The Federal Reserve Board

Meeting of the Federal Open Market Committee
June 29-30, 2005 Presentation Materials -- Text Version

Presentation Materials (7.40 MB PDF)

Pages 172 to 234 of the Transcript

Appendix 1: Materials used by Messrs. Gallin, Lehnert, Peach, Rudebusch, and Williams

Material for **Special Staff Presentations on Housing Valuations and Monetary Policy**
June 29, 2005

STRICTLY CONFIDENTIAL (FR) CLASS II-FOMC

Is Housing Overvalued?

Joshua Gallin
Board of Governors of the Federal Reserve System

Exhibit 1
Is Housing Overvalued?

Top panel

Title: Changes in Real House Prices: The United States
Series: Changes in real house prices
Horizon: 1976 to 2005
Description: Data are plotted as one curve. Units are four-quarter percent change. Shaded bars appear on the figure for 1980, mid-1981 through 1982, mid-1990 to early 1991, and 2001.

The series begins 1976 at about negative 2, rises generally to about 8 in early 1978, falls to about 7 in late 1978, and then rises to about 8 in early 1979. The series generally falls to about negative 4 in early 1980, fluctuates between that point and negative 1 until late 1982, and then generally rises to about 6 in late 1986. The series generally falls to about negative 5 in late 1990. The series generally rises to end at about 9 in year-end 2004.

Note: Real house prices are the repeat-transactions price index relative to the personal consumption expenditures chain-price index.

Sources. BEA and OFHEO.

Middle-left panel

Title: Real Price Changes: Western Cities
Series: San Francisco and Las Vegas

Horizon: 1975 to 2005:Q1
Description: Data are plotted as two curves. Units are four-quarter percent change.

For San Francisco, the series begins in 1975 at about 10, rises generally to about 20 in mid-1977, falls to about 5 in 1978, and rises to about 12 in late 1979. The series then generally falls to about negative 8 in late 1982, generally rises to about 19 in late 1989, and falls to about negative 8 in early 1991. The series rises to about negative 3 later that year and fluctuates between that point and negative 4 until early 1994. The series falls to negative 5 in late 1994 and then generally rises to about 20 in late 2000. The series falls to about 5 in early 2002, rises to about 8 in mid-2002, falls to about 4 in late 2003, and then generally rises to end at about 15 in 2005:Q1.

For Las Vegas, the series begins at about 10 in 1979, rises to about 12 in the middle of that year, and then falls to about negative 3 in late 1979. The series rises to about negative 2 in early 1980 and fluctuates between that point and negative 1 until late 1980. The series then falls to negative 5 toward year-end 1980, rises to about 11 in early 1981, falls to about 1 in late 1980. The series then rises to about 18 in mid-1982, falls to about negative 3 in mid-1982, and then rises to about 16 toward year-end 1982. The series then generally falls to about negative 20 in late 1983, generally rises to about 5 in mid-1986, and then generally falls to about negative 5 in early 1987. The series remains at this level until early 1988 and then rises to about 5 in mid-1990. The series then generally falls to about negative 3 in early 1995, rises to about 5 in early 1996, falls to about negative 1 in mid-1997, rises to about 5 in mid-1998, and then falls to about negative 1 in late 1999. The series then generally rises to about 7 in late 2001, remains at about that level until late 2003, rises to about 40 in late 2004, and then falls to end at a little more than 30 in 2005:Q1.

The curves overlap in 1979, 1981, 1982, 1983, 1990, 1997, and 2003.

Middle-right panel

Title: Real Price Changes: Eastern Cities
Series: New York and Miami
Horizon: 1975 to 2005:Q1
Description: Data are plotted as two curves. Units are four-quarter percent change.

For New York, the series begins at about negative 3 in 1975, generally rises to about 2 in early 1977, and falls to about negative 5 in late 1977. The series then generally rises to about 9 in early 1979. The series falls to a little less than zero in early 1981, rises to about 2 later that year, and then falls to about negative 4 in mid-1982. The series rises to about 22 in late 1986, generally falls to about negative 15 in late 1990, and generally rises to about 12 in late 2002. The series then falls to about 5 in late 2003, generally rises to about 15 in late 2004, and then falls to end at about 12 in 2005:Q1.

For Miami, the series begins at about negative 9 in 1975, rises to about negative 1 in 1976, then fluctuates between negative 5 and 9 between 1977 and 1982. The series generally remains a bit under or over zero from 1983 to 1998 when it generally begins to rise, ending at about 20 in 2005:Q1.

The curves overlap in every year from 1975 to 1983, in 1989, and all years between 1993 and 2005.

Bottom-left panel
Anecdotes from the Housing Market

- Increased speculation.
- Rosy assessments of future appreciation.
- Increased reliance on novel financing without full recognition of the associated risks.

Bottom-right panel
Valuing Housing

- Is housing affordable for the typical household?
    - Are prices too high relative to incomes?
    - Are required mortgage payments affordable?
- Are prices too high relative to rents?

Exhibit 2

Top-left panel
A Framework for Valuing Housing

- Rental payments in the housing market are analogous to dividends in the stock market.
- High prices can be justified by high rents or low carrying costs.
- Carrying costs include interest payments, net taxes, and depreciation.

Top-right panel
The Data

- Repeat-transactions price indexes from OFHEO and Freddie Mac.
- Tenants' rent index from the CPI.
- Several adjustments address shortcomings of the data.

Middle panel

Title: Price-Rent Ratio and Real Carrying Costs
Series: Real carrying cost (interest payments, net taxes, depreciation) and price-rent ratio
Horizon: 1970 to 2005
Description: Data are plotted as two curves. Units are percent for real carrying cost and ratio for price-rent ratio.

For real carrying cost, the series begins at about 6.25 in 1970, generally falls to about 3.5 in late 1979, and generally rises to about 8.5 in early 1982. The series falls to about 5.9 in mid-1983, generally rises to about 7.9 in mid-1984, and generally falls to about 4.25 in early 1987. The series generally rises to about 6.25 in mid-1990, generally falls to about 4.8 in late 1993, and generally rises to about 6.5 in late 1994. The series generally falls to about 5.75 in early 1996, generally rises to about 7 in early 2000, generally falls to about 4.5 in early 2003, and fluctuates between that point and 5.25 until year-end 2004, when the series ends at about 4.5.

For price-rent ratio, the series begins in 1970 at about 20, falls to about 18 toward year-end 1971, and then generally rises to a little more than 24 in mid-1979. The series generally falls to about 20.5 in late 1985, generally rises to about 22 in late 1989, and then generally falls to about 20.5 in mid-1991. The series remains at about that level until late 1997 and then generally rises to end at about 27 in late 2004.

The curves overlap in 1974, 1976, 1981, 1987, and 2001.

Note. The price-rent ratio is the repeat-transactions house-price index divided by CPI tenants' rent, adjusted by Board staff. The real carrying cost includes effective after-tax mortgage rates, local property taxes, and depreciation relative to ten-year inflation expectations from the Philadelphia Fed survey.

Bottom panel

Title: Price-Rent Ratios and Subsequent Changes in Real Prices
Series: Price-rent ratios and subsequent changes in real prices
Horizon: Range of price-rent ratio starts at 19.0 and ends at 24.5 (x axis)
Description: Data are plotted as a scatter plot. Units are cumulative percent change, real prices, subsequent three years (y axis). A trend line slants from left to right, starting at about 4 (at 19.0 price-rent ratio) and ending at about negative 1 (about 24.25 price-rent ratio). Data points are represented by dots on the figure, with most clustered between about 20.25 and about 21.75 on the x axis and 20 and negative 10 on the y axis.

The following descriptions are in order from left to right as depicted on the figure: For 1970:Q3, the dot is located at about 19.45 on the x axis and 4 on the y axis. For 2002:Q1, the dot is located at about 22.25 on the x axis and about 21 on the y axis. For 1979:Q2, the dot is located at 24.25 on the x axis and about negative 7 on the y axis.

Exhibit 3

Top panel
Price-Rent Ratios and Subsequent Changes in Real Prices: Selected Cities

Percent deviation from long-run level

	San Francisco	New York	Chicago	Miami
Price-Rent Ratio				
1979:Q2	7	-4	9	4
1989:Q4	15	16	2	3
2005:Q1	34	21	12	64
Real Price Change, subsequent three years (cumulative)				
1979:Q2	-5	2	-20	3
1989:Q4	-12	-16	1	-5

Middle-left panel
Two Models of House Price Changes

Variables in the basic model

- Recent house prices
- Real income, real carrying costs, and the unemployment rate

Extra variables in error-correction model

- Lagged price-rent ratio
- Lagged level of carrying costs

Middle-right panel

Title: Projection of Real Price Changes
Series: History and staff forecast, basic model, and error-correction model

Horizon: 2002 to 2006 (forecast period begins after 2005:Q1)
Description: Data are plotted as three curves. Units are four-quarter percent change. Vertical line is located at 2005:Q1.

For history and staff forecast, the series begins at about 6 in 2002, rises generally to about 8 in late 2004 and then falls to about 7.5 in 2005:Q1. After that point the series falls to end at about 1 in year-end 2006.

For basic model, the series begins at about 7.5 in 2005:Q1, and then generally falls to end at about 4 in year-end 2006.

For error-correction model, the series begins at about 7.5 in 2005:Q1, and then generally falls to end at about negative 1.75 in year-end 2006.

Bottom panel
Conclusions

- The price-rent ratio is very high by historical standards, suggesting that housing might be overvalued by as much as 20 percent.
- Historical experience suggests that the change in real house prices going forward will be slower than in recent years.
- The evidence cannot rule out either further rapid gains in house prices for a time or a rapid correction back toward fundamentals.

House Prices and Mortgage Finance

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Board of Governors of the Federal Reserve System

Exhibit 1
Household Sector Vulnerability to House Price Declines

Top panel
Estimated Loan-to-Value Distribution of Outstanding Mortgages

Percent of borrowers

	Less than 70	70-79	80-89	90+
September 2003	56	19	18	7
March 2005	64	18	14	4

Source. LoanPerformance Corp. (LPC) servicer data, flow of funds accounts (FFA), OFHEO

Middle-left panel

Title: Sensitivity of Household Sector to Price Declines
Series: September 2003 and March 2005
Horizon: September 2003 and March 2005
Description: Data are plotted as two curves. Horizontal axis units are price decline (percent). Vertical axis units are percent of borrowers with negative equity.

The September 2003 curve begins at about 0 percent price decline and about 2 percent of borrowers

with negative equity and trends up to end at 30 percent price decline and about 43 percent of borrowers with negative equity.

The March 2005 curve begins at about 0 percent price decline and about 1 percent of borrowers with negative equity and trends up to end at 30 percent price decline and about 35 percent of borrowers with negative equity.

Middle-right panel

Title: LTV at Origination Against Price Change
Series: Plot points by state. Not all plot points are labeled.
Horizon: 1999 to 2003
Description: Data are plotted as a scatter plot. Horizontal axis units are annualized price change, 1999-2003 (percent). Vertical axis units are average LTV at origination, 2004.

Data points are heavily grouped together between 2 and 6 annualized price change and between about 80 and 86 average LTV at origination, 2004. Most other data points fall between 6 and 10 annualized price change and 75 and 80 average LTV at origination, 2004.

Labeled states are plotted as follows:

- Utah is plotted at about 2 annualized price change and about 82.5 average LTV at origination, 2004.
- Oklahoma is plotted at about 3.5 annualized price change and about 85.9 average LTV at origination, 2004.
- Texas is plotted at about 4.1 annualized price change and about 85 average LTV at origination, 2004.
- Nevada is plotted at about 4.8 annualized price change and about 79.9 average LTV at origination, 2004.
- Illinois is plotted at about 5 annualized price change and about 80.5 average LTV at origination, 2004.
- Florida is plotted at about 7.5 annualized price change and about 79.5 average LTV at origination, 2004.
- New York is plotted at about 8.1 annualized price change and about 77.1 average LTV at origination, 2004.
- Massachusetts is plotted at about 9.5 annualized price change and about 74.4 average LTV at origination, 2004.
- California is plotted at about 9.6 annualized price change and about 74.4 average LTV at origination, 2004.
- District of Columbia is plotted at about 11.9 annualized price change and about 78.5 average LTV at origination, 2004.

Bottom-left panel

Title: Mortgage Delinquency Rates
Series: All loans, and loans at commercial banks
Horizon: 1991 to 2005
Description: Data are plotted as curves and are quarterly. Units are percent.

The all loans series begins in 1991 at about 5.2, drops to about 3.9 in 1994, then rises to about 5.5 in 2001, and generally falls to end in 2005:Q1 at about 4.3.

The loans at commercial banks series begins at about 3.4 in 1991, then mostly falls to end in

2005:Q1 at about 1.4.

Source. MBA, Call Reports

Bottom-right panel
Conclusions

- Average LTV has decreased over the past 18 months
- Most borrowers have substantial equity in their homes
- Rapidly rising house prices have kept mortgage delinquencies and losses low
- Some households are very highly leveraged

Exhibit 2
Characteristics of Interest-Only (IO) Mortgages in RMBS Pools

Top-left panel
Components of Home Mortgage Debt

	2003:Q1	2005:Q1
	billions of dollars	
1. RMBS pools	591	1,191
2. IO RMBS pools	54	296
3. Total home mortgage debt	6,491	8,282
Memo:		
4. IO RMBS share of home mortgages (percent)	0.8	3.6

Source. LPC RMBS data, FFA

Top-right panel

Title: IO Share of RMBS Against Price Change
Series: Plot points by state. Not all plot points are labeled.
Horizon: 1999 to 2003
Description: Data are plotted as a scatter plot. Horizontal axis is annualized price change, 1999-2003 (percent). Vertical axis is IO share of RMBS (percent). r = 0.3

Data points are heavily grouped together between 2 and 4 annualized price change on the horizontal axis and about 0 and 21 IO share of RMBS on the vertical axis. Most other plot points are scattered between about 6 and 10 annualized price change and about 10 and 49 IO share of RMBS.

Labeled states are plotted as follows:

- Utah is plotted at about 2 annualized price change and about 28 IO share of RMBS.
- Nevada is plotted at about 4.5 annualized price change and about 45 IO share of RMBS.
- Illinois is plotted at about 5 annualized price change and about 15 IO share of RMBS.
- Florida is plotted at about 7.5 annualized price change and about 30 IO share of RMBS.
- New York is plotted at about 8 annualized price change and about 15 IO share of RMBS.
- Massachusetts is plotted at about 9.5 annualized price change and about 20 IO share of RMBS.
- California is plotted at about 9.6 annualized price change and about 47 IO share of RMBS.

- District of Columbia is plotted at about 11.5 annualized price change and about 45 IO share of RMBS.

Note. Data are from purchase originations in 2004

Middle panel

Title: Loan-to-Value Ratios of Interest-Only Mortgages at Origination
Series: March 2003, March 2004, and February 2005
Horizon: March 2003, March 2004, and February 2005
Description: Data are plotted as three bars in four groups: less than 70; 70-79; 80-89; and 90+. Units are percent of interest-only mortgage debt.

The set of bars at less than 70: March 2003 is about 45, March 2004 is about 33, and February 2005 is about 25.

The set of bars at 70-79: March 2003 is about 46, March 2004 is about 55, and February 2005 is about 60.

The set of bars at 80-89: March 2003 is about 5, March 2004 is about 8, and February 2005 is about 8.

The set of bars at 90+: March 2003 is about 4, March 2004 is about 7, and February 2005 is about 7.

Note. Data are for IO RMBS pools only; observations are weighted by mortgage size.

Bottom panel

Title: Credit Scores of Interest-Only Mortgages
Series: March 2003, March 2004, and February 2005
Horizon: March 2003, March 2004, and February 2005
Description: Data are plotted as three bars in four groups: FICO Scores 420-659, 660-719, 720-779, and 780-900. Units are percent of interest-only mortgage debt.

The set of bars at 420-659: March 2003 is about 9.5, March 2004 is about 9, and February 2005 is about 9.

The set of bars at 660-719: March 2003 is about 35, March 2004 is about 36, and February 2005 is about 37.

The set of bars at 720-779: March 2003 is about 44, March 2004 is about 44, and February 2005 is about 43.5.

The set of bars at 780-900: March 2003 is about 13, March 2004 is about 12, and February 2005 is about 11.

Note. Data are for IO RMBS pools only; observations are weighted by mortgage size.

