

Meeting of the Federal Open Market Committee June 28-29, 2006 Presentation Materials -- Text Version

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

Pages 146 to 177 of the Transcript

Appendix 1: Materials used by Mr. Kos

Page 1

Top panel

Title: MSCI Equity Indices

Series: MSCI Indices for: Latin America, Emerging Europe/Middle East/Africa, All Emerging Markets, Emerging Asia, Japan, U.S., Europe, indexed to 100 on 5/1/2004

Horizon: May 1, 2004 to June 27, 2006

Description: All indices were increasing until a drop-off beginning on May 10, 2006 (labeled with a tripwire).

Middle panel

Title: Realized Volatility of MSCI Equity Indices

Series: Rolling 21-day volatility of daily returns on MSCI Indices: Emerging Markets, Europe, Japan, and U.S.

Horizon: January 2, 2006 to June 27, 2006

Description: There was a pickup in volatility starting on May 10, 2006 (labeled with a tripwire).

Bottom panel

S&P 500: Periods with Greater than 10% Price Declines

(Since January 2, 1942)

| Start Date | End Date | Percentage Decline |
|------------|------------|--------------------|
| 9/21/1943 | 11/29/1943 | -10.21 |
| 8/13/1946 | 10/9/1946 | -22.55 |
| 6/15/1948 | 6/13/1949 | -20.57 |
| 6/9/1950 | 7/17/1950 | -13.40 |
| 3/17/1953 | 9/15/1953 | -13.03 |
| 8/2/1956 | 2/25/1957 | -12.79 |
| 7/12/1957 | 10/21/1957 | -20.23 |
| 1/5/1960 | 3/8/1960 | -11.46 |
| 12/12/1961 | 5/28/1962 | -23.60 |

| Start Date | End Date | Percentage Decline |
|-----------------|------------------|--------------------|
| 2/9/1966 | 10/7/1966 | -22.18 |
| 11/29/1968 | 7/29/1969 | -17.43 |
| 10/24/1969 | 1/30/1970 | -13.35 |
| 3/3/1970 | 5/26/1970 | -23.21 |
| 4/28/1971 | 8/9/1971 | -10.73 |
| 1/11/1973 | 8/22/1973 | -16.39 |
| 3/13/1974 | 10/3/1974 | -37.56 |
| 7/15/1975 | 9/16/1975 | -14.14 |
| 7/18/1977 | 2/28/1978 | -13.78 |
| 9/12/1978 | 11/15/1978 | -13.35 |
| 2/13/1980 | 3/27/1980 | -17.07 |
| 11/20/1980 | 9/25/1981 | -19.68 |
| 11/30/1981 | 3/17/1982 | -13.67 |
| 5/7/1982 | 8/12/1982 | -14.27 |
| 10/10/1983 | 7/24/1984 | -14.38 |
| 8/25/1987 | 10/19/1987 | -33.24 |
| 7/16/1990 | 10/17/1990 | -19.02 |
| 10/17/1997 | 10/27/1997 | -10.80 |
| 7/17/1998 | 9/10/1998 | -17.41 |
| 9/1/2000 | 3/11/2003 | -47.35 |
| 5/9/2006 | 6/27/2006 | -6.15 |

Page 2

Top panel Select International Equity Performance

Percent

| | January 2, 2006 to May 10, 2006 | May 11, 2006 to June 27, 2006 |
|--------------|---------------------------------|-------------------------------|
| Brazil | 24.60 | -14.35 |
| India | 34.32 | -18.37 |
| Mexico | 21.51 | -15.24 |
| Russia | 54.58 | -18.97 |
| South Africa | 21.39 | -7.19 |
| South Korea | 4.45 | -14.83 |
| Turkey | 9.57 | -25.72 |

Middle panel

Select Foreign Currency Performance vs. U.S. Dollar

Percent

| | January 2, 2006 to May 10, 2006 | May 11, 2006 to June 27, 2006 |
|--------------|---------------------------------|-------------------------------|
| Brazil | 12.64 | -5.96 |
| India | 0.34 | -2.75 |
| Mexico | -2.01 | -4.75 |
| Russia | 6.35 | -0.18 |
| South Africa | 4.57 | -16.69 |
| South Korea | 8.48 | -2.42 |
| Turkey | -0.53 | -16.05 |

Bottom panel

Title: Select Metals Prices

Series: Zinc and copper 3-month futures prices and silver, gold, and platinum spot prices, indexed to 100 on 1/2/2006

Horizon: January 2, 2006 through June 27, 2006

Description: All metals prices were consistently increasing with copper and zinc rising the most until May 10, 2006, when all metals prices started to decline.

Page 3

Top-left panel

Title: Implied Volatility on the S&P 100

Series: VIX Index; average of the VIX Index since January 1990 is also shown (19.26 percent)

Horizon: January 3, 2005 to June 27, 2006

Description: Index started to pick up after May 1, 2006.

Top-right panel

Title: Treasury Yield Implied Volatility

Series: Merrill Lynch Move Index; average of the Move Index since January 1990 is also shown (101.01 basis points)

Horizon: January 3, 2005 to June 27, 2006

Description: Index slowly declined after January 3, 2005.

Middle-left panel

Title: Investment Grade Credit Spread

Series: Lehman Option Adjusted Investment Grade Credit Spread

Horizon: January 3, 2005 to June 27, 2006

Description: Spread started to edge up in May 2006.

Middle-right panel

Title: High Yield Credit Spread

Series: Merrill Lynch High Yield Credit Spread

Horizon: January 3, 2005 to June 27, 2006

Description: Spread started to edge up in May 2006.

Bottom panel

Title: EMBI+ Spread to Comparable Treasuries

Series: JP Morgan EMBI+ Spread

Horizon: January 3, 2005 to June 27, 2006

Description: EMBI+ spread decreased, for most of the period, until it started to edge up in May 2006.

Page 4

Top panel

Title: Current 3-Month Deposit Rates and Rates Implied by Traded Forward Rate Agreements

Series: U.S. dollar and euro 3-month Libor fixings, 3-month forward, 6-month forward, and 9-month forward rates

Horizon: April 1, 2006 to June 27, 2006

Description: U.S. and euro forward rates rose steadily over the period shown.

Middle panel

Title: Bank of Japan Current Account Balances and Overnight Call Rate

Series: Bank of Japan current account balances and uncollateralized yen overnight call rate

Horizon: January 2, 2006 to June 27, 2006

Description: Current account balances decreased in the first part of the year, but began to rise in mid-June. The uncollateralized overnight call rate remained close to zero until jumping up in late-May and mid-June.

Bottom panel

Title: Japanese Sovereign Yield Curve

Series: The yield curve, including Japanese 3-month, 6-month, 1-year, 2-year, 5-year, and 10-year yields.

Horizon: There are two curves shown for the dates of 6/28/05 and 6/27/06.

Description: The more recent curve from 6/27/2006 shows that Japanese yields have increased since 6/28/2005.

Page 5

Top panel

Title: 2- and 10-Year Treasury Yields and Target Fed Funds Rate

Series: 10-year Treasury yield, 2-year Treasury yield, and target fed funds

Horizon: April 1, 2006 to June 27, 2006

Description: Short and intermediate Treasury yields rose as the target federal funds rate increased.

Middle-left panel

Title: U.S. Breakeven Inflation Rates

Series: 5-year 5-year forward and 10-year breakeven inflation rates

Horizon: January 2, 2006 to June 27, 2006

Description: Both 5-year 5-year forward and 10-year breakeven inflation rates have risen approximately 20 basis points since the beginning of 2006.

Middle-right panel

Title: U.S. Breakeven Inflation Rates

Series: 5-year 5-year forward and 10-year breakeven inflation rates

Horizon: January 2, 2002 to June 27, 2006

Description: Both 5-year 5-year forward and 10-year breakeven inflation rates rose approximately 100 basis points between January 2002 and mid-2004, when the tightening cycle began. Since June 2004, breakevens have revolved between 2.2 and 2.6%.

Bottom-left panel

Title: U.S. Dollar vs. Euro

Series: Euro currency performance in dollars per euro

Horizon: January 2, 2006 to June 27, 2006

Description: The euro appreciated against the dollar, with the eurodollar exchange rate moving from approximately 1.18 to 1.29 dollars per euro between January and May, before falling back slightly to 1.26 dollars per euro in May and June.

Bottom-right panel

Title: U.S. Dollar vs. Yen

Series: Yen currency performance in yen per dollar

Horizon: January 2, 2006 to June 27, 2006

Description: The dollar has appreciated against the yen since mid-May, with the dollar/yen currency pair moving from approximately 110 to 116 yen per dollar.

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Top panel

Title: Tuesday Float Levels and Forecasts

Series: Monetary Projections forecasts of Federal Reserve float and the actual levels

Horizon: October 2005 to June 2006

Description: The deviations of float forecasts from the actual levels of float are examined.

The Tuesday after a Monday holiday is replaced with Wednesday.

Middle panel

Title: Tuesday Float Levels and Forecasts

Series: Monetary Projections forecasts of Federal Reserve float and the actual levels

Horizon: October 2004 to June 2005

Description: The deviations of float forecasts from the actual levels of float are examined.

The Tuesday after a Monday holiday is replaced with Wednesday.

Bottom panel

Title: Rate Volatility and Float Forecast Errors on Tuesdays

Series: Forecast errors of Federal Reserve float and the standard deviation of the daily effective fed funds rate (all for two separate time periods).

Horizon: There are two time periods: October 2004 to June 2005 and October 2005 to June 2006

Description: The relationship between float forecast errors and the volatility of trading in the fed funds market is examined.

Appendix 2: Materials used by Messrs. Slifman, Wilcox, and Kamin

Material for **Staff Presentation on the Economic Outlook**

June 28, 2006

STRICTLY CONFIDENTIAL (FR) CLASS I-FOMC*

*Downgraded to Class II upon release of the July 2006 Monetary Policy Report.

Exhibit 1

Recent Indicators

Top-left panel

Real GDP

Percent change, annual rate

| Period | History | May Greenbook | Current Forecast |
|---------|---------|---------------|------------------|
| 2005:Q3 | 4.15 | ND | ND |
| 2005:Q4 | 1.65 | ND | ND |
| 2006:Q1 | ND | 5.28 | 5.82 |
| 2006:Q2 | ND | 3.66 | 2.01 |
| 2006:Q3 | ND | 3.17 | 2.67 |

Top-right panel

Real Personal Consumption Expenditures

Series: Real personal consumption expenditures

Horizon: 2003:Q1 to May 2006 (May is a staff estimate based on published retail sales, light motor vehicle sales and CPI data.)

Description: Data are plotted as one curve. Solid dots, representing quarterly average, generally overlay the curve through most of the horizon; a circle, representing staff estimate, is located at May 2006. Units are trillions of 2000 dollars, annual rate. Percent change at an annual rate for specific time periods is 0.9 percent for 2005:Q4, 5.2 percent for 2006:Q1, and 2.2 percent for 2006:Q2(p).

The series starts at about 7.2 in 2003:Q1 and generally rises to about 7.9 in 2005:Q2. The series falls to a little more than 7.8 in 2005:Q3, remains at about that level until 2005:Q4, and then generally rises to end at a little less than 8.1 in May 2006.

Middle-left panel

Single-Family Housing Starts

Series: Starts and adjusted permits (Adjusted for non-permit-issuing localities.)

Horizon: 2003 to May 2006

Description: Data are plotted as two curves. Units are millions of units, annual rate.

For starts, the series begins in early 2003 at a little more than 1.5 and falls to about 1.3 later in the period. From that point, the series generally rises to about 1.7 in late 2003 and falls to about 1.6 by the end of that year. The series then falls to about 1.5 in early 2004. The series fluctuates between that point and about 1.7 for the remainder of the year. The series rises to nearly 1.8 in early 2005, falls to almost 1.5 later in the period, and fluctuates between that point and about 1.8 until early 2006. The series then falls to a little more than 1.5 later in the period and rises to end at a little less than 1.6 in May 2006.

For adjusted permits, the series begins in 2003 at a little less than 1.5 and generally rises to a little more than 1.6 in early 2004. The series then falls to nearly 1.6 later in the period, generally rises to a little more than 1.8 in mid-2005, and generally falls to a little more than 1.6 by the end of that year. The series rises to nearly 1.7 in early 2006, and then falls to end at a little less than 1.5 in May 2006.

Both series generally overlap each other throughout the horizon (except for 2006).

Middle-right panel

Orders and Shipments of Nondefense Capital Goods*

Series: Orders and shipments

Horizon: 2003 to May 2006

Description: Data are plotted as two curves. Data are three-month moving averages. Units are billions of dollars.

For orders, the series starts at about 50 in early 2003, generally rises to about 50 in midyear, falls to a little less than 50 in late 2003, and then rises to nearly 52.5 in year-end. The series then falls to a little less than 50 in early 2004, generally rises to nearly 52.5 in late 2004, falls to almost 52 toward year-end 2004, and then generally rises to end at about 62 in May 2006.

For shipments, the series starts at about 52 in early 2003, generally falls to about 50 later in the period, remains at about that level until late 2003, rises to about 51 toward year-end 2003, and then falls to a little less than 50 in early 2004. The series then generally rises to end at about 61 in May 2006.

Both series overlap in 2003, 2004, and early 2005.

* Excluding aircraft. [Return to text](#)

Bottom-left panel

Initial Claims for Unemployment Insurance

Series: Initial claims for unemployment insurance

Horizon: 2003 to June 17, 2006

Description: Data are plotted as one curve. Data are four-week moving average. Units are thousands.

The initial claims for unemployment insurance series starts at about 400 in early 2003, rises to almost 450 later in the period, and falls to about 350 by the end of that year. The series rises to about 375 in early 2004 and generally falls to about 325 by the end of that year. The series rises to about

335 in early 2005, generally falls to about 325 later in that period, and fluctuates between that point and about 340 until mid-2005. The series then generally falls to about 320 later in the period, rises to about 390 in late 2005, and then generally falls to about 280 in early 2006. The series then generally rises to about 335 later in the period and then falls to about 320 on June 17, 2006.

