middle-right panel

Liquid Assets Relative to Short-Term Liabilities, Nonfinancial Corporations

Liquid Assets Relative to Short-Term Liabilities, Nonfinancial Corporations. The period covered is from 1970 through 2002:Q1, and the data are quarterly percentage values. Five shaded bars denote the recession periods of 1969-1970, 1973-1975, 1980, 1981-1982, and 1990-1991, as defined by the National Bureau of Economic Research (NBER), and a vertical line indicates the NBER peak for the recession beginning in 2001:Q1. The series begins at about 24 percent in 1970:Q1, in the midst of the first recession (1969:Q4-1970:Q4), and exits the recession at about 23 percent. The series fluctuates slightly, enters the second recession (1973:Q4-1975:Q1) at about 23 percent, and exits the recession at about 28 percent. It increases sharply, reaching about 32 percent at the start of 1976, and then begins to decline steadily at the start of 1977, entering the third recession (1980:Q1-1980:Q3) at about 24 percent, where it stays throughout the recession. It decreases as it enters the fourth recession (1981:Q3-1982:Q4) at about 21 percent; it dips and then increases to exit the recession at about 22 percent. Next, the series begins to increase, reaching about 28 percent at the start of 1984 before

gradually declining to about 20 percent at the start of the fifth recession (1990:Q3-1991:Q1). It increases to exit the recession at about 24 percent, gradually rises to enter the NBER peak in 2001:Q1 at about 31 percent, and continues to increase, to nearly 40 percent in 2002:Q1.

Bottom-left panel

Growth of Profits and Output

Growth of Profits and Output. The period covered is the thirty-four years from 1970 through 2003, and the data are average annual percent changes presented as a scatter plot. Each of the thirty-four dots in the chart shows, for a given year, the intersection of the average percent change in output (shown on the horizontal, or x, axis, which extends from negative 4 percent to positive 10 percent) with the average percent change in profits (shown on the vertical, or y, axis, which extends from negative 20 percent to positive 40 percent). Profits are measured as economic profits, and output is measured as nonfarm business GDP, less housing. A horizontal line is drawn at 0 percent change in profits, and a vertical line is drawn at 0 percent change in output. A trendline, representing the historical relationship between the two variables for the 1970-2003 period, extends from lower left to upper right through the following three x-y coordinates: beginning at the lower left at negative 4, negative 10; to the intersection of the horizontal and vertical lines at about 0, 0; and ending at the upper right at positive 10, positive 23. The annual change in profits ranges from about negative 15 percent to just under 30 percent, and the yearly change in output ranges from almost negative 4 percent to about 8 percent. The only data points identified by year are those for 2002 and 2003. Compared with the historical relationship between output and profits, the 2002 data point was above the trendline, and the 2003 data point was below the trendline, but both were well within the range of historical variation. In 2002, profits grew about 15 percent, and output grew slightly less than 3 percent. In 2003, profit growth edged down to about 5 percent, and output growth increased to almost 5 percent.

Bottom-right panel

Analysts' Forecasts of Growth in S&P 500

Earnings Per Share*

Percent

	Forecast	Bias Adjusted
2003	19.6	9 to 14
Long-term growth	12.6	7-1/2 to 9

*As of June 21, 2002. [Return to table](#)

Chart 5

Financial Conditions: Household and Banking Sectors

Top-left panel

Household Debt Service Burden

Household Debt Service Burden.* The period covered is from 1980 through 2002:Q2, and the data are percentage values. Three shaded bars denote the recession periods of 1980, 1981-1982, and 1990-1991, as defined by the National Bureau of Economic Research (NBER), and a vertical line indicates the NBER peak for the recession beginning in 2001:Q1. The series begins at just above 13 percent at the start of the first recession (1980:Q1-1980:Q3) and stays at that value throughout the recession. It then decreases as it enters the second recession (1981:Q3-1982:Q4) at about 12.5

percent; it fluctuates throughout the recession and exits at about 12.5 percent. After a brief dip, the series begins to increase, reaching about 14.25 percent at the start of 1987 before declining to about 13.25 percent at the start of the third recession (1990:Q3-1991:Q1). The series decreases, exiting the recession at about 13 percent, and it continues to drop, dipping to just below 12 percent at the start of 1993, where it stays until it begins to increase again in mid-1994. It rises steadily and enters the NBER peak in 2001:Q1 at just above 14 percent. It fluctuates a bit and is estimated to be just above 14 percent in 2002:Q2.

*Required debt payments relative to disposable personal income. [Return to text](#)

Top-right panel

Household Delinquency Rates

Household Delinquency Rates. The data are percentage values represented as three curves. The first curve is nonprime auto loans, and it covers the period from 1998 through March 2002. The second curve is household loans at commercial banks, and it covers the period from 1991 through 2002:Q1. The third curve is auto loans at finance companies, and it covers the period from 1990 through April 2002. Broadly, the household loans at commercial banks series and the auto loans at finance companies series have similar curve patterns, each fluctuating between about 2 percent and about 4 percent over the course of each series. The nonprime auto loans series follows a similar pattern as the other two series between 1997 and the start of 2001, although it fluctuates between about 5 percent and about 6.5 percent. In contrast to the other two series, in 2001 it begins a sharp increase, reaching nearly 9 percent in 2002:Q1.

Specifically, the nonprime auto loans series begins in 1998 at about 5 percent and then fluctuates between 5 percent and 6 percent until the beginning of 2001, when it starts to increase, reaching almost 9 percent in March 2002. The household loans at commercial banks series begins in 1991 at just below 4 percent, gradually declines to just above 2 percent at the start of 1995, fluctuates between 2 percent and 3 percent between 1995 and the end of 2001, and is just below 3 percent in 2002:Q1. The auto loans at finance companies series begins in 1990 at just above 2 percent, fluctuates between about 2 percent and about 3 percent from 1990 through early 1995, rises to almost 4 percent in mid-1997, and gradually decreases to about 2 percent in April 2002.

Notes. For household loans at commercial banks, data on consumer loans and residential real estate loans were from Call Report. Nonprime auto loans are staff calculations using Moody's data.

Middle-left panel

Household Assets and Liabilities Relative to Disposable Income

Household Assets and Liabilities Relative to Disposable Income. The period covered is from 1990 through 2003. Data are quarterly. Data are given as a ratio and are presented as two curves: The first curve shows the ratio of assets to disposable income, and the second shows liabilities relative to disposable income. The assets curve is generally flat between 1990 and 1995, rises from 1995 through 2000, and then decreases through the projected 2003 value. In contrast, the liabilities curve remains generally flat throughout the entire period, rising just slightly beginning in 1995.

More specifically, the assets series starts at a ratio of just below 6 at the beginning of 1990 and remains at about that level until 1995. In 1995, the ratio begins to rise, reaching about 6.5 in 1998 and hitting a peak of just above 7 at the start of 2000. The series then starts to decrease, reaching about 6.5 at the start of 2002, and it is projected to be about 6 at the end of 2003. The liabilities series begins with a ratio of just below 1 in 1990 and stays at that level through 1995. It gradually rises to reach about 1 in 1999 and continues its slight increase to just above 1 at the start of 2002. The series is projected to remain at just above 1 through the end of 2003.

Middle-right panel

Real House Prices

Real House Prices.* The period covered is from 1976 through 2003, and the data are the four-quarter percent change. A horizontal line is drawn at 0 percent. Three shaded bars denote the recession periods of 1980, 1981-1982, and 1990-1991, as defined by the National Bureau of Economic Research (NBER), and a vertical line indicates the NBER peak for the recession beginning in 2001:Q1. The series begins at just above negative 2 percent in 1976 and increases sharply to about 7 percent in 1979. It decreases to about 5 percent at the start of the first recession (1980:Q1-1980:Q3) and drops sharply to exit the recession at about 0 percent. The series continues its decline, reaching about negative 2 percent at the start of the second recession (1981:Q3-1982:Q4) and exiting the recession at about negative 4 percent. The series begins to rise, reaching about 4 percent at the start of 1987 before decreasing again, entering the third recession (1990:Q3-1991:Q1) at about 0 percent and then dropping sharply to exit the recession at about negative 4 percent. It fluctuates and gradually increases to enter the NBER peak in 2001:Q1 at just below 8 percent and then drops sharply to just over 4 percent at mid-2002. Projections show it reaching just above 2 percent at the start of 2004.

*OFHEO repeat sales index deflated by core PCE chain-weight price index. [Return to text](#)

Bottom-left panel

Real House Prices and Income, Coastal Cities

Real House Prices and Income, Coastal Cities.* The period covered is from 1977 through 2001. Data are given as an annual index, with 1994 equal to 100, and are presented as two curves: The first is real house prices, and the second is real per-capita income. Both series follow similar curves between 1977 and the start of 1986, with each increasing at a gradual rate. At the start of 1986, the real house prices index rises sharply until 1989, after which it starts to decline until 1997. In 1997, the index starts to rise again and continues increasing through 2001. In contrast, the real per-capita income series stays on a generally steady upward path for the time period shown.

More specifically, in 1977, the real house prices index is at just above 63. The index rises to about 76 in 1980, dips slightly, and then increases to about 120 in 1989. It then starts to decrease, dropping to about 95 in 1997, before rising again, to reach about 132 in 2001. The real per-capita income index is at about 74 in 1997, reaches just above 76 in 1980, and continues rising to about 100 in 1989. It fluctuates between 100 and 102 from 1989 through 1996, and it then rises, reaching about 127 in 2001.

*Includes Seattle, San Francisco Bay Area, Los Angeles, San Diego, Boston, New York City, Philadelphia, Baltimore, and Washington, D.C. [Return to text](#)

Bottom-right panel

Health of the Banking Sector

Health of the Banking Sector. The period covered is from 1990 through 2002:Q1, and the data are percentage values. Data are presented as two curves: One is return on assets and is given as a quarterly value, and the other is the share of assets at well-capitalized banks. The curves are presented together but follow different percentage scales. Both series have similar curve patterns, generally rising between 1990 and 1994. In 1994, the return on assets series generally levels out, whereas the share of assets series continues to rise until mid-1995, after which it also levels out.