Exhibit 3
Financial Institution Risk Exposure

Top-left panel
Credit Risk Exposure

Institutions	Mortgage Types
1. Housing GSEs	Conforming, mostly fixed-rate
2. Private Mortgage Insurers	High LTV
3. RMBS Pools	Wide variety
4. Banks and Thrifts	Wide variety

Top-right panel
Housing GSEs

1. Average LTV at origination	70
2. Estimated average current LTV	57
3. Average credit score (FICO)	723
4. Percent of guaranteed mortgages with credit enhancement	19

Note. Data are from Freddie Mac only

Source. Freddie Mac 2004 Annual Report

Middle-left panel

Title: Private Mortgage Insurers
Series: Income/capital and risk/capital
Horizon: 1988 to 2003
Description: Data are plotted as two curves and are annual. Units are ratios.

The income/capital curve begins at about negative 0.18 at the beginning of 1988, then generally rises to about 0.16 in late 1999, and falls a bit to end in early 2003 at about 0.09.

The risk/capital curve begins in early 1988 at about 18, rises a bit to about 24 in 1991, then generally falls to about 9 at the beginning of 2003.

The two curves overlap at about 1997.

Source. Mortgage Insurance Companies of America

Middle-right panel
Risks in RMBS Pools

- RMBS pools contain relatively risky mortgages
- Pools are structured to allow investors to choose risk exposure
- Pools are exceptionally transparent
- Pricing depends on loss modeling

Bottom-left panel

Title: Mortgage Share of Assets, Banks and Thrifts
Series: Mortgage share of assets, banks and thrifts
Horizon: Not indicated
Description: Data are plotted as bars and represent quartiles. Units are percent of total assets.

For the bottom quartile, about 5.

For the second quartile, about 12.

For the third quartile, about 21.

For the top quartile, about 41.

Note. Not weighted by assets

Bottom-right panel
Assets and Capital Ratios

Mortgage Share Quartile	Average Assets (billions)	Average Tier 1 Capital Ratio
1. Bottom	0.9	16.5
2. Second	0.8	10.3
3. Third	1.4	10.1
4. Top	1.4	10.4

Measuring House Prices

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Slide 1
The OFHEO Home Price Index

- An index of the average price of single-family homes purchased (refinanced) with conforming, conventional mortgages
  - Excludes cash sales and sales financed with FHA, VA, and jumbo loans.
- A "repeat-sales" index
  - Measures sales prices or appraised values of properties at same address at different points in time.
- A transactions-based price index.

Slide 2
The Constant-Quality New Home Price Index

- Based on a sample of new homes sold, regardless of how the sale was financed.
- Hedonic methods are used to hold physical and locational characteristics constant over time.
  - Sales prices regressed on numerous characteristics such as lot size, square footage of structure, presence of air conditioning, fire places, etc.

Slide 3
Nominal Home Price Appreciation

% Change - Year to Year

Period	OFHEO Index	Census Constant-

	Quality New Home Price Index	
1976:Q1	4.12	N/A
1976:Q2	5.58	N/A
1976:Q3	7.48	N/A
1976:Q4	7.54	N/A
1977:Q1	9.03	N/A
1977:Q2	9.92	N/A
1977:Q3	11.56	N/A
1977:Q4	13.19	N/A
1978:Q1	13.43	15.02
1978:Q2	13.02	13.68
1978:Q3	13.58	16.14
1978:Q4	13.32	13.07
1979:Q1	14.89	0.19
1979:Q2	14.09	1.88
1979:Q3	13.12	-0.54
1979:Q4	11.96	0.18
1980:Q1	9.17	13.42
1980:Q2	7.43	9.04
1980:Q3	8.52	9.98
1980:Q4	6.98	6.64
1981:Q1	5.89	9.43
1981:Q2	6.60	9.31
1981:Q3	4.66	6.60
1981:Q4	4.34	6.89
1982:Q1	4.83	4.55
1982:Q2	3.46	2.79
1982:Q3	1.62	1.86
1982:Q4	2.23	0.00
1983:Q1	2.74	0.15
1983:Q2	3.40	0.90
1983:Q3	4.61	3.34
1983:Q4	4.24	4.29
1984:Q1	3.90	2.69
1984:Q2	4.44	4.63
1984:Q3	4.75	4.12
1984:Q4	5.36	5.15

1985:Q1	5.29	3.94
1985:Q2	5.34	1.00
1985:Q3	6.26	-0.42
1985:Q4	6.67	0.28
1986:Q1	7.18	1.26
1986:Q2	7.71	4.52
1986:Q3	7.80	6.52
1986:Q4	8.27	3.77
1987:Q1	8.52	5.68
1987:Q2	8.19	4.86
1987:Q3	7.88	4.93
1987:Q4	6.87	6.18
1988:Q1	6.44	4.98
1988:Q2	6.67	3.61
1988:Q3	6.04	3.17
1988:Q4	6.19	2.78
1989:Q1	5.72	3.37
1989:Q2	4.89	4.98
1989:Q3	6.14	3.81
1989:Q4	6.01	3.45
1990:Q1	5.05	3.62
1990:Q2	3.60	0.59
1990:Q3	1.63	2.01
1990:Q4	0.20	1.43
1991:Q1	0.55	-0.47
1991:Q2	1.01	2.71
1991:Q3	0.69	2.09
1991:Q4	2.54	0.82
1992:Q1	2.45	1.52
1992:Q2	1.78	0.23
1992:Q3	2.80	-0.34
1992:Q4	1.85	2.68
1993:Q1	1.01	2.54
1993:Q2	2.08	5.03
1993:Q3	1.67	5.25
1993:Q4	2.03	3.63
1994:Q1	2.66	6.07
1994:Q2	2.13	4.25

1994:Q3	1.78	4.12
1994:Q4	0.76	5.25
1995:Q1	0.66	2.65
1995:Q2	2.09	2.09
1995:Q3	3.42	2.08
1995:Q4	4.50	2.60
1996:Q1	5.39	3.20
1996:Q2	3.69	1.74
1996:Q3	2.50	2.65
1996:Q4	2.58	1.62
1997:Q1	2.26	1.60
1997:Q2	3.00	3.52
1997:Q3	4.13	1.89
1997:Q4	4.58	2.79
1998:Q1	5.23	2.96
1998:Q2	5.21	1.65
1998:Q3	5.10	3.22
1998:Q4	4.98	3.49
1999:Q1	4.49	4.69
1999:Q2	5.07	4.97
1999:Q3	5.29	4.82
1999:Q4	5.24	4.31
2000:Q1	6.32	2.93
2000:Q2	6.69	4.92
2000:Q3	7.08	4.60
2000:Q4	7.60	5.93
2001:Q1	8.11	4.88
2001:Q2	8.22	4.69
2001:Q3	7.91	2.93
2001:Q4	7.55	2.46
2002:Q1	6.61	5.93
2002:Q2	6.70	3.23
2002:Q3	7.22	4.19
2002:Q4	7.55	6.04
2003:Q1	7.20	3.68
2003:Q2	6.51	4.18
2003:Q3	6.02	7.40
2003:Q4	8.17	5.54

2004:Q1	8.45	7.63
2004:Q2	9.98	9.18
2004:Q3	13.33	6.96
2004:Q4	11.17	8.43
2005:Q1	N/A	4.37

Note: Shading represents NBER recessions (as shown in the chart, approximately 1980, mid-1981 through 1982, mid-1990 to early 1991, and 2001).

Source: Census Bureau and Office of Federal Housing Enterprise Oversight

Slide 4
Ratio of Home Price Over Median Family Income

Ratio

Period	OFHEO Index Price* / Median Family Income	Constant-Quality Index Price* / Median Family Income
1977	2.67	2.67
1978	2.75	2.77
1979	2.81	2.51
1980	2.82	2.56
1981	2.79	2.60
1982	2.75	2.54
1983	2.72	2.47
1984	2.65	2.40
1985	2.67	2.31
1986	2.71	2.26
1987	2.78	2.27
1988	2.84	2.26
1989	2.83	2.21
1990	2.81	2.18
1991	2.80	2.17
1992	2.81	2.16
1993	2.83	2.22
1994	2.74	2.22
1995	2.69	2.17
1996	2.67	2.13
1997	2.62	2.07
1998	2.63	2.03
1999	2.64	2.03

Period	OFHEO Index Price* / Median Family Income	Constant-Quality Index Price* / Median Family Income
2000	2.72	2.05
2001	2.90	2.10
2002	3.09	2.19
2003	3.24	2.26
2004	3.47	2.36

* Both indices have been converted to dollars using the median price of existing homes in 1979Q1. Return to table

Note: Shading represents NBER recessions.

Source: Office of Federal Housing Enterprise Oversight and Bureau of Economic Analysis

Slide 5
Distribution of Single-Family Homes by Value: 2003

Home Values	# of Single-Family Units
0	207.35
10,000	254.31
20,000	307.72
30,000	367.33
40,000	432.60
50,000	502.61
60,000	576.11
70,000	651.47
80,000	726.78
90,000 (25^{th})	799.91
100,000	868.55
110,000	930.40
120,000	983.25
130,000	1,025.14
140,000	1,054.44
150,000 (50^{th})	1,070.00
160,000	1,071.19
170,000	1,057.96
180,000	1,030.85
190,000	990.92
200,000	939.74
210,000	879.22
220,000	811.53

Home Values	# of Single-Family Units
230,000	738.99
240,000	663.88
250,000 (75^{th})	588.39
260,000	514.47
270,000	443.79
280,000	377.67
290,000	317.08
300,000 (80^{th})	262.63
310,000	214.61
320,000	173.01
330,000	137.60
340,000	107.96
350,000	83.57

As shown in the chart, mean price of existing homes sold (215,000) corresponds with about 883 single-family units, and mean price of homes purchased with conventional loans (243,000) corresponds with about 679 single-family units.

Source: American Housing Survey

Slide 6
Appreciation and Turnover Rates by Percentile

(percent per year)

	Percentile			
	25th	50th	75th	80th
Appreciation Rate (1997 - 2003)	4.5%	5.6%	7.5%	8.7%
Turnover Rate (average 1997 - 2003)	5.9%	7.5%	8.6%	7.4%

Source: American Housing Survey

Slide 7
OFHEO Index and Home Improvements

Top panel

Index, 1977 = 1

Year	Ratio of OFHEO to Constant-Quality Index
1977	1.000
1978	0.990
1979	1.119

Year	Ratio of OFHEO to Constant-Quality Index
1980	1.102
1981	1.075
1982	1.082
1983	1.099
1984	1.104
1985	1.156
1986	1.197
1987	1.225
1988	1.257
1989	1.279
1990	1.287
1991	1.286
1992	1.301
1993	1.271
1994	1.234
1995	1.238
1996	1.252
1997	1.265
1998	1.294
1999	1.298
2000	1.327
2001	1.381
2002	1.409
2003	1.433
2004	1.469

Note: Shading represents NBER recessions.

Bottom panel

2000 Dollars

Year	Real Property Improvements Per Housing Unit Per Year
1977	683
1978	743
1979	742
1980	735
1981	658
1982	563

Year	Real Property Improvements Per Housing Unit Per Year
1983	587
1984	647
1985	677
1986	795
1987	812
1988	808
1989	770
1990	704
1991	667
1992	731
1993	814
1994	850
1995	837
1996	861
1997	866
1998	858
1999	876
2000	896
2001	894
2002	962
2003	990
2004	1015

Note: Shading represents NBER recessions.

Source: Census Bureau, Office of Federal Housing Enterprise Oversight, and Bureau of Economic Analysis

Slide 8
Ratios of Median Home Value to Median Family Income by Percentile of Home Value

Slide 9
Implicit Land Price Increases Derived from Constant-Quality New Home Price Indices*

(compound annual rate, 1998-2004)

U.S.	Northeast	Midwest	South	West
5.5%	7.3%	2.9%	2.8%	10.0%

* Based on the assumption that land represents 50 percent of the value of the property. Return to text

Slide 10
Single-Family Investment Properties

(renter-occupied plus vacant for rent)
Thousands of Housing Units (Percent)

	1997	1999	2001	2003
Renter-Occupied	11,165 (14.9%)	11,530 (14.7%)	11,473 (14.0%)	10,704 (13.0%)
Vacant for Rent	854	750	860	927
Total	12,019 (16.0%)	12,280 (15.7%)	12,333 (15.1%)	11,631 (14.2%)

Source: American Housing Survey

Monetary Policy Responses to Asset Price Movements

Glenn D. Rudebusch
Federal Reserve Bank of San Francisco

Page 1
Monetary Policy and Asset Prices: The Basics

1. Asset price decomposition:

Assume an asset price (AP_t) consists of a component determined by its fundamentals (F_t) and a bubble component (B_t): $AP_t = F_t + B_t$.

2. Two proposals for the appropriate monetary policy reaction to an asset price:

Standard Policy (SP):

- Widespread agreement that the SP is a minimum appropriate reaction.
- Respond to an asset price insofar as it conveys information about the future evolution of output and inflation--the goal variables of monetary policy.
- In following the SP, it still may be useful--if possible--to identify F_t and B_t.

Bubble Policy (BP):

- Respond to relevant information as in the SP and also try to influence the asset price directly in order to contain or reduce the bubble and limit costs associated with movements in B_t.

3. A best-case scenario for Standard and Bubble Policies:

Example: Consider the *ideal* theoretical conditions where the decomposition of an asset price (AP_t) into its fundamentals (F_t) and a bubble (B_t) is *known*.

Series: Fundamentals (F_t), asset price (AP_t), and AP'_t
Description: Data are plotted as three curves.

The x-axis represents time (t) and has three tick marks dividing it into four sections. The first section of the x-axis is about one-half the size of the second and third sections. The fourth section is about one-half the size of the first section. The y-axis units are unknown, and the axis has four tick marks dividing it into five equal sections.

The fundamentals (F_t) series starts at the beginning of the first section of the x-axis and about two-thirds up the first section of the y-axis and generally rises to end at about four-fifths into the third section of the y-axis at the end of the last section of the x-axis.

The asset price series (AP_t) starts at the beginning of the first section of the x-axis and about one-third into the first section of the y-axis; it generally rises to about three-fourths into the fifth section of the y-axis at two-thirds into the third section of the x axis. The curve then generally drops to about the first tick mark of the y-axis at about three-fourths of the third section of the x-axis. The curve generally rises again to end about two-thirds into the third section of the y-axis at the end of the last section of the x-axis.

The AP'_t curve starts near the end of the second section of the x-axis and about one-fourth into the third section of the y-axis. The curve generally rises to end at about four-fifths into the third section of the y-axis at the end of the last section of the x-axis.

The fundamentals (F_t) and the asset price (AP_t) curves overlap throughout the first and second sections of the x-axis and again about three-fourths into the third section of the x-axis. The curves overlap once more at about four-fifths into the last section of the x-axis.

The fundamentals (F_t) and AP'_t curves overlap about three-fourths into the third section of the x-axis.

The Standard Policy (SP) would:

- Try to offset the effects of AP_t with higher rates than recommended by the fundamentals before the crash and lower rates afterward.

The Bubble Policy (BP) would:

- Respond to information as in the SP, but also try to reduce the bubble fluctuations and achieve, ideally, the AP'_t path. This would likely require higher rates than the SP before the crash and lower rates afterward.

Page 2
Should Monetary Policy Try to Reduce an Asset Price Bubble?

Decision tree for Standard and Bubble Policies

Q1. Can a bubble--or asset price misalignment--be identified? (Yes or No)

Yes	No
Asset price appears misaligned. [Continue to Q2]	The asset price is arguably aligned with fundamentals. ***Follow Standard Policy*** [Stop]

Q2. Do bubble fluctuations result in large macroeconomic consequences that monetary policy cannot readily offset? (Yes or No)

Yes	No
Fallout may include a severe financial crisis, imbalances, or	Macroeconomic consequences from asset price boom and

Yes	No
misallocations that cannot be well offset by monetary policy. [Continue to Q3]	bust are minor or they occur with a lag, so monetary policy can effectively offset them. ***Follow Standard Policy*** [Stop]

Q3. Is monetary policy a good way to deflate the bubble? (Yes or No)

Yes	No
Relative to the cost of alternatives the dislocations associated with monetary policy actions are small. ***Follow Bubble Policy*** [Stop]	Interest rate effects on bubble are uncertain or costly, especially relative to alternative deflation strategies. ***Follow Standard Policy*** [Stop]

Page 3
Two Episodes of Possible Asset Price Bubbles

Real-time answers to decision-tree questions

1. Equity prices in 1999-2000:

Q1: A bubble could be identified in certain sectors and perhaps in overall market.
Q2: Serious capital misallocation appeared likely during boom and severe fallout from financial instability was possible during bust. Both hard to rectify.
Q3: It appeared unlikely that any bubble could be deflated by monetary policy.