Bottom-right panel
New Orders Indexes

Series: ISM, Empire State, and Philadelphia

Horizon: For ISM, 2003 to May 2006 and, for Empire State and Philadelphia, 2003 to June 2006

Description: Data are plotted as three curves. Units are diffusion index. There is a horizontal line at 50.

The ISM series starts a little below 60 in early 2003, falls to about 45 later in the period, and generally rises to just above 70 by the end of the year. The series then generally falls to about 55 in late 2004 and then rises to about 65 by the end of the year. The series generally falls to about 52 in mid-2005 and fluctuates between that point and about 62 until early 2006. The series then generally falls to end at about 54 in May 2006.

The Empire State series starts at about 55 in early 2003, falls to about 45 later in that period, and generally rises to a little below 70 by the end of the year. The series then falls to about 63 in early 2004, rises to about 69 later in that period, and then generally falls to about 59 in late 2004. The series fluctuates between that point and about 66 until the end of the year. The series generally falls to about 45 in early 2005, rises to about 65 in late 2005, falls to about 58 later in the period, and then generally rises to about 64 by the end of the year. The series remains at about that level until early 2006, falls to about 58 later in the period, and then generally rises to end at about 63 in June 2006.

The Philadelphia series starts at about 55 in 2003, falls to about 45 later in the period, and generally rises to about 67 by the end of the year. The series generally falls to about 62 in early 2004, rises to about 68 in mid-2004, and generally falls to about 58 in early 2005. The series then rises to about 60 later in the period, falls to about 53 in mid-2005, and rises to about 59 later in the period. The series falls to about 50 in late 2005 and then fluctuates between that point and about 58 until the end of the year. The series generally rises to about 60 in early 2006, falls to about 51 later in the period, and rises to end at about 59 in June 2006.

All of the series generally overlap through the horizon.

Exhibit 2
Longer-Run Projection and Key Background Factors

Top-left panel
Real GDP

Percent change*

| Period | History | May Greenbook | Current Forecast |
|-----------|---------|---------------|------------------|
| 2003-2005 | 3.67 | ND | ND |
| 2006:H1 | ND | 4.47 | 3.90 |
| 2006:H2 | ND | 3.11 | 2.67 |
| 2007 | ND | 2.99 | 2.66 |

* Annual figures are Q4/Q4. Half-year figures are Q4/Q2 or Q2/Q4. [Return to table](#)

Top-right panel Change in Wage and Salary Disbursements

Percent change, annual rate

| Period | Percent Change | May GB | Forecast | May GB Forecast |
|---------|----------------|--------|----------|-----------------|
| 2005:Q1 | 4.91 | 4.91 | ND | ND |
| 2005:Q2 | 3.05 | 3.05 | ND | ND |
| 2005:Q3 | 6.50 | 6.50 | ND | ND |
| 2005:Q4 | 1.55 | 4.79 | ND | ND |
| 2006:Q1 | 5.61 | 5.99 | ND | ND |
| 2006:Q2 | ND | ND | 5.80 | 5.42 |
| 2006:Q3 | ND | ND | 5.11 | 6.06 |
| 2006:Q4 | ND | ND | 5.10 | 5.72 |
| 2007:Q1 | ND | ND | 5.41 | 5.97 |
| 2007:Q2 | ND | ND | 4.84 | 5.31 |
| 2007:Q3 | ND | ND | 4.73 | 5.25 |
| 2007:Q4 | ND | ND | 4.64 | 5.21 |

Middle-left panel Federal Funds Rate

Quarterly average
Percent

| Period | Federal Funds Rate | May GB | Forecast | May GB Forecast |
|---------|--------------------|--------|----------|-----------------|
| 2002:Q4 | 1.44 | ND | ND | ND |
| 2003:Q1 | 1.25 | ND | ND | ND |
| 2003:Q2 | 1.23 | ND | ND | ND |
| 2003:Q3 | 1.00 | ND | ND | ND |
| 2003:Q4 | 1.00 | ND | ND | ND |
| 2004:Q1 | 1.00 | ND | ND | ND |
| 2004:Q2 | 1.00 | ND | ND | ND |
| 2004:Q3 | 1.42 | ND | ND | ND |
| 2004:Q4 | 1.94 | ND | ND | ND |
| 2005:Q1 | 2.44 | ND | ND | ND |
| 2005:Q2 | 2.91 | ND | ND | ND |
| 2005:Q3 | 3.43 | ND | ND | ND |
| 2005:Q4 | 3.97 | ND | ND | ND |
| 2006:Q1 | 4.42 | 4.42 | ND | ND |
| 2006:Q2 | 4.90 | 4.90 | ND | ND |

| Period | Federal Funds Rate | May GB | Forecast | May GB Forecast |
|---------|--------------------|--------|----------|-----------------|
| 2006:Q3 | ND | ND | 5.25 | 5.00 |
| 2006:Q4 | ND | ND | 5.25 | 5.00 |
| 2007:Q1 | ND | ND | 5.25 | 5.00 |
| 2007:Q2 | ND | ND | 5.25 | 5.00 |
| 2007:Q3 | ND | ND | 5.25 | 5.00 |
| 2007:Q4 | ND | ND | 5.25 | 5.00 |

Middle-right panel Wilshire 5000

Index, ratio scale

| Period | Index | May GB | Forecast | May GB Forecast |
|---------|----------|----------|----------|-----------------|
| 2003:Q1 | 8051.86 | ND | ND | ND |
| 2003:Q2 | 9342.95 | ND | ND | ND |
| 2003:Q3 | 9649.68 | ND | ND | ND |
| 2003:Q4 | 10799.63 | ND | ND | ND |
| 2004:Q1 | 11039.42 | ND | ND | ND |
| 2004:Q2 | 11138.91 | ND | ND | ND |
| 2004:Q3 | 10895.48 | ND | ND | ND |
| 2004:Q4 | 11971.14 | ND | ND | ND |
| 2005:Q1 | 11638.27 | ND | ND | ND |
| 2005:Q2 | 11876.74 | ND | ND | ND |
| 2005:Q3 | 12289.26 | ND | ND | ND |
| 2005:Q4 | 12517.69 | ND | ND | ND |
| 2006:Q1 | 13155.44 | 13155.00 | ND | ND |
| 2006:Q2 | 12480.00 | 13440.00 | ND | ND |
| 2006:Q3 | ND | ND | 12680.00 | 13655.00 |
| 2006:Q4 | ND | ND | 12880.00 | 13870.00 |
| 2007:Q1 | ND | ND | 13085.00 | 14090.00 |
| 2007:Q2 | ND | ND | 13290.00 | 14315.00 |
| 2007:Q3 | ND | ND | 13500.00 | 14540.00 |
| 2007:Q4 | ND | ND | 13715.00 | 14770.00 |

Bottom-left panel House Prices

Four-quarter percent change

| Period | OFHEO House Price Index* | Forecast |
|---------|--------------------------|----------|
| 2002:Q4 | 7.42 | ND |

| Period | OFHEO House Price Index* | Forecast |
|---------|--------------------------|----------|
| 2003:Q1 | 7.11 | ND |
| 2003:Q2 | 6.46 | ND |
| 2003:Q3 | 5.98 | ND |
| 2003:Q4 | 7.85 | ND |
| 2004:Q1 | 8.24 | ND |
| 2004:Q2 | 9.86 | ND |
| 2004:Q3 | 12.94 | ND |
| 2004:Q4 | 11.99 | ND |
| 2005:Q1 | 13.15 | ND |
| 2005:Q2 | 14.14 | ND |
| 2005:Q3 | 12.71 | ND |
| 2005:Q4 | 13.33 | ND |
| 2006:Q1 | 12.53 | ND |
| 2006:Q2 | ND | 10.02 |
| 2006:Q3 | ND | 7.76 |
| 2006:Q4 | ND | 5.45 |
| 2007:Q1 | ND | 4.06 |
| 2007:Q2 | ND | 3.31 |
| 2007:Q3 | ND | 2.75 |
| 2007:Q4 | ND | 2.37 |

* All transactions index. [Return to table](#)

Bottom-right panel Crude Oil Prices

Quarterly average
Dollars per barrel

| Period | West Texas Intermediate | May GB | Forecast | May GB Forecast |
|---------|-------------------------|--------|----------|-----------------|
| 2002:Q4 | 28.27 | ND | ND | ND |
| 2003:Q1 | 34.12 | ND | ND | ND |
| 2003:Q2 | 29.04 | ND | ND | ND |
| 2003:Q3 | 30.22 | ND | ND | ND |
| 2003:Q4 | 31.18 | ND | ND | ND |
| 2004:Q1 | 35.25 | ND | ND | ND |
| 2004:Q2 | 38.34 | ND | ND | ND |
| 2004:Q3 | 43.89 | ND | ND | ND |
| 2004:Q4 | 48.31 | ND | ND | ND |
| 2005:Q1 | 49.68 | ND | ND | ND |
| 2005:Q2 | 53.09 | ND | ND | ND |

| Period | West Texas Intermediate | May GB | Forecast | May GB Forecast |
|---------|-------------------------|--------|----------|-----------------|
| 2005:Q3 | 63.08 | ND | ND | ND |
| 2005:Q4 | 60.03 | ND | ND | ND |
| 2006:Q1 | 63.34 | 63.34 | ND | ND |
| 2006:Q2 | 70.18 | 72.36 | ND | ND |
| 2006:Q3 | ND | ND | 69.60 | 75.85 |
| 2006:Q4 | ND | ND | 71.28 | 76.87 |
| 2007:Q1 | ND | ND | 72.16 | 76.96 |
| 2007:Q2 | ND | ND | 72.36 | 76.68 |
| 2007:Q3 | ND | ND | 72.11 | 76.19 |
| 2007:Q4 | ND | ND | 71.70 | 75.65 |

Exhibit 3 Business Fixed Investment

Top-left panel E&S Spending excluding Transportation

Series: High tech (contribution), other (contribution)

Horizon: 2003 to 2007. Data are projected for 2006 and 2007.

Description: Data are plotted as stacked bars. There are five bars. Units are percent change, Q4/Q4.

The bars for each period indicate the following:

- For 2003, high tech is about 6; plus other, total is about 9.
- For 2004, high tech is just below 6; plus other, total is just below 12.
- For 2005, high tech is about 8; plus other, total is just above 9.
- For 2006, the forecast shows high tech at just above 6; plus other, total is about 8.
- For 2007, the forecast shows high tech at about 6; plus other, total is about 7.

Top-right panel U.S. Personal Computer and Server Sales

Series: PCs, servers

Horizon: 1999 to 2006:Q1

Description: Data are plotted as two curves. Data are expressed as millions of units.

The series for PCs begins in 1999 at about 11, rises through mid-2000 to a little above 13, then falls to about 11 by the middle of 2001. The series then continues generally upward through 2006:Q1 to end around 16.

The series for servers starts in 1999 at just above 0.3 and then drops to about 0.3 by the end of the year. The series rises to about 0.5 in mid-2000, then dips to about 0.4 at the beginning of 2001. The series then increases through 2006:Q1 to end just above 0.8.

The curves overlap in 2001, 2002, 2004, late 2005, and 2006:Q1.

Middle-left panel Computer Projection

- Servers
 - New generations: faster computing and lower electricity consumption.
 - Sources of demand: financial services companies; internet content providers
- PCs
 - New Intel chip design will increase performance and reduce power consumption.
 - Prices on old chips plummeting.

Middle-right panel Real Nonresidential Structures

Percent change, Q4/Q4

| | | 2005 | 2006 ^P | 2007 ^P |
|----|--------------------------------|------|-------------------|-------------------|
| 1. | Total Nonres. | 1.5 | 10.3 | 4.6 |
| 2. | Drilling and mining | 16.7 | 11.7 | 7.4 |
| 3. | Nonres ex. drilling and mining | -2.8 | 9.5 | 3.3 |

p - staff projection [Return to table](#)

Bottom-left panel Drilling Rigs in Operation

Series: Drilling rigs in operation

Horizon: 1998 to 2006:Q2

Description: Data are plotted as a curve. Units are number of rigs.

At the start of 1998, the series begins at approximately 1,000. The series then drops to about 500 in early 1999, increases to about 1,300 by mid-2001, then falls to about 800 at the start of 2002. The series then increases through 2006:Q2 to end at about 1,600.

Source: Baker Hughes Tool Company.

Bottom-right panel Office Vacancy Rate and Rent per Square Foot

Series: Office vacancy rate, rent per square foot

Horizon: 1998 to 2006:Q2

Description: Data are plotted as two curves and are quarterly. Units are percent for vacancy rate and dollars for rent per square foot.

In 1998, the series for vacancy rate starts at nearly 9, then generally decreases through mid-2000 to about 7. The series then rises to reach about 14.5 by early 2004, then decreases to end at about 12 in 2006:Q2.

The series for rent per square foot starts in 1998 at about 21.5, increases through 1999 to about 24, then dips to about 23.5 by early 2000. The series rises to about 26 at the start of 2001, then falls to about 22 through 2004; the series then increases to end at about 24 in 2006:Q2.

The curves overlap in 1998 and 2001.