More specifically, the return on assets series begins at just below 0.5 percent at the start of 1990. It drops to about 0.25 percent in 1991 and then rises, reaching about 1.25 percent in 1994. The series

then generally levels out, fluctuating between about 1 percent and nearly 1.5 percent between 1994 and 2002:Q1. The share of assets at well-capitalized banks series starts at about 30 percent in 1990 and rises slightly to about 35 percent in 1991. It then starts to rise sharply, reaching about 95 percent in mid-1995; the series then levels out, remaining between about 95 percent and just below 100 percent through 2002:Q1.

Chart 6 Business Investment

Top-left panel Real Business Fixed Investment

(Percent change, annual rate)

	2002			2003
	Q1	Q2	H2	
1. Total BFI	-8	1	5	11
2. E&S	-2	4	8	13
3. NRS	-23	-7	-2	4

Top-right panel Semiconductors and Computers

Index, Jan. 2000 = 100; Monthly

	Semiconductor production	Real computer shipments
Jan 2000	100.00	100.00
Feb 2000	104.74	93.78
Mar 2000	111.84	94.85
Apr 2000	117.77	103.36
May 2000	123.15	103.90
Jun 2000	126.76	104.71
Jul 2000	129.41	106.92
Aug 2000	130.55	105.20
Sep 2000	131.61	108.06
Oct 2000	132.69	108.45
Nov 2000	134.32	105.15
Dec 2000	135.05	109.49
Jan 2001	130.08	110.12
Feb 2001	128.41	106.31
Mar 2001	126.17	110.56
Apr 2001	121.01	105.14
May 2001	117.82	104.47
Jun 2001	113.23	99.13
Jul 2001	109.85	102.08
Aug 2001	109.55	87.60
Sep 2001	111.28	93.70
Oct 2001	113.46	98.97
Nov 2001	113.65	103.27

	Semiconductor production	Real computer shipments
Dec 2001	114.91	105.52
Jan 2002	119.92	108.06
Feb 2002	125.06	105.61
Mar 2002	127.22	103.14
Apr 2002	129.28	109.43
May 2002	132.19	ND

Middle-left panel

Revisions to Year-Ahead Earnings for S&P 500

Revisions to Year-Ahead Earnings for S&P 500. The period covered is from 1999 through June 2002, and the data are percentage values given as a three-month moving average. Data are presented as two curves: One is telecom service, and the second curve is "all other." A horizontal line is drawn at 0 percent. The two series have similar curve patterns throughout 1999 but diverge in early 2000, with telecom service decreasing sharply and "all other" increasing slightly, then dropping gradually. Both series come together again in mid-2001 and have similar curve fluctuations through June 2002.

More specifically, telecom service enters 1999 at just above 0 percent and then dips to just below 0 percent, where it remains through 1999. In early 2000, the series decreases to about negative 3 percent, increases slightly, and then drops sharply to reach about negative 8 percent at the start of 2001. It then rises again, reaching negative 2 percent in late 2001 and ending just below negative 2 percent in June 2002. The "all other" series enters 1999 at about negative 1 percent, rises slightly to about 0 percent through the remainder of 1999, and then increases to just above 0 percent in mid-2000 before dropping to about negative 3 percent in mid-2001. The series drops a bit to about negative 4 percent at the end of 2001, increases to about 0 percent in early 2002, and then drops to negative 1 percent in June 2002.

Middle-right panel

Accelerator Effects

Four-quarter percent change in real E&S

	Accelerator*	Percent Change in E&S	Recent percent change	Trend E&S
1971	-2.99	-5.45	ND	0.56
1972	1.88	8.54	ND	11.04
1973	4.74	16.87	ND	17.19
1974	-0.36	13.58	ND	6.22
1975	-6.06	-3.04	ND	-6.04
1976	-1.11	-6.18	ND	4.60
1977	4.47	9.23	ND	16.61
1978	1.74	16.35	ND	10.74
1979	1.25	14.94	ND	9.68
1980	-2.64	3.42	ND	1.31
1981	-4.47	-3.55	ND	-2.62
1982	-0.30	5.13	ND	6.35
1983	-0.82	-9.10	ND	5.23

	Accelerator*	Percent Change in E&S	Recent percent change	Trend E&S
1984	5.38	20.69	ND	18.57
1985	4.07	13.84	ND	15.75
1986	-3.45	2.54	ND	-0.43
1987	-1.13	1.60	ND	4.56
1988	0.26	1.72	ND	7.55
1989	0.67	8.98	ND	8.43
1990	-1.31	4.86	ND	4.17
1991	-2.49	-0.59	ND	1.64
1992	-0.71	-0.53	ND	5.47
1993	2.76	11.59	ND	12.93
1994	1.30	11.48	ND	9.79
1995	-0.22	12.02	ND	6.52
1996	-0.28	8.95	ND	6.39
1997	0.15	11.80	ND	7.32
1998	1.24	13.69	ND	9.66
1999	0.34	14.92	ND	7.72
2000	-0.06	11.20	ND	6.86
2001	-1.38	8.28	-8.52	4.02
2002	-2.50	ND	4.21	1.61
2003	0.49	ND	13.36	8.05

*(8-quarter percent change in real business output less year-earlier 8-quarter percent change) [Return to table](#)

Bottom-left panel Nonresidential Buildings

Index, Jan. 1998 = 100; Twelve-month moving average

	Contracts	Construction
Jan 1985	69.79	62.67
Feb 1985	70.54	63.86
Mar 1985	71.48	64.93
Apr 1985	72.85	66.03
May 1985	73.15	67.08
Jun 1985	73.58	67.97
Jul 1985	74.61	68.85
Aug 1985	74.93	69.68
Sep 1985	76.31	70.50
Oct 1985	77.19	71.29
Nov 1985	77.32	72.10
Dec 1985	77.08	72.87
Jan 1986	76.65	73.25
Feb 1986	77.41	73.56
Mar 1986	76.67	73.47
Apr 1986	76.86	73.37

	Contracts	Construction
May 1986	75.88	72.89
Jun 1986	76.01	72.38
Jul 1986	75.26	71.93
Aug 1986	74.93	71.53
Sep 1986	74.54	70.93
Oct 1986	73.58	70.59
Nov 1986	73.47	70.00
Dec 1986	73.68	69.38
Jan 1987	73.42	68.79
Feb 1987	72.69	68.37
Mar 1987	73.22	67.99
Apr 1987	72.78	67.71
May 1987	72.29	67.92
Jun 1987	73.29	68.01
Jul 1987	74.48	68.27
Aug 1987	74.75	68.66
Sep 1987	74.95	69.15
Oct 1987	75.65	69.36
Nov 1987	75.64	69.96
Dec 1987	76.94	70.43
Jan 1988	76.57	70.89
Feb 1988	77.89	71.09
Mar 1988	77.81	71.80
Apr 1988	77.39	72.37
May 1988	77.77	72.78
Jun 1988	77.40	73.46
Jul 1988	76.72	73.87
Aug 1988	77.60	74.08
Sep 1988	77.11	74.15
Oct 1988	76.76	74.37
Nov 1988	76.84	74.37
Dec 1988	75.78	74.74
Jan 1989	77.24	75.33
Feb 1989	76.38	75.94
Mar 1989	76.21	76.39
Apr 1989	76.54	76.62
May 1989	77.37	76.85
Jun 1989	77.20	77.09
Jul 1989	77.34	77.41
Aug 1989	76.85	78.03
Sep 1989	78.49	78.74
Oct 1989	79.16	79.31
Nov 1989	79.32	80.03
Dec 1989	80.65	80.08

	Contracts	Construction
Jan 1990	80.20	80.35
Feb 1990	79.73	80.96
Mar 1990	79.93	81.36
Apr 1990	79.67	81.79
May 1990	78.83	82.22
Jun 1990	78.31	82.63
Jul 1990	77.07	83.25
Aug 1990	75.48	83.29
Sep 1990	73.25	83.21
Oct 1990	71.98	82.94
Nov 1990	71.36	82.38
Dec 1990	68.74	82.25
Jan 1991	66.78	81.62
Feb 1991	65.96	80.74
Mar 1991	64.41	79.71
Apr 1991	64.03	79.12
May 1991	63.11	77.82
Jun 1991	61.19	76.31
Jul 1991	60.31	74.49
Aug 1991	59.94	73.01
Sep 1991	58.49	71.43
Oct 1991	57.57	69.98
Nov 1991	55.84	68.49
Dec 1991	55.48	67.00
Jan 1992	55.80	65.65
Feb 1992	56.66	64.27
Mar 1992	56.46	63.45
Apr 1992	55.80	62.01
May 1992	55.08	61.34
Jun 1992	56.16	60.93
Jul 1992	56.71	60.73
Aug 1992	56.00	60.12
Sep 1992	56.78	59.96
Oct 1992	57.11	60.06
Nov 1992	57.25	60.21
Dec 1992	56.74	60.28
Jan 1993	56.13	60.28
Feb 1993	54.89	60.35
Mar 1993	55.37	60.10
Apr 1993	54.96	60.10
May 1993	55.00	60.27
Jun 1993	54.63	60.29
Jul 1993	54.85	60.17
Aug 1993	55.54	60.55