Title: U.S. Stock Market Indexes
Series: NASDAQ and S&P 500
Horizon: 1995 to 2005
Description: Data are plotted on two curves. Units are index, January 3, 1995=100.

The NASDAQ series begins at about 100 in the beginning of 1995 and generally rises to about 275 in mid-1998. It rises sharply to just under 700 in early 2000, then generally drops to just under 200 in early 2001. The curve stays mostly steady ending in mid-2005 at just under 300.

The S&P 500 series begins at about 100 in 1995, rising steadily and remaining between 200 and 300 between mid-1997 and mid-2005.

The curves overlap in all years except between late 1998 and early 2001.

2. Bond prices in 1994:

Q1: A bubble or bond price misalignment appeared likely. Termed an "inflation scare" or "credibility gap."
Q2: Possible fallout from propagation of high-inflation expectations.
Q3: It appeared likely monetary policy could guide prices back to fundamentals.

Title: 30-Year Treasury Bond Yield
Series: 30-Year Treasury Bond Yield
Horizon: 1993 to 1996
Description: Data are plotted as a curve. Units are percent.

The 30-year Treasury bond yield curve begins at about 7.3 in early 1993, drops down to about 5.7 near the end of 1993, then generally trends upward to about 8.2 in late 1994. The curve then falls to about 6.0 at the end of 1995, rises again to about 7.3 in mid-1996, and ends 1996 at about 6.4.

Monetary Policy Implications of a House Price Bubble

John C. Williams
Federal Reserve Bank of San Francisco

A Tale of Two Bubbles

- House prices today: a 20% decline would
  - reduce household wealth by $3.6 trillion (30% of current GDP)
  - raise saving rate by nearly 1-1/2 percentage points in the long-run
  - lower the long-run equilibrium real funds rate (r*) by 40 basis points.
- Stock prices in early 2000: twice as large a potential problem as house price overvaluation today.
  - Stock market overvalued by 60% in March 2000; correction implied a $6.7 trillion reduction in wealth (70% of GDP at the time).
  - In the event, stock market wealth fell by $4.6 trillion from March 2000 to March 2001, and at trough was down $8.5 trillion.
- Cautionary note: policy cushion today is noticeably smaller than in early 2000.

Monetary Policy Implications of a Bursting Housing Bubble

- Three scenarios:
  1. 20% decline in house prices relative to path in June *Greenbook*
  2. Scenario 1 + spillover effects on demand
  3. Scenario 2 + rise in bond premiums.
- Two policies: Optimal policy and Taylor rule
  - Optimal perfect foresight policy: assumes equal weights on unemployment and inflation deviations from targets of 5 and 1.5 percent, respectively, and small penalty on interest rate changes.
  - Taylor Rule: coefficient of 1 on output gap and ½ on inflation gap; r* adjusts to changes in housing wealth and bond premiums.

1. Effects of 20 Percent Decline in House Prices

Top-left panel

Title: Unemployment Rate

Series: Optimal policy, Taylor Rule, and June Greenbook (optimal policy)
Horizon: 2004 to 2008
Description: Data are plotted as three curves. Units are not defined.

The optimal policy series begins at about 5.6 in 2004, falls to about 5.1 in late 2005, and ends at about 5.25 in late 2008.

The June Greenbook (optimal policy) series begins in 2005 at about 5.1 and ends in late 2008 at about 5.25.

The Taylor Rule series begins at about 5.6 in 2004, falls to about 5.1 in late 2005, rises to about 5.4 in late 2006, and ends at about 5.3 in late 2008.

The June Greenbook (optimal policy) curve and the optimal policy curve overlap from 2006 to late 2008. The optimal policy curve and the Taylor Rule curve overlap from 2004 until mid-2005.

Top-right panel

Title: Core PCE Price Inflation (4-quarter change)
Series: Optimal policy, Taylor Rule, and June Greenbook (optimal policy)
Horizon: 2004 to 2008
Description: Data are plotted as three curves. Units are not defined.

The optimal policy series and the Taylor Rule curve overlap and start at about 1.3 in early 2004 and trend up to about 2.1 in mid-2005. In early 2006, the curves stop overlapping. The Taylor Rule series ends in 2008 at about 1.80, and the optimal policy series ends 2008 at about 1.85.

The June Greenbook (optimal policy) curve begins in 2005 at slightly over 2 and ends in 2008 at about 1.85.

The June Greenbook (optimal policy) curve overlaps the optimal policy curve and the Taylor Rule curve between 2005 and 2006 and overlaps the Taylor Rule curve again in mid-2007.

Middle panel

Title: Federal Funds Rate
Series: Optimal policy, Taylor Rule, and June Greenbook (optimal policy)
Horizon: 2004 to 2008
Description: Data are plotted as three curves. Units are not defined.

Both the optimal policy curve and the Taylor Rule curve start at about 1 in mid-2004. Both overlap and rise together to about 3.5 in late 2005. The Taylor Rule curve rises to about 4 in early 2006 and ends in late 2008 at about 3. The optimal policy curve ends at about 3.2 toward the end of 2008.

The June Greenbook (optimal policy) curve begins in mid-2005 at about 3.1 and ends at about 3.7 in late 2008.

The Taylor Rule curve and the optimal policy curve overlap from 2004 to late 2005 and again around early 2007. All three curves overlap in 2005. The June Greenbook curve and the Taylor Rule curve continue to overlap through early 2006.

Bottom panel

- House prices decline 20% relative to June Greenbook path by end of 2007.
- Demand shock: no significant tradeoff of goals.

- Macroeconomic effects build gradually: Under Taylor Rule, policy can respond to them as they develop.

2. Scenario 1 + Demand Spillovers

Top-left panel

Title: Unemployment Rate
Series: Optimal policy, Taylor Rule, and June Greenbook (optimal policy)
Horizon: 2004 to 2008
Description: Data are plotted as three curves. Units are not defined.

The optimal policy series begins at about 5.6 in 2004, falls to about 5.1 in late 2005, and ends slightly under 5.25 in late 2008.

The Taylor Rule series begins at about 5.6 in 2004, falls to about 5.1 in late 2005, rises to about 5.85 in 2007, and ends at about 5.1 in late 2008.

The June Greenbook (optimal policy) series begins in 2005 at about 5.1 and ends at just over 5.25 in late 2008.

The optimal policy and the Taylor Rule curves overlap until mid-2005 and again in late 2008. The optimal policy curve and the June Greenbook curve overlap in late 2007.

Top-right panel

Title: Core PCE Price Inflation (4-quarter change)
Series: Optimal policy, Taylor Rule, and June Greenbook (optimal policy)
Horizon: 2004 to 2008
Description: Data are plotted as three curves. Units are not defined.

The optimal policy curve and the Taylor Rule curve overlap and start at about 1.3 in early 2004, then trend up to about 2.1 in mid-2005. The Taylor Rule curve ends in 2008 at about 1.70, and the optimal policy curve ends in 2008 at about 1.75.

The June Greenbook (optimal policy) curve begins in 2005 at slightly over 2 and ends in 2008 at about 1.9.

The optimal policy curve and the Taylor Rule curve overlap between 2004 and 2005. The June Greenbook (optimal policy) curve and the optimal policy curve overlap between 2005 and 2006. The June Greenbook curve overlaps the Taylor Rule curve between 2005 and 2007 and overlaps the optimal policy curve in early 2008.

Middle panel

Title: Federal Funds Rate
Series: Optimal policy, Taylor Rule, and June Greenbook (optimal policy)
Horizon: 2004 to 2008
Description: Data are plotted as three curves. Units are not defined.

The Taylor Rule curve starts at about 1 in mid-2004, rises to about 3.7 in early 2006, falls to about 2.1 in 2007, and ends at just under 3 in 2008.

The optimal policy curve begins at about 1 in mid-2004, rises to about 2.8 in 2005, and drops to about 2.5 in 2006. The series ends in 2008 at about 3.7.

The June Greenbook (optimal policy) curve begins in 2005 at about 2.8 and ends at about 3.7 in late 2008.

The Taylor Rule curve and the optimal policy curve overlap from 2004 to 2005 and again in early 2007. The June Greenbook (optimal policy) curve and the Taylor Rule curve overlap in 2005.

Bottom panel

- House price declines rattle consumer confidence and dry up equity extraction from mortgage refinancing, crimping household spending.
- Optimal policy: funds rate declines to 2-1/4% by middle of 2006.
- Taylor Rule fails to act in anticipation of spillover effects and responds too gradually once they occur.

3. Scenario 2 + Falling Bond Prices

Top-left panel

Title: Unemployment Rate
Series: Optimal policy, Taylor Rule, and June Greenbook (optimal policy)
Horizon: 2004 to 2008
Description: Data are plotted as three curves. Units are not defined.

The optimal policy series begins at about 5.6 in 2004, falls to about 5.1 in late 2005, and ends slightly under 5.25 in late 2008.

The Taylor Rule series begins at about 5.6 in 2004, falls to about 5.1 in late 2005, rises to about 6.1 in 2007, and ends slightly under 5.25 in late 2008.

The June Greenbook (optimal policy) series begins in 2005 at about 5.1 and ends at just over 5.25 in late 2008.

The June Greenbook (optimal policy) and the Taylor Rule curves overlap until mid-2005 and again in late 2008. The optimal policy and the Taylor Rule curves overlap from early 2004 until early 2006. The optimal policy and the June Greenbook curves overlap in late 2007.

Top-right panel

Title: Core PCE Price Inflation (4-quarter change)
Series: Optimal policy, Taylor Rule, and June Greenbook (optimal policy)
Horizon: 2004 to 2008
Description: Data are plotted as three curves. Units are not defined.

Both the optimal policy curve and the Taylor Rule curve start at about 1.3 in early 2004, then trend up to about 2.1 in mid-2005. The Taylor Rule curve ends in 2008 at about 1.70, and the optimal policy curve ends in 2008 at about 1.75.

The June Greenbook (optimal policy) curve begins in 2005 at slightly over 2 and ends in 2008 at about 1.9.

The optimal policy curve and the Taylor Rule curve overlap between 2004 and 2005. The June Greenbook (optimal policy) curve and the optimal policy curve overlap between 2005 and 2006. The June Greenbook curve overlaps the Taylor Rule curve in 2005 and 2006 and overlaps the optimal policy curve in early 2008.

Middle panel

Title: Federal Funds Rate
Series: Optimal policy, Taylor Rule, and June Greenbook (optimal policy)
Horizon: 2004 to 2008
Description: Data are plotted as three curves. Units are not defined.

The Taylor Rule curve starts at about 1 in mid-2004, rises to about 3.2 in early 2006, falls to about 1.2 in 2007, and ends in late 2008 at about 2.

The optimal policy curve begins at about 1 in mid-2004, rises to about 2.8 in 2005, and drops to about 0.8 in 2006. The series ends in 2008 at about 2.8.

The June Greenbook (optimal policy) curve begins in 2005 at about 2.8 and ends at about 3.7 in late 2008.

The Taylor Rule curve and the optimal policy curve overlap from 2004 to 2005 and again in early 2007.

Bottom panel

- House prices decline 20% as before, with demand spillovers.
- Term premiums on long-term bonds increase 75 basis points by year-end.
- Optimal policy drives funds rate below 1 percent by middle of 2006.
- Optimal policy able to forestall significant rise in unemployment rate; under Taylor Rule, unemployment rate reaches 6 percent.

Using Monetary Policy to Preempt a Worsening House Price Misalignment

- Pro: House price misalignment may
  - contribute to conditions that lead to a sharp contraction in economic activity that is difficult for policy to counteract
  - misallocate resources toward housing-related activities.
- Con: Effectiveness of such policies is open to question
  - uncertain empirical relationship between housing prices, interest rates, and other factors
  - difficulties in assessing existence and magnitude of misalignment.

[Appendix 1, continued]

House Prices and Rents in Selected Metropolitan Areas

Top-left panel

Title: San Francisco

Series: Real price and real rent
Horizon: 1975 to 2005
Description: Data are plotted as two curves. Units are four-quarter percent change.

The real price series begins at about 10 in 1975, drops to about negative 9 in 1983, rises to about 19 in 1990, then drops down again to about negative 9 in 1991. The series generally rises to about 20 in 2001 and ends at about 15 in 2005.

The real rent series begins at about negative 5 in 1975, then rises to about 5 in 1984, and ends at about negative 2 in 2005.

The two curves overlap in 1981, 1986, 1987, 1991, 1999, and 2003.

Top-right panel

Title: San Francisco
Series: Price-rent ratio
Horizon: 1975 to 2005
Description: Data are plotted as a curve. Units are percent deviation from long-run level.

The price-rent ratio series begins at just under negative 10 in 1975, rises to about 10 in 1980, drops to about negative 5 in 1986, rises to about 15 in 1990, then drops to about negative 5 in 1998, and ends at about 33 in 2005.

Middle-left panel

Title: Chicago
Series: Real price and real rent
Horizon: 1975 to 2005
Description: Data are plotted as two curves. Units are four-quarter percent change.

The real price series begins at about 10 in 1975, then drops to about negative 12 in 1981, rises to about 1 in 1982, drops to about negative 11 in 1983, rises to about 2 in 1984, and ends at about 8 in 2005.

The real rent series begins at about negative 5 in 1975, rises to about 1 in 1982, and ends at just above 0 in 2005.

The two curves overlap in 1979, 1981, 1983, 1984, 1986, and 1991 through 1999.

Middle-right panel

Title: Chicago
Series: Price-rent ratio
Horizon: 1975 to 2005
Description: Data are plotted as a curve. Units are percent deviation from long-run level.

The price-rent ratio series begins at about negative 5 in 1975, rises to about 10 in 1978, and ends at about 11 in 2005.

Bottom-left panel

Title: Cleveland
Series: Real price and real rent
Horizon: 1975 to 2005

Description: Data are plotted as two curves. Units are four-quarter percent change.

The real price series begins at about 9 in 1975, drops to about negative 16 in 1982, rises to about 8 in 1983, and ends at about 1 in 2005.

The real rent series begins at about negative 5 in 1975 and ends at just below 0 in 2005.

The two curves overlap in 1980, 1983, 1984, 1986, 1991, 1992, 1995, 1997, 2001, and 2002.

Bottom-right panel

Title:Cleveland
Series: Price-rent ratio
Horizon: 1975 to 2005
Description: Data are plotted as a curve. Units are percent deviation from long-run level.

The price-rent ratio series begins at about negative 3 in 1975, drops to about negative 7 in 1982, and ends in 2005 at about 6.

Sources: OFHEO, BEA, and BLS.

House Prices and Rents in Selected Metropolitan Areas

Top-left panel

Title: Boston
Series: Real price and real rent
Horizon: 1975 to 2005
Description: Data are plotted as two curves. Units are four-quarter percent change.

The real price series begins at about 0 in 1978, drops to about negative 1 in 1980, rises to about 25 in 1986, drops to about negative 13 in 1990, and ends at about 9 in 2005.

The real rent series begins at about negative 5 in 1975 and ends at just below 0 in 2005.

The two curves overlap in 1981, 1983, 1988, 1992, 1993, 1994, 1995, and 1997.

Top-right panel

Title: Boston
Series: Price-rent ratio
Horizon: 1975 to 2005
Description: Data are plotted as a curve. Units are percent deviation from long-run level.

The price-rent ratio series begins at about negative 8 in 1975, rises to about 25 in 1987, drops to about negative 8 in 1995, and ends at about 20 in 2005.

Middle-left panel

Title: New York
Series: Real price and real rent
Horizon: 1975 to 2005
Description: Data are plotted as two curves. Units are four-quarter percent change.

The real price series begins at about negative 3 in 1976, then rises to just over 20 in 1987, drops to about negative 12 in 1990, and ends at about 12 in 2005.

The real rent series begins at about negative 4 in 1975 and ends at about 1 in 2005.

The two curves overlap in 1976, 1977, 1982, 1983, 1988, 1992, 1993, 1995, and 1998.

Middle-right panel

Title: New York
Series: Price-rent ratio
Horizon: 1975 to 2005
Description: Data are plotted as a curve. Units are percent deviation from long-run level.

The price-rent ratio series begins at about negative 5 in 1975, rises to just under 30 in 1988, drops to about negative 9 in 1997, and ends at about 20 in 2005.