Exhibit 4 Household Sector

Top-left panel Real PCE and DPI

Percent change*

| Period | DPI* | PCE | DPI Forecast | PCE Forecast |
|---------|------|------|--------------|--------------|
| 2005 | 1.53 | 2.94 | ND | ND |
| 2006:H1 | ND | ND | 2.27 | 3.70 |
| 2006:H2 | ND | ND | 5.02 | 3.00 |
| 2007 | ND | ND | 4.13 | 2.96 |

* Excluding December 2004 Microsoft Dividend. Annual figures are Q4/Q4. Half-year figures are Q4/Q2 or Q2/Q4. [Return to table](#)

Top-right panel Saving Rate and Wealth-to-Income Ratio

| Period | Personal Saving Rate (percent) | Wealth-to-Income Ratio | Personal Saving Rate Forecast | Wealth-to-Income Ratio Forecast |
|---------|-----------------------------------|---------------------------|----------------------------------|------------------------------------|
| 2003:Q1 | 1.93 | 4.90 | ND | ND |
| 2003:Q2 | 2.10 | 5.06 | ND | ND |
| 2003:Q3 | 2.48 | 5.06 | ND | ND |
| 2003:Q4 | 1.95 | 5.30 | ND | ND |
| 2004:Q1 | 1.84 | 5.28 | ND | ND |
| 2004:Q2 | 1.65 | 5.31 | ND | ND |
| 2004:Q3 | 1.21 | 5.33 | ND | ND |
| 2004:Q4 | 1.20 | 5.47 | ND | ND |
| 2005:Q1 | 0.53 | 5.47 | ND | ND |
| 2005:Q2 | -0.24 | 5.55 | ND | ND |
| 2005:Q3 | -1.59 | 5.67 | ND | ND |
| 2005:Q4 | -0.55 | 5.68 | ND | ND |
| 2006:Q1 | -1.32 | 5.77 | ND | ND |
| 2006:Q2 | ND | ND | -1.27 | 5.64 |
| 2006:Q3 | ND | ND | -0.76 | 5.61 |
| 2006:Q4 | ND | ND | -0.30 | 5.58 |
| 2007:Q1 | ND | ND | 0.15 | 5.54 |
| 2007:Q2 | ND | ND | 0.39 | 5.51 |
| 2007:Q3 | ND | ND | 0.62 | 5.48 |

| Period | Personal Saving Rate (percent) | Wealth-to-Income Ratio | Personal Saving Rate Forecast | Wealth-to-Income Ratio Forecast |
|---------|-----------------------------------|---------------------------|----------------------------------|------------------------------------|
| 2007:Q4 | ND | ND | 0.87 | 5.45 |

Note: Excluding December 2004 Microsoft dividend.

Middle-left panel

Sales of Single-family Homes

Series: Existing homes, new homes

Horizon: 2003 to May 2006

Description: Data are plotted as two curves and are monthly. Units are millions at an annual rate.

The series for existing homes begins in 2003 at about 5.4, generally increases to about 5.8 in the second half of the year, then fluctuates between about 5.4 and 5.7 until year-end. The series climbs to about 6.2 in mid-2004, then dips to about 5.8 toward the end of the year. The series then generally increases through mid-2005, when it reaches about 6.4, then falls to about 5.7 by year-end. The series increases to a bit above 6.0 at the start of 2006, then decreases to end at about 5.7 in May 2006.

The series for new homes starts in 2003 at about 1.0, dipping slightly to about 0.9 before generally increasing to about 1.2 in mid-2003, then falls to about 1.1 by year-end. The series increases to about 1.3 at the beginning of 2004, then fluctuates between about 1.1 and 1.3 until the end of the year. In 2005, the curve fluctuates between nearly 1.2 and just below 1.4; the series then drops to slightly above 1.0 at the start of 2006 and increases to end at a little more than 1.2 in May 2006.

The curves overlap in mid-2003 and early 2004.

Middle-right panel

Unsold Homes*

Series: Existing homes, new homes

Horizon: 2003 to May 2006

Description: Data are plotted as two curves. Units are month's supply.

The series for existing homes starts in 2003 just below 5.5, then generally decreases to about 5.0 toward year-end. The series increases to about 5.5 in early 2004 and then falls until mid-2004, when it reaches about 4.5. The series then generally increases to a little below 7.5 in May 2006.

The series for new homes starts in 2003 at about 4.0, drops to about 3.5 by midyear, then increases to about 4.0 through the beginning of 2004. The series dips to just above 3.5 in mid-2004 and increases to a little less than 4.5 toward year-end. The series then generally climbs upward through the beginning of 2006 to about 6.0, then decreases to end a bit above 5.5 in May 2006.

* Inventory of unsold homes relative to 3-month moving average of sales. [Return to text](#)

Bottom-left panel

Real Residential Investment

Billions of 2000 dollars

| Period | Real Residential Investment | Forecast |
|---------|-----------------------------|----------|
| 2002:Q4 | 479.40 | ND |
| 2003:Q1 | 484.77 | ND |
| 2003:Q2 | 496.01 | ND |

| Period | Real Residential Investment | Forecast |
|---------|-----------------------------|----------|
| 2003:Q3 | 521.23 | ND |
| 2003:Q4 | 535.66 | ND |
| 2004:Q1 | 542.43 | ND |
| 2004:Q2 | 565.07 | ND |
| 2004:Q3 | 568.76 | ND |
| 2004:Q4 | 571.02 | ND |
| 2005:Q1 | 584.08 | ND |
| 2005:Q2 | 599.30 | ND |
| 2005:Q3 | 609.95 | ND |
| 2005:Q4 | 614.20 | ND |
| 2006:Q1 | 616.86 | ND |
| 2006:Q2 | ND | 605.12 |
| 2006:Q3 | ND | 586.76 |
| 2006:Q4 | ND | 582.00 |
| 2007:Q1 | ND | 578.04 |
| 2007:Q2 | ND | 577.26 |
| 2007:Q3 | ND | 575.10 |
| 2007:Q4 | ND | 571.90 |

Bottom-right panel

Investor and Second-Home Mortgage Originations

Series: Investor, second homes

Horizon: Mid-2003 to March 2006

Description: Data are plotted as two curves. Units are percent of total originations.

The series for investor starts in the second half of 2003 at about 3, then generally rises to reach about 8 by the end of the year. The series drops to about 5 at the start of 2004; the series then fluctuates between about 4 and slightly above 6 until mid-2004, then increases to about 8 by year-end. The series falls to about 4 at the start of 2005, generally increases to about 7 by midyear, then fluctuates between just above 5 and a little above 6 through the end of the year. The series increases to about 7 at the start of 2006, then decreases to end a bit above 6 in March 2006.

The series for second homes starts in the second half of 2003 just below 3. The series continues generally upward and fluctuates between a little below 3 and about 5 through mid-2004, then decreases to about 3 by year-end. The series then increases through mid-2005 to about 5, decreases to approximately 4, then increases to about 6 toward the end of the year. The series then generally decreases to end at about 5.9 in March 2006.

Source: LoanPerformance.

Exhibit 5

Household Financial Conditions

Top-left panel

Homeowners' Financial Obligation Ratio

Series: Homeowners' financial obligation ratio

Horizon: 1980 to 2004:Q4

Description: Data are plotted as a curve. Units are percent of homeowner disposable income.

The series begins in 1980 at about 13.5, rises to about 13.75 in early 1980, falls to about 13.4 in mid-1980, and then rises to about 13.8 in early 1981. The series remains at about that level until late 1983, generally rises to about 15.75 in mid-1986, and fluctuates between that point and about 15 until early 1990. The series then falls to about 14.25 in late 1991, rises to about 14.4 later in that period, and falls to about 14.2 in early 1992. The series rises to about 14.4 in mid-1992, falls to about 14.2 in late 1992, and then generally rises to about 16.1 in late 2001. The series falls to about 15.75 in mid-2002, generally rises to about 16.75 in late 2004, and then falls to end at a little below 17 in 2004:Q4.

Top-right panel

Mortgage Payment Resets

Percent*

| | | 2006 | 2007 | 2008 and beyond |
|-----|------------------|------|------|-----------------------|
| ARM | | | | |
| 1. | First rate reset | 27 | 25 | 48 |
| IOs | | | | |
| 2. | First rate reset | 11 | 24 | 65 |
| 3. | End of IO term | 4 | 10 | 86 |

* Percent of mortgages in category experiencing indicated type of payment change relative to all mortgages in the category that have yet to face first payment change. [Return to table](#)

Note: Figures are staff estimates based on LoanPerformance.

Middle-left panel

Delinquency Rates

Series: Subprime, prime

Horizon: 2003:Q3 to 2006:Q2 (April)

Description: Data are plotted as two curves. Units are percent.

For subprime, the series begins in 2003:Q3 at about 7.4, falls to about 7.3 in 2003:Q4, and rises to about 7.4 later in that period. The series then generally falls to about 6.5 in 2004:Q2, falls to about 6.25 in 2004:Q4, rises to about 6.4 in 2005:Q1, and generally falls to about 5.5 in 2005:Q2. The series generally rises to about 6.75 in early 2006:Q1, falls to about 6.25 later in that period, and rises to end at about 6.5 in 2006:Q2.

For prime, the series begins in 2003:Q3 at about 1 and generally remains at about that level until it ends at about 1 in 2006:Q2.

Note: Ninety-plus days delinquent or in foreclosure.

Source: LoanPerformance.

Middle-right panel

Delinquency Rates for Subprime Mortgages

Series: Variable rate, fixed rate

Horizon: 2003:Q3 to 2006:Q2 (April)

Description: Data are plotted as two curves. Units are percent.

For variable rate, the series begins in 2003:Q3 at about 8.1, falls to about 7.9 in early 2003:Q4, and rises to a little more than 8 later in that period. The series then generally falls to about 6.3 in 2004:Q3, generally rises to about 6.4 in 2004:Q4, and generally falls to about 6.3 later in that period. The series rises to about 6.5 in 2005:Q1, falls to about 5.9 in 2005:Q2, and generally rises to about 7.7 in 2006:Q1. The series generally falls to about 7.2 later in that period and rises to end at about 7.4 in 2006:Q2.

For fixed rate, the series begins in 2003:Q3 at about 7.3, generally falls to about 6.1 in 2004:Q3, and generally rises to about 6.4 in 2005:Q1. The series generally falls to about 5.8 in 2005:Q2, generally rises to about 6.4 in 2005:Q4, remains at about that level until 2006:Q1, and then generally falls to end at about 5.6 in 2006:Q2.

The curves overlap in 2005:Q1 and 2005:Q2.

Note: Ninety-plus days delinquent or in foreclosure.

Source: LoanPerformance.

Bottom-left panel

Consumer Sentiment by Income Group

Series: Upper two-thirds, lower third

Horizon: 2002 to May 2006

Description: Data are plotted as two curves. Data are three-month moving averages. Units are index, Jan. 2002 = 100.

For upper two-thirds, the series begins in January 2002 at 100, generally rises to about 109 in mid-2002, and then generally falls to about 93 toward year-end 2002. The series rises to about 96 in early 2003, falls to 91 later in that period, generally rises to about 114 in early 2004, falls to about 107 later in that period, fluctuates between that point and 111 until early 2005, and falls to about 100 later in that period. The series rises to about 108 in mid-2005 and falls to about 89 toward year-end 2005. The series rises to about 105 in early 2006 and then falls to end at about 98 in May 2006.

For lower third, the series begins in January 2002 at 100, rises to about 107 in mid-2002, and generally falls to about 91 in early 2003. The series then rises to about 102 in mid-2003, falls to about 95 toward year-end 2003, and rises to about 104 in early 2004. The series fluctuates between that point and about 100 until late 2004, falls to about 99 later in that period, and fluctuates between that point and about 106 until mid-2005. The series then falls to about 83 toward year-end 2005, rises to about 95 in early 2006, and then falls to end at about 89 in May 2006.

The curves overlap in 2002 and 2003.

Source: Michigan Survey.

Bottom-right panel

Implications

- Baseline projection for the household sector incorporates these developments.

- The greater stress among the most financially vulnerable segment of households presents a risk to the forecast.

Exhibit 6

The Outlook for Compensation

Top-left panel

Compensation Per Hour

Percent change, annual rate

| | | P&C | ECI |
|-------|----|-----|-----|
| 2005: | Q1 | 5.6 | 3.8 |
| | Q2 | 1.3 | 2.5 |
| | Q3 | 5.5 | 2.9 |
| | Q4 | -.9 | 2.8 |
| 2006: | Q1 | 5.1 | 2.4 |

Top-right panel

Selected Differences Between the ECI and P&C Comp per Hour

- **Measurement objectives:** The cost of employing a fixed market-basket of labor versus the current workforce.
- **Source data:** A survey of firms versus administrative records covering the universe of firms.
- **Technical issues:** For example, the handling of stock options and pension-related costs.

Middle-left panel

Unemployment Rate

Percent

| Period | Unemployment Rate | NAIRU | Unemployment Rate Forecast | NAIRU Forecast |
|---------|-------------------|-------|----------------------------|----------------|
| 2000:Q1 | 4.00 | 5.13 | ND | ND |
| 2000:Q2 | 3.90 | 5.12 | ND | ND |
| 2000:Q3 | 4.00 | 5.12 | ND | ND |
| 2000:Q4 | 3.90 | 5.13 | ND | ND |
| 2001:Q1 | 4.20 | 5.10 | ND | ND |
| 2001:Q2 | 4.40 | 5.09 | ND | ND |
| 2001:Q3 | 4.80 | 5.09 | ND | ND |
| 2001:Q4 | 5.50 | 5.09 | ND | ND |
| 2002:Q1 | 5.70 | 5.08 | ND | ND |
| 2002:Q2 | 5.80 | 5.06 | ND | ND |
| 2002:Q3 | 5.70 | 5.06 | ND | ND |
| 2002:Q4 | 5.90 | 5.06 | ND | ND |

| Period | Unemployment Rate | NAIRU | Unemployment Rate Forecast | NAIRU Forecast |
|---------|-------------------|-------|----------------------------|----------------|
| 2003:Q1 | 5.90 | 5.03 | ND | ND |
| 2003:Q2 | 6.10 | 5.01 | ND | ND |
| 2003:Q3 | 6.10 | 5.01 | ND | ND |
| 2003:Q4 | 5.80 | 5.01 | ND | ND |
| 2004:Q1 | 5.70 | 5.02 | ND | ND |
| 2004:Q2 | 5.60 | 5.02 | ND | ND |
| 2004:Q3 | 5.50 | 5.01 | ND | ND |
| 2004:Q4 | 5.40 | 5.00 | ND | ND |
| 2005:Q1 | 5.20 | 5.01 | ND | ND |
| 2005:Q2 | 5.10 | 5.01 | ND | ND |
| 2005:Q3 | 5.00 | 5.01 | ND | ND |
| 2005:Q4 | 5.00 | 4.99 | ND | ND |
| 2006:Q1 | 4.71 | 4.99 | ND | ND |
| 2006:Q2 | ND | ND | 4.68 | 5.00 |
| 2006:Q3 | ND | ND | 4.76 | 5.00 |
| 2006:Q4 | ND | ND | 4.86 | 5.00 |
| 2007:Q1 | ND | ND | 4.96 | 5.00 |
| 2007:Q2 | ND | ND | 5.05 | 5.00 |
| 2007:Q3 | ND | ND | 5.13 | 5.00 |
| 2007:Q4 | ND | ND | 5.20 | 5.00 |

Middle-right panel Real Compensation and Productivity Growth*

Average annual rates of growth

| Period | Real Compensation Per Hour | Productivity | Real Compensation Per Hour Forecast | Productivity Forecast |
|-----------------|----------------------------|--------------|-------------------------------------|-----------------------|
| 1973-1993 | 1.33 | 1.55 | ND | ND |
| 1994-2001** | 2.45 | 2.21 | ND | ND |
| 2002-2006:Q1** | 2.15 | 3.28 | ND | ND |
| 2006:Q1-2007:Q4 | ND | ND | 2.88 | 2.48 |

* Nonfarm business sector. Compensation is deflated by the price index for NFB output. [Return to text](#)

** Data are approximate. [Return to table](#)

Bottom-left panel Price Markup for the Nonfarm Business Sector

Series: Price markup for the nonfarm business sector

Horizon: Late 1993 to 2007 (data are projected for the period beginning in early 2006 through 2007)

Description: Data are plotted as one curve. Units are index. There is a horizontal line at about 1.57, which represents the average for the period from 1973:Q1 to 2006:Q1. The horizontal line overlays

the curve toward year-end 1999, in late 2001, and in early 2002.