	Contracts	Construction
Sep 1993	55.58	60.83
Oct 1993	55.98	60.84
Nov 1993	56.35	61.10
Dec 1993	57.44	61.50
Jan 1994	58.53	61.63
Feb 1994	59.18	61.73
Mar 1994	59.81	62.41
Apr 1994	60.18	63.27
May 1994	60.77	63.97
Jun 1994	61.84	64.71
Jul 1994	62.20	65.35
Aug 1994	63.40	65.98
Sep 1994	64.47	66.59
Oct 1994	64.43	67.28
Nov 1994	65.87	67.96
Dec 1994	66.73	68.61
Jan 1995	67.72	69.66
Feb 1995	68.59	71.00
Mar 1995	69.48	71.90
Apr 1995	70.57	72.74
May 1995	72.23	73.42
Jun 1995	73.14	74.20
Jul 1995	73.97	75.33
Aug 1995	74.46	76.02
Sep 1995	75.43	76.72
Oct 1995	76.30	77.47
Nov 1995	77.57	78.13
Dec 1995	77.55	78.91
Jan 1996	78.03	79.81
Feb 1996	77.52	80.39
Mar 1996	77.72	80.76
Apr 1996	78.88	81.29
May 1996	79.20	81.88
Jun 1996	79.32	82.68
Jul 1996	79.96	83.11
Aug 1996	80.88	84.05
Sep 1996	81.39	85.08
Oct 1996	81.67	86.41
Nov 1996	82.35	87.79
Dec 1996	83.86	88.94
Jan 1997	84.24	90.11
Feb 1997	85.84	91.44
Mar 1997	86.16	92.54
Apr 1997	87.30	93.43

	Contracts	Construction
May 1997	89.07	94.35
Jun 1997	90.59	95.04
Jul 1997	92.46	96.28
Aug 1997	92.45	97.33
Sep 1997	93.69	98.15
Oct 1997	96.80	98.60
Nov 1997	97.44	98.91
Dec 1997	98.48	99.45
Jan 1998	100.00	100.00
Feb 1998	101.89	100.45
Mar 1998	104.03	101.33
Apr 1998	104.18	102.44
May 1998	104.61	103.29
Jun 1998	105.72	104.44
Jul 1998	106.59	105.02
Aug 1998	109.32	105.70
Sep 1998	110.39	106.24
Oct 1998	110.46	107.05
Nov 1998	111.51	108.10
Dec 1998	112.60	109.08
Jan 1999	114.66	109.76
Feb 1999	115.04	110.61
Mar 1999	115.58	111.25
Apr 1999	117.43	111.49
May 1999	118.42	111.86
Jun 1999	119.14	111.78
Jul 1999	118.99	111.96
Aug 1999	117.98	111.82
Sep 1999	118.30	111.86
Oct 1999	118.04	111.60
Nov 1999	117.96	111.38
Dec 1999	117.31	111.11
Jan 2000	114.52	111.05
Feb 2000	116.09	111.18
Mar 2000	118.03	111.50
Apr 2000	117.20	111.94
May 2000	116.49	112.68
Jun 2000	116.77	113.48
Jul 2000	116.67	114.31
Aug 2000	117.04	115.43
Sep 2000	116.98	116.57
Oct 2000	117.90	117.83
Nov 2000	118.35	118.89
Dec 2000	119.61	120.05

	Contracts	Construction
Jan 2001	121.93	121.34
Feb 2001	121.22	122.11
Mar 2001	119.30	123.08
Apr 2001	119.19	123.81
May 2001	118.79	123.90
Jun 2001	117.16	123.97
Jul 2001	116.01	123.94
Aug 2001	115.17	123.40
Sep 2001	113.58	122.83
Oct 2001	112.12	121.99
Nov 2001	110.11	120.93
Dec 2001	107.80	119.63
Jan 2002	105.09	118.10
Feb 2002	103.48	116.55
Mar 2002	100.61	114.50
Apr 2002	98.72	112.83
May 2002	97.44	ND

Bottom-right panel
Office Buildings

	Vacancy rate (Percent)	Real Investment (Billions of 1996 dollars)
1985:Q1	15.70	55.83
1985:Q2	16.40	57.41
1985:Q3	16.10	56.94
1985:Q4	16.40	57.24
1986:Q1	16.80	54.94
1986:Q2	17.00	51.02
1986:Q3	17.30	47.76
1986:Q4	17.30	47.06
1987:Q1	17.70	44.74
1987:Q2	17.30	43.71
1987:Q3	17.30	44.72
1987:Q4	17.30	45.99
1988:Q1	18.90	44.45
1988:Q2	18.50	46.39
1988:Q3	18.30	45.95
1988:Q4	18.20	45.22
1989:Q1	18.20	45.75
1989:Q2	18.30	44.02
1989:Q3	18.30	44.46
1989:Q4	18.60	43.09
1990:Q1	18.80	42.87

	Vacancy rate (Percent)	Real Investment (Billions of 1996 dollars)
1990:Q2	18.80	41.13
1990:Q3	18.70	40.94
1990:Q4	18.90	38.54
1991:Q1	19.00	34.90
1991:Q2	19.10	33.58
1991:Q3	18.80	31.54
1991:Q4	18.90	28.96
1992:Q1	19.10	27.88
1992:Q2	19.10	26.80
1992:Q3	18.90	25.34
1992:Q4	18.70	27.64
1993:Q1	18.30	28.05
1993:Q2	18.00	27.85
1993:Q3	17.60	26.01
1993:Q4	17.00	25.58
1994:Q1	16.80	26.29
1994:Q2	16.30	28.10
1994:Q3	15.90	27.21
1994:Q4	15.50	28.19
1995:Q1	15.20	29.77
1995:Q2	14.70	31.80
1995:Q3	14.40	31.35
1995:Q4	14.10	28.97
1996:Q1	13.80	28.09
1996:Q2	13.10	32.08
1996:Q3	12.80	34.07
1996:Q4	12.10	35.56
1997:Q1	11.60	37.08
1997:Q2	11.20	35.42
1997:Q3	10.50	40.15
1997:Q4	9.80	42.04
1998:Q1	9.50	44.11
1998:Q2	9.30	46.20
1998:Q3	9.00	44.55
1998:Q4	8.90	48.81
1999:Q1	9.50	50.41
1999:Q2	9.60	49.17
1999:Q3	9.60	50.08
1999:Q4	9.10	48.89
2000:Q1	8.60	50.02
2000:Q2	8.00	54.70
2000:Q3	7.70	57.48
2000:Q4	7.80	60.25
2001:Q1	9.10	59.17

	Vacancy rate (Percent)	Real Investment (Billions of 1996 dollars)
2001:Q2	10.30	54.64
2001:Q3	12.00	49.06
2001:Q4	13.20	46.03
2002:Q1	14.20	40.79

Chart 7 Household Spending

Top panel Growth in Real PCE and Residential Investment

(Percent, annual rate)

	Four quarters ending at peak	Recession	Four quarters after trough
1. Average in previous cycles	2.0	-.5	6.3
2. Current cycle and forecast	3.2	3.3	2.5

Note. Previous cycles include all postwar peaks and troughs through 1991. Trough of current cycle is assumed to be 2002:Q1.

Middle panel Growth of Real Capital Stocks

Percent change; Annual

	Consumer durables	Consumer durables- Forecast	Private Residential Structures	Private Residential Structures-Forecast
1970	4.19	ND	2.75	ND
1971	5.41	ND	3.75	ND
1972	6.78	ND	4.37	ND
1973	7.65	ND	4.12	ND
1974	4.38	ND	2.76	ND
1975	3.66	ND	2.08	ND
1976	5.42	ND	2.84	ND
1977	6.18	ND	3.63	ND
1978	6.00	ND	3.77	ND
1979	4.68	ND	3.38	ND
1980	1.91	ND	2.21	ND
1981	1.89	ND	1.83	ND
1982	1.42	ND	1.17	ND
1983	3.90	ND	2.25	ND
1984	6.10	ND	2.73	ND
1985	6.82	ND	2.65	ND
1986	7.33	ND	3.08	ND
1987	6.16	ND	2.95	ND
1988	5.97	ND	2.77	ND

	Consumer durables	Consumer durables- Forecast	Private Residential Structures	Private Residential Structures-Forecast
1989	5.10	ND	2.52	ND
1990	3.49	ND	2.13	ND
1991	0.83	ND	1.53	ND
1992	1.82	ND	1.83	ND
1993	3.07	ND	2.20	ND
1994	3.87	ND	2.30	ND
1995	3.94	ND	2.13	ND
1996	4.24	ND	2.40	ND
1997	4.74	ND	2.32	ND
1998	6.02	ND	2.58	ND
1999	7.32	ND	2.72	ND
2000	8.00	ND	2.61	ND
2001	7.60	7.60	2.59	2.59
2002	ND	7.15	ND	2.65
2003	ND	6.56	ND	2.57

Note: As shown in the chart, shaded bars denote the recession periods of 1969:Q4-1970:Q4, 1973:Q4-1975:Q1, 1980:Q1-1980:Q3, 1981:Q3-1982:Q4, and 1990:Q3-1991:Q1, as defined by the National Bureau of Economic Research (NBER), and a vertical line indicates the NBER peak in March 2001 for the recession beginning in 2001:Q1.