Bottom-left panel

Title: Miami
Series: Real price and real rent
Horizon: 1975 to 2005
Description: Data are plotted as two curves. Units are four-quarter percent change.

The real price series begins at about negative 9 in 1976, rises to about 8 in 1979, drops to about negative 7 in 1981, and ends at about 20 in 2005.

The real rent series begins at about negative 4 in 1978, rises to about 5 in 1981, and ends at about 3 in 2005.

The two curves overlap in 1980, 1981, 1982, 1983, 1984, 1986, 1989, 1990, 1992, 1995, and 1996.

Bottom-right panel

Title: Miami
Series: Price-rent ratio
Horizon: 1975 to 2005
Description: Data are plotted as a curve. Units are percent deviation from long-run level.

The price-rent ratio series begins at about negative 4 in 1978 and stays mostly steady until about 2000, when it begins to climb sharply, ending at about 63 in 2005.

Sources: OFHEO, BEA, and BLS.

Measures of Prices, Rents, and Costs in the Housing Market

Top panel

Title: Changes in Real House Prices and Rents
Series: Repeat-transactions price index (adjusted), constant-quality price index for new homes, and rent index (adjusted)
Horizon: 1979 to 2005:Q1
Description: Data are plotted as three curves. Units are four-quarter percent change.

The repeat-transactions price index (adjusted) series begins at about 4.7 in 1979, drops to about negative 3.9 in 1981, rises to about 4.2 in 1986, falls to about negative 4.1 in 1990, and climbs to about 7.9 in 2005:Q1.

The constant-quality price index for new homes series begins in 1980 at about 2.1, falls to about negative 5 in 1982, rises to about 3.9 in 1986, drops to about negative 5 in 1991, rises to about 4 in 1994, and ends at about 2 at the end of 2004.

The rent index (adjusted) series begins at just under 0 in 1979, rises to about 4.2 in 1986, and ends at about 1 at the end of 2004.

The repeat-transactions price index (adjusted) curve and constant-quality price index for new homes curve overlap from 1980 through 1987, and in 1990, 1991, 1992, 1995, 1996, and 1997.

The repeat-transactions price index (adjusted) curve and the rent index curve overlap in 1980, 1986, 1990, 1993, 1994, 1996, and 1997.

The constant-quality price index for new homes curve and the rent index curve overlap in 1980, 1981, 1986, 1988, 1989, 1992, 1995, 1996, 1997, 1998, 2000, 2001, and 2002.

Bottom panel

Title: Levels of Real House Prices and Construction Costs
Series: Repeat-transactions price index (adjusted), constant-quality price index for new homes, and construction costs
Horizon: 1979 to 2004
Description: Data are plotted as three curves. Units are index (1979=100).

The repeat-transactions price index (adjusted) series begins at about100 in 1979, drops to about 92 in 1983, and ends at about 141 in 2004.

The constant-quality price index for new homes series begins at about 100 in 1979, drops to about 88 in 1992, and ends at about 115 in 2004.

The construction costs series begins at about 100 in 1979, drops to about 91 in 1991, and ends at about 103 at the end of 2004.

The repeat-transactions price index (adjusted) curve and the constant-quality price index for new homes curve overlap in 1985.

The repeat-transactions price index (adjusted) curve and the construction costs curve overlap in 1980 and 1986.

The constant-quality price index for new homes curve and the construction costs curve overlap in 1981, 1989, 1990, 1995, and 1998.

Sources: OFHEO, Freddie Mac, BLS, Census, BEA, and Engineering News Record.

Appendix 2: Materials used by Mr. Kos

Page 1

Top panel

Title: Current U.S. 3-Month Deposit Rates and Rates Implied by Traded Forward Rate Agreements
Series: LIBOR fixed, 3-month forward, 9-month forward
Horizon: March 1, 2005 - June 28, 2005
Description: US forward contracts rates rose.

Middle panel

Title: Spread Between 2- and 10-Year Treasury Yields
Series: 2-Year Treasury Yield and 10-Year Treasury Yield spread and Average since 1980
Horizon: January 1980 - June 2005
Description: The spread narrowed below the average.

Bottom panel

Title: TIPS Breakevens and Crude Oil Futures
Series: 5-year TIPS breakeven rate, 10-year TIPS breakeven rate, and Front month crude oil futures
Horizon: January 13, 2005 - June 28, 2005
Description: TIPS breakeven rates decreased, while the front month crude oil futures increased.

Page 2

Top panel

Title: High Yield and Auto Debt Spreads
Series: GM, Ford, and High Yield Index
Horizon: January 3, 2005 - June 28, 2005
Description: High yield and auto debt spreads widened.

Source: Merrill Lynch, Bloomberg

Middle panel

Title: Dow Jones CDX 5-Year Investment Grade Credit Default Swaps Index
Series: Dow Jones CDX 5-Year Investment Grade Credit Default Swaps Index
Horizon: April 1, 2005 - June 28 2005
Description: The Dow Jones CDX 5-year investment grade credit default swap index increased slightly.

Bottom panel

Title: Select Hedge Fund Index Returns
Series: Aggregate Hedge Fund Index and Convertible Arbitrage Index
Horizon: December 31, 2004 - June 24, 2005
Description: Select hedge fund indexes had negative returns.

Source: HFR

Page 3

Top panel

Title: Euro-Area 3-Month Deposit Rates and Rates Implied by Traded Forward Rate Agreements
Series: Libor fixed, 3-month forward, and 9-month forward
Horizon: March 1, 2005 - June 28, 2005
Description: Euro forward contracts rates rose.

Middle-left panel

Title: Euro-Dollar
Series: Euro-dollar
Horizon: January 3, 2004 - June 28, 2005
Description: The dollar appreciated against the Euro.

Middle-right panel

Title: Interest Rate Differentials
Series: US 2-year Treasury note and 2-year German Schatz
Horizon: June 28, 2004 - June 28, 2005
Description: The US 2-year Treasury note rate increased, while the 2-year German Schatz rate decreased.

Bottom-left panel

Title: Euro-Dollar Risk Reversals
Series: 1-year 25 delta risk reversal
Horizon: February 1, 2000 - June 28, 2005
Description: There is a premium for Euro put options.

Bottom-right panel

Title: IMM Net Non-Commercial Euro Positions
Series: IMM Net Non-Commercial Euro Positions
Horizon: January 2005 - June 2005
Description: Non-commercial Euro positions decreased.

Page 4

Top panel

Title: Global 10-Year Sovereign Debt Yields
Series: Australia, UK, US, Canada, and Germany
Horizon: March 15, 2005 - June 28, 2005
Description: 10-year sovereign debt yields decreased.

Middle panel

Title: Japanese Government Bond Yield Curve
Series: 6/28/04 and 6/28/05
Horizon: 3-month, 6-month, 1-year, 2-year, 3-year, 5-year, 7-year, 10-year, 15-year, 20-year, and 30-year
Description: The Japanese bond yield curve rate decreased for long term yields.

Bottom panel

Title: Year-To-Date Global Equity Performance
Series: USD Return and local currency return for: US S&P 500, Mexico Bolsa, Brazil Bovespa, U.K. FTSE, French CAC, German DAX, Italy MIB Index, and Japan Nikkei
Horizon: Year-to-date
Description: Local currency returns are mostly positive, with the U.S. and Brazil being outliers. USD returns are mostly negative, with Mexico, Brazil, and the U.K. being outliers.

Appendix 3: Materials used by Messrs. Oliner, Wilcox, and Leahy

Material for **Staff Presentation on the Economic Outlook**
June 30, 2005

STRICTLY CONFIDENTIAL (FR) CLASS I-FOMC*
*Downgraded to Class II upon release of the July 2005 Monetary Policy Report.

Exhibit 1
Recent Indicators

Top-left panel

Title: Real Personal Consumption Expenditures
Series: Real personal consumption expenditures
Horizon: 2003 to May 2005
Description: Data are plotted as a curve. Units are trillions of 2000 dollars at an annual rate.

The curve starts in 2003:Q1 just above 7.2, followed by an increase to just above 7.4 by 2003:Q3. It dips to about 7.4 in 2003:Q4, then increases through 2004:Q2 to about 7.6. The curve decreases to a bit less than 7.6 in 2004:Q3, then moves upward to end at nearly 7.9 in May 2005.

The chart shows 10 dots that denote quarterly averages and generally follow the contour of the curve. The dot for 2003:Q1 is just above 7.2, the dot for 2003:Q2 is at about 7.3, the dot for 2003:Q3 is just above 7.4, and the dot for 2003:Q4 is about 7.5. The dot for 2004:Q1 is just above 7.5, the dot for 2004:Q2 is slightly below 7.6, the dot for 2004:Q3 is at about 7.7, and the dot for 2004:Q4 is a bit below 7.8. The dot for 2005:Q1 is just below 7.8, and the 10th dot for 2005:Q2 represents a staff estimate and is at approximately 7.9.

[inset box]
Percent change, a.r.

Q1	3.6
Q2[e]	3.1

Top-right panel

Title: Sales of Single-Family Homes
Series: Existing homes and New homes
Horizon: 2001 to May 2005
Description: Data are plotted as two curves and are monthly. Units are millions at an annual rate.

The existing homes curve begins in 2001 at just below 4.5. It then generally increases, reaching about 4.9 by 2001:Q3, and decreasing through year-end to a bit above 4.5. The curve rises to about 5.2 at the start of 2002, falls to about 4.7 by midyear, then continues generally upward through mid-2003 to about 5.9. The curve then decreases to about 5.3 at the start of 2004, and generally rises to about 6.1 by the end of the year. The curve dips to a bit below 6.0 at the beginning of 2005, then increases to end at about 6.2 in May 2005.

At the start of 2001, the new homes curve begins at about 0.9, then decreases to just above 0.8 toward the end of the year. The curve generally continues upward to reach nearly 1.1 by year-end 2002, followed by a decrease to about 0.9 at the start of 2003. It then generally increases, climbing to a bit above 1.2 at the start of 2004, and decreasing to approximately 1.1 by midyear. The curve generally rises through May 2005 to end at about 1.3.

Middle-left panel

Title: Orders and Shipments of Nondefense Capital Goods (excluding aircraft)
Series: Orders and shipments
Horizon: 2001 to May 2005
Description: Data are plotted as two curves and are monthly. Units are billions of dollars.

At the start of 2001, orders of nondefense capital goods are about 64 but then decrease to about 50 toward year-end. The orders curve increases to approximately 54 at the beginning of 2002, then fluctuates between about 50 and 53 through the end of the year. The curve then generally trends upward through May 2005 to end at about 65.

Shipments are at approximately 62 at the start of 2001, then decrease to about 52 by year-end. The curve remains at about 54 through the start of 2003, then continues generally upward through May 2005 to end at about 65.

Middle-right panel
Reserve Bank Queries on Capital Spending Plans Over Next 6-12 Months

	Jan. 2005	June 2005
Expect spending will:	percent	
Increase	47	42
Decrease	13	12
Be about unchanged	39	46

Note. Figures for Jan. 2005 do not sum to 100 because of rounding.

Bottom-left panel

Title: Initial Claims
Series: Four-week moving average and weekly
Horizon: 2003 to June 25, 2005
Description: Data are plotted as two curves. Units are thousands.

The four-week moving average curve starts at just below 400 at the beginning of 2003 and then rises to about 449 by midyear. The curve continues generally downward, remaining at about 350 through 2004; it dips to just above 300 at the start of 2005, then increases to end at about 325 on June 25, 2005.

The weekly curve starts at about 360 in 2003 and then fluctuates upward to about 450 by midyear. It then generally decreases, remaining at about 350 through 2004. The curve dips to about 299 at the start of 2005, after which it generally increases to end a bit above 300 on June 25, 2005.

Bottom-right panel

Title: Core PCE Prices
Series: Core PCE prices
Horizon: 1997 to May 2005
Description: Data are plotted as a curve and are presented monthly. Unit is 12-month percent change.

The curve starts at about 1.7 in 1997 and then continues generally downward through mid-1998 until it reaches about 1.0. It fluctuates upward to about 2.0 in 2000, followed by a decrease to about 1.5 by year-end. In 2001, the curve increases to approximately 2.2, drops to about 1.5 by midyear, then increases to end the year at about 2.2. The curve drops to about 1.6 near mid- 2002, then increases to just below 2.5 by year-end. The curve generally decreases through the start of 2004 to approximately 1.0, then rises to end at about 1.6 in May 2005.

[inset box]
Percent change

	Mar.	Apr.	May
Greenbook	.3	.1	.3
Published	.2	.1	.2

Exhibit 2
Key Background Factors

Top-left panel

Title: Interest Rates
Series: 10-year Treasury rate and federal funds rate
Horizon: 2001 to 2006. Data are projected from the April 2005 Greenbook for 2005 and 2006.
Description: The data are plotted as two curves and are presented as a quarterly average. Units are percent.

The 10-year Treasury rate curve begins at about 5 at the start of 2001 and drops to about 4.8 by year-end. It increases to a bit above 5 in mid-2002, decreases through mid-2003 to about 3.8, and generally increases to about 4.8 in mid-2004. The curve falls to about 4 in mid-year 2005. In the projected area, the curve begins slightly above 4 in mid-2005 then remains at about that level until year-end 2006. A forecast for the curve from the April 2005 Greenbook starts at about 4.1 in early 2005 and remains at about that level through 2006.

The federal funds rate curve begins at about 5.8 at the start of 2001. It drops through mid-2004 to about 1, then increases to about 3.5 in mid-2005. In the projected area, the curve begins at about 3.5 in mid-2005 and generally rises to end just below 4 in 2006. A forecast for the curve from the April 2005 Greenbook starts at about 3 in mid-2005 and ends at about 3.5 at the start of 2006.

The curves overlap in 2001.

Top-right panel

Title: Fiscal Impetus
Series: Fiscal impetus
Horizon: 2001 to 2006. Data are projected from the April 2005 Greenbook for 2005 and 2006.
Description: The data are plotted as bars. There are six bars. Units are percent of GDP. A horizontal line is drawn at zero.

The bars for each period indicate the following:

For 2001, about 0.5.
For 2002, about 1.0.
For 2003, just below 1.0.
For 2004, about 0.8.
For 2005, the bar shows a forecast at about 0.3.
For 2006, the bar shows a forecast just above 0.3.

Middle-left panel

Title: Equity Prices
Series: Wilshire 5000
Horizon: 2001 to 2006. Data are projected from the April 2005 Greenbook for 2005 and 2006.
Description: Data are plotted as a curve and represent the quarter-end. Units are index, ratio scale.

The curve begins at about 10,400 at the start of 2001 and drops to about 9,500 by midyear. It increases to about 11,000 in early 2002, drops to about 7,800 by mid-2002, then generally increases to about 12,500 in mid-2005. In the projected area, the curve begins at about 12,500 in mid-2005 and rises to end just above 13,000 in 2006. A forecast for the curve from the April 2005 Greenbook starts slightly below 12,000 in early 2005 and increases through 2006 to end just below 13,000.

Middle-right panel

Title: House Prices
Series: OFHEO repeat-transactions index
Horizon: 2001 to 2006. Data are projected from the April 2005 Greenbook for 2005 and 2006.
Description: Data are plotted as a curve and are presented quarterly. Units are index, 1980:Q1=100, ratio scale.

The curve begins at about 255 at the start of 2001, then increases to about 358 in mid-2005. In the projected area, the curve begins at about 359 and generally rises through 2006 to end at about 375. A forecast for the curve from the April 2005 Greenbook starts in early 2005 at about 358 and increases through 2006 to a bit below 375.

Bottom-left panel

Title: Crude Oil Prices
Series: West Texas Intermediate
Horizon: 2001 to 2006. Data are projected from the April 2005 Greenbook for 2005 and 2006.
Description: Data are plotted as a curve and are presented as a quarterly average. Units are dollars per barrel.

The curve begins at about 30 at the start of 2001 and drops to about 20 by the end of the year. It increases through the start of 2003 to about 35 and dips to about 30 through the end of the year. The curve then generally increases to about 57 in mid-2005. In the projected area, the curve begins at

about 57 in mid-2005 and generally rises through 2006 to end at about 60. A forecast from the April 2005 Greenbook starts at about 50 in early 2005, then increases a bit through 2006 to end at about 54.

Bottom-right panel

Title: Broad Real Dollar
Series: Broad real dollar
Horizon: 2001 to 2006. Data are projected from the April 2005 Greenbook for 2005 and 2006.
Description: Data are plotted as a curve and are presented as a quarterly average. Units are index, 2000=100.