The series begins in late 1993 at about 1.59, generally rises to about 1.64 in late 1997, and generally falls to about 1.54 in early 2000. The series rises to about 1.56 in mid-2000, falls to a little more than 1.54 in late 2000, rises to a little less than 1.55 later in that period, and then falls to about 1.53 in early 2001. The series generally rises to about 1.63 in mid-2004, falls to a little less than 1.60 toward year-end 2004, and rises to end at about 1.64 in early 2006. In the projected area, the series begins in early 2006 at about 1.64 and then generally falls to end at a little less than 1.63 toward year-end 2007.

Bottom-right panel Compensation per Hour

Percent change from year earlier

| Period | P&C | ECI | P&C Forecast | ECI Forecast |
|---------|------|------|--------------|--------------|
| 1994:Q1 | 2.30 | 3.30 | ND | ND |
| 1994:Q2 | 1.70 | 3.40 | ND | ND |
| 1994:Q3 | 1.20 | 3.30 | ND | ND |
| 1994:Q4 | 1.40 | 3.10 | ND | ND |
| 1995:Q1 | 1.10 | 2.90 | ND | ND |
| 1995:Q2 | 1.90 | 2.80 | ND | ND |
| 1995:Q3 | 2.60 | 2.60 | ND | ND |
| 1995:Q4 | 2.90 | 2.60 | ND | ND |
| 1996:Q1 | 3.10 | 2.70 | ND | ND |
| 1996:Q2 | 3.50 | 2.90 | ND | ND |
| 1996:Q3 | 3.70 | 2.90 | ND | ND |
| 1996:Q4 | 3.20 | 3.10 | ND | ND |
| 1997:Q1 | 2.80 | 3.00 | ND | ND |
| 1997:Q2 | 2.60 | 2.90 | ND | ND |
| 1997:Q3 | 2.80 | 3.20 | ND | ND |
| 1997:Q4 | 4.20 | 3.40 | ND | ND |
| 1998:Q1 | 5.50 | 3.50 | ND | ND |
| 1998:Q2 | 6.10 | 3.50 | ND | ND |
| 1998:Q3 | 6.80 | 3.80 | ND | ND |
| 1998:Q4 | 5.50 | 3.50 | ND | ND |
| 1999:Q1 | 5.50 | 3.00 | ND | ND |
| 1999:Q2 | 4.40 | 3.30 | ND | ND |
| 1999:Q3 | 3.60 | 3.10 | ND | ND |
| 1999:Q4 | 5.20 | 3.40 | ND | ND |
| 2000:Q1 | 6.90 | 4.60 | ND | ND |
| 2000:Q2 | 6.80 | 4.60 | ND | ND |
| 2000:Q3 | 8.00 | 4.60 | ND | ND |

| Period | P&C | ECI | P&C Forecast | ECI Forecast |
|---------------|----------------|------------|-------------------------|---------------------|
| 2000:Q4 | 6.40 | 4.40 | ND | ND |
| 2001:Q1 | 4.50 | 4.20 | ND | ND |
| 2001:Q2 | 4.80 | 4.00 | ND | ND |
| 2001:Q3 | 3.30 | 4.00 | ND | ND |
| 2001:Q4 | 3.50 | 4.10 | ND | ND |
| 2002:Q1 | 3.40 | 3.80 | ND | ND |
| 2002:Q2 | 3.90 | 4.00 | ND | ND |
| 2002:Q3 | 3.80 | 3.50 | ND | ND |
| 2002:Q4 | 3.10 | 3.10 | ND | ND |
| 2003:Q1 | 3.10 | 3.60 | ND | ND |
| 2003:Q2 | 3.50 | 3.50 | ND | ND |
| 2003:Q3 | 4.30 | 3.90 | ND | ND |
| 2003:Q4 | 5.00 | 4.00 | ND | ND |
| 2004:Q1 | 4.30 | 3.80 | ND | ND |
| 2004:Q2 | 3.80 | 3.90 | ND | ND |
| 2004:Q3 | 4.10 | 3.80 | ND | ND |
| 2004:Q4 | 5.90 | 3.80 | ND | ND |
| 2005:Q1 | 6.40 | 3.50 | ND | ND |
| 2005:Q2 | 5.80 | 3.10 | ND | ND |
| 2005:Q3 | 5.60 | 2.90 | ND | ND |
| 2005:Q4 | 2.80 | 2.90 | ND | ND |
| 2006:Q1 | 2.71 | 2.60 | ND | ND |
| 2006:Q2 | ND | ND | 3.58 | 2.87 |
| 2006:Q3 | ND | ND | 3.49 | 3.03 |
| 2006:Q4 | ND | ND | 5.07 | 3.22 |
| 2007:Q1 | ND | ND | 5.12 | 3.54 |
| 2007:Q2 | ND | ND | 5.25 | 3.62 |
| 2007:Q3 | ND | ND | 5.27 | 3.68 |
| 2007:Q4 | ND | ND | 5.22 | 3.71 |

Exhibit 7
The Outlook for Price Inflation

Top-left panel
PCE Prices

Percent change

| | Total | Core | Market-Based Core |
|---------|--------------|-------------|--------------------------|
| Jan. | .5 | .15 | .09 |
| Feb. | .1 | .15 | .11 |
| Mar. | .4 | .34 | .32 |
| Apr. | .5 | .25 | .21 |
| May (f) | .4 | .25 | .26 |
| Q1 | 2.0 | 2.0 | 1.6 |
| Q2 (f) | 4.3 | 3.1 | 2.8 |

Note: Quarterly figures are at annual rates.

Top-right panel PCE Prices

Four-quarter percent change

| Period | Total | Core | Market-based core | Total forecast | Core forecast | Market-based core forecast |
|---------------|--------------|-------------|--------------------------|-----------------------|----------------------|-----------------------------------|
| 2001:Q1 | 2.22 | 1.62 | 1.51 | ND | ND | ND |
| 2001:Q2 | 2.37 | 1.82 | 1.65 | ND | ND | ND |
| 2001:Q3 | 2.05 | 1.95 | 1.75 | ND | ND | ND |
| 2001:Q4 | 1.74 | 2.22 | 1.76 | ND | ND | ND |
| 2002:Q1 | 1.15 | 1.84 | 1.46 | ND | ND | ND |
| 2002:Q2 | 1.21 | 1.79 | 1.53 | ND | ND | ND |
| 2002:Q3 | 1.52 | 1.89 | 1.48 | ND | ND | ND |
| 2002:Q4 | 1.79 | 1.55 | 1.37 | ND | ND | ND |
| 2003:Q1 | 2.32 | 1.51 | 1.34 | ND | ND | ND |
| 2003:Q2 | 1.77 | 1.31 | 1.18 | ND | ND | ND |
| 2003:Q3 | 1.82 | 1.23 | 1.09 | ND | ND | ND |
| 2003:Q4 | 1.73 | 1.27 | 1.02 | ND | ND | ND |
| 2004:Q1 | 1.94 | 1.65 | 1.28 | ND | ND | ND |
| 2004:Q2 | 2.73 | 2.01 | 1.53 | ND | ND | ND |
| 2004:Q3 | 2.60 | 1.99 | 1.45 | ND | ND | ND |
| 2004:Q4 | 3.06 | 2.23 | 1.67 | ND | ND | ND |
| 2005:Q1 | 2.66 | 2.16 | 1.76 | ND | ND | ND |
| 2005:Q2 | 2.54 | 1.98 | 1.64 | ND | ND | ND |
| 2005:Q3 | 3.10 | 1.95 | 1.65 | ND | ND | ND |
| 2005:Q4 | 3.03 | 1.96 | 1.68 | ND | ND | ND |
| 2006:Q1 | 2.96 | 1.86 | 1.53 | ND | ND | ND |
| 2006:Q2 | ND | ND | ND | 3.21 | 2.19 | 1.85 |
| 2006:Q3 | ND | ND | ND | 2.74 | 2.42 | 2.10 |

| Period | Total | Core | Market-based core | Total forecast | Core forecast | Market-based core forecast |
|---------|-------|------|-------------------|----------------|---------------|----------------------------|
| 2006:Q4 | ND | ND | ND | 2.47 | 2.37 | 2.12 |
| 2007:Q1 | ND | ND | ND | 2.54 | 2.43 | 2.20 |
| 2007:Q2 | ND | ND | ND | 2.01 | 2.21 | 1.99 |
| 2007:Q3 | ND | ND | ND | 2.09 | 2.19 | 1.95 |
| 2007:Q4 | ND | ND | ND | 2.15 | 2.17 | 1.93 |

Middle-left panel PCE Energy Prices

Four-quarter percent change

| Period | PCE energy prices | Percent change, annual rate | PCE energy prices forecast | Percent change, annual rate, forecast |
|---------|-------------------|-----------------------------|----------------------------|---------------------------------------|
| 2001:Q1 | 10.91 | 10.51 | ND | ND |
| 2001:Q2 | 10.34 | 10.04 | ND | ND |
| 2001:Q3 | 1.13 | -19.41 | ND | ND |
| 2001:Q4 | -9.94 | -32.87 | ND | ND |
| 2002:Q1 | -14.1 | -8.622 | ND | ND |
| 2002:Q2 | -10.5 | 29.534 | ND | ND |
| 2002:Q3 | -4.89 | 2.98 | ND | ND |
| 2002:Q4 | 7.67 | 10.27 | ND | ND |
| 2003:Q1 | 21.03 | 45.86 | ND | ND |
| 2003:Q2 | 10.68 | -9.41 | ND | ND |
| 2003:Q3 | 11.90 | 7.60 | ND | ND |
| 2003:Q4 | 7.18 | -7.17 | ND | ND |
| 2004:Q1 | 4.07 | 29.66 | ND | ND |
| 2004:Q2 | 13.37 | 27.54 | ND | ND |
| 2004:Q3 | 10.97 | -1.23 | ND | ND |
| 2004:Q4 | 17.91 | 18.32 | ND | ND |
| 2005:Q1 | 11.48 | 3.63 | ND | ND |
| 2005:Q2 | 11.71 | 28.57 | ND | ND |
| 2005:Q3 | 24.01 | 50.00 | ND | ND |
| 2005:Q4 | 21.84 | 10.26 | ND | ND |
| 2006:Q1 | 20.69 | -0.23 | ND | ND |
| 2006:Q2 | ND | ND | 21.07 | 30.23 |
| 2006:Q3 | ND | ND | 8.01 | -5.01 |
| 2006:Q4 | ND | ND | 4.05 | -5.02 |
| 2007:Q1 | ND | ND | 4.68 | 2.20 |
| 2007:Q2 | ND | ND | -1.53 | 1.98 |

| Period | PCE energy prices | Percent change, annual rate | PCE energy prices forecast | Percent change, annual rate, forecast |
|---------|-------------------|-----------------------------|----------------------------|---------------------------------------|
| 2007:Q3 | ND | ND | 0.07 | 1.30 |
| 2007:Q4 | ND | ND | 1.40 | 0.15 |

Middle-right panel Expected Inflation

Series: Michigan SRC, next twelve months; Michigan SRC, next five-to-ten years; TIPS, five-to-ten years ahead (estimates of inflation compensation based on smoothed nominal and inflation-indexed Treasury yield curves.)

Horizon: For Michigan SRC curves, 2001 to June 2006 (data for June are preliminary) and, for TIPS, 2001 to June 23, 2006

Description: Data are plotted as three curves. Units are percent.

For Michigan SRC, next twelve months, the series begins in early 2001 at about 3, falls to about 2.9 later in that period, and then rises to about 3.2 in mid-2001. The series falls to about 2.7 mid-2001, rises to about 2.9 later in that period, and then falls sharply to about 0.25 in year-end 2001. The series then generally rises to about 2.9 in early 2002, generally falls to about 2.5 toward year-end 2002, generally rises to about 3.1 in early 2003, and generally falls to about 1.8 in mid-2003. The series generally rises to about 3.25 in early 2004, remains at about that level until mid-2004, falls to about 2.9 in late 2004, and rises to about 3.1 later in that period. The series fluctuates between that point and about 2.9 until early 2005, rises to about 3.25 later in that period, and then generally falls to about 3 in mid-2005. The series generally rises to about 4.7 in late 2005, generally falls to about 3 in early 2006, generally rises to about 4 in mid-2006, and then falls to end at about 3.25 in June 2006.