Bottom panel

Growth of Real Disposable Income and Labor Productivity

Percent change from 5 years earlier, annual rate

	Labor productivity, nonfarm business	Labor productivity, nonfarm business- Forecast	Real DPI	Real DPI-Forecast
1970	2.00	ND	4.30	ND
1971	2.14	ND	4.11	ND
1972	2.43	ND	4.19	ND
1973	2.47	ND	4.65	ND
1974	2.09	ND	3.87	ND
1975	2.35	ND	3.40	ND
1976	2.26	ND	3.39	ND
1977	1.89	ND	3.18	ND
1978	1.52	ND	2.80	ND
1979	1.77	ND	3.52	ND
1980	1.16	1.17	3.31	ND
1981	0.66	0.67	2.90	ND
1982	0.24	0.24	2.44	ND
1983	0.88	0.87	2.06	ND
1984	1.40	1.38	3.01	ND
1985	1.72	1.71	3.52	ND
1986	2.08	2.07	3.70	ND
1987	2.27	2.27	3.86	ND

	Labor productivity, nonfarm business	Labor productivity, nonfarm business- Forecast	Real DPI	Real DPI-Forecast
1988	1.62	1.63	4.13	ND
1989	1.35	1.35	3.12	ND
1990	1.31	1.31	2.89	ND
1991	0.94	0.95	2.33	ND
1992	1.62	1.61	2.52	ND
1993	1.45	1.45	1.92	ND
1994	1.56	1.56	1.92	ND
1995	1.53	1.53	2.01	ND
1996	1.80	1.79	2.44	ND
1997	1.46	1.46	2.44	ND
1998	1.88	1.88	3.23	ND
1999	2.09	2.08	3.21	ND
2000	2.55	2.56	3.38	ND
2001	2.42	2.43	3.59	3.59
2002	ND	2.82	ND	3.84
2003	ND	2.60	ND	3.31

Note: As shown in the chart, shaded bars denote the recession periods of 1969:Q4-1970:Q4, 1973:Q4-1975:Q1, 1980:Q1-1980:Q3, 1981:Q3-1982:Q4, and 1990:Q3-1991:Q1, as defined by the National Bureau of Economic Research (NBER), and a vertical line indicates the NBER peak in March 2001 for the recession beginning in 2001:Q1.

Chart 8 Productivity

Top-left panel Alternative Estimates of Labor Productivity

(Percent change)

	2000:Q1-2001:Q1	2001:Q1-2002:Q1
<i>Product side:</i>		
Establishment hours	2.6	4.2
Household hours	2.2	3.4
<i>Income side:</i>		
Establishment hours	2.7	5.1
Household hours	2.3	4.3

Top-right panel Structural Labor Productivity

Percent change, Q4/Q4

	Productivity
1973-1995	1.4
1995-2000	2.6

	Productivity
2001	2.3
2002	2.0
2003	2.5

Middle-left panel

Contribution of Private Capital Deepening

Percent change, Q4/Q4

	Contribution
1973-1995	0.6
1995-2000	1.3
2001	0.6
2002	0.4
2003	0.8

Middle-right panel

Multifactor Productivity

Percent change, Q4/Q4

	Productivity
1973-1995	0.6
1995-2000	1.1
2001	1.4
2002	1.3
2003	1.5

Bottom panel

Adjustment Costs and Labor Productivity

(Percent change, Q4/Q4)

	1998	1999	2000	2001	2002	2003
1. Measured productivity	2.9	3.0	2.6	2.1	3.1	1.8
<i>Productivity net of adjustment costs:</i>						
2a. Low adjustment costs	3.0	3.0	2.7	2.0	3.2	1.9
2b. High adjustment costs	3.3	3.2	2.9	1.8	3.2	2.2

Chart 9

Labor Markets

Top-left panel

Labor Productivity

Chained 1996 dollars per hour

	Structural	Actual GB	Slower scenario (0%)	Faster scenario (2.5%)	Baseline scenario (1.0%)
2001:Q1	38.31	38.11	ND	ND	ND
2001:Q2	38.53	38.30	ND	ND	ND
2001:Q3	38.74	38.40	ND	ND	ND
2001:Q4	38.96	38.91	ND	ND	ND
2002:Q1	39.14	39.72	ND	ND	ND
2002:Q2	39.33	39.94	39.94	39.94	39.94
2002:Q3	39.52	ND	39.94	40.19	40.06
2002:Q4	39.72	ND	39.94	40.44	40.14

Top-right panel
Effects on Employment

	Change in Payroll* ('000s)		Unemployment Rate
	average monthly		
	Q3	Q4	Q4
Faster	-60	40	6.6
Baseline	150	200	5.9
Slower	320	240	5.5

*Private [Return to table](#)

Middle-left panel
Initial Claims

Thousands

	Claims	4-week moving average
8-Jan-2000	292.37	282.39
15-Jan-2000	284.81	282.79
22-Jan-2000	275.23	283.58
29-Jan-2000	283.56	283.99
5-Feb-2000	303.75	286.84
12-Feb-2000	292.56	288.78
19-Feb-2000	287.48	291.84
26-Feb-2000	271.19	288.75
4-Mar-2000	282.20	283.36
11-Mar-2000	267.56	277.11
18-Mar-2000	268.12	272.27
25-Mar-2000	273.50	272.84
1-Apr-2000	270.39	269.89
8-Apr-2000	266.94	269.74
15-Apr-2000	267.93	269.69

	Claims	4-week moving average
22-Apr-2000	263.84	267.28
29-Apr-2000	287.66	271.59
6-May-2000	289.44	277.22
13-May-2000	278.35	279.82
20-May-2000	279.15	283.65
27-May-2000	282.22	282.29
3-Jun-2000	289.06	282.20
10-Jun-2000	287.23	284.42
17-Jun-2000	287.60	286.53
24-Jun-2000	288.75	288.16
1-Jul-2000	277.49	285.27
8-Jul-2000	294.59	287.11
15-Jul-2000	298.60	289.86
22-Jul-2000	288.78	289.86
29-Jul-2000	293.92	293.97
5-Aug-2000	299.31	295.15
12-Aug-2000	311.77	298.44
19-Aug-2000	313.05	304.51
26-Aug-2000	314.73	309.71
2-Sep-2000	307.74	311.82
9-Sep-2000	317.83	313.34
16-Sep-2000	316.57	314.22
23-Sep-2000	295.94	309.52
30-Sep-2000	303.68	308.51
7-Oct-2000	310.89	306.77
14-Oct-2000	312.09	305.65
21-Oct-2000	310.70	309.34
28-Oct-2000	317.36	312.76
4-Nov-2000	332.00	318.04
11-Nov-2000	325.92	321.49
18-Nov-2000	332.07	326.84
25-Nov-2000	355.18	336.29
2-Dec-2000	338.77	337.99
9-Dec-2000	331.16	339.29
16-Dec-2000	351.35	344.11
23-Dec-2000	368.43	347.43
30-Dec-2000	370.50	355.36
6-Jan-2001	333.97	356.06
13-Jan-2001	312.71	346.40
20-Jan-2001	330.22	336.85
27-Jan-2001	366.02	335.73
3-Feb-2001	357.22	341.54
10-Feb-2001	356.99	352.61
17-Feb-2001	350.45	357.67

	Claims	4-week moving average
24-Feb-2001	377.90	360.64
3-Mar-2001	377.54	365.72
10-Mar-2001	388.64	373.63
17-Mar-2001	387.74	382.95
24-Mar-2001	377.68	382.90
31-Mar-2001	396.65	387.68
7-Apr-2001	397.42	389.87
14-Apr-2001	385.40	389.29
21-Apr-2001	400.40	394.97
28-Apr-2001	411.37	398.65
5-May-2001	380.05	394.30
12-May-2001	395.43	396.81
19-May-2001	403.03	397.47
26-May-2001	414.24	398.19
2-Jun-2001	409.11	405.45
9-Jun-2001	421.63	412.00
16-Jun-2001	388.77	408.44
23-Jun-2001	371.15	397.66
30-Jun-2001	385.30	391.71
7-Jul-2001	408.96	388.54
14-Jul-2001	399.05	391.12
21-Jul-2001	379.95	393.32
28-Jul-2001	376.97	391.23
4-Aug-2001	389.13	386.28
11-Aug-2001	387.62	383.42
18-Aug-2001	392.93	386.66
25-Aug-2001	403.06	393.19
1-Sep-2001	408.71	398.08
8-Sep-2001	431.78	409.12
15-Sep-2001	400.36	410.98
22-Sep-2001	470.09	427.74
29-Sep-2001	543.18	461.35
6-Oct-2001	485.88	474.88
13-Oct-2001	502.07	500.31
20-Oct-2001	516.40	511.88
27-Oct-2001	513.73	504.52
3-Nov-2001	444.54	494.19
10-Nov-2001	445.98	480.16
17-Nov-2001	424.46	457.18
24-Nov-2001	489.80	451.19
1-Dec-2001	466.84	456.77
8-Dec-2001	407.04	447.04
15-Dec-2001	386.73	437.60
22-Dec-2001	415.22	418.96

	Claims	4-week moving average
29-Dec-2001	420.67	407.42
5-Jan-2002	386.20	402.21
12-Jan-2002	406.38	407.12
19-Jan-2002	389.66	400.73
26-Jan-2002	403.17	396.35
2-Feb-2002	377.63	394.21
9-Feb-2002	385.26	388.93
16-Feb-2002	377.16	385.81
23-Feb-2002	387.95	382.00
2-Mar-2002	386.08	384.11
9-Mar-2002	394.30	386.37
16-Mar-2002	382.27	387.65
23-Mar-2002	409.81	393.12
30-Mar-2002	465.62	413.00
6-Apr-2002	435.26	423.24
13-Apr-2002	457.03	441.93
20-Apr-2002	429.04	446.74
27-Apr-2002	422.92	436.06
4-May-2002	410.19	429.79
11-May-2002	421.65	420.95
18-May-2002	417.06	417.96
25-May-2002	414.50	415.85
1-Jun-2002	381.61	408.70
8-Jun-2002	398.16	402.83
15-Jun-2002	385.05	394.83

Middle-right panel

Current Employment Conditions

Conference Board

Percent

	Jobs plentiful	Jobs hard to get
Jan 1990	27.20	21.60
Feb 1990	28.10	20.50
Mar 1990	29.20	21.80
Apr 1990	26.60	22.30
May 1990	26.90	22.90
Jun 1990	23.40	23.70
Jul 1990	25.60	22.10
Aug 1990	21.40	25.80
Sep 1990	20.60	25.10
Oct 1990	15.30	29.80
Nov 1990	13.70	29.40