The curve starts at about 104 at the beginning of 2001 and increases to about 109 in early 2002. It then generally falls to about 90 in early 2005 and rises to about 95 in mid-2005. In the projected area, the curve begins at about 95 and falls through 2006 to end at about 94. A forecast from the April 2005 Greenbook starts at about 93 at the beginning of 2005, then decreases to end at about 90 in 2006.

Exhibit 3
Forecast Summary

Top-left panel

Title: Real GDP
Series: Real GDP
Horizon: 2000 to 2006; Data are projected for 2005 and 2006.
Description: Data are plotted as a curve. Units are four-quarter percent change.

The series begins at about 4 in 2000:Q1, then increases to about 5 in the second quarter. It falls through 2001:Q4 to about 0, increases to reach about 2.25 in 2002:Q3, then decreases to about 2 by 2003:Q1. The series climbs to about 5 toward the second quarter of 2004, then decreases to approximately 4 by year-end.

The figure also has two shaded areas that represent a projection period with a 70 percent confidence interval and a 90 percent confidence interval. The band for the 70 percent confidence interval starts in 2005:Q1 at about 3.75, gradually expanding to about 5.25 on the upper end and 1.75 on the lower end by year-end 2006. The 90 percent confidence interval begins in 2005:Q1 at about 3.75, gradually expanding to a bit above 6 on the upper end and 0.5 on the lower end by year-end 2006.

In the projected period, the series begins at a little less than 4 in 2005:Q1, then decreases to about 3.75 by the end of 2006.

Top-right panel
Real GDP

(Percent change, Q4 to Q4)

	Jan. GB	June GB	Revision
2004	3.8	3.9	.1
2005	3.9	3.6	-.3
2006	3.6	3.4	-.2

Middle-left panel

Title: Unemployment Rate
Series: Unemployment rate
Horizon: 2000 to 2006; Data are projected for 2005 and 2006.
Description: Data are plotted as a curve. Units are percent.

The series begins at about 4 in 2000:Q1 and remains at about that level through year-end. It then continues generally upward, reaching about 6.25 by 2003:Q3, then decreasing through 2004:Q4 to almost 5.25.

The figure also has two shaded areas that represent a projection period with a 70 percent confidence interval and a 90 percent confidence interval. The 70 percent confidence interval begins in 2005:Q1 at about 5.25, gradually expanding to nearly 6 on the upper end and 4.25 on the lower end by year-end 2006. The 90 percent confidence interval begins in 2005:Q1 at about 5.25, gradually expanding to about 6.5 on the upper and about 3.75 on the lower end by year-end 2006.

In the projected period, the series starts at about 5.25 in 2005:Q1, then decreases slightly through 2006:Q4 to a bit above 5.

Middle-right panel
Unemployment Rate

(Percent, Q4)

	Jan. GB	June GB	Revision
2004	5.4	5.4	.0
2005	5.3	5.1	-.2
2006	5.1	5.1	.0

Bottom-left panel

Title: Core PCE Prices
Series: Core PCE prices
Horizon: 2000 to 2006; Data are projected for 2005 and 2006.
Description: Data are plotted as a curve. Units are four-quarter percent change.

The series begins at about 2 in the first quarter of 2000, then dips to about 1.75 by year-end. The curve increases through 2001:Q4 to about 2.25, then generally moves downward to about 1 by 2003:Q3. The series then increases through year-end 2004 to reach about 1.5.

The figure also has two shaded areas that represent a projection period with a 70 percent confidence interval and a 90 percent confidence interval. The 70 percent confidence interval starts in 2005:Q1 at about 1.5, gradually expanding to about 2.75 on the upper end and slightly above 1 on the lower end by year-end 2006. The 90 percent confidence interval begins in 2005:Q1 at about 1.5, gradually expanding to about 3.25 on the upper end and about 0.5 on the lower end by the end of 2006.

In the projected period, the series starts at about 1.5 in 2005:Q1, followed by an increase to just above 2 by the fourth quarter. It then decreases to just below 2 at the end of 2006.

Bottom-right panel
Core PCE Prices

(Percent change, Q4 to Q4)

	Jan. GB	June GB	Revision
2004	1.5	1.6	.1
2005	1.6	2.1	.5
2006	1.4	1.9	.5

Exhibit 4
Does Any Slack Remain In The Labor Market?

Top-left panel

Title: Unemployment Rate
Series: Unemployment rate and NAIRU
Horizon: 1996 to 2006; Data are projected for 2005 and 2006.
Description: Data are plotted on two curves. Units are percent.

The unemployment rate curve starts in 1996 at about 5.5; it then decreases, reaching a little less than 4 by year-end 2000. The curve continues upward to about 6.25 at the start of 2004, then decreases to just above 5 by the end of the year.

A forecast period starts in 2005 at a bit above 5 and remains at about that point through 2006.

The NAIRU curve begins at just over 5 in 1996 and stays at about that level through the forecast period.

Top-right panel

Title: Labor Force Participation Rate
Series: Labor force participation rate and trend
Horizon: 1996 to 2006; Data are projected for 2005 and 2006.
Description: Data are plotted on two curves. Units are percent.

The labor force participation rate curve starts in 1996 at approximately 66.5, then fluctuates between about 67.0 and 67.1 through 1999. The curve continues upward through early 2000 to about 67.3, followed by a decrease to approximately 66.9 by year-end. The curve rises to about 67.2 in 2001, after which it trends downward to about 65.7 at the end of 2004.

A forecast period starts in 2005 at about 66.0 and stays at about that level through 2006.

The trend curve starts in 1996 at about 66.6, where it remains through 2002. It then decreases to about 66.3 by year-end 2004.

A forecast period starts in 2005 at about 66.3 and decreases through 2006 to end just above 66.0.

Middle-left panel

Title: Total Hours Worked
Series: Total hours worked and trend
Horizon: 1996 to 2006; Data are projected for 2005 and 2006.
Description: Data are plotted on two curves. Units are billions of hours at an annual rate.

The total hours worked curve starts at about 216 in 1996 and continues upward to about 236 by 2001. The curve falls to about 230 in 2002, remains at about 234 in 2003, then generally rises through year-end 2004 to about 236.

A forecast period starts in 2005 at about 236 and increases through 2006, reaching approximately 244.

The trend curve starts at about 222 in 1996, then increases through the end of 2004 to about 243.

A forecast period starts in 2005 at about 243 and climbs to nearly 245 by year-end 2006.

Middle-right panel

Title: Jobs Plentiful Versus Hard to Get
Series: Jobs plentiful versus hard to get
Horizon: 1990 to 2005:Q2
Description: Data are plotted as a curve. Units are diffusion index values. A horizontal line is drawn just above 110 that shows the average for 1997:H1.

The curve begins in 1990 at a little less than 110 and then decreases, falling to about 51 by 1992. The curve increases through 2000 until it reaches about 145; it drops to about 71 by 2003 and then rises to end at about 100 in 2005:Q2.

Source: Conference Board.

Bottom-left panel

Title: Jobs Hard to Fill
Series: Jobs hard to fill
Horizon: 1990 to 2005:Q2
Description: Data are plotted as a curve. Unit is percent. A horizontal line is drawn a bit above 25 that shows the average for 1997:H1. Note that 2005:Q2 is the April-May average.

The curve begins at about 21 in 1990, followed by a decrease to about 11 by year-end 1991. It then generally moves upward to reach about 35 in 2000. The curve continues downward through 2003 to about 16, then increases through 2005:Q2 to end at about 24.

Source: National Federation of Independent Business.

Bottom-right panel

Title: Persons Working Part-Time for Economic Reasons
Series: Persons working part-time for economic reasons
Horizon: 1994 to 2005:Q2
Description: Data are plotted as a curve. Unit is percent of household employment. A horizontal line is drawn slightly above 3.0 that shows the average for 1997:H1. Note that 2005:Q2 is the April-May average.

The curve starts at about 3.7 in 1994, then generally falls to about 2.3 by 2000. It increases to about 3.2 in 2001, dips to almost 3.0 in 2002, and rises through early 2004 to about 3.4. The curve then decreases to end at about 3.0 in 2005:Q2.

Exhibit 5

Is Compensation Growth Feeding Price Inflation?

Top-left panel
P&C Compensation Per Hour

(Percent change, annual rate)

2004:	Q1	2.1
	Q2	6.0
	Q3	5.5
	Q4	10.2
2005:	Q1	6.3

Top-right panel

Title: Hourly Compensation and Core PCE Prices
Series: P&C comp per hour, ECI, and Core PCE prices
Horizon: 1999 to 2005:Q1 for P&C comp per hour and Core PCE prices; 1999 to March 2005 for ECI
Description: Data are plotted as three curves. Units are percent change from a year earlier.

The P&C comp per hour curve starts just above 5 in 1999:Q1, followed by a drop to about 3.1 in 1999:Q3. The curve then rises to about 8 in 2000:Q3; it generally decreases through 2003:Q2 to just below 3, then rises to about 5.1 in 2003:Q4. The curve drops to about 4.1 through 2004:Q3, then increases to end at about 7 in 2005:Q1.

The ECI curve starts at about 3 in 1999:Q1 and increases to just above 4 through 2000. The curve then generally decreases to end at about 3.1 in March 2005.

The Core PCE prices curve starts at about 1 in 1999:Q1 and stays at about that level through 2000; it begins to increase to reach about 2.1 by year-end 2001, then generally decreases through 2005:Q1 to end just below 2.

The P&C comp per hour curve and the ECI curve overlap in 2001:Q3 and 2003:Q2.

Middle-left panel
Why The Bulge in CPH Likely Reflects Stock Option Exercises

- Option exercises included in CPH but not in ECI.
- Industry composition of revision to CPH in 2004:Q4 looks suggestive.
- Exercises by senior executives stepped up in 2004.
- Stock prices rose and accounting rules changed in 2004:Q4.

Middle-right panel
Compensation Per Hour

(Percent change over the year)

		2004	2005	2006
1.	P&C comp per hour	5.9	4.0	5.0
2.	ECI total comp	3.8	4.0	4.8
3.	Wage and salaries	2.4	3.5	4.4

		2004	2005	2006
4.	Benefit costs	6.9	5.4	5.5

Bottom-left panel
Alternative Scenario: Stronger Compensation Pressures

- Hourly compensation increases 1 percentage point per year faster than in the baseline.
- Firms protect their profit margins. By the end of the scenario, markup is back at baseline.

Bottom-right panel

Title: Core PCE Prices
Series: Core PCE prices and stronger compensation pressures
Horizon: 2000 to 2006. Data are projected for 2005 to 2006.
Description: Data plotted as two curves. Confidence intervals are represented as two bands. Units are four-quarter percent change.

The figure has two shaded areas that represent a projection period with a 70 percent confidence interval and a 90 percent confidence interval. The band for the 90 percent confidence interval begins in 2005 at about 1.75, gradually expanding to about 3.25 at the upper end and about 0.5 at the lower end in year-end 2006.

The band for the 70 percent confidence interval begins in 2005 at about 1.75, gradually expanding to about 2.75 at the upper end and about 1 at the lower end in year-end 2006.

The series for core PCE prices begins in mid-2005 at about 1.8 and generally stays at that level until near the end of 2006. The series is in the 70 percent confidence interval from mid-2005 to late 2006.

The series for stronger compensation pressures begins in 2005 at about 1.5, rising generally until it reaches about 3 toward the end of 2006. The series is in the 70 percent confidence interval in 2005 and early 2006. The series then rises into the 90 percent confidence interval from about mid-2006 until near the end of 2006.

Exhibit 6
Why Has Core Inflation Sped Up?

Top-left panel

Title: Evolution of the Greenbook Forecast For Core PCE Prices
Series: Forecast for 2004, forecast for 2005, and forecast for 2006
Horizon: December 2003 to June 2005
Description: Data are plotted as three curves. Units are percent change, Q4/Q4. The dates on the x-axis represent the Greenbook publication date.

The forecast for 2004 curve begins in December 2003 at about 1.1. It increases to about 1.8 in August 2004, then decreases to end at about 1.6 in June 2005.

The forecast for 2005 curve starts in December 2003 at about 1.0, then generally rises to end at about 2.1 in June 2005.

The forecast for 2006 curve begins in September 2004 at about 1.3, then increases to end at about 1.8

in June 2005.

The forecast for 2004 curve and the forecast for 2005 curve overlap in January 2004 and October 2004.

The forecast for 2004 curve and the forecast for 2006 curve overlap in March 2005.

Top-right panel

Title: Price of Imported Oil
Series: Price of imported oil
Horizon: 2003 to 2006. Data are projected from the June 2005 Greenbook, the December 2004 Greenbook, and the December 2003 Greenbook.
Description: Data are plotted as a curve. Units are dollars per barrel.

The curve begins in 2003:Q1 at about 28, followed by a drop to about 26 in the second quarter. The curve generally increases through 2004:Q4 to about 45, then decreases to end at about 43 in 2005:Q1.

A forecast from the June 2005 Greenbook starts slightly above 43 in 2005:Q1, then increases to end at about 55 in 2006.

A forecast from the December 2004 Greenbook starts at about 42 in 2005:Q1 and stays at about that level through 2006.

A forecast from the December 2003 Greenbook begins at about 29 in 2003:Q4, then decreases through 2005:Q4 to end at about 26.

Note. Price is BOP unit value of crude oil and refined product imports.

Middle-left panel

Title: Core PPI Intermediate Materials Prices
Series: Core PPI intermediate materials prices
Horizon: 2003 to 2006. Data are projected from the June 2005 Greenbook, the December 2004 Greenbook, and the December 2003 Greenbook.
Description: Data are plotted as a curve. Units are index, 2000=100, ratio scale.

The curve begins at about 99 in 2003:Q1, then increases to end just below 106 in 2005:Q2.

A forecast from the June 2005 Greenbook starts at nearly 106 in 2005:Q2, then rises to end at about 107 in 2006:Q4.

A forecast from the December 2004 Greenbook begins at about 103 at the end of 2004 and increases to end at about 105 in 2006:Q4.

A forecast from the December 2003 Greenbook starts in 2003:Q4 at about 99, then increases through 2005:Q4 to end at nearly 103.

Middle-right panel

Title: Core Nonfuel Import Prices
Series: Core nonfuel import prices.
Horizon: 2003 to 2006. Data are projected from the December 2004 Greenbook, the June 2005 Greenbook, and the December 2003 Greenbook.
Description: Data are plotted as a curve. Units are index, 2000=100, ratio scale.

The curve begins at about 101 in 2003:Q1, then rises to end at about 112 in 2005:Q2.

A forecast from the December 2004 Greenbook starts in 2004:Q2 at nearly 108, then increases to end at about 118 in 2006:Q4.

A forecast from the June 2005 Greenbook starts a bit above 112 in 2005:Q2; then increases to end just above 116 in 2006:Q4.

A forecast from the December 2003 Greenbook begins in 2003:Q1at about 101, then climbs to end at about 108 in 2005:Q4.

Bottom-left panel
Revisions to Staff Projections of Core PCE Inflation

(Percentage points)

		2004	2005
1.	Revision since Dec. 2003 Greenbook	.5	1.0
Contribution of:			
2.	Energy prices	.2	.5
3.	Import and commodity prices	.3	.4
4.	Other factors	.0	.1

Bottom-right panel
PCE Prices

(Percent change, Q4/Q4)

		2004	2005	2006
1.	**Total**	**2.6**	**2.5**	**1.7**
2.	Energy	18.5	9.9	-1.4
3.	Food	2.9	2.2	2.2
4.	**Core**	**1.6**	**2.1**	**1.9**

Exhibit 7
Why Hasn't Real GDP Growth Been Marked Down More?

Top-left panel

Title: Evolution of the Greenbook Forecast for Real GDP
Series: Forecast for 2004, forecast for 2005, and forecast for 2006
Horizon: December 2003 to June 2005
Description: Data are plotted as three curves. Units are percent change, Q4/Q4. The dates on the x-axis represent the Greenbook publication date.

The forecast for 2004 curve starts just above 5 in December 2003. It generally decreases through October 2004 to about 3.7, then increases to end just below 4 in June 2005.

The forecast for 2005 curve starts at about 3.9 in December 2003 and rises through March 2004 to

about 4. It then generally decreases through June 2005 to end at about 3.6.

The forecast for 2006 curve starts at about 4 in September 2004, then decreases to end at about 3.4 in June 2005.