For Michigan SRC, next five-to-ten years, the series begins in early 2001 at about 2.9, rises to about 3.1 later in that period, and then generally falls to about 2.8 toward year-end 2001. The series fluctuates between that point and 3.2 until it ends at about 3 in June 2006.

For TIPS, five-to-ten years ahead, the series begins in early 2001 at about 1.9, generally rises to about 2.9 in mid-2001, and generally falls to about 2.1 toward year-end 2001. The series generally rises to about 3 in early 2002, fluctuates between that point and about 2.7 until early 2003, and generally falls to about 2.5 in late 2003. Toward year-end 2003, the series generally rises to about 3.2, falls to about 2.9, and rises to about 3.25. The series generally falls to about 2.7 in early 2005, generally rises to about 2.9 in mid-2005, and generally falls to about 2.5 in late 2005. The series generally rises to about 2.9 toward year-end 2005 and fluctuates between that point and about 2.6 until it ends at about 2.8 on June 23, 2006.

The curves generally overlap throughout the horizon except for the TIPS curve from early 2001 to mid-2001 and from early 2005 to June 23, 2006.

Bottom panel PCE Prices

Percent change, annual rate*

| | | 2005 | 2006:H1 | 2006:H2 | 2007 |
|----|-----------------|-------|---------|---------|-------|
| 1. | PCE price index | 3.0 | 3.1 | 1.8 | 2.2 |
| 2. | (May GB) | (3.0) | (3.0) | (2.1) | (2.0) |

| | | 2005 | 2006:H1 | 2006:H2 | 2007 |
|----|----------|--------|---------|---------|-------|
| 3. | Energy | 21.8 | 14.0 | -5.0 | 1.4 |
| 4. | (May GB) | (21.8) | (13.9) | (1.3) | (1.5) |
| 5. | Core PCE | 2.0 | 2.5 | 2.2 | 2.2 |
| 6. | (May GB) | (2.0) | (2.3) | (2.1) | (2.0) |

* Annual figures are Q4/Q4. Half-yearly figures are Q4/Q2 or Q2/Q4. [Return to table](#)

Exhibit 8

Have Inflation Models Been Moving off Track Recently?

Top panel

Two Models Among Many

- A **backward-looking model** proxies for underlying or expected inflation using lagged inflation only.
- A **partly forward-looking model** uses a weighted average of lagged inflation and expected inflation as measured in the Survey of Professional Forecasters.
- Neither model has been substantially and consistently surprised by the performance of inflation over the last several years.

Middle panels

The Backward-Looking Model

Middle-left panel

Core PCE Prices

Series: Actual (figure for 2006:Q2 is a staff forecast) and simulated

Horizon: 1999 to 2006:Q2

Description: Data are plotted as six curves. (The curve for actual core PCE prices is a solid line; the curves for simulated core PCE prices are five dashed lines.) Red dots overlay the curve for core PCE prices. Units are four-quarter percent change.

For actual core PCE prices, the series starts at a little less than 1.5 in 1999 and rises to almost 2 in early 2000. The series drops to about 1.5 in late 2000 and generally rises to a little more than 2 by late 2001. The series then generally falls to about 1.25 in late 2003. The series generally rises to a little more than 2 in late 2004, generally falls to a little less than 2 in early 2006, and rises to end at a little more than 2.25 in 2006:Q2.

For simulated core PCE prices, there are five series. The first series starts at about 1.5 in late 2000, and then rises to a little below 2 by the end of 2001. The series generally falls to nearly 1 in early 2003, remains at about that level until mid-2003, and then generally rises to about 2.25 in 2006:Q2. The second series starts at about 2.25 in late 2001 and generally falls to about 1.25 in early 2003. The series then generally rises to about 2.5 in 2006:Q2. The third series starts at about 1.5 in late 2002, falls to a little less than 1.5 in mid-2003, and then generally rises to end at almost 2.75 in 2006:Q2. The fourth series starts at about 1.25 in late 2003 and generally rises to almost 2.5 in 2006:Q2. The fifth series starts at about 2.25 in late 2004, falls to about 2 in early 2005, and then generally rises to end at almost 2.75 in 2006:Q2.

Both series overlap in 2001, 2002, 2003, and 2004.

Middle-right panel

Kalman Filter Estimates of the NAIRU*

Series: Two-sided estimates and one-sided estimates

Horizon: 1990 to 2006:Q2

Description: The data are plotted as two curves. Units are percent. Vertically, the shaded area is between about 6.0 (top left) and a little less than 5.0 (bottom left) and between almost 5.75 (top right) and almost 4.0 (bottom right). Horizontally (top and bottom of shaded area), the shaded area starts in early 1990 (left side) and ends in early 2006 (right side). Data for 2006:Q2 is represented as a dot and is located at a little less than 5.0.

The two-sided estimates series starts just below 5.5 in 1990, and generally falls to a little less than 5.0 in early 2006.

The one-sided estimates series starts just below 6.0 in 1990 and fluctuates between that point and about 5.75 until late 1995. The series then generally falls to about 5.0 in late 2000 and fluctuates between that point and about 5.2 until early 2006. The series ends at nearly 5.0 in early 2006.

Both series overlap in 2000 and 2006.

* The shaded area denotes the 90 percent confidence region for the two-sided estimates. [Return to text](#)

Bottom panels

The Partly Forward-Looking Model

Bottom-left panel

Core PCE Prices

Series: Actual (figure for 2006:Q2 is a staff forecast) and simulated

Horizon: 1999 to 2006:Q2

Description: Data are plotted as six curves. (The curve for actual core PCE prices is a solid line; the curves for simulated core PCE prices are five dashed lines.) Red dots overlay the curve for core PCE prices. Units are four-quarter percent change.

The actual core PCE prices series starts at about 1.5 in 1999, generally rises to a little less than 2 in late 1999, and falls to a little less than 1.5 in late 2000. The series generally rises to about 2.25 in late 2001, generally falls to about 1.25 in late 2003, and generally rises to about 2.25 in late 2004. The series generally falls to a little less than 2 in early 2006 and rises to end at about 2.25 in 2006:Q2.

For simulated core PCE prices, there are five series. The first series starts at about 1.5 in late 2000, falls to a little more than 1.25 in early 2001, rises to about 1.5 in late 2001, falls to about 1.25 in late 2003, and rises to end at nearly 2.25 in 2006:Q2. The second series starts at about 2.25 in late 2001, falls to about 1.5 in late 2003, and generally rises to end at almost 2.25 in 2006:Q2. The third series starts at a little more than 1.5 in late 2002, generally falls to a little less than 1.5 in late 2003, and generally rises to end at almost 2.25 in 2006:Q2. The fourth series starts at about 1.25 in late 2003 and generally rises to end at nearly 2.25 in 2006:Q2. The fifth series starts at about 2.25 in late 2004, falls to nearly 2 in early 2005, rises to about 2.25 in late 2005, and remains at about that level until ending at a little more than 2.25 in 2006:Q2.

Both series overlap in 2001, 2003, 2004, 2005, and 2006.

Bottom-right panel

Kalman Filter Estimates of the NAIRU*

Series: Two-sided estimates and one-sided estimates

Horizon: 1990 to 2006:Q2

Description: Data are plotted as two curves. Units are percent. The shaded area is between about 5.5 (top left) and a little more than 4.0 (bottom left) and between a little more than 5.5 (top right) and about 3.75 (bottom right). Horizontally (top and bottom of shaded area), the shaded area starts in early 1990 (left side) and ends in early 2006 (right side). Data for 2006:Q2 is represented as a dot and is located at about 4.75.

The two-sided estimates series starts at a little less than 5.0 in early 1990, generally falls to about 4.75 in late 1997, and remains at about that level through early 2006.

The one-sided estimates series starts at about 5.0 in early 1990 and then fluctuates between about 5.1 and a little less than 5.5 until late 1994. The series generally falls to about 4.5 in late 2000, rises to about 4.75 in late 2001, and remains at about that level until early 2003. The series then falls to about 4.6 in late 2003, rises to about 4.8 in mid-2004, and remains at about that level until ending at about 4.75 in early 2006.

Both series overlap in 1997, 1999, 2000, 2001, 2002, 2003, 2004, and 2006.

* The shaded area denotes the 90 percent confidence region for the two-sided estimates. [Return to text](#)

Exhibit 9

The Pass-Through of Energy Prices

Top panel

Energy Prices and a PPI for Energy-Intensive Industries

Series: PPI for energy-intensive industries, PPI for finished energy

Horizon: 1991 to 2006:Q1

Description: Data are plotted as two curves. Units are four-quarter percent change (Vertical axis for PPI for energy-intensive industries, ranging from 15 to negative 15, is on the right side; vertical axis for PPI for finished energy, ranging from 30 to negative 30, is on the left side.) There is a horizontal line at zero.

For PPI for energy-intensive industries, the series begins in 1991 at about 5, falls to about negative 2 in late 1991, and generally rises to about 12 in mid-1995. The series falls to near zero in mid-1996, rises to about 2 in early 1997, and generally falls to about negative 2.5 in late 1998. The series then rises to about 7 in mid-2000, falls to about negative 3 in early 2002, and generally rises to about 6 in early 2003. The series falls to about 3.5 in late 2003, generally rises to about 12 in late 2004, and remains at about that level until early 2005. The series falls to about 7 in late 2005, rises to about 7.5 later in that period, and falls to end at about 7 in 2006:Q1.

For PPI for finished energy, the series begins in 1991 at about 12, generally falls to about negative 10 later that year, generally rises to about 3 in late 1992, and fluctuates between that point and about 1 until early 1993. The series then generally falls to about negative 2 in mid-1994, rises to about 3.5 in mid-1995, falls to about negative 0.5 in late 1995, and remains at about that level toward year-end 1995. The series rises to about 11.5 in late 1996, generally falls to about negative 10 in early 1998, fluctuates between that point and negative 9 until year-end 1998, and generally rises to about 25 in early 2000. The series generally falls to about negative 19 in early 2002, rises to about 24 in early 2003, and generally falls to about 3 in early 2004. The series generally rises to about 23 in late 2005 and falls to end at about 19 in 2006:Q1.

The curves overlap in 1991, 1992, 1993, 1996, 1997, 1999, 2001, 2002, 2004, and 2005.

Note: The PPI for energy-intensive industries is a staff-calculated aggregation of price indexes for industries having an energy cost share greater than 5 percent, based on the 1997 input-output table.

Middle panel

Estimated Pass-through into Core PCE price inflation*

Series: Backward-looking model, partly forward-looking model

Horizon: 1981 to early 2006

Description: Data are plotted as two curves. Units are percentage points. There is a horizontal line at zero.

For backward-looking model, the series begins in 1981 at about 0.82, generally falls to about 0.24 in mid-1990, rises to about 0.26 in late 1992, and remains at about that level until late 1993. The series then falls to about 0.22 in early 1994, and generally falls to about 0.07 in early 1996. The series falls to about 0.05 in late 1996, generally rises to about 0.08 in early 2000, falls near to zero in late 2000, and remains at about that level until year-end 2000. The series generally rises to about 0.1 in early 2002, falls to about 0.08 in late 2002, and fluctuates between that point and about 0.1 until late 2005. The series rises to end at about 0.11 in early 2006.

For partly forward-looking model, the series begins in 1981 at about 0.2, rises to about 0.25 in early 1982, remains at about that level until mid-1982, and falls to about 0.1 in early 1983. After rising slightly in mid-1983, the series falls to about 0.1 in late 1983, generally rises to about 0.26 in late 1984, falls to about 0.23 in early 1985, and generally rises to about 0.26 in early 1986. The series remains at about that level until late 1986, falls to about 0.24 in year-end 1986, and generally rises to about 0.25 in early 1994. The series generally falls to about 0.09 in early 1996, generally rises to about 0.23 in late 1997, and then generally falls to about 0.07 in late 2000. The series generally rises to about 0.12 in early 2002, falls to about 0.1 in late 2002, and generally rises to about 0.15 in early 2004. The series generally falls to about 0.09 in late 2005 and rises to end at about 0.11 in early 2006.

The curves overlap in 1989, 1990, 1992, 1993, 1994, 1995, 1996, 2000, and 2006.

* The vertical axis measures the estimated response of core PCE price inflation after eight quarters to a permanent 10-percent increase in the relative price of energy. The results are based on 15-year rolling estimation periods. Dates on the horizontal axis denote the end of the estimation window. [Return to text](#)

Bottom panel

Judgmental Assumptions about Energy-Price Pass-Through

- We assume that a permanent ten-percent increase in the relative price of energy would boost core inflation about 0.2 percentage point after eight quarters.
- Models that are forced to assume zero energy-price pass-through have been a little surprised by how high inflation has been in the last few quarters.
- Models that assume a larger pass-through than the one we use judgmentally have been a little surprised by how low inflation has been.

Exhibit 10

Housing Prices in the CPI and PCE Price Index

Top panel

Two Approaches to Measuring the Price of Owner-Occupied Housing Services

- The *user-cost* approach:

$$(1) \quad \begin{array}{l} \text{Price of} \\ \text{housing services} \end{array} = P_{\{t\}}(i_{\{i\}} + \delta - E_{\{t\}}\pi^{\{h\}}_{\{t+1\}})$$

= imputed interest expense + depreciation - expected capital gain

- The *rental-equivalence* approach:

$$(2) \quad \begin{array}{l} \text{Price of} \\ \text{housing services} \end{array} = \text{Rent}$$

- In a perfect world, the two approaches would give the same answer, implying:

$$(3) \quad \text{Rent} = P_{\{t\}}(i_{\{i\}} + \delta - E_{\{t\}}\pi^{\{h\}}_{\{t+1\}})$$

- OER is a theoretically appropriate element of a cost-of-living index.

- Whether the FOMC should define its objectives relative to such an index depends on what costs you are seeking to minimize.