	Jobs plentiful	Jobs hard to get
Dec 1990	12.40	31.70
Jan 1991	11.40	33.10
Feb 1991	10.00	33.20
Mar 1991	10.40	35.70
Apr 1991	9.40	35.50
May 1991	9.80	37.80
Jun 1991	8.70	37.50
Jul 1991	7.80	37.60
Aug 1991	8.60	38.60
Sep 1991	7.20	40.00
Oct 1991	5.50	43.50
Nov 1991	5.10	47.10
Dec 1991	4.30	47.80
Jan 1992	4.90	47.00
Feb 1992	4.40	48.90
Mar 1992	4.80	46.90
Apr 1992	5.00	45.20
May 1992	5.90	40.30
Jun 1992	6.30	40.60
Jul 1992	5.80	43.00
Aug 1992	5.60	46.80
Sep 1992	6.00	45.70
Oct 1992	5.40	45.70
Nov 1992	6.80	45.50
Dec 1992	7.00	42.80
Jan 1993	7.80	38.40
Feb 1993	7.00	40.20
Mar 1993	7.00	40.40
Apr 1993	7.80	41.60
May 1993	8.00	40.40
Jun 1993	7.50	41.00
Jul 1993	8.20	40.00
Aug 1993	8.50	40.50
Sep 1993	9.00	39.00
Oct 1993	9.10	38.80
Nov 1993	9.50	36.10
Dec 1993	9.50	36.30
Jan 1994	11.30	34.40
Feb 1994	12.20	31.70
Mar 1994	13.10	32.50
Apr 1994	14.50	28.90
May 1994	14.60	32.40
Jun 1994	15.90	29.50
Jul 1994	15.20	28.60

	Jobs plentiful	Jobs hard to get
Aug 1994	15.60	28.20
Sep 1994	15.80	28.50
Oct 1994	16.10	29.70
Nov 1994	19.90	27.60
Dec 1994	21.10	24.20
Jan 1995	22.60	25.50
Feb 1995	21.80	24.50
Mar 1995	23.20	24.50
Apr 1995	23.00	23.70
May 1995	22.90	24.20
Jun 1995	21.00	24.60
Jul 1995	24.00	23.10
Aug 1995	23.60	24.60
Sep 1995	22.70	25.10
Oct 1995	20.60	27.00
Nov 1995	22.70	25.60
Dec 1995	21.60	24.80
Jan 1996	21.30	26.30
Feb 1996	21.80	23.40
Mar 1996	22.50	26.20
Apr 1996	23.00	21.40
May 1996	24.80	22.80
Jun 1996	24.60	23.60
Jul 1996	26.50	22.40
Aug 1996	27.00	21.90
Sep 1996	26.40	20.40
Oct 1996	25.40	22.40
Nov 1996	26.50	21.40
Dec 1996	28.80	20.70
Jan 1997	30.90	18.60
Feb 1997	32.50	18.50
Mar 1997	33.10	18.50
Apr 1997	31.10	19.50
May 1997	34.90	17.40
Jun 1997	36.00	16.50
Jul 1997	36.20	16.90
Aug 1997	37.20	17.00
Sep 1997	36.40	16.10
Oct 1997	33.50	18.80
Nov 1997	36.40	17.40
Dec 1997	40.10	16.00
Jan 1998	40.10	16.40
Feb 1998	42.80	13.20
Mar 1998	45.00	13.80

	Jobs plentiful	Jobs hard to get
Apr 1998	44.30	14.30
May 1998	44.20	14.00
Jun 1998	44.70	13.50
Jul 1998	46.10	14.00
Aug 1998	44.80	13.80
Sep 1998	45.20	14.30
Oct 1998	41.90	15.30
Nov 1998	40.70	14.40
Dec 1998	42.50	14.60
Jan 1999	46.60	13.00
Feb 1999	47.80	11.90
Mar 1999	47.30	12.20
Apr 1999	47.80	12.70
May 1999	47.60	12.50
Jun 1999	47.30	12.30
Jul 1999	49.40	11.50
Aug 1999	49.40	12.70
Sep 1999	47.50	12.70
Oct 1999	47.60	13.30
Nov 1999	48.10	11.80
Dec 1999	51.80	11.80
Jan 2000	55.20	11.20
Feb 2000	51.20	11.40
Mar 2000	53.30	10.60
Apr 2000	52.40	12.10
May 2000	53.00	11.00
Jun 2000	53.70	11.20
Jul 2000	55.80	9.60
Aug 2000	53.50	11.50
Sep 2000	52.50	10.60
Oct 2000	50.00	12.00
Nov 2000	50.60	11.10
Dec 2000	50.80	12.40
Jan 2001	49.00	12.80
Feb 2001	43.70	12.40
Mar 2001	43.80	12.60
Apr 2001	40.10	14.20
May 2001	39.30	14.30
Jun 2001	38.30	13.90
Jul 2001	35.60	14.10
Aug 2001	33.60	16.00
Sep 2001	27.10	18.80
Oct 2001	20.90	20.60
Nov 2001	17.50	22.70

	Jobs plentiful	Jobs hard to get
Dec 2001	17.90	21.90
Jan 2002	18.40	22.50
Feb 2002	18.20	22.60
Mar 2002	20.60	21.10
Apr 2002	20.90	22.70
May 2002	21.20	21.90
Jun 2002	20.10	23.10

Bottom panel
Hourly Labor Compensation

Four-quarter percent change

	P&C compensation per hour	P&C compensation per hour-Forecast	Employment cost index	Employment cost index- Forecast
1995:Q1	1.25	ND	2.98	ND
1995:Q2	2.02	ND	2.87	ND
1995:Q3	2.59	ND	2.52	ND
1995:Q4	2.57	ND	2.67	ND
1996:Q1	2.75	ND	2.73	ND
1996:Q2	3.11	ND	2.79	ND
1996:Q3	3.18	ND	2.85	ND
1996:Q4	3.25	ND	2.91	ND
1997:Q1	3.23	ND	2.89	ND
1997:Q2	2.47	ND	2.87	ND
1997:Q3	2.72	ND	3.08	ND
1997:Q4	3.42	ND	3.44	ND
1998:Q1	4.56	ND	3.42	ND
1998:Q2	5.70	ND	3.54	ND
1998:Q3	5.91	ND	3.74	ND
1998:Q4	5.30	ND	3.40	ND
1999:Q1	4.53	ND	3.01	ND
1999:Q2	4.13	ND	3.28	ND
1999:Q3	4.25	ND	3.17	ND
1999:Q4	4.54	ND	3.43	ND
2000:Q1	5.32	ND	4.56	ND
2000:Q2	6.23	ND	4.58	ND
2000:Q3	6.79	ND	4.68	ND
2000:Q4	7.82	ND	4.50	ND
2001:Q1	7.30	7.34	4.23	ND
2001:Q2	6.48	6.51	4.05	ND
2001:Q3	5.54	5.55	3.94	ND
2001:Q4	3.88	3.86	4.10	ND

	P&C compensation per hour	P&C compensation per hour-Forecast	Employment cost index	Employment cost index- Forecast
2002:Q1	3.40	3.33	3.86	3.86
2002:Q2	ND	2.85	ND	3.75
2002:Q3	ND	2.68	ND	3.71
2002:Q4	ND	2.95	ND	3.52
2003:Q1	ND	3.11	ND	3.50
2003:Q2	ND	3.28	ND	3.50
2003:Q3	ND	3.36	ND	3.50
2003:Q4	ND	3.40	ND	3.53

Chart 10 Prices

Top-left panel Unit Labor Costs*

Based on actual productivity

Four-quarter percent change

	Unit Labor Costs	Forecast
1999	1.50	ND
2000	5.00	ND
2001	1.70	ND
2002	ND	-0.29
2003	ND	1.58

Based on structural productivity

Four-quarter percent change

	Unit Labor Costs	Forecast
1999:Q1	1.65	ND
1999:Q2	1.23	ND
1999:Q3	1.31	ND
1999:Q4	1.57	ND
2000:Q1	2.30	ND
2000:Q2	3.17	ND
2000:Q3	3.69	ND
2000:Q4	4.66	ND
2001:Q1	4.39	ND
2001:Q2	3.77	ND
2001:Q3	3.03	ND
2001:Q4	1.57	1.57
2002:Q1	ND	1.13
2002:Q2	ND	0.73
2002:Q3	ND	0.64

	Unit Labor Costs	Forecast
2002:Q4	ND	0.98
2003:Q1	ND	1.01
2003:Q2	ND	1.04
2003:Q3	ND	0.99
2003:Q4	ND	0.89

*P&C basis. [Return to text](#)

Top-right panel

Core Non-oil Import Prices

Four-quarter percent change

	Price	Forecast
1998:Q1	-1.50	ND
1998:Q2	-1.40	ND
1998:Q3	-2.26	ND
1998:Q4	-2.03	ND
1999:Q1	-1.30	ND
1999:Q2	-1.04	ND
1999:Q3	0.09	ND
1999:Q4	0.35	ND
2000:Q1	0.77	ND
2000:Q2	1.47	ND
2000:Q3	1.61	ND
2000:Q4	1.60	ND
2001:Q1	1.78	ND
2001:Q2	0.00	ND
2001:Q3	-1.97	ND
2001:Q4	-3.15	ND
2002:Q1	-4.22	-4.22
2002:Q2	ND	-2.58
2002:Q3	ND	0.24
2002:Q4	ND	1.88
2003:Q1	ND	3.23
2003:Q2	ND	3.55
2003:Q3	ND	2.93
2003:Q4	ND	2.73