The forecast for 2004 curve and the forecast for 2005 curve overlap in September 2004, October 2004, January 2005, and March 2005.

The forecast for 2006 curve overlaps the forecast for 2004 curve and the forecast for 2005 curve in December 2004.

Top-right panel

Title: Contribution of Oil Prices to Real GDP Growth
Series: Forecast for 2005 and forecast for 2004
Horizon: December 2003 to June 2005
Description: Data are plotted as two curves. Units are percentage points. A horizontal line is drawn at zero. The dates on the x-axis represent the Greenbook publication date. Note that the contribution of oil prices to real GDP growth is relative to prices in the December 2003 Greenbook.

The forecast for 2005 curve starts at about 0.0 in December 2003 and falls to about negative 0.5 in October 2004. It increases to about negative 0.4 in December 2004, then decreases to end at about negative 0.9 in June 2005.

The forecast for 2004 curve starts at about 0.0 in December 2003. It decreases through June 2005 to end at about negative 0.5.

The forecast for 2005 curve and the forecast for 2004 curve overlap in January 2004.

Middle-left panel

Title: Greenbook Forecasts of Fiscal Impetus
Series: Greenbook forecasts of fiscal impetus
Horizon: December 2003 to June 2005
Description: Data are plotted as two bars in three groups: as of December 2003, as of December 2004, and as of June 2005. In each group, one bar represents 2004, and the other bar represents 2005. Units are percent of real GDP. A horizontal line is drawn at zero.

The bars for each period indicate the following:

As of December 2003, 2004 is at about 0.7, and 2005 is at about negative 0.4.
As of December 2004, 2004 is at about 0.6, and 2005 is at about negative 0.1.
As of June 2005, 2004 is at about 0.5, and 2005 is at about 0.3.

Middle-right panel
Revisions to Staff Projections of Real GDP Growth

(Percentage points)

		2004	2005
1.	Revision since Dec. 2003 Greenbook	-1.4	-.2
Contribution of:			
2.	Oil prices	-.5	-.9

		2004	2005
3.	Fiscal Impetus	-.2	.7
4.	Other factors	-.7	.0

Bottom panel
Real GDP and Selected Components

(Percent change, Q4/Q4)

		2004	2005	2006
1.	Real GDP	3.9	3.6	3.4
2.	*(January GB)*	*(3.8)*	*(3.9)*	*(3.6)*
Contributions to real GDP growth (percentage points):				
3.	Domestic final sales	4.4	3.9	3.8
4.	*(January GB)*	*(4.2)*	*(4.0)*	*(4.0)*
5.	Net exports	-.8	-.1	-.4
6.	Inventory investment	.4	-.1	.0
Memo:				
7.	Output gap (Q4 levels)	1.1	.7	.7

Exhibit 8
Have Markets Built in Sufficient Allowance for Risk?

Top panel

Title: Equity Valuation
Series: 12-month forward trend E/P ratio for S&P 500 and real Treasury perpetuity yield (yield on synthetic perpetuity minus Philadelphia Fed 10-year expected inflation)
Horizon: 1986 to 2005:Q2
Description: Data are plotted as two curves. Data are quarterly. Units are percent.

The 12-month forward trend E/P ratio for S&P 500 series begins in 1986 at about 9, then generally falls until reaching a little more than 6 in mid-1987. The series then rises to about 8.5 by year-end 1987, falls a bit to nearly 8 in early 1988, stays at about that level until later that year, and then the series falls to about 7.8 in mid-1989. The series generally rises to about 9 by year-end 1990. It generally falls to a little more than 4 near year-end 1999. The series remains at about that level until late 2000, rises generally to about 7 in mid-2002, maintains its position at about that level until early 2003, and then generally drops to about 5.5 by year-end 2003. From that point, the series generally rises to end just under 6 in 2005:Q2.

The real Treasury perpetuity yield series begins in 1986 at about 5.5, falls to about 3.8 a little later that year, and then generally rises to reach about 5 in mid-1988. The series falls to about 3.5 toward year-end 1989, rises to about 4.25 in early 1990, and remains generally at that level until about year-end 1992. The series falls to about 3.75 toward year-end 1993, rises to about 4.5 toward year-end 1994, and falls to about 3.75 in late 1995. The series then rises to about 4.5 in mid-1996, remains generally at that level until mid-1997, and generally falls to about 3.5 in late 1998. From that

period, the series generally rises to about 4.5 in late 1999, generally falls to about 3.5 in early 2001, and remains at about that level until about mid-2004. The series then falls to end at a little more than 2 in 2005:Q2.

The curves overlap in late 1999.

Middle-left panel

Title: Decomposition of High-Yield Spread
Series: High-yield spread and compensation for expected loss
Horizon: 1990 to 2005 (June 2005 for high-yield spread and 2005:Q2 for compensation for expected loss)
Description: Data are plotted as two curves. Units are percentage points.

For high-yield spread, the series begins at about 7.5 in early 1990, rises to about 10 in early 1991, and then generally falls to about 4.5 in early 1992. The series generally falls again, reaching about 3.75 in mid-1994. From that point, the series then generally rises to about 4.5 in late 1995, falls to 3.5 in mid-1998, and rises to about 6 in late 1998. The series falls to 4.5 in late 1999 and rises to about 9 in 2000. From this point, the series fluctuates between a little less than 8 and about 11 until late 2002. The series generally falls to about 3.75 in early 2005, rises to about 4.25 in early 2005, and falls slightly to end at a little more than 4 in June 2005.

For compensation for expected loss, the series begins at about 4 in early 1990, falls to about 3.75 in mid-1990, and then rises to about 4 in early 1991. The series gradually rises overall to about 4 toward year-end 1995, falls to about 3.5 in early 1997, and then generally rises, reaching a little less than 4 in late 1998. The series falls a bit in early 1999 and generally rises to a little more than 4 in late 2000. The series then falls to about 3 in 2002, remains at about that level until mid-2003, and falls to a little less than 3 in late 2003. The series generally rises to end at about 3.5 in 2005:Q2.

The curves overlap from mid-1997 to mid-1998.

Middle-right panel

Title: Commercial Real Estate Prices and Net Operating Income
Series: Price and net operating income (NOI)
Horizon: 1980 to 2005:Q1
Description: Data are plotted as two curves. Data are quarterly. Units are index, 1978=100, ratio scale.

The price series begins at about 130 in 1980, generally rises to 235 in late 1990, falls to about 180, and then generally rises to end at about 300 in 2005:Q1.

The net operating income series starts at about 120, generally rises until reaching about 180 in 1985, remaining at about that level until early 1986, and then falls to about 160 toward the end of that year. The series generally remains at that level until mid-1990, rises to about 170 toward year-end, and then generally rises again until reaching about 270 in early 2001. The series then generally falls to end at about 200 in 2005:Q1.

The curves overlap in 1995 and 2001.

Source: NCREIF.

Bottom-left panel

Title: Commercial Real Estate Valuation

Series: NOI/price ratio and real Treasury perpetuity yield
Horizon: 1990 to 2005:Q1
Description: Data are plotted as two curves. Data are quarterly. Units are index, 1990:Q1=5 for NOI/price ratio and percent for real Treasury perpetuity yield.

The NOI/price ratio series begins at 5 in 1990, generally rises to about 6.5 toward year-end 1993, then rises slightly to about 7 in early 1995, and remains generally at that level until early 1998. The series gradually falls to about 6.25 in early 1999, remains at about that level until early 2000, and rises gradually to about 6.75 in mid-2001. The series then falls to end at about 4.25 in 2005:Q1.

The real Treasury perpetuity yield series begins at about 4.25, rises to about 4.75 by late 1990, and then generally falls to about 3.5 in 1993. The series rises to about 4.75 in late 1994, falls to about 3.75 in late 1995, rises to about 4.25, and remains at about that level until mid-1997. The series then generally falls to about 3 in late 1998, rises to a little more than 4 in late 1999, and then falls to about 3.5 in early 2001. After rising slightly to about 3.75 a bit later in 2001, the series then fluctuates between 3.75 and 2.9 until mid-2004. The series falls to end at about 2.5 in 2005:Q1.

The curves overlap in 1990.

Bottom-right panel

Title: Office Vacancy Rate and Rent per Square Foot
Series: Vacancy rate and rent per square foot
Horizon: 1998 to 2005:Q2
Description: Data are plotted as two curves. Data are quarterly. Units are percent for vacancy rate and dollars for rent per square foot.

The vacancy rate series begins at about 8.75 in 1998, drops a bit to about 8.5 in late 1998, rises to about 8.8 in early 1999, and then generally falls to about 7 in mid-2000. The series generally rises to about 14.5 in early 2003 and gradually falls to end at about 12.5 in 2005:Q2.

The rent per square foot series begins at about 22, generally rises to 24 in late 1999, and then falls to about 23.75 in early 2000. The series rises to about 26.5 in early 2001, generally falls to about 22.25 in mid-2003, remains at about that level until late 2004, and then rises to end at about 23.1 in 2005:Q2.

The curves overlap in 1998 and 2001.

Source: CoStar. Data for 2005:Q2 are preliminary.

Exhibit 9
Is Corporate Credit Quality Starting to Slip?

Top-left panel

Title: Bond Default and C&I Loan Delinquency Rates
Series: Bond default rate (six-month moving average) and C&I loan delinquency rate
Horizon: 1990 to 2005 (May 2005 for bond default rate and 2005:Q1 for C&I loan delinquency rate)
Description: Data are plotted as two curves. Units are percent of outstandings.

The bond default rate series begins at about 1.8 in 1990, remains generally at that level until later in that year, and then rises to about 3.25 in early 1991. The series then generally falls to 0.6 in late

1991, rises to a little more than 1 in early 1992, falls to 0.5 later in that year, and remains generally at that level until late 1998. The series then generally rises to a little more than 1 in mid-1999, falls a little to 0.9 around year-end 1999, rises to a little more than 1 in 2000, and remains at about that level until rising to about 2.9 in early 2001. The series falls to about 2.25 later that year and then rises to about 3.75 in 2003. The series falls to a little more than zero in 2004 and rises to about 0.9 before falling a bit to end at about 0.5 in May 2005.

The C&I loan delinquency rate series begins at about 5 in 1990, rises to about 6 in 1991, and then falls to about 2 in 1994. The series falls to about 1.75 in 1997 and rises almost to 4 in 2002. The series then falls to end at about 1.5 in 2005:Q1.

The curves overlap in 2001 and 2003.

Top-right panel

Title: Financial Ratios (nonfinancial corporations)
Series: Cash to assets, and interest expense to cash flow
Horizon: 1990 to 2005:Q1
Description: Data are plotted as two curves. Units are percent (right scale for cash to assets and left scale for interest expense to cash flow).

The cash to assets series begins at about 5 in 1990, rises generally to about 7.5 in 1999, falls to about 7 in 2000, and then rises to end at about 10.5 in 2004. The series is projected to end at about the same level in 2005:Q1.

The interest expense to cash flow series begins at about 25 in 1990, rises slightly in 1991, and then generally falls to about 15 in 1997. The series rises to a little more than 20 in 2001 and then falls to end at about 12 in 2004. The series is projected to end at about 11 in 2005:Q1.

The curves overlap in 1994.

Source: Compustat.

Middle-left panel

Title: Payouts to Shareholders (nonfinancial corporations)
Series: Cash mergers, share repurchases, and dividends
Horizon: 2001 to 2005:Q1
Description: Data are plotted as stacked bars. As shown in the chart, approximate values are as follows.

Billions of dollars, annual rate

	Cash mergers	Share repurchases	Dividends
2001	55	145	105
2002	50	145	105
2003	20	170	110
2004	120	200	190
2005:Q1	105	220	180

Middle-right panel

Title: High-Yield Bond Issuance as a Share of Total Bond Issuance (nonfinancial corporations)

Series: High-yield bond issuance as a share of total bond issuance
Horizon: 1997 to 2005:H1
Description: Data are plotted as bars. As shown in the chart, approximate values are as follows.

	Percent
1997	40
1998	38
1999	28
2000	20
2001	22
2002	19
2003	35
2004	42
2005:H1	35

Bottom-left panel

Title: Share of High-Yield Bond Proceeds Used to Refinance Existing Debt
Series: Share of high-yield bond proceeds used to refinance existing debt
Horizon: 1997 to 2005:H1
Description: Data are plotted as bars. As shown in the chart, approximate values are as follows.

	Percent
1997	40
1998	45
1999	47
2000	35
2001	70
2002	65
2003	68
2004	55
2005:H1	45

Bottom-right panel

Title: Profit Share (domestic nonfinancial corporations' ratio of economic profits before tax to sector GDP)
Series: Profit share
Horizon: 1974 to 2006 (data are projected for 2005 and 2006)
Description: Data are plotted as one curve. Data are quarterly. Units are percent.

The series begins in 1975 at a little more than 9 and rises to about 13.25 toward year-end. The series falls to about 12 in 1976, rises to a little more than 13 in 1977, falls to a little more than 11 in 1978, rises to almost 13 later that year, and then generally falls to about 8 in 1980. The series rises to about 10.5 in 1981 and generally falls to about 8 in late 1982. The series then rises to about 12 in 1984 and

then generally falls (a brief increase occurred in 1985) to about 9 in 1986. The series rises generally to about 11.5 in late 1988, generally falls to about 8.5 in 1991, and generally rises again to about 13.25 in 1997. The series then falls generally to about 6 in late 2001 and then generally rises to end at about 11.25 in 2004.

In the projected area, the series begins at about 11 in 2005, rises to about 11.25 toward the end of that year, and then falls to end at about 10.75 in 2006.

Solid vertical bars are present in 1974, most of 1980, toward year-end of 1981 and extending through 1982, most of 1990 and the early part of 1991, and 2001.

Exhibit 10
Are Households Facing Significant Financial Stress?

Top-left panel

Title: Delinquency Rates
Series: Securitized credit card loans, auto loans at finance companies, and home mortgages at banks
Horizon: 1996 to 2005 (April for securitized credit card loans and auto loans at finance companies, and Q1 for home mortgages at banks).
Description: Data are plotted as three curves. Units are percent.

The securitized credit card loans series begins at about 4.25 in 1996, rises generally to about 5.5 in 1997, and then falls generally to about 4.5 in 2000. The series rises generally to about 5.25 in 2001, remains at about that level until mid-2003, and then falls generally to end at a little more than 4 in April 2005.

The auto loans at finance companies series begins at about 3 in 1996, rises generally to about 3.5 in 1997, and then falls generally to about 2 in 2000. The series rises a bit to about 2.25 and remains at about that level until late 2001. The series then falls to about 2 in early 2002, rises a bit to about 2.1 in mid-2003, and falls to about 2 toward the end of that year. The series remains generally at about that level until late 2004 when the series falls to a little less than 2 in early 2005 and then rises to end at a little more than 2 in April 2005.

The home mortgages at banks series begins at about 2.25 in 1996, remains at about that level until late 1998, then rises to about 2.5 in early 1999; later in that year, the series falls to a little less than 2, rises again to about 2, and then falls to about 2. The series remains at about that level until midyear 2000 then rises to about 2.5 in early 2001. Afterward, the series falls generally to about 1.5 in mid-2003, rises to about 1.75 in late 2003, and then falls to end at about 1.25 in 2005:Q1.

The auto loans at finance companies series and the home mortgage at banks curves overlap periodically in 2000, 2001, and 2002.

Top-right panel

Title: Bank Lending Standards for Consumer Loans (average for credit cards and other consumer loans)
Series: Bank lending standards for consumer loans
Horizon: 1996 to 2005:Q2
Description: Data are plotted as one curve. There is a horizontal zero line. Above the horizontal line represents tighter standards, below the horizontal line represents easier standards. Units are net

percent.

The series begins at about 20 in 1996, rises to 35 in midyear, then falls generally to 5 toward year-end 1998. The series then rises to about 10 in early 1999, falls generally to about zero in 2000, and then rises to about 20 in early 2001. The series fluctuates between 20 and 12 from that point until late 2002 and then falls generally to end at about negative 13 in 2005:Q2.

Source: Senior Loan Officer Survey.

Middle-left panel
2004 Survey of Consumer Finances

- Results are preliminary.
- Subject to revision as SCF staff continues to process the data.
- Results are *confidential* until public release of 2004 data next January.

Middle-right panel

Title: Households With Any Payments 60 Days Past Due
Series: Share of households and share of debt
Horizon: 1989 to 2004
Description: Data are plotted as two curves. Units are percent.