Bottom-left panel

Housing Affordability and the Rental Vacancy Rate*

Series: Housing affordability, rental vacancy rate

Horizon: 1990 to 2006:Q1

Description: Data are plotted as two curves. Units are percent. (Vertical axis for housing affordability, ranging from 170 to 100, is on the right side; vertical axis for rental vacancy rate, ranging from 11 to 6, is on the left side.)

For housing affordability, the series begins in 1990 at about 106, generally rises to about 156 in late 1993, falls to about 143 in early 1994, rises to about 146 later in that period, falls to about 142 in early 1995, and then generally rises to about 152 in late 1996. The series falls to about 145 in mid-1997, generally rises to about 159 in late 1998, generally falls to about 138 in late 2000, and generally rises to about 158 in early 2003. The series fluctuates between about 151 and 159 until early 2004 and generally falls to end at a little less than 120 in 2006:Q1.

For rental vacancy rate, the series begins in 1990 at about 7.5, falls to about 7 later in that period, and then fluctuates between that point and 7.8 until early 1993. The series falls to about 6.8 in late 1993, rises to about 7.5 in early 1994, falls to about 7.2 in late 1994, and generally rises to about 8 in mid-1996. The series falls to about 7.5 in early 1997, fluctuates between that point and about 8.3 until late 2000, and generally rises to about 9.2 in early 2002. The series falls to about 8.4 later in that period, generally rises to about 10.5 in early 2004, and then generally falls to end at about 9.5 in 2006:Q1.

The curves overlap in 1991 and 2003.

* Housing affordability is defined as the ratio of median family income to the amount required to qualify for a mortgage on the median-priced existing single-family home. [Return to text](#)

Bottom-right panel

Tenants' Rent and OER

Series: OER, tenants' rent

Horizon: 1990 to 2007 (data are projected for the period beginning in early 2006 through 2007)

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

For OER, the series begins in 1990 at about 5, generally falls to about 3 in mid-1991, and fluctuates between that point and about 3.5 until early 1996. The series then generally falls to about 2.75 in early 1997, generally rises to about 3.25 in late 1998, falls to about 2.3 in late 1999, and generally rises to about 4.5 in late 2002. The series falls to about 1.9 in early 2004, rises to about 2.5 in mid-2004, and fluctuates between that point and about 2.25 until late 2005. The series then rises to end at about 3.25 in early 2006. In the projected area, the series begins in early 2006 at about 3.25, rises to about 3.75, and then generally falls to end at about 3 in late 2007.

For tenants' rent, the series begins in early 1990 at about 4.1, generally falls to about 2.1 in late 1992, and fluctuates between that point and about 2.5 until late 1995. The series generally rises to about 3.4 in late 1998, and falls to about 3 in late 1999. The series generally rises to about 4.6 in late 2001, falls to about 2.5 in early 2004, and generally rises to end at about 3.25 in early 2006. In the projected area, the series begins in early 2006 at about 3.25, rises to about 3.3, and then generally falls to end at about 3 in late 2007.

The curves overlap in 1991, 1997, 1998, 2002, 2003, 2006, and 2007.

Exhibit 11

Outlook for Foreign Growth

Exhibit 11 is comprised of six panels, including graphs on the euro area, Japan, and Mexico, a table on foreign real GDP, and graphs on policy interest rates and on stock prices and EMBI spreads.

Top-left panel

Euro Area

A line chart plots manufacturing orders, IP, and retail sales for mid-2004 through March or April 2006. The range of the y-axis is [90, 125]; index, July 2004 = 100. All three series begin at 100. IP and retail sales both rise to about 103 by April 2006, and both series track closely throughout the entire period. Manufacturing orders, with some volatility, rise to about 108 by March 2006.

Top-center panel

Japan

A line chart plots machinery orders and IP for mid-2004 through April 2006. The range of the y-axis is [90, 125]; index, July 2004 = 100. Both series begin at 100. IP rises to about 104 by April 2006. Machinery orders, with some volatility, rise to about 123 by April 2006.

Top-right panel

Mexico

A line chart plots exports and IP for mid-2004 through April or May 2006. The range of the right y-axis, which measures IP, is [90, 125]; index, July 2004 = 100. The range of the left y-axis, which measures exports, is [90, 150]; index, July 2004 = 100. Both series begin at 100. IP rises to about 107 by April 2006. Exports, with some volatility, rise to about 135 by May 2006.

Middle panel

Foreign Real GDP*

Percent change, a.r.**

| | | Q1 | Q2p | H2p | | |
|-----|-----------------------------|------------|------------|------------|------------|------------|
| 1. | Total Foreign | 4.1 | 4.5 | 3.5 | 3.3 | 3.3 |
| 2. | Industrial Countries | 2.6 | 3.1 | 2.7 | 2.4 | 2.4 |
| | <i>of which:</i> | | | | | |
| 3. | Japan | 2.8 | 3.1 | 3.0 | 2.0 | 1.8 |
| 4. | Euro Area | 1.9 | 2.4 | 2.7 | 2.0 | 1.5 |
| 5. | United Kingdom | 2.2 | 2.3 | 2.5 | 2.6 | 2.7 |
| 6. | Canada | 2.9 | 3.8 | 2.5 | 2.6 | 2.9 |
| 7. | Emerging Economies | 6.4 | 6.6 | 4.6 | 4.6 | 4.6 |
| | <i>of which:</i> | | | | | |
| 8. | China | 10.2 | 13.3 | 8.0 | 7.6 | 8.1 |
| 9. | Emerging Asia ex. China | 7.2 | 5.0 | 4.7 | 4.8 | 4.9 |
| 10. | Mexico | 5.5 | 6.3 | 3.2 | 3.4 | 3.4 |

* Aggregates weighted by shares of U.S. exports. [Return to text](#)

** Year is Q4/Q4; half years are Q4/Q2; quarters are percent change from previous quarter. [Return to table](#)

Bottom-left panel

Policy Interest Rates

A line chart plots policy interest rates (percent) for the United Kingdom, Canada, the euro area, and Japan for 2004 through mid-2006 (actual) and for mid-2006 through 2007 (forecast). The policy rate for the United Kingdom starts at 4 percent, rises to 4¾ percent in mid-2004, declines to 4½ percent in mid-2005, rises to 4¾ percent in late 2006, and stays there through the end of the period. The policy rate for Canada starts at 2¼ percent, immediately declines to 2 percent, rises to 2½ percent in late 2004, stays at that rate through early 2005, rises to 2¾ percent in late 2005, rises further to 4¼ percent by mid-2006, and stays there through the end of the period. The policy rate for the euro area starts at 2 percent, stays at that rate through mid-2005, rises to 3¼ percent by late 2006, and stays there through the end of the period. The policy rate for Japan starts in the second quarter of 2006 at 0 percent, and rises to ¾ percent by the end of the period.

Bottom-right panel

Stock Prices and EMBI Spreads

A line chart plots the EMBI+ spread, stock prices for emerging markets, and stock prices for industrial countries on a weekly basis for 2004 through mid-2006. The range of the right y-axis, which measures the stock prices for emerging markets and for industrial countries as a ratio scale, Jan. 5, 2004 = 100, is [75, 225]. The range of the left y-axis, which measures the EMBI+ spread in basis points, is [150, 600]. The source for stock prices is MSCI. All three series are somewhat volatile. The spread for EMBI+ starts at just under 400 basis points, rises to about 550 basis points by mid-2004, and then falls to about 190 basis points by early 2006, and then rises to about 240 basis points by the end of the period. Both stock price series begin at 100. The stock prices for emerging markets fall to about 88 by mid-2004, rise to about 190 by early 2006, and then fall to about 150 by the end of the period. The stock prices for industrial countries fall to about 95 by mid-2004, rise to about 135 by early 2006, and then fall to about 120 by the end of the period.

Exhibit 12

Commodity Prices and Global Growth

Exhibit 12 is a three-by-two array of panels, including graphs on consumer price inflation, primary commodity prices, spot prices, real commodity prices, a table on China's contribution to growth, and a graph on China inflation indicators.

Top-left panel

Consumer Price Inflation

A line chart of consumer prices for emerging economies and industrial economies for 2004 through 2006:Q1 (actual) and for 2006:Q2 through 2007 (forecast). The range of the y-axis is [0, 6]. The series are quarterly percent changes at an annual rate. Consumer price inflation for emerging economies starts at just over 4 percent, falls to about 2½ percent by 2006:Q1, rises to about 4¼ percent by late 2006, and then eases to about 3¼ percent by the end of the period. Consumer price inflation for industrial economies starts at about 1¾ percent, falls to about ½ percent by early 2005, rises to about 1-1/3 percent by 2006:Q1, rises to about 2½ percent by 2006:Q2, and then eases to about 1-2/3 percent by the end of the period.

Top-right panel

Primary Commodity Prices

A line chart plots primary commodity prices for WTI, copper, metals, and non-energy commodities for 2004 through mid-2006 (actual) and for mid-2006 through 2007 (forecast). The range of the right y-axis, which measures the prices of copper, metals, and non-energy commodities each in terms of an index, 2004:Q1=100, is [90, 270]. The range of the left y-axis, which measures the WTI price in U.S. dollars per barrel, is [30, 90]. The WTI price starts at about \$35 per barrel, and rises to about \$70 per barrel by mid-2006; over the forecast horizon, the WTI price rises further to about \$73 by the end of the period. The indexes of prices of copper, metals, and non-energy commodities all start at 100. The index for copper prices rises to about 180 by early 2006, rises sharply to about 270 by mid-2006, and then declines to about 205 by the end of the forecast period. The index for metals prices rises to about 155 by mid-2006 and then declines to about 140 by the end of the forecast period. The index for prices of non-energy commodities rises to about 140 by mid-2006, and then rises to about 145 by the end of the forecast period.

Middle-left panel

Spot Prices

A line chart plots spot prices on a weekly basis for copper and zinc for 2005 through June 2006. The range of the y-axis is [75, 325]; index, January 7, 2005 = 100. Both series start at 100. The index for copper prices rises to about 285 in May 2006 and then declines to about 235 by end-June 2006. The index for zinc prices rises to about 310 in May 2006 and then declines to about 230 by end-June 2006.

Middle-right panel

Real Commodity Prices

A line chart of real commodity prices, year-over-year percent change, plots world GDP, real commodity prices, and real WTI for 1990-2005. The range of the right y-axis, which measures real commodity prices and the real WTI price, is [-45, 60]. The range of the left y-axis, which measures

world GDP, is [-2, 6]. World GDP is aggregated with PPP exchange rates. The percent change for world GDP starts at about 2.9 percent and, with some volatility, rises to about 5½ percent in 2004, and then eases a bit to about 5 percent in 2005. The percent change for the real WTI price starts at about 15 percent and, with considerable volatility, falls to about -30 percent in 1998, and then rises to about 30-31 percent in 2004-2005. The percent change for real commodity prices starts at about -10 percent and, with some volatility, rises to about 15 percent in 2004, and then eases to about 5 percent in 2005.

Bottom-left panel

China's Contribution to Growth

| | 2003 | 2004 | 2005 |
|---|------|------|------|
| 1. World GDP growth (%) | 4.1 | 5.3 | 4.8 |
| 2. Contribution of China | 1.4 | 1.5 | 1.5 |
| 3. Increase in world oil consumption (Mb/d) | 1.6 | 3.2 | 1.1 |
| 4. Increase in Chinese oil consumption (Mb/d) | 0.6 | 0.9 | 0.2 |

Bottom-right panel

China Inflation Indicators

A chart of China inflation indicators plots monthly CPI excluding food as a line chart for 2001 through early 2006, and plots annual steel production and annual steel capacity as a bar chart for 2001-2005. The range of the right y-axis, which measures CPI inflation excluding food in terms of twelve-month percent change, is [-2, 3]. The range of the left y-axis, which measures annual steel production and annual steel capacity in millions of tons, is [0, 500]. There is no data available for steel capacity in 2004. The twelve-month percent change of CPI inflation excluding food starts at nearly 2 percent, falls to about -1 percent by mid-2002, and rises to about ¾ percent by the end of the period. Approximate values for annual steel production and annual steel capacity for the five periods are as follows:

Millions of tons

| | 2001 | 2002 | 2003 | 2004 | 2005 |
|--|------|------|------|------|------|
| Annual steel production (solid red bars) | 140 | 180 | 220 | 270 | 350 |
| Annual steel capacity (cross-hatched red bars) | 150 | 200 | 260 | ND | 480 |

Exhibit 13

Global Inflation Indicators

Exhibit 13 is comprised of seven panels, including graphs on industrial country resource utilization, developing country resource utilization, the euro area, Canada, Mexico, unit labor costs, and ten-year inflation expectations for industrial economies excluding Japan.

Top-left panel

Industrial Country Resource Utilization

A line chart plots the industrial country output gap and plots manufacturing capacity utilization for the euro area, Japan, Canada, and the United Kingdom for 1999 through early 2006. The range of the

right y-axis, which measures manufacturing capacity utilization in percent, is [-12, 12]. The range of the left y-axis, which measures the output gap in percent, is [-2, 2]. The output gap is defined as: (actual output minus potential output) divided by potential output. The industrial country output gap is aggregated using U.S. import weights. Manufacturing capacity utilization is defined as the percent deviation from average 1995 - present. The industrial country output gap starts at about $-1\frac{1}{4}$ percent, rises to about $1\frac{2}{3}$ percent by mid-2000, falls to about $-1\frac{7}{8}$ percent by mid-2003, and rises to just over 0 percent by the end of the period. Euro-area manufacturing capacity utilization starts at 0 percent, rises to about 3 percent by late 2000, falls to about -2 percent by mid-2003, and rises to 0 percent by the end of the period. Japan's manufacturing capacity utilization starts at about -4 percent, rises to about 2 percent by late 2000, falls to about -11 percent by late 2001, and rises to about 6 percent by the end of the period. Canada's manufacturing capacity utilization starts at about 3 percent and stays at about that rate through late 2000, falls to about -5 percent by late 2001, rises to about 2 percent by early 2005, and declines to about $\frac{1}{2}$ percent by the end of the period. The United Kingdom's manufacturing capacity utilization starts at about -2 percent, rises to about $\frac{1}{2}$ percent by late 2000, falls to around -4 percent by mid-2003, rises to about 1 percent by mid-2004, and declines to about -2 percent by the end of the period.