Middle-left panel

PCE Food and Energy Prices

Percent change, Q4/Q4

	Food	Food-Forecast	Energy	Energy-Forecast

	Food	Food-Forecast	Energy	Energy-Forecast
1998	1.90	ND	-9.58	ND
1999	1.97	ND	12.18	ND
2000	2.51	ND	15.35	ND
2001	3.20	ND	-9.87	ND
2002	ND	1.62	ND	2.98
2003	ND	2.08	ND	-0.87

Middle-right panel
Inflation Expectations

Michigan SRC, One-year
ahead, median

	Percent
Jan 1998	2.30
Feb 1998	2.40
Mar 1998	2.50
Apr 1998	2.40
May 1998	2.60
Jun 1998	2.70
Jul 1998	2.60
Aug 1998	2.40
Sep 1998	2.30
Oct 1998	2.50
Nov 1998	2.30
Dec 1998	2.50
Jan 1999	2.70
Feb 1999	2.50
Mar 1999	2.70
Apr 1999	2.70
May 1999	2.80
Jun 1999	2.50
Jul 1999	2.70
Aug 1999	2.80
Sep 1999	2.70
Oct 1999	2.90
Nov 1999	2.90
Dec 1999	3.00
Jan 2000	3.00
Feb 2000	2.90
Mar 2000	3.20
Apr 2000	3.20
May 2000	3.00
Jun 2000	2.90

	Percent
Jul 2000	3.00
Aug 2000	2.70
Sep 2000	2.90
Oct 2000	3.20
Nov 2000	2.90
Dec 2000	2.80
Jan 2001	3.00
Feb 2001	2.80
Mar 2001	2.80
Apr 2001	3.10
May 2001	3.20
Jun 2001	3.00
Jul 2001	2.60
Aug 2001	2.70
Sep 2001	2.80
Oct 2001	1.00
Nov 2001	0.40
Dec 2001	1.80
Jan 2002	1.90
Feb 2002	2.10
Mar 2002	2.70
Apr 2002	2.80
May 2002	2.70
Jun 2002	3.00

FRB Philadelphia, One-year ahead

	Percent
1998:Q1	2.25
1998:Q2	2.45
1998:Q3	2.48
1998:Q4	2.30
1999:Q1	2.20
1999:Q2	2.20
1999:Q3	2.38
1999:Q4	2.53
2000:Q1	2.50
2000:Q2	2.60
2000:Q3	2.70
2000:Q4	2.68
2001:Q1	2.50
2001:Q2	2.50
2001:Q3	2.60
2001:Q4	2.18

	Percent
2002:Q1	2.20
2002:Q2	2.35

Bottom panel

Core Consumer Prices

Four-quarter percent change

	Current-methods CPI	Current-methods CPI-Forecast	PCE	PCE-Forecast	Market-Based PCE	Market-Based PCE-Forecast
1995:Q1	2.36	ND	2.59	ND	2.04	ND
1995:Q2	2.49	ND	2.53	ND	1.83	ND
1995:Q3	2.54	ND	2.28	ND	1.78	ND
1995:Q4	2.69	ND	2.27	ND	1.86	ND
1996:Q1	2.60	ND	2.04	ND	1.66	ND
1996:Q2	2.37	ND	1.87	ND	1.53	ND
1996:Q3	2.29	ND	1.74	ND	1.39	ND
1996:Q4	2.21	ND	1.83	ND	1.40	ND
1997:Q1	2.10	ND	1.97	ND	1.40	ND
1997:Q2	2.20	ND	2.11	ND	1.55	ND
1997:Q3	1.99	ND	1.98	ND	1.42	ND
1997:Q4	1.92	ND	1.73	ND	1.19	ND
1998:Q1	2.04	ND	1.54	ND	1.18	ND
1998:Q2	2.01	ND	1.39	ND	1.07	ND
1998:Q3	2.17	ND	1.52	ND	1.27	ND
1998:Q4	2.17	ND	1.58	ND	1.38	ND
1999:Q1	2.01	ND	1.53	ND	1.40	ND
1999:Q2	1.99	ND	1.42	ND	1.39	ND
1999:Q3	2.00	ND	1.41	ND	1.28	ND
1999:Q4	2.08	ND	1.48	ND	1.41	ND
2000:Q1	2.20	ND	1.85	ND	1.48	ND
2000:Q2	2.36	ND	1.97	ND	1.58	ND
2000:Q3	2.51	ND	1.99	ND	1.74	ND
2000:Q4	2.48	ND	1.93	ND	1.73	ND
2001:Q1	2.62	ND	1.85	ND	1.84	ND
2001:Q2	2.63	ND	1.59	ND	1.64	ND
2001:Q3	2.64	ND	1.29	ND	1.63	ND
2001:Q4	2.69	ND	1.60	ND	1.65	ND
2002:Q1	2.54	2.51	1.20	1.20	1.30	1.33
2002:Q2	ND	2.51	ND	1.47	ND	1.56
2002:Q3	ND	2.39	ND	1.71	ND	1.54
2002:Q4	ND	2.27	ND	1.37	ND	1.45
2003:Q1	ND	2.22	ND	1.48	ND	1.50
2003:Q2	ND	2.14	ND	1.39	ND	1.36

	Current-methods CPI	Current-methods CPI-Forecast	PCE	PCE-Forecast	Market-Based PCE	Market-Based PCE-Forecast
2003:Q3	ND	2.11	ND	1.37	ND	1.32
2003:Q4	ND	2.08	ND	1.36	ND	1.29

Chart 11 Financial Developments

Chart 11 is a three-by-two array of panels, including graphs for nominal exchange rates, a previous depreciation episode, three-month euro futures rates, three-month yen futures rates, a table on interest rates, and a graph on broad stock price indexes.

Top-left panel

Nominal Exchange Rates

Nominal Exchange Rates, Foreign currency/U.S. dollar, on a weekly basis for 2000 through mid-2002. The range of the y-axis is [90, 140]; index, Jan. 3, 2000 = 100. The three series are the euro, the yen, and a basket of "major currencies," where the last is the trade-weighted average against major currencies. The chart shows the decline in the nominal exchange value of the dollar that has occurred since shortly after the January 2002 chart show in terms of these currencies. The major currencies index starts at 100, moves generally upward to about 118 by early 2002, and then declines to about 110 by mid 2002. The euro begins at 100, increases to about 120 by late 2000, drops to about 110 by the end of 2000, increases to about 120 by mid-2001, drops to about 108 a few months later, climbs to about 118 by early 2002, and then declines to about 105 by mid-2002. The yen starts at 100, fluctuates around 105 during most of 2000, rises to slightly over 130 by early 2002, and then declines to just over 120 by mid-2002.

Top-right panel

Previous Depreciation Episode

Previous Depreciation Episode, Foreign currency/U.S. dollar, on a weekly basis for 1984-1987. The range of the y-axis is [50, 130]; index, Jan. 3, 1984 = 100. The three series are the Canadian dollar, the German mark, and the yen. The Canadian dollar starts at 100, rises gradually to about 112 by early 1986, and then declines gradually to about 105 by the end of 1987. The German mark begins at about 100, dips immediately to about 94, rises to about 122 by early 1985, and then drops steeply to about 60 by the end of 1987. The yen starts at 100, dips immediately to about 96, rises to about 110 by early 1985, and then drops steeply to about 54 by the end of 1987.

Middle-left panel

Three-Month Euro Futures Rates

Three-Month Euro Futures Rates for 2002-2003, as of January 29, 2002, as of March 28, 2002, and as of June 24, 2002. The range of the y-axis is [3.0, 5.0]; unit is percent. The futures rates as of January 29, 2002, begin at about 3.5 percent and rise to about 4.8 percent by the end of the period. The futures rates as of March 28, 2002, begin at about 3.6 percent and rise to about 5 percent by the end of the period. The futures rates as of June 24, 2002, begin at about 3.5 percent and rise to about 4.5 percent by the end of the period.

Middle-right panel

Three-Month Yen Futures Rates

Three-Month Yen Futures Rates for 2002-2003, as of January 29, 2002, as of March 28, 2002, and as of June 24, 2002. The range of the y-axis is [0.0, 2.0]; unit is percent. The rates as of January 29, 2002, begin at about 0.1 percent and rise to about 0.4 percent by the end of the period. The rates as of March 28, 2002, and as of June 24, 2002 track almost identically; they begin at about 0.1 percent and rise to about 0.3 percent by the end of the period.

Bottom-left panel

Interest Rates

The table reports spot short-term and long-term interest rates and their change since the January 2002 meeting. The first column shows the level as of 6/24/02, and the second column shows the change from 1/29/02 to 6/24/02.

	Level 6/24/02	Change 1/29/02 to 6/24/02
Three-Month		
1. Euro	3.46	0.09
2. Japan	0.02	-0.02
3. United States	1.81	0.01
Ten-Year		
1. Germany	4.93	-0.08
2. Japan	1.32	-0.15
3. United States	4.84	-0.18

Bottom-right panel

Broad Stock Price Indexes for the S&P 500, the DJ Euro, and the TOPIX for 2000 through mid-2002. The range of the y-axis is [50, 120]; index, Jan. 3, 2000 = 100. The S&P 500 starts at 100 and, with modest volatility, declines to about 70 by late 2001, rises to about 80 by early 2002, and then declines to about 70 by mid-2002. The DJ Euro starts at 100 and, with modest volatility, rises to about 112 in early 2000, declines to about 60 by late 2001, rises to about 75 by early 2002, and then declines to about 64 by mid-2002. The TOPIX starts at 100, and, with modest volatility, declines to about 60 by late 2001 and then fluctuates around 60 through mid-2002.

Chart 12

Foreign Outlook

Chart 12 is a three-by-two array of panels, including graphs of real GDP, foreign real GDP, industrial production, business confidence, and exports, and a table of real GDP growth for industrial countries.