The share of households curve begins at about 5.4 in 1989 and drops to about 4.6 in 1992. It increases through mid-1998 to about 6, drops to about 5.2 in mid-2001, then increases to end at almost 7 in late 2004.

The share of debt curve begins at about 4.2 in 1989 and drops to about 4 in 1992. It increases through mid-1998 to a bit above 5, decreases to about 4.4 in mid-2001, then increases to end at about 4.8 in late 2004.

Source: Survey of Consumer Finances.

Bottom-left panel
Assets, Debt, and Net Worth, Change from 2001 to 2004

- Substantial rise in assets. Driven by appreciation in house prices. Fairly widespread across income groups.
- Rapid debt growth throughout the income distribution.
- For median-income households, little change in net worth. But net worth rose for high-income households.

Source: Survey of Consumer Finances.

Bottom-right panel

Title: Household Net Worth to DPI
Series: Household net worth to DPI
Horizon: 1995 to 2006 (data is projected for part of 2005 and all of 2006)
Description: Data are plotted as one curve. Data are quarterly. Unit is ratio.

The series begins at about 4.75 in 1995, rises until reaching about 5.75 in early 1998, falls to about 5.5 later that year, and then rises generally to about 6.25 in early 2000. The series falls generally to a little less than 5 in 2002. The series then rises generally from that point to about 5.5 in early 2005.

In the projected area, the series begins at about 5.5, rises slightly, and then falls to end at a little less than 5.5 in 2006.

Exhibit 11
Foreign Outlook and Financial Market Indicators

Exhibit 11 is a two-by-two array of panels of U.S. and foreign GDP, stock prices, EMBI+ spreads, and ten-year government bond yields.

Top-left panel
U.S. and Foreign GDP

U.S. and Foreign GDP plots U.S. GDP as a line chart and total foreign GDP as a bar chart for 2004:H1 (actual), 2004:H2 (actual), 2005:Q1 (actual), 2005:Q2 (forecast), 2005:H2 (forecast), 2006:H1 (forecast), and 2006:H2 (forecast). The range of the y-axis is [0,5]; unit is percent change, a.r. Data for total foreign GDP are weighted by shares of U.S. merchandise exports. Years are Q4/Q4; half years are Q2/Q4 or Q4/Q2. Approximate values for U.S. real GDP and total foreign real GDP for the seven periods are as follows.

	2004:H1	2004:H2	2005:Q1	2005:Q2	2005:H2	2006:H1	2006:H2
U.S. GDP (black line)	3.8	3.9	3.7	2.9	3.6	3.4	3.3
Total Foreign GDP (red bars)	4.2	3.0	2.7	3.2	3.4	3.3	3.3

Top-right panel
Stock Prices*

Stock Prices on a weekly basis for emerging markets and for industrial countries for 2003 through mid-2005. The range of the y-axis is [75, 200]; ratio scale, Jan. 3, 2003 = 100. Both series begin at 100 and are somewhat volatile. The emerging markets series falls to about 93 by early 2003, rises to about 155 by early 2004, declines to about 135 by mid-2004, and then rises to about 172 by the end of the period. The industrial countries series falls to about 87 by early 2003, rises to about 124 by early 2004, declines to about 117 by mid-2004, and then rises to about 135 by the end of the period.

* Source: MSCI. Return to text

Bottom-left panel
EMBI+ Spreads

EMBI+ Spreads on a weekly basis for 2003 through mid-2005 for Brazil, Mexico, and Overall excluding Argentina. The range of the y-axis is [1, 15]; units are percentage points. The spreads for Brazil start at about 14 percentage points, and, with considerable volatility, fall to about 3¾ percentage points by early 2005, and rise to about 4¼ percentage points by the end of the period. The spreads for Mexico start at just over 3 percentage points, decline to about 1½ basis points by early 2005, and rise to about 1¾ percentage points by the end of the period. The overall spreads excluding Argentina start at about 6½ percentage points and fall, with some volatility, to about 2½ percentage points by early 2005, and then rise to about 3 percentage points by the end of the period.

Bottom-right panel
Ten-Year Government Bond Yields

Ten-Year Government Bond Yields on a weekly basis for U.S. Treasury bonds and for weighted-average foreign bonds for 2003 through mid-2005. The range of the y-axis is [3.0, 5.0]; unit is percent. The yields for weighted-average foreign bonds are the average of rates for Australia, Canada, the euro area, Japan, Sweden, Switzerland, and the United Kingdom, weighted by trade shares. The yields for U.S. Treasury bonds start at about 4.1 percent, and, with considerable volatility, fall to about 3.2 percent by mid-2003, rise to about 4.6 percent by early 2005, and then fall to just under 4 percent by the end of the period. The yields for weighted-average foreign bonds start at about 4.1 percent, and, with considerable volatility, fall to about 3.4 percent by mid-2003, rise to nearly 4.5 percent by mid-2004, fall to about 3.6 percent by early 2005, rise quickly to about 3.85 percent and then fall to about 3.3 percent by the end of the period.

Exhibit 12
Long-Term Interest Rates and Monetary Policy

Exhibit 12 is a three-by-four array of panels of weekly data. All graphs are shaded yellow from November 2003 through the end of the period (mid-2005) to indicate the period of time during which the central banks of the countries discussed on this page tightened monetary policy. The four top panels plot "Ten-Year Government Bond Yields" for the United States and Germany, Canada, the United Kingdom, and Japan. The four middle panels plot "Long-Term Nominal and Inflation-Indexed Yields" for the euro, the Canadian dollar, sterling, and the yen. The four bottom panels plot "Monetary Policy Indicators" for the United States and the euro area, Canada, the United Kingdom, and Japan.

Top panels
Ten-Year Government Bond Yields

Ten-Year Government Bond Yields for the United States and Germany for 2003 through mid-2005. The range of the y-axis is [3, 6]; unit is percent. The yields for the United States start at just over 4 percent, and, with considerable volatility, rise to about 4½ percent by October 2003, and then ease to just above 4 percent by the end of the period. The yields for Germany start at about 4-1/3 percent, and, with considerable volatility, rise to about 4½ percent by October 2003, and then fall to just below 3¼ percent by the end of the period.

Ten-Year Government Bond Yields for Canada for 2003 through mid-2005. The range of the y-axis is [3, 6]; unit is percent. The yields for Canada start at about 5 percent, and, with considerable volatility, decline to just below 5 percent by October 2003, and then fall to about 3¾ percent by the end of the period.

Ten-Year Government Bond Yields for the United Kingdom for 2003 through mid-2005. The range of the y-axis is [3, 6]; unit is percent. The yields for the United Kingdom start at about 4½ percent, and, with considerable volatility, rise to about 5 percent by October 2003, rise further to about 5¼ percent by mid-2004, and then fall to about 4¼ percent by the end of the period.

Ten-Year Government Bond Yields for Japan for 2003 through mid-2005. The range of the y-axis is [0, 3]; unit is percent. The yields for Japan start at about 7/8 percent, and, with considerable volatility, rise to about 1½ percent by October 2003, rise further to about 1-7/8 percent by mid-2004, and then fall to about 1¼ percent by the end of the period.

Middle panels
Long-Term Nominal and Inflation-Indexed Yields

Long-Term Nominal and Inflation-Indexed Yields for the euro for 2003 through mid-2005. The range of the y-axis is [0, 6]; unit is percent. The nominal yields for the euro start at about 4¼ percent, and, with considerable volatility, ease to about 4 percent by October 2003, and then decline to about 2¾ percent by the end of the period. The inflation-indexed yields for the euro start at about 2½ percent, and, with considerable volatility, decline to about 2 percent by October 2003, and then fall to just below 1 percent by the end of the period.

Long-Term Nominal and Inflation-Indexed Yields for the Canadian dollar for 2003 through mid-2005. The range of the y-axis is [0, 6]; unit is percent. The nominal yields for the Canadian dollar start at about 5-1/3 percent, and, with considerable volatility, ease to about 5 percent by October 2003, and then decline to just above 4 percent by the end of the period. The inflation-indexed yields for the Canadian dollar start at about 3¼ percent, and, with some volatility, ease to about 3 percent by October 2003, and then fall to about 1¾ percent by the end of the period.

Long-Term Nominal and Inflation-Indexed Yields for sterling for 2003 through mid-2005. The range of the y-axis is [0, 6]; unit is percent. The nominal yields for sterling start at about 4½ percent, and, with considerable volatility, rise to about 4¾ percent by October 2003, rise to about 5¼ percent by mid-2004, and then decline to about 4¼ percent by the end of the period. The inflation-indexed yields for sterling start at just above 2 percent, and, with considerable volatility, ease to about 2 percent by October 2003, and then decline to about 1¾ percent by the end of the period.

Long-Term Nominal and Inflation-Indexed Yields for the yen. Although the dates on the chart are set for 2003 through mid-2005, the data actually begin in early 2004. The range of the y-axis is [0, 6]; unit is percent. The nominal yields for the yen start in early 2004 at about 1-1/3 percent, and, with some volatility, rise to nearly 2 percent by mid-2004, and then decline to about 1 percent by the end of the period. The inflation-indexed yields for the yen start in early 2004 at just above 1 percent, and, with some volatility, decline to about ½ percent by the end of the period.

Bottom panels
Monetary Policy Indicators

Monetary Policy Indicators for the euro-area refinance rate and the U.S. target federal funds rate for 2003 through mid-2005. The range of the y-axis is [0, 4]; unit is percent. The euro-area refinance rate starts at 2¾ percent, falls to 2 percent by mid-2003, and remains there through the end of the period. The U.S. target federal funds rate starts at 1¼ percent, falls to 1 percent by mid-2003, stays there through mid-2004, and then rises to 3 percent by the end of the period.

Monetary Policy Indicators for the Canadian Bank rate for 2003 through mid-2005. The range of the y-axis is [0, 5]; unit is percent. The Canadian Bank rate starts at 3 percent, rises to 3½ percent by mid-2003, falls back to 3 percent by late 2003, falls further to 2¼ percent by mid-2004, rises to 2¾ percent by late 2004, and remains there through the end of the period.

Monetary Policy Indicators for the U.K. repo rate for 2003 through mid-2005. The range of the y-axis is [0, 6]; unit is percent. The U.K. repo rate starts at 4 percent, falls to 3½ percent by late 2003, rises to 4¾ percent by late 2004, and remains there through the end of the period.

Monetary Policy Indicators for balances at the Bank of Japan for 2003 through mid-2005. The range of the y-axis is [15, 40]; units are trillions of yen. The balances at the Bank of Japan start at about 20 trillion yen, rise quickly at about 30 trillion yen, fall almost immediately to about 26 trillion yen, rise to about 30 trillion yen by October 2003, stay at about that level through early 2004, rise to about 33 trillion yen in early 2004, and then fluctuate between about 30-34 trillion yen, ending at about 33 trillion yen by the end of the period.

Exhibit 13
Euro Area and Japan

Exhibit 13 is a three-by-two array of panels for earnings per share, BBB corporate bond spreads, real effective exchange rates, euro-area confidence indicators, euro-area real GDP, and Japanese real GDP.

Top-left panel
Earnings per Share

Earnings per Share on a yearly basis for the euro area and Japan for 1990-2004 (actual) and 2005-2006 (forecast). The range of the y-axis is [-50, 350]; index, 1990=100. Earnings per share is defined as operating earnings per share in local currency for MSCI indexes; forecasts are from I/B/E/S surveys in mid-June 2005. Both series start at 100. Earnings per share for the euro area fall to about 60 by 1993, rise to about 180 by 2000, fall to about 120 by 2002, rise to about 275 by 2004, and then rise to about 330 over the forecast horizon. Earnings per share for Japan, with some volatility, fall to about -40 by 2001, rise to about 130 by 2004, and rise further to about 175 over the forecast horizon.

Top-right panel
BBB Corporate Bond Spreads

BBB Corporate Bond Spreads on a weekly basis for the euro and the yen for 2002 through mid-2005. The range of the y-axis is [0, 250]; units are basis points. The spreads for the euro start at about 175 basis points, and, with some volatility, rise to about 240 basis points by late 2002, fall to about 100 basis points by mid-2003, and then decline more gradually to about 60 basis points by the end of the period. The spreads for the yen start at about 60 basis points and decline gradually to about 25 basis points by the end of the period.

Middle-left panel
Real Effective Exchange Rates

Real Effective Exchange Rates on a monthly basis for the euro and the yen for 2004 through mid-2005 (actual) and for mid-2005 through 2006 (forecast). The range of the y-axis is [90, 105]; index, Jan. 2004 = 100. Both series begin at 100. The index for the euro, with some volatility, falls to about 97 by early 2004, rises to about 103 by late 2004, falls to about 96 by mid-2005, and stays at about that level through the forecast period. The index for the yen, with some volatility, falls to about 94 by mid-2005, and then eases to about 92½ by the end of the forecast period.

Middle-right panel
Euro-Area Confidence Indicators

Euro-Area Confidence Indicators on a monthly basis for the industrial and consumer sectors for 2002 through mid-2005. The range of the y-axis is [-25,5]; unit is diffusion index. A diffusion index is defined as the percent of respondents reporting an increase minus the percent of respondents reporting a decrease. The series for the industrial sector starts at about -15, rises to about -3 by late 2004, and falls to about -11 by the end of the period. The series for the consumer sector starts at about -11, falls to about -22 by early 2003, rises to about -15 by early 2004 and stays at about that level through the end of the period.

Bottom-left panel
Euro-Area Real GDP

Euro-Area Real GDP as a bar chart for 2004:H1 (actual), 2004:H2 (actual), 2005:Q1 (actual), 2005:Q2 (forecast), 2005:H2 (forecast), 2006:H1 (forecast), and 2006:H2 (forecast). The range of the y-axis is [-1, 6]; unit is percent change, a.r. Half years are Q2/Q4 or Q4/Q2. Approximate values for the seven periods are as follows.

	2004:H1	2004:H2	2005:Q1	2005:Q2	2005:H2	2006:H1	2006:H2
Euro-Area Real GDP	2.1	0.8	2.1	1.2	1.7	1.75	1.75

Bottom-right panel
Japanese Real GDP

Japanese Real GDP as a bar chart for 2004:H1 (actual), 2004:H2 (actual), 2005:Q1 (actual), 2005:Q2 (forecast), 2005:H2 (forecast), 2006:H1 (forecast), and 2006:H2 (forecast). The range of the y-axis is [-1, 6]; unit is percent change, a.r. Half years are Q2/Q4 or Q4/Q2. Approximate values for the seven periods are as follows.

	2004:H1	2004:H2	2005:Q1	2005:Q2	2005:H2	2006:H1	2006:H2
Japanese Real GDP	2.3	-0.4	4.8	1.4	1.4	1.5	1.8

Exhibit 14
China: Why is Import Growth Slowing?

Exhibit 14 is a three-by-two array of panels of the merchandise trade balance, merchandise trade, exports to China, real GDP, exports by category, and consumer prices.

Top-left panel
Merchandise Trade Balance

Merchandise Trade Balance as a twelve-month moving sum for 1985 through mid-2005. The range of the y-axis is [-20, 80]; units are billions of dollars. The trade balance starts at a deficit of about $2 billion, falls to a deficit of about $15 billion by early 1986, rises into surplus by mid-1990 and reaches a surplus of about $10 billion by early 1991, falls back into deficit in mid-1993 and reaches a deficit of about $12 billion by the beginning of 1994, rises back into surplus by the end of 1994 and reaches a surplus of about $46 billion by mid-1998, falls to a surplus of about $14 billion by mid-2004, and then rises sharply to a surplus of about $72 billion by the end of the period.

Top-right panel
Merchandise Trade

Merchandise Trade in terms of exports and imports on a monthly basis for 2003 through mid-2005. The range of the y-axis is [20, 70]; units are billions of dollars. Exports start at about $33 billion and rise fairly steadily to about $62 billion by the end of the period. Imports start at about $34 billion and rise to about $52 billion by the end of the period.

Middle-left panel
Exports to China

Exports to China from Taiwan, Korea, and Japan for 2003 through mid-2005. The range of the y-axis is
[-20, 180]; unit is twelve-month percent change. All the series are somewhat volatile. The twelve-month percent change of exports from Taiwan starts at about 120 percent, rises immediately to nearly 180 percent, drops quickly to about 70 percent by early 2003, rises to about 160 percent by early 2004, and falls to about 10 percent by the end of the period. The twelve-month percent change of exports from Korea starts at about 55 percent, rises immediately to about 80 percent, drops quickly to about 30 percent by early 2003, rises to about 70 percent by mid-2004, and falls to just above 20 percent by the end of the period. The twelve-month percent change of exports from Japan starts at about 30 percent, rises immediately to about 65 percent, drops to about 25 percent by mid-2003, and then falls to about 0 percent by the end of the period.