Top-right panel

Developing Country Resource Utilization

A line chart plots manufacturing capacity utilization for South Korea, Mexico, and Thailand for 1999 through early 2006. The range of the y-axis is [-12, 12]; unit is percent. Manufacturing capacity utilization is defined as the percent deviation from average 1995 - present. South Korea's manufacturing capacity utilization starts at about -7 percent, rises to about 3 percent by late 2000, falls to about -6 percent by late 2001, and rises to about 5 percent by the end of the period. Mexico's manufacturing capacity utilization starts at about -1 percent, rises to about 2 percent by late 2000, falls to about -4 percent by early 2002, and rises to about 5 percent by the end of the period. Thailand's manufacturing capacity utilization starts at about -7 percent, rises to about 2 percent by late 2000, falls to about -10 percent by early 2002, and rises to about 8 percent by the end of the period.

Middle-left panel

Euro Area

A line chart plots headline CPI, core CPI, and wages in terms of twelve-month percent change for 2003 through early 2006. The range of the y-axis is [-1, 6]. Headline CPI starts at just over 2 percent, and, with some volatility, falls to about $1\frac{3}{4}$ percent by early 2004, and then rises to about $2\frac{1}{2}$ percent by the end of the period. Core CPI starts at about 2 percent and declines to about $1\frac{1}{4}$ percent by the end of the period. Wages start at just over 3 percent, decline to about $2\frac{1}{4}$ percent by mid-2004, and then stay there through the end of the period.

Middle-center panel

Canada

A line chart plots headline CPI, core CPI, and wages in terms of twelve-month percent change for 2003 through early 2006. The range of the y-axis is [-1, 6]. Headline CPI starts at about $4\frac{1}{2}$ percent, and, with some volatility, falls to about $\frac{2}{3}$ percent by early 2004, and then rises to about $2\frac{3}{4}$ percent by the end of the period. Core CPI starts at about $3\frac{1}{4}$ percent, declines to about $1\frac{1}{4}$ percent by early 2004, and then rises to about 2 percent by the end of the period. Wages start at about 2 percent and, with some volatility, rise to about 4 percent by the end of the period.

Middle-right panel

Mexico

A line chart plots headline CPI, core CPI, and wages in terms of twelve-month percent change for 2003 through early 2006. Wages are for manufacturing only and are the three-month moving average of twelve-month percent changes. The range of the y-axis is [-1, 6]. Headline CPI starts at about $5\frac{1}{4}$ percent, rises immediately to about $5\frac{3}{4}$ percent, and then, with some volatility, falls to about 3 percent by the end of the period. Core CPI starts at about $3\frac{3}{4}$ percent and declines to about $3\frac{1}{4}$ percent by the end of the period. Wages start at about 1 percent and, with considerable volatility, rise to about $4\frac{1}{2}$ percent by the end of the period.

Bottom-left panel

Unit Labor Costs

A line chart plots unit labor costs (four-quarter percent change) for Canada, the United Kingdom, France, and Germany for 2003 through early 2006. The range of the y-axis is [-3, 5]. Unit labor costs for Canada start at about $2\frac{1}{2}$ percent, rise to about $3\frac{1}{2}$ percent by late 2003, fall to about $\frac{3}{4}$ percent by late 2004, rise to about $3\frac{1}{2}$ percent in late 2005, and decline to about $2\frac{2}{3}$ percent by the end of the period. Unit labor costs for the United Kingdom start at about 3 percent, fall to about $1\frac{1}{2}$ percent by early 2004, rise to about 4 percent in mid-2005, and decline to about $2\frac{1}{4}$ percent by the end of the period. Unit labor costs for France start at about 2 percent, fall to about $\frac{3}{4}$ percent by early 2004, and rise to about $1\frac{3}{4}$ percent by the end of the period. Unit labor costs for Germany start at just above 0 percent, rise to about $\frac{3}{4}$ percent by late 2003, and fall to about $-1\frac{1}{2}$ percent by the end of the period.

Bottom-right panel

10-Year Inflation Expectations

A line chart plots ten-year inflation expectations, industrial economies excluding Japan, for the break-even rate and for the Consensus Economics survey for 2003 through mid-2006. The range of the y-axis is [1.7, 2.9]; unit is percent. Industrial countries excluding Japan comprise Canada, the euro area, Sweden, and the United Kingdom, weighted by trade shares. The break-even rate starts at about 2 percent and, with some volatility, rises to about $2\frac{1}{2}$ percent by the end of the period. The Consensus Economics survey starts at about 2 percent and remains at about that rate throughout the entire period.

Exhibit 14

External Imbalances and the Dollar

Exhibit 14 is comprised of five panels, including graphs on current account as a percent of world GDP, the nominal trade balance, nominal dollar indexes, ten-year government bond yields, and a table on U.S. financial flows.

Top-left panel

Current Account/World GDP

A line chart plots current account/world GDP for oil exporters, emerging Asia, Japan, and the United States for 1997-2005. The range of the y-axis is [-3.0, 1.0]; unit is percent. The series for oil exporters starts at just over 0 percent, declines to about -0.2 percent in 1998, and then rises to about 0.8 percent by 2005. The series for emerging Asia starts at just over 0 percent and rises to about 0.6 percent by 2005. The series for Japan starts at about 0.3 percent and stays at about that rate for the

entire period. The series for the United States starts at about -0.5 percent and falls to about -1.8 percent by 2005.

Top-right panel

Nominal Trade Balance

A line chart plots the nominal trade balance on a monthly basis for the non-oil and total trade balances for 2004 through April 2006. The range of the y-axis is [-70, -25]; units are billions of dollars. The non-oil trade balance starts at about -\$32 billion and falls to about -\$40 billion by the end of the period. The total trade balance starts at about -\$45 billion, falls to about -\$67 billion by late 2005, rises to about -\$62 billion by early 2006, and declines to about -\$63 billion by the end of the period.

Middle-left panel

Nominal Dollar Indexes

A line chart plots nominal dollar indexes on a daily basis for the major currencies index, the broad dollar index, and the index for other important trading partners for January through late June 2006. The range of the y-axis is [94, 104]; index, Jan. 6, 2006 = 100. The broad dollar index includes major currencies and other important trading partners. The major currencies index is the trade-weighted average against major foreign currencies. The index for other important trading partners is the trade-weighted average against other important trading partners. All three series begin at 100 and are somewhat volatile. The major currencies index fluctuates between about 100-102 through mid-April, falls to about 95 by mid-May, and then rises to nearly 98 by the end of the period. The broad dollar index fluctuates between about 99-101 through mid-April, falls to about 96½ by mid-May, and then rises to about 99¼ by the end of the period. The index for other important trading partners fluctuates between about 98-100 through mid-April, falls to about 98¼ by mid-May, and then rises to about 101 by the end of the period.

Middle-right panel

Ten-Year Government Bond Yields

A line chart plots ten-year government bond yields on a daily basis for U.S. Treasury bonds and for weighted-average foreign bonds for January through late June 2006. The range of the y-axis is [3.0, 6.0]; unit is percent. Yields for weighted-average foreign bonds are defined as the average of rates for Australia, Canada, the euro area, Japan, Sweden, Switzerland, and the United Kingdom, weighted by trade shares. Yields for U.S. Treasury bonds start at about 4.4 percent and rise to about 5.3 percent by the end of the period. Yields for weighted-average foreign bonds start at about 3.5 percent and rise to about 4.2 percent by the end of the period.

Bottom panel

U.S. Financial Flows

Billions of dollars, s.a.

| | | 2005:Q4 | 2006:Q1 | March | April |
|----|--------------------------------------|---------|---------|-------|-------|
| 1. | Current account balance | -223 | -209 | ... | ... |
| 2. | Official capital, net inflow | 77 | 76 | 17 | 21 |
| 3. | Private capital, net inflow | 166 | 82 | ... | ... |
| | <i>Of which:</i> | | | | |
| 4. | Foreign purchases of U.S. securities | 193 | 181 | 74 | 14 |

| | 2005:Q4 | 2006:Q1 | March | April |
|---|---------|---------|-------|-------|
| 5. U.S. purchases of foreign securities | -48 | -53 | -21 | -14 |
| 6. Net banking flows | 56 | 11 | 5 | 87 |

Exhibit 15

Alternative Scenarios for the Dollar

Exhibit 15 is a four-by-two array of panels, including graphs on the broad real dollar, the nominal trade balance, the contribution of real net exports to U.S. GDP growth, core import prices, core PCE prices, the Federal Funds rate, U.S. real GDP growth, and foreign real GDP growth.

Top-left panel

Broad Real Dollar

A line chart plots the broad real dollar for 1995 through mid-2006 (actual), along with the Greenbook baseline forecast and an alternative simulation for mid-2006 through 2007. The range of the y-axis is [65, 105]; index, 2003:Q1 = 100. The actual broad real dollar starts at about 84, rises to about 105 by early 2002, and falls to about 90 by mid-2006. The Greenbook baseline forecast declines slightly to about 87 by the end of 2007. The alternative simulation declines to about 74 by the end of 2007.

Top-right panel

Nominal Trade Balance

A line chart plots nominal trade balance for 2004 through mid-2006 (actual), along with the Greenbook baseline forecast and an alternative simulation for mid-2006 through 2007. The range of the y-axis is [-8, -3]; unit is percent of GDP. The trade balance starts at about $-4\frac{3}{4}$ percent of GDP and falls to about -6 percent of GDP by mid-2006. The Greenbook baseline forecast declines a bit more to about $-6\frac{1}{4}$ percent of GDP by early 2007 and then rises to about -6 percent of GDP by the end of the period. The alternative simulation declines to about $-6\frac{1}{3}$ percent of GDP by early 2007 and then rises to about $-5\frac{3}{4}$ percent of GDP by the end of the period.

Middle-left top panel

Contribution of Real Net Exports to U.S. GDP Growth

A line chart plots the contribution of real net exports to U.S. GDP growth for 2004 through mid-2006 (actual), along with the Greenbook baseline forecast and an alternative simulation for mid-2006 through 2007. The range of the y-axis is [-2.0, 2.0]; units are percentage points, a.r. The series starts at about -1.2 percentage points, rises to about 1.1 percentage points by mid-2005, falls to about -1.4 percentage points in late 2005, and rises to about 0.2 percentage point by mid-2006. The Greenbook baseline forecast falls to about -0.6 percentage point by the end of 2007. The alternative simulation rises to about 1 percentage point by mid-2007, and then declines to about 0.4 percentage point by the end of 2007.

Middle-right top panel

Core Import Prices*

A line chart plots core import prices for 2004 through mid-2006 (actual), along with the Greenbook

baseline forecast and an alternative simulation for mid-2006 through 2007. The range of the y-axis is [-2, 8]; unit is percent change, a.r. The series starts at about 5-1/3 percent, falls to just below 0 percent by mid-2005, and rises to about 3¼ percent by mid-2006. The Greenbook baseline forecast rises to about 3¾ percent in late 2006, declines to about 1 percent by mid-2007, and stays at that rate through the end of 2007. The alternative simulation rises to about 6½ percent in late 2006, declines to about 4¼ percent by mid-2007, and stays at that rate through the end of 2007.

* Excludes fuels, computers, and semiconductors. [Return to text](#)

Middle-left bottom panel

Core PCE Prices

A line chart plots core PCE prices for 2004 through mid-2006 (actual), along with the Greenbook baseline forecast and an alternative simulation for mid-2006 through 2007. The range of the y-axis is [0, 4]; unit is percent change, a.r. The series starts at about 2¾ percent, falls to about 1-1/3 percent by mid-2005, and rises to about 3 percent by mid-2006. The Greenbook baseline forecast falls to about 2¼ percent in late 2006, and stays at about that rate through the end of 2007. The alternative simulation falls to about 2½ percent in late 2006, and stays at about that rate through the end of 2007.

Middle-right bottom panel

Federal Funds Rate

A line chart plots the federal funds rate for 2004 through mid-2006 (actual), along with the Greenbook baseline forecast and an alternative simulation for mid-2006 through 2007. The range of the y-axis is [0, 7]; unit is percent. The federal funds rate starts at 1 percent and rises to about 4¾ percent by mid-2006. The Greenbook baseline forecast rises to about 5¼ percent by late 2006 and stays there throughout the forecast period. The alternative simulation rises to about 6¼ percent by the end of 2007.

Bottom-left panel

U.S. Real GDP Growth

A line chart plots real U.S. GDP growth for 2004 through mid-2006 (actual), along with the Greenbook baseline forecast and an alternative simulation for mid-2006 through 2007. The range of the y-axis is [0, 8]; unit is percent, a.r. Real U.S. GDP growth starts at about 4¼ percent and fluctuates between about 3¼ percent to 4¼ percent through mid-2005, falls to about 1½ percent by late 2005, spikes to about 5¾ percent in early 2006, and falls to about 2 percent by mid-2006. The Greenbook baseline forecast rises to about 2¾ percent by the end of 2007. The alternative simulation rises to about 3¾ percent by the end of 2007.

Bottom-right panel

Foreign Real GDP Growth

A line chart plots foreign real GDP growth for 2004 through mid-2006 (actual), along with the Greenbook baseline forecast and an alternative simulation for mid-2006 through 2007. The range of the y-axis is [0, 8]; unit is percent, a.r. Foreign real GDP growth starts at about 5¼ percent, falls to about 2½ percent by early 2005, rises to about 4½ percent by early 2006, and falls to about 3-1/3 percent by mid-2006. The Greenbook baseline forecast remains at about 3-1/3 percent through the end of 2007. The alternative simulation edges down to about 3 percent by the end of 2007.