Top-left panel

Real GDP

Real GDP (percent change, SAAR*), U.S. and total foreign,** as a bar chart for 2001:H1 (actual), 2001:H2 (actual), 2002:H1 (projected), 2002:H2 (projected), 2003:H1 (projected), and 2003:H2 (projected). The range of the y-axis is [-1, 6]. Approximate values for the six periods are as follows.

Percent change, SAAR

	2001		2002		2003	
	H1	H2	H1	H2	H1	H2
United States (red)	0.8	0.1	3.9	3.5	4.0	4.1
Total foreign (blue)	-0.1	0.2	3.0	3.4	3.5	3.5

*Half years are Q2/Q4 or Q4/Q2. [Return to text](#)

**Total foreign GDP growth is calculated using U.S. total export weights. [Return to text](#)

Top-right panel

Foreign Real GDP

Foreign Real GDP* (percent change, Q4/Q4), for industrial countries, Asia, and Latin America, as a bar chart for 2001 (actual), 2002 (projected), and 2003 (projected). The range of the y-axis is [-2, 7]. Approximate values for the three years are as follows.

Percent change, Q4/Q4

	2001	2002	2003
Industrial countries (red)	0.3	2.8	2.8
Asia (blue)	0.75	5.5	5.7
Latin America (green)	-1.6	2.4	3.7

*Foreign real GDP growth is calculated using U.S. total export weights. [Return to text](#)

Middle-left panel

Industrial Production

Industrial Production for 2000 through mid-2002 for the euro area, the U.K., Canada, and Japan. The range of the y-axis is [85, 110]; index, Jan. 2000 = 100, SA. All four indexes start at 100 at the beginning of the period. The index for the euro area rises to about 107 by the end of 2000, falls to about 102 by late 2001, and rises slightly to about 103 by the end of the period. The index for the U.K. rises to about 103 by mid-2000, declines to about 95 in early 2002, with a slight uptick to about 96 by mid-2002. The index for Canada rises to about 102 by mid-2000, declines to about 95 by end-2001, and then rises to about 98 by the end of the period. The index for Japan rises to about 106 by mid-2000, falls sharply to just below 90 by late 2001, and then rises slightly to about 92 by the end of the period.

Middle-right panel

Business Confidence

Business Confidence for 2000 through mid-2002 for the euro area, the U.K., Canada, and Japan. The graph uses diffusion indexes for the euro area, the U.K., and Japan; the range of the left y-axis is [-40, 30] for the euro area, the U.K., and Japan. The graph uses a business confidence index where 2000:Q1 = 100 for Canada; the range of the right y-axis is [50, 100] for Canada. The index for the euro area starts at about 0, and, with little volatility, rises to about 8 by mid-2000, declines to about -15 by late 2001, and then rises to about -8 by the end of the period. The index for the U.K. starts at about 10, and, with some volatility, drops to about -28 by end-2001 and then rises to about 5 by the end of the period. The index for Japan starts at -10, and, with little volatility, rises to about -8 by late 2000, falls to about -30 by late 2001, and then rises to about -15 by the end of the period. The index

for Canada starts at 100, and, with significant volatility, falls to about 56 by mid-2001 and then rises strongly to about 88 by early 2002.

Bottom-left panel

Exports

Exports* for 2000 through mid-2002 for the euro area, Canada, the U.K., and Japan. The range of the y-axis is [75, 115]; index, Jan. 2000 = 100, SA. All four indexes start at 100 at the beginning of the period. The index for the euro area remains near 100 through late 2000, rises to about 107 by early 2001, declines quickly to about 100 and, with modest volatility, remains near 100 for the rest of the period. The index for the U.K. remains near 100 through late 2000, rises to about 104 by early 2001, declines to about 92 by early 2002, and rises to about 94 by the end of the period. The index for Canada rises to about 110 by early 2001, declines to about 90 by late 2001, and then rises to nearly 95 by the end of the period. The index for Japan rises to about 103 by late 2000, drops to about 78 by early 2002, and then rises to about 82 by the end of the period.

*Three-month moving average. [Return to text](#)

Bottom-right panel

Real GDP Growth

A table showing "Real GDP Growth, Percent, SAAR" for 2001:H2 (actual), 2002:H1 (forecast), 2002:H2 (forecast), and 2003 (forecast). Forecasts are the staff baseline forecast.

Percent, SAAR*

	2001	2002		2003
	H2	H1	H2	
1. Industrial countries**	0.1	2.7	3.0	2.9
2. Euro Area	-0.4	1.2	2.8	2.7
3. Japan	-3.5	0.5	0.8	1.2
4. Canada	1.2	4.7	3.6	3.5
5. United Kingdom	0.8	1.9	3.3	2.9

*Years are Q4/Q4; half years are Q2/Q4 or Q4/Q2. [Return to table](#)

**Calculations use U.S. total export weights. [Return to table](#)

Chart 13

Emerging Market Countries

(Weekly data)

Chart 13 is a three-by-two array of panels focusing on the contrasting experiences of the Asian and Latin American emerging market countries. Down the left-hand side of the page are the panels for Asia: a graph of nominal exchange rates, a graph of offshore-dollar bond spreads, and a table on real GDP growth. Down the right-hand side of the page are the panels for Latin America: a graph of nominal exchange rates, a graph of Brady bond spreads, and a table on real GDP growth.

Asia

Top-left panel

Nominal Exchange Rates

Nominal Exchange Rates, Foreign currency/U.S. dollar, for the Thai baht, the Korean won, and the Taiwanese dollar for 2000 through mid-2002. The range of the y-axis is [90, 125]; index, Jan. 7, 2000 = 100. The indexes for all the currencies start at 100 at the beginning of 2000. The index for the Thai baht rises to about 123 by mid-2001 and then declines to about 113 by mid-2002. The index for the Korean won rises to about 120 by early 2001, immediately declines slightly, ranges from about 111-117 through early 2002, and then falls to about 107 by mid-2002. The index for the Taiwanese dollar stays at around 100 for the most of 2000, rises to about 113 by mid-2001 and stays at about that level through early 2002, and then declines to about 109 by the end of the period.

Middle-left panel

Offshore-Dollar Bond Spreads

Offshore-Dollar Bond Spreads for 2000 through mid-2002 for China, Korea, and Thailand. The range of the y-axis is [0, 3]; unit is percentage points. The spreads for China start at about $1\frac{1}{4}$ percentage points, rise to about $1\frac{1}{2}$ percentage points by late 2000, decline to about 1 percentage point by early 2001, and then rise gradually to about $1\frac{3}{4}$ percentage points by mid-2002. The spreads for Korea start at about $1\frac{1}{2}$ percentage points, rise to about $2\frac{1}{2}$ percentage points by late 2000, decline to about $1\frac{1}{3}$ percentage points by late 2001, and then rise gradually to about $1\frac{3}{4}$ percentage points by mid-2002. The spreads for China and Korea are nearly the same from late 2001 through the end of the period. The spreads for Thailand start at about $1\frac{1}{2}$ percentage points and range from $1\frac{1}{4}$ to $1\frac{1}{2}$ percentage points through early 2001, then drop to just below 1 percentage point, rise to over 2 percentage points by mid-2001, drop to about $\frac{3}{4}$ percentage point by late 2001, and then fluctuate between about $\frac{2}{3}$ percentage point and 1 percentage point through mid-2002, ending at about $\frac{2}{3}$ percentage point.

Bottom-left panel

Real GDP Growth

A table showing "Real GDP Growth, Percent, SAAR" for 2001:H2 (actual), 2002:H1 (forecast), 2002:H2 (forecast), and 2003 (forecast). Forecasts are the staff baseline forecast.

Percent, SAAR^{*}

	2001	2002		2003
	H2	H1	H2	
1. Developing Asia ^{**}	3.1	5.7	5.2	5.6
<i>of which:</i>				
2. China	7.1	7.8	7.2	7.5
3. Korea	5.8	6.9	5.5	6.0
4. Taiwan	2.3	6.7	5.0	5.0
5. Thailand	3.4	7.1	4.5	4.5

*Years are Q4/Q4; half years are Q2/Q4 or Q4/Q2. [Return to table](#)

**Calculations use U.S. total export weights. [Return to table](#)

Latin America

Top-right panel

Nominal Exchange Rates, Foreign currency/U.S. dollar, for the Argentine peso, the Brazilian real, and the Mexican peso, from 2000 through mid-2002. The range of the y-axis is [50, 400]; index, Jan.

7, 2000 = 100. The indexes for all the currencies start at 100 at the beginning of 2000 and remain close to 100 for all of 2000. The index for the Argentine peso remains flat at 100 until the beginning of 2002, when the country ended its one-to-one peg to the U.S. dollar, at which point the currency began rising sharply, reaching about 370 by mid-2002. The index for the Brazilian real rises to just over 150 by late 2001, falls to about 130 by early 2002, and rises to just over 150 by the end of the period. The index for Mexico remains around 100 for the entire period.

Middle-right panel

Brady Bond Spreads for 2000 through mid-2002 for Argentina, Brazil, and Mexico. The range of the y-axis is [0, 75]; unit is percentage points. The spreads for Argentina range from about 15-20 percentage points from the beginning of the period through late 2001, rise steeply to over 50 percentage points by end-2001, and then range from about 50 to about 70 percentage points, ending at about 60 percentage points at the end of the period. The spreads for Brazil range from about 10-15 percentage points for most of the period, with a slight increase to about 17 percentage points at the end of the period. The spreads for Mexico start at about 5 percentage points and trend slightly downward to about 3 percentage points by the end of the period.

Bottom-right panel

Real GDP Growth

A table showing "Real GDP Growth, Percent, SAAR" for 2001:H2 (actual), 2002:H1 (forecast), 2002:H2 (forecast), and 2003 (forecast). Forecasts are the staff baseline forecast.