Middle-right panel
Real GDP

Real GDP as a bar chart for 2004:Q1 through 2005:Q1 (actual), and for 2005:Q2 through 2006:Q4 (forecast). The range of the y-axis is [0, 15]; unit is percent change, a.r. As shown in the chart, approximate values for the twelve periods are as follows.

	2004				2005				2006			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Real GDP	14	2½	10	11½	13	8	8	7½	7½	7½	7½	7½

Bottom-left panel
Exports by Category

Exports by Category as a twelve-month moving sum for road vehicles and for iron and steel for 1995 through mid-2005. The range of the y-axis is [0, 25]; units are billions of dollars. Both series start at about $2 billion. Exports of road vehicles rise gradually to about $7 billion by mid-2002 and then rise fairly sharply, reaching about $19 billion by the end of the period. Exports of iron and steel fluctuate between about $2 billion to $5 billion until mid-2004, when they rise sharply, reaching about $20 billion by the end of the period.

Bottom-right panel
Consumer Prices

Consumer prices for overall consumer prices and for consumer prices excluding food for 2003 through mid-2005. The range of the y-axis is [-1, 6]; unit is twelve-month percent change. Overall consumer prices start at about ½ percent, rise fairly sharply to about 5¼ percent by mid-2004, and then fall to about 1¾ percent by the end of the period. Consumer prices excluding food start at about -¾ percent and rise to about 1 percent by the end of the period.

Exhibit 15
Outlook for Commodity Prices and U.S. External Accounts

Exhibit 15 is comprised of five panels, including graphs on primary commodity prices, the broad real dollar, and WTI, a table on the balance of payments, and a graph on the current account balance.

Top-left panel

Primary Commodity Prices

Primary Commodity Prices on a monthly basis for metals and non-fuel commodities for 2002 through mid-2005 (actual) and for mid-2005 through 2006 (forecast). The range of the y-axis is [80, 200]; index, Jan. 2002 = 100. The primary commodity prices are IMF indexes. The non-fuel primary commodities index is weighted by U.S. import shares. Both indexes begin at 100. The index for metals rises gradually to about 105 by early 2003, rises sharply to about 190 by mid-2005, and then eases to about 175 by the end of the forecast period. The index for non-fuel primary commodities rises to about 155 by mid-2005, and then eases to just under 150 by the end of the forecast period.

Top-right panel
Broad Real Dollar

Broad Real Dollar on a monthly basis for 2002 through mid-2005 (actual), and for mid-2005 through 2006 (forecast). The range of the y-axis is [75, 105]; index, Jan. 2002 = 100. The actual broad real dollar starts at 100, declines to about 87 by mid-2005, and then eases slightly to about 86 by the end of the forecast period.

Middle-left panel
WTI

WTI on a monthly basis for the spot price and for far-dated futures for 2002 through mid-2005 (actual) and for mid-2005 through 2006 (forecast for the spot price only). The range of the y-axis is [15, 65]; unit is dollars per barrel. The WTI spot price starts at about $20 per barrel, rises to about $58 per barrel by mid-2005, rises further to about $62 per barrel by end-2005, and then eases to about $58 per barrel by the end of the forecast period. The WTI far-dated futures start at about $20 per barrel and rise to about $54 per barrel by mid-2005; there is no forecast for the WTI far-dated futures.

Bottom-left panel
Balance of Payments

Billions of dollars, a.r.

		Trade Balance	Net Invest. Income	Current Account
2005	Q1	-687	21	-780
	Q2	-701	18	-785
	H2	-747	5	-847
2006	H1	-776	-20	-907
	Q3	-783	-42	-934
	Q4	-800	-58	-960
Change from 2005Q1 To 2006Q4		-113	-79	-180

Bottom-right panel
Current Account Balance

Current Account in terms of percent of GDP and in terms of level (billions of dollars) for 1995 through early 2005 (actual) and for early 2005 through 2006 (forecast). The range of the left y-axis, measured in terms of percent of GDP, is [-10, 1]. The range of the right y-axis, measured in terms of level or billions of dollars, a.r., is [-1000, 100]. The graph shows the current account to be in deficit

for the entire period; the two series track closely most of the period, but the gap between them widens beginning in late 2004. The current account in terms of level starts at a deficit of about $125 billion, which widens to about $780 billion by early 2005. The forecast shows the deficit widening further, to about $960 billion by end-2006. The current account in terms of percent of GDP starts at a deficit of about 1¾ percent of GDP, which widens to a deficit of nearly 6½ percent of GDP by early 2005. The forecast shows the deficit widening further to about 7¼ percent of GDP by end-2006.

Exhibit 16

Top panel
ECONOMIC PROJECTIONS FOR 2005

	FOMC		Staff
	Range	Central Tendency	
	Percentage change, Q4 to Q4		
Nominal GDP	**5 to 6¼**	**5½ to 5¾**	**5.9**
February 2005	(5 to 6)	(5½ to 5¾)	(5.4)
Real GDP	**3 to 3¾**	**3½**	**3.6**
February 2005	(3½ to 4)	(3¾ to 4)	(3.9)
Core PCE Prices	**1½ to 2¼**	**1¾ to 2**	**2.1**
February 2005	(1½ to 2)	(1½ to 1¾)	(1.6)
	Average level, Q4, percent		
Unemployment rate	**5 to 5¼**	**5**	**5.1**
February 2005	(5 to 5½)	(5¼)	(5.3)

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

Bottom panel
ECONOMIC PROJECTIONS FOR 2006

	FOMC		Staff
	Range	Central Tendency	
	Percentage change, Q4 to Q4		
Nominal GDP	**5 to 6**	**5¼ to 5½**	**5.4**
February 2005	(5 to 5¾)	(5 to 5½)	(5.3)
Real GDP	**3¼ to 3¾**	**3¼ to 3½**	**3.4**
February 2005	(3¼ to 3¾)	(3½)	(3.6)
Core PCE Prices	**1½ to 2½**	**1¾ to 2**	**1.9**
February 2005	(1½ to 2)	(1½ to 1¾)	(1.4)
	Average level, Q4, percent		
Unemployment rate	**5**	**5**	**5.1**
February 2005	(5 to 5¼)	(5 to 5¼)	(5.1)

Appendix 4: Materials used by Mr. Reinhart

Exhibit 1

Exhibit 1 discusses recent financial market developments.

Top-left panel
Expected Federal Funds Rates*

A line chart displays the current expected path of the funds rate derived from federal funds futures along with the expected path as of the time of the May meeting. The chart indicates that investors expect the funds rate to plateau at a level of about 3-3/4 percent beginning early in 2006. The current funds rate path is somewhat lower than the path anticipated at the time of the May meeting at horizons beyond the first quarter of 2006.

* Estimates from federal funds and eurodollar futures, with an allowance for term premia and other adjustments. Return to text

Top-right panel
Probability of a Pause at Upcoming FOMC Meetings

A bar chart displays the current probability of a pause in tightening computed from market data and the same probabilities computed as of the time of the May meeting. The chart indicates that investors put high odds on pause in tightening by the end of 2005.

Middle panel
Nominal Treasury Yields*

A line chart displays two- and ten-year Treasury yields since the beginning of 2004. Ten-year yields have moved lower, on balance, over this period, while the two-year yield has risen appreciably. As a result, the yield curve is quite flat at present.

* Par yields from an estimated off-the-run Treasury yield curve. Return to text

Bottom-left panel
Change In Ten-Year Yields Since June 29, 2004

	basis points
1. Nominal Treasury	-79
2. TIPS	-52
3. Inflation Compensation	-26
4. One-Year Forward*	-170
5. AA Corporate	-78
6. Euro Swap Rate	-120

*One-year nominal forward rate maturing ten years ahead. Return to table

Bottom-right panel

Actual and Expected Treasury One-year Forward Rates*

A line chart displays one-year Treasury forward rates currently and one year ago. In addition, the chart plots the schedule of current one-year forward rates that the market had anticipated one year ago. The chart indicates that the current term structure of Treasury forward rates is significantly lower and flatter than the market had expected would be the case a year ago.

* Forward rates are the one-year nominal rates maturing at the end of the year shown on the horizontal axis that are implied by the smoothed Treasury yield curve. Return to text

Exhibit 2

Exhibit 2 presents information on the Treasury yield curve.

Top panel
Slope of Yield Curve*

A line chart plots the slope of the Treasury yield curve computed as the spread of the ten-year yield over the one-year yield. The spread has tended to widen substantially during recessions as the Federal Reserve eases the stance of monetary policy. Most recently, the spread has narrowed sharply.

* Ten-year over one-year constant maturity spread. Return to text

Note. Shaded areas represent NBER contractions.

Middle-left panel
Factors Encouraging the Demand for Relative to the Supply of Long Duration Securities

- Reduced macro volatility
- Increased demand for duration
- Reduced supply of duration
- Increased global saving

Middle-right panel
Factors Damping Growth Prospects

- Higher oil prices
- Potential increase in domestic saving rate
- Large and sustained trade deficits

Bottom-left panel
Term Premium of One-Year Forward Nominal Rate Maturing Ten Years Ahead*

A line chart reports a measure of the term premium for the forward rate maturing ten years ahead. This measure suggests that the term premium has declined substantially since the middle of June 2004.

* Derived from three-factor arbitrage-free term structure model. Return to text

Bottom-right panel
Four-Quarter-Ahead Real GDP Growth Forecast

A line chart displays the time series of the four quarter ahead real GDP growth forecasts from a simple regression model that includes the slope of the yield curve as an explanatory variable. The

chart indicates that the GDP growth forecast has been revised down over much of the last year.

Note. Shaded areas represent NBER contractions.

Exhibit 3

Top-left panel
Values from Policy Rules and Futures Markets

A chart plots the level of the funds rate and the prescriptions from a range of interest rate rules over the period from 1988 to present. The current level of the funds rate is at the upper end of the range of interest rate rule prescriptions. In addition, the prescriptions tend to flatten out over the next year based on the staff's outlook for output and inflation.

See explanatory note in Chart 8 of the Bluebook.

Top-right panel
Range of Estimated Equilibrium Real Rates

A chart displays the current level of the real federal funds rate relative to a range of model estimates of the equilibrium real rate. The current level of the real federal funds rate is below the range of model-based estimates, suggesting that the stance of monetary policy is accommodative.

See explanatory note in Chart 7 of the Bluebook.

Middle-left panel
What can go wrong?

- Stop too soon
  -- Allowing inflation expectations to become unanchored
- Stop too late
  -- Allowing slack to persist

Middle-right panel
Inflation Compensation

A line chart displays inflation compensation over the next five years and five to ten years ahead based on Treasury Inflation Protected Securities (TIPS). Both series have moved down significantly since the beginning of 2005.

Bottom-left panel
Intended Federal Funds Rate*

A line chart displays the evolution of the intended federal funds rate since 1988. The chart indicates that the current period of sustained tightening is roughly comparable to the length of previous tightening episodes.

* Red shading indicates periods of sustained tightening. Blue shading indicates periods of sustained easing. Return to text

Bottom-right panel
Risk Spreads*

A line chart displays investment- and speculative-grade corporate risk spreads since early 2002. Both

series spiked in 2002 but declined substantially through early 2005. Since May, both risks spreads have widened noticeably.

* Measured relative to an estimated off-the-run Treasury yield curve. Return to text

Exhibit 4

Top panel
Monetary Policy Alternatives

Policy Risk	Yield Curve Signal	
	Decline in Term Premium	**Economic Weakness**
Stopping Too Soon	C	
Stopping Too Late		A

Bottom panel
Statement Challenges

- "…the stance of monetary policy remains accommodative"
- "…coupled with robust underlying growth in productivity"
- "…with appropriate monetary policy action, the upside and downside risks to the attainment of both sustainable growth and price stability should be kept roughly equal."
- "…that policy accommodation can be removed at a pace that is likely to be measured."

Table 1: Alternative Language for the June FOMC Announcement

[Note: In Appendix 4, Table 1, emphasis (strike-through) has been added to indicate strike-through text in the original document. Strong emphasis (bold) indicates bold red text in the original document.]

	May FOMC	**Alternative A**	**Alternative B**	**Alternative C**
Policy Decision	1. The Federal Open Market Committee decided today to raise its target for the federal funds rate by 25 basis points to 3 percent.	The Federal Open Market Committee decided today to raise its target for the federal funds rate by 25 basis points to **3-1/4** percent.	The Federal Open Market Committee decided today to raise its target for the federal funds rate by 25 basis points to **3-1/4** percent.	The Federal Open Market Committee decided today to raise its target for the federal funds rate by **50** basis points to **3-1/2** percent.
Rationale	2. The Committee believes that, even after this action, the stance of monetary policy remains accommodative and, coupled with robust underlying growth in productivity, is providing ongoing support to economic activity.	The Committee believes that~~,~~ ~~even after this action, the stance of~~ **the degree of** monetary policy ~~remains accommodative~~ **accommodation has been substantially reduced.** ~~and, coupled with r~~ **R**obust underlying growth in productivity~~, is providing ongoing~~ **continues to provide** support to economic activity.	[no change]	The Committee believes that, even after this action, the stance of monetary policy remains accommodative and~~,~~ ~~coupled with robust underlying growth in productivity,~~ is providing ongoing support to economic activity.

	May FOMC	Alternative A	Alternative B	Alternative C
	3. Recent data suggest that the solid pace of spending growth has slowed somewhat, partly in response to the earlier increases in energy prices. Labor market conditions, however, apparently continue to improve gradually.	~~Recent data suggest that the solid pace of spending growth has~~ **Nonetheless, growth in spending** slowed somewhat **in the spring**, partly in response to ~~the earlier increases in~~ **elevated** energy prices. Labor market conditions, however, apparently continue to improve gradually.	**Although energy prices have risen further,** ~~Recent data suggest that the solid pace of spending growth has slowed somewhat, partly in response to the earlier increases in energy prices~~ **the expansion remains firm and** ~~L~~ **l**abor market conditions~~, however, apparently~~ continue to improve gradually.	~~Recent data suggest that t~~ **T**he ~~solid~~ **underlying** pace of spending growth ~~has slowed somewhat, partly in response to~~ **remains solid despite elevated** ~~the earlier increases in~~ energy prices. Labor market conditions~~, however, apparently~~ continue to improve ~~gradually~~.
	4. Pressures on inflation have picked up in recent months and pricing power is more evident. Longer-term inflation expectations remain well contained.	~~Pressures~~ **Readings** on inflation have ~~picked up~~ **been subdued** in recent months**,** and ~~pricing power is more evident. L~~ **l**onger-term inflation expectations ~~remain well contained~~ **have declined**.	Pressures on inflation have ~~picked up in recent months and pricing power is more evident. L~~ **stayed elevated, but l**onger-term inflation expectations remain well contained.	Pressures on inflation have picked up **further** in recent months ~~and pricing power is more evident. L~~**, although measures of l**onger-term inflation expectations remain well contained.
	5. The Committee perceives that, with appropriate monetary policy action, the upside and downside risks to the attainment of both sustainable growth and price stability should be kept roughly equal.	The Committee perceives that, with appropriate monetary policy ~~action~~, the upside and downside risks to the attainment of both sustainable growth and price stability should be kept roughly equal.	[no change]	~~The Committee perceives that, with appropriate monetary policy action, the upside and downside risks to the attainment of both sustainable growth and price stability should be kept roughly equal.~~
Assessment of Risk	6. With underlying inflation expected to be contained, the Committee believes that policy accommodation can be removed at a pace that is likely to be measured. Nonetheless, the Committee will respond to changes in economic prospects as needed to fulfill its obligation to maintain price stability.	With underlying inflation expected to be contained, the Committee believes that **remaining** policy accommodation can be removed at a pace that is likely to be measured. Nonetheless, the Committee will respond to changes in economic prospects as needed to fulfill its obligation to maintain price stability.	[no change]	~~With underlying inflation expected to be contained, the Committee believes that policy accommodation can be removed at a pace that is likely to be measured. Nonetheless,~~ **T**he Committee will respond to changes in economic prospects as needed to fulfill its obligation **to foster the attainment of both sustainable economic growth and** ~~maintain~~ price stability.

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