Percent, SAAR^{*}

	2001	2002		2003
	H2	H1	H2	
1. Latin America ^{**}	-1.8	1.4	3.2	3.6
<i>of which:</i>				
2. Mexico	-1.6	2.2	4.1	4.3
3. Brazil	-0.7	3.7	0.7	2.1
4. Argentina	-17.5	-8.5	-5.0	-0.3

*Years are Q4/Q4; half years are Q2/Q4 or Q4/Q2. [Return to table](#)

**Calculations use U.S. total export weights. [Return to table](#)

Chart 14

External Outlook

Chart 14 shows five panels, including a table on recent developments in exports and imports, a graph on the real exchange rate outlook, tables on real export growth and real import growth, and a graph on the contribution of exports and imports to U.S. GDP growth.

Top-left panel

Recent Developments: Exports and Imports

The table "Recent Developments: Exports and Imports, Billions of dollars, SAAR" reports trade data for April that were released after the Greenbook forecast was completed.

Billions of dollars, SAAR

2002:	Q1	April
-------	----	-------

2002:	Q1	April
1. Goods Exports	659	683
<i>of which:</i>		
2. Capital goods	284	290
3. Services	276	279
4. Total Goods and Services	934	961
5. Goods Imports	1084	1162
<i>of which:</i>		
6. Oil	77	111
7. Capital goods	277	285
8. Services	230	231
9. Total Goods and Services	1314	1393
10. Balance	-379	-431

Top-right panel

Real Exchange Rate Outlook

Real Exchange Rate Outlook* for 2000 through mid-2002 (actual), along with the January Greenbook forecast for early 2002 through 2003 and the June Greenbook forecast from mid-2002 through 2003. The range of the y-axis is [95, 125]; index, 2000:Q1 = 100. The actual real exchange rate starts at 100 at the beginning of the period, rises to about 116 by early 2002, and then declines to about 112 by mid-2002. The January Greenbook forecast starts at about 116 in early 2002 and stays roughly flat for the rest of the period. The June Greenbook forecast declines from about 112 in mid-2002 to about 106 by the end of 2003.

*Import/export weighted average of major foreign currencies. [Return to table](#)

Middle-left panel

Real Export Growth

Percent, Q4/Q4

	2000	2001	2002	2003
Growth of real exports				
1. G & S	7.0	-10.9	6.0	8.4
Percentage point contribution				
2. Services	1.2	-2.0	2.4	1.9
3. Goods	5.8	-8.8	3.6	6.5
<i>of which:</i>				
4. Core*	3.5	-5.8	2.4	3.8

*Excludes computers and semiconductors. [Return to table](#)

Middle-right panel

Real Import Growth

Percent, Q4/Q4

	2000	2001	2002	2003

	2000	2001	2002	2003
Growth of real imports				
1. G & S	11.3	-8.5	9.4	9.2
Percentage point contribution				
2. Services	1.9	-2.4	1.2	0.6
3. Goods	9.5	-6.4	8.1	8.4
<i>of which:</i>				
4. Core*	7.1	-3.9	5.8	5.8

*Excludes computers, semiconductors, and oil. [Return to table](#)

Bottom panel

Contribution to U.S. GDP Growth

Contribution to U.S. GDP Growth* by exports and imports as a bar chart for 1999 (actual), 2000 (actual), 2001 (actual), 2002 (projected), and 2003 (projected) on a semi-annual basis. The range of the y-axis is

[-3, 3]; unit is percentage points, AR. Approximate values for the ten half-year periods are as follows.

Percentage points, AR

	1999		2000		2001		2002		2003	
	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
Exports (red)	-0.2	1.0	1.2	0.25	-0.75	-1.6	0.4	0.6	0.5	0.9
Imports (blue)	-1.25	-1.5	-2.25	-0.75	1.0	1.4	-1.6	-1.1	-1.3	-1.2

*Half years are Q2/Q4 or Q4/Q2. [Return to text](#)

Chart 15

External Sector

Chart 15 is a three-by-two array of panels, including a chart on the U.S. current account, a table on U.S. capital flows, and graphs giving simulation results exploring the consequences of a substantial dollar depreciation on real GDP for the euro area, Japan, Canada and Mexico, and developing Asia.

Top-left panel

Current Account

Current Account in terms of percent of GDP and in terms of level (billions of dollars) for 1990 through early 2002 (actual) and for early 2002 through 2003 (forecast). The range of the left y-axis, measured in terms of percent of GDP, is [-7, 1]. The range of the right y-axis, measured in terms of level or billions of dollars, is [-700, 100]. The two series track closely for the entire period. The current account in terms of level starts at a deficit of about \$100 billion, rises to a surplus of nearly \$50 billion at the end of 1990, immediately drops back into deficit, which continues to widen to about \$500 billion by early 2002. The forecast shows the deficit widening further, to about \$600 billion by end-2003. The current account in terms of percent of GDP starts at a deficit of about 1½ percent of GDP, rises to a surplus of nearly 1 percent of GDP at the end of 1990, immediately drops back into deficit, which continues to widen to a deficit of about 4½ percent of GDP by early 2002.

The forecast shows the deficit widening further, to around 5 percent of GDP by end-2003.

Top-right panel

Capital Flows

Billions of dollars, SAAR

	2001		2002
	H1	H2	Q1
1. Official capital, net	-37	37	39
2. Private capital, net	414	350	359
<i>of which:</i>			
3. For. purch. of U.S. sec.	448	352	259
4. <i>of which stocks</i>	148	91	100
5. U.S. purch. of for. sec.	-157	-32	8
6. <i>of which stocks</i>	-155	-59	6
7. For. D.I. in U.S.	189	72	103
8. U.S. D.I. abroad	-177	-138	-90
9. Statistical discrepancy	37	-15	51

Middle/bottom panel

Real GDP; Simulation Results

The bottom four panels use the staff model to explore the consequences of a substantial dollar depreciation on real GDP for the euro area, Japan, Canada and Mexico, and developing Asia. The black lines in each of the boxes show the Greenbook baseline forecast for real GDP for each of the four regions. The red lines are the alternative presented in the Greenbook for the negative shock to the dollar of 20 percent against most currencies, but only 10 percent against the Canadian dollar and Mexican peso. The blue lines are a second alternative scenario for a shock that is more concentrated toward the euro (about a 35 percent decline in the dollar in terms of the euro and the pound) and away from the yen and the currencies of developing Asia; the Canadian and Mexican currencies are left to be as near the Greenbook baseline in this second alternative as they were in the Greenbook alternative.

Middle-left panel

Simulation results for real GDP for the Euro Area for the Greenbook baseline (black line), the Greenbook alternative (red line), and the large euro shock (blue line) simulations for 2002:Q2 through 2003. The range of the y-axis is [100, 112]; index, 2002:Q2 = 100. All simulations start at 100 at the beginning of the period and rise, tracking closely, to just over 102 by mid-2003. In mid-2003, the simulation results diverge, with the Greenbook baseline simulation rising to just over 104, the Greenbook alternative simulation rising to just under 104, and the large euro shock simulation falling to just under 102 by end-2003.

Middle-right panel

Simulation results for real GDP for Japan for the Greenbook baseline (black line), the Greenbook alternative (red line), and the large euro shock (blue line) simulations for 2002:Q2 through 2003. The range of the y-axis is [100, 112]; index, 2002:Q2 = 100. All simulations start at 100 at the beginning of the period. The Greenbook baseline simulation rises to just under 102, the Greenbook alternative simulation rises to about 101, and the large euro shock simulation rises to just over 102 by end-2003.

Bottom-left panel

Simulation results for real GDP for Canada and Mexico for the Greenbook baseline (black line), the Greenbook alternative (red line), and the large euro shock (blue line) simulations for 2002:Q2 through 2003. The range of the y-axis is [100, 112]; index, 2002:Q2 = 100. All simulations start at 100 at the beginning of the period and rise, tracking nearly identically, to about 106 by end-2003.

Bottom-right panel

Simulation results for real GDP for Developing Asia for the Greenbook baseline (black line), the Greenbook alternative (red line), and the large euro shock (blue line) simulations for 2002:Q2 through 2003. The range of the y-axis is [100, 112]; index, 2002:Q2 = 100. All simulations start at 100 at the beginning of the period. The Greenbook baseline and Greenbook alternative simulations, tracking nearly identically, rise to about 103 by early 2003. In early 2003, the two simulation results diverge, with the Greenbook baseline simulation rising to just over 108, and the Greenbook alternative simulation rising to about 106 by end-2003. The large euro shock simulation tracks with the other two simulations for only one quarter, rising to about 101 by 2002:Q3; the euro shock simulation then diverges from the other two simulations and rises to nearly 111 by end-2003.

Chart 16

Top panel

ECONOMIC PROJECTIONS FOR 2002

	FOMC		Staff
	Range	Central Tendency	
Percentage change, Q4 to Q4			
Nominal GDP	4½ to 5½	4¾ to 5¼	4.7
February 2002	(3½ to 5½)	(4 to 4½)	(4.3)
Real GDP	3 to 4	3½ to 3¾	3.5
February 2002	(2 to 3½)	(2½ to 3)	(2.7)
PCE Prices	1¼ to 2	1½ to 1¾	1.5
February 2002	(1 to 2)	(About 1½)	(1.3)
Average level, Q4, percent			
Unemployment rate	5½ to 6¼	5¾ to 6	5.9
February 2002	(5¾ to 6½)	(6 to 6¼)	(6)

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

Bottom panel

ECONOMIC PROJECTIONS FOR 2003

	FOMC		Staff
	Range	Central Tendency	
Percentage change, Q4 to Q4			
Nominal GDP	4½ to 6	5 to 5¾	5.6

	FOMC		Staff
	Range	Central Tendency	
Real GDP	3¼ to 4¼	3½ to 4	4.1
PCE Prices	1 to 2¼	1½ to 1¾	1.4
Average level, Q4, percent			
Unemployment rate	5 to 6	5¼ to 5½	5.5

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