Top panel**ECONOMIC PROJECTIONS FOR 2006**

| | FOMC | | Staff |
|--------------------------|-----------------------------------|------------------|------------|
| | Range | Central Tendency | |
| | Percentage change, Q4 to Q4 | | |
| Nominal GDP | 5½ to 6½ | 6 to 6¼ | 6.1 |
| February 2006 | (5¼ to 6½) | (5½ to 6) | (6.0) |
| Real GDP | 3 to 3¾ | 3¼ to 3½ | 3.3 |
| February 2006 | (3¼ to 4) | (About 3½) | (3.7) |
| Core PCE Prices | 2¼ to 3 | 2¼ to 2½ | 2.4 |
| February 2006 | (1¾ to 2½) | (About 2) | (2.2) |
| | Average level, Q4, percent | | |
| Unemployment rate | 4½ to 5 | 4¾ to 5 | 4.9 |
| February 2006 | (4½ to 5) | (4¾ to 5) | (5.0) |

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

Bottom panel**ECONOMIC PROJECTIONS FOR 2007**

| | FOMC | | Staff |
|--------------------------|-----------------------------------|------------------|------------|
| | Range | Central Tendency | |
| | Percentage change, Q4 to Q4 | | |
| Nominal GDP | 4¾ to 6 | 5 to 5½ | 5.0 |
| February 2006 | (5 to 6) | (5 to 5¾) | (5.0) |
| Real GDP | 2½ to 3¼ | 3 to 3¼ | 2.7 |
| February 2006 | (3 to 4) | (3 to 3½) | (3.0) |
| Core PCE Prices | 2 to 2¼ | 2 to 2¼ | 2.2 |
| February 2006 | (1¾ to 2) | (1¾ to 2) | (1.8) |
| | Average level, Q4, percent | | |
| Unemployment rate | 4¼ to 5¼ | 4¾ to 5 | 5.2 |
| February 2006 | (4½ to 5) | (4¾ to 5) | (5.1) |

Appendix 3: Materials used by Mr. Reinhart

Material for **FOMC Briefing on Monetary Policy Alternatives**

Vincent R. Reinhart

June 29, 2006

Class I FOMC - Restricted-Controlled FR

Exhibit 1: Policy Expectations and Asset Prices

Top panel

Federal Funds and Eurodollar Futures

A line chart showing an intradaily time series of July 2006 federal funds futures rates and December 2007 Eurodollar futures rates, since just before the May FOMC meeting. Both generally drifted higher over this period. Lines are shown marking the effects of selected events: the May FOMC announcement, the release of April CPI data, the release of the FOMC minutes, the release of nonfarm payrolls data, the Chairman's IMC speech, and the release of May CPI data. Each of these events was followed by a marking up of futures rates, with the sole exception of the nonfarm payrolls releases, which was followed by a decline in futures rates.

Note. 5-minute intervals.

Middle-left panel

Expected Federal Funds Rates*

A line chart that shows the trajectory of the expected federal funds rate through August 2008, derived from money market futures quotes, as of May 9, 2006, June 22, 2006, and June 28, 2006. The path for monetary policy shifted upwards notably from May 9 to June 22. It rose a little further still from June 22 to June 28.

* Estimates from federal funds and Eurodollar futures, with an allowance for term premiums and other adjustments. [Return to text](#)

Middle-right panel

Reasons for Inversion of Futures Curve

- Optimal response to inflation bulge
- Nonlinearity in the housing market
- Policy mistake

Bottom-left panel

Selected Financial Market Quotes*

| | June 28, 2006 | Change from May 9, 2006 | Change from June 22, 2006 |
|--------------------------|---------------|----------------------------|------------------------------|
| Nominal | -percent- | -basis points- | -basis points- |
| 1. Two-Year | 5.32 | 32 | 6 |
| 2. Ten-Year | 5.32 | 13 | 5 |
| Inflation Compensation** | -percent- | -basis points- | -basis points- |
| 3. Five-Year | 2.53 | -11 | -1 |
| 4. Ten-Year | 2.59 | -10 | 0 |
| Stock Prices | -level- | -percent- | -percent- |
| 5. S&P 500 | 1246.00 | -6 | 0 |
| 6. Russell 2000 | 688.04 | -12 | 0 |

* Yields and inflation compensation derived from smoothed yield curves. [Return to text](#)

** Carry-adjusted [Return to table](#)

Bottom-right panel

Change in Implied One-Year Forward Rates Since the May FOMC

A bar chart that shows changes in real and inflation compensation forward rates since May 9, 2006 (as of June 28, 2006). One-year forward rates ending two-, five-, seven- and ten-years hence are shown. All real forward rates increased, especially at the one-to-two year horizon. Forward rates of inflation compensation declined at all horizons shown.

Note. Forward rates are the one-year rates maturing at the end of the year shown on the horizontal axis as implied by smoothed yield curves fitted to nominal and indexed Treasury securities.

Exhibit 2:

The Case for Pausing

Top panel

Case for Alternative A

- Weak data on spending
- Concern about housing slump
- Cumulative tightening that has already occurred may be sufficient, given lags in policy.
- Consistent with a number of policy rules

Middle-left panel

Housing Market Surveys

A line chart showing monthly data on homebuying attitudes from the Michigan survey and builders' ratings of current new home sales from a survey conducted by the National Association of Home Builders. Data are shown from the start of 2002 through June 2006. Both series have fallen sharply over the last year.

Note. Builders' ratings are seasonally adjusted by Board staff.

Sources: Michigan Survey (Homebuying attitudes); National Association of Home Builders (Builders ratings).

Middle-right panel

Estimated Policy Rules

A line chart that shows the actual and Greenbook-projected path of the funds rate, and forecast-based and outcome-based estimated policy rules. The graph also shows 70 percent and 90 percent confidence intervals obtained from model simulations. The forecast-based and outcome-based policy rules are very similar, and both slope downwards modestly to a bit below 4-1/2 percent even though the Greenbook-projected path is flat at 5-1/4 percent.

Bottom panels

Optimal Policy with 2 Percent Inflation Goal

Optimal policy with a 2 percent inflation goal derived from FRB/US. There are three line charts, showing the implied trajectories of the federal funds rate, the unemployment rate, and core PCE inflation, through 2010.

Bottom-left panel
Federal Funds Rate

As shown in the chart, the federal funds rate peaks at a bit over 5 percent in 2007 and slopes downwards thereafter.

Bottom-center panel
Unemployment Rate

As shown in the chart, the unemployment rate peaks at a bit over 5 percent in 2008 and moves back down to 5 percent thereafter.

Bottom-right panel
Core PCE Inflation

As shown in the chart, core PCE inflation rises to nearly 2-1/2 percent later this year and next year, before moving back down towards the 2 percent goal.

Exhibit 3:
The Case for Tightening

Top panels
Evolution of Staff Forecast

Top-left panel
Unemployment rate

A line chart shows the forecast for the unemployment rate in 2005, 2006 and 2007 in each Greenbook since the start of 2004. There is no trend to these forecasts over the period, but the forecast for the unemployment rate in 2006 and 2007 rose in the most recent Greenbook.

Top-right panel
Change in Core PCE Prices

A line chart shows the corresponding forecasts for core PCE inflation, which all consistently trended upwards.

Middle panels
Optimal Policy Implications of Recent Changes in the Staff Outlook (Inflation Target: 1.5 Percent)

Optimal policy with a 1.5 percent inflation goal derived from FRB/US in January 2006 and in June 2006. There are three line charts, showing the implied trajectories of the federal funds rate, the unemployment rate, and core PCE inflation, through 2010.

Middle-left panel
Federal Funds Rate

As shown in the chart, in the June 2006 simulations, the federal funds rate peaks at over 5-1/2 percent in 2007, more than 50 basis points above the peak from the previous simulations.

Middle-center panel
Unemployment Rate

As shown in the chart, the trajectory of the unemployment rate has also moved higher, except that at

the very near term, it is down a little.

Middle-right panel Core PCE Inflation

As shown in the chart, the trajectory of core PCE inflation has also moved higher.

Bottom panel Inflation Compensation

A line chart showing a daily time series of five-year and five-to-ten-year forward inflation compensation implied by yields on nominal Treasury securities and TIPS over the period since June 2004. Rates of inflation compensation declined since the last FOMC meeting, but have fluctuated in a narrow range over the last year.

Bottom panel inset box Correlation between policy expectations and forward inflation compensation

- Far-forward inflation compensation declined and policy expectations firmed following official statements
- Data releases led to increases in policy expectations and inflation compensation

Exhibit 4: More Tightening to Come?

Top panel Range of Estimated Equilibrium Real Rates

A line chart reproduces the Bluebook chart on staff estimates of the equilibrium real interest rate, R^* . The 90-percent confidence interval around the staff estimates of R^* prepared for the current FOMC meeting ranges from roughly 0 to 6 percent. The 70-percent confidence interval ranges from about 1 to 5 percent. The range of the staff estimates is roughly 2 to 4 percent. The Greenbook-consistent measure of R^* is currently about 2-1/2 percent. The actual real federal funds rate is currently about 2-3/4 percent, and would be about 3 percent if the Committee tightened policy by 25 basis points, and 3-1/4 percent if the Committee tightened policy by 50 basis points. Over the period since mid-2004, the actual real federal funds rate has trended higher, moving from about -1 percent to its current value of 2-3/4 percent. The range of estimated values of R^* has only moved slightly higher over the same period.

Explanatory notes are provided after Chart 7 of the Bluebook.

Middle panels Placing Greater Weights on the Inflation Objective (Inflation Target: 1.5 Percent)

Optimal policy with a 1.5 percent inflation goal derived from FRB/US using equal weights on the three stabilization objectives (which are keeping core PCE inflation close to its long run goal, keeping inflation close to the NAIRU, and minimizing fluctuations in the federal funds rate). There are three charts showing the paths for the federal funds rate, the unemployment rate, and core PCE inflation, through 2010. The line charts also show what the optimal policies would be if the weight on the inflation objective were increased.

Middle-left panel

Federal Funds Rate

As shown in the chart, increasing the weight on the inflation objective would imply a substantially tighter path for policy, with the funds rate peaking over 6 percent.

Middle-center panel Civilian Unemployment Rate

As shown in the chart, if greater weight were placed on the inflation objective, the unemployment rate would rise to about 5-3/4 percent, before edging lower in 2009 and 2010.

Middle-right panel Core PCE Inflation

As shown in the chart, if greater weight were placed on the inflation objective, core PCE inflation would move down towards its 1-1/2 percent target more rapidly than with equal weights on the objectives. Even still, core PCE inflation would be above 1-1/2 percent in 2010.

Bottom-left panel Probabilities of Alternative Policy Paths over June and August FOMC meetings*

A line chart showing the evolution of the probabilities of four alternative paths for policy since just before the May FOMC meeting. Odds of no change at the two meetings, no change in June and a 25 basis point increase in August, a 25 basis point increase in June and no change in August, and a 25 basis point increase at both meetings are shown. These are derived from federal funds futures and options prices. The odds of a 25 basis point increase at both meetings rose consistently, especially following the release of May CPI data.

* Calculated from federal funds futures and options prices, with term premium and other adjustments [Return to text](#)

Bottom-right panel

- Markets have become convinced of a quarter-point rate hike today.
- Odds of a further rate hike in August have moved up to about 70 percent.

Table 1: Alternative Language for the June FOMC Announcement

[Note: In Appendix 3, Table 1, emphasis (italic) has been added to indicate normal red text in the original document. Strong emphasis (bold) has been added to indicate normal blue 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 5 percent. | The Federal Open Market Committee decided today to leave its target for the federal funds rate <i>unchanged</i> at 5 percent. | The Federal Open Market Committee decided today to raise its target for the federal funds rate by 25 basis points to 5¼ percent. | The Federal Open Market Committee decided today to raise its target for the federal funds rate by <i>50 basis points</i> to 5½ percent. |
| Rationale | 2. Economic growth has been quite strong so far this year. The Committee sees growth as likely to moderate to a more sustainable pace, partly reflecting a gradual cooling of the housing market and the | <i>Recent indicators suggest that economic growth is moderating noticeably from its quite strong pace earlier this year, partly reflecting a cooling of the housing market and the lagged</i> | <i>Recent indicators suggest that economic growth is moderating from its quite strong pace earlier this year, partly reflecting a gradual cooling of the housing market and the lagged</i> | <i>Recent indicators suggest that economic growth is moderating from its quite strong pace earlier this year, but the level of resource utilization remains relatively high.</i> |

May FOMC

Alternative A

Alternative B

Alternative C

lagged effects of increases in interest rates and energy prices.

effects of increases in interest rates and energy prices.

effects of increases in interest rates and energy prices.

3. As yet, the run-up in the prices of energy and other commodities appears to have had only a modest effect on core inflation, ongoing productivity gains have helped to hold the growth of unit labor costs in check, and inflation expectations remain contained. Still, possible increases in resource utilization, in combination with the elevated prices of energy and other commodities, have the potential to add to inflation pressures.

The Committee views the pickup in core inflation this spring as unwelcome but likely to be transitory. Ongoing productivity gains, anchored inflation expectations, and moderate economic growth should reduce inflation in coming quarters.

Readings on core inflation have been elevated in recent months. Ongoing productivity gains have held down the rise in unit labor costs, and inflation expectations remain contained. However, the high levels of resource utilization and of the prices of energy and other commodities have the potential to sustain inflation pressures.

Ongoing productivity gains and contained inflation expectations should restrain inflation going forward. However, recent readings on core inflation have been elevated, which the Committee views as unwelcome.

4. The Committee judges that some further policy firming may yet be needed to address inflation risks but emphasizes that the extent and timing of any such firming will depend importantly on the evolution of the economic outlook as implied by incoming information.

The Committee judges that the risks to the attainment of price stability remain tilted to the upside but recognizes that the moderation in the growth of aggregate demand, along with other forces, should work to contain inflation going forward. While the Committee judges that some further policy firming may yet be needed to address inflation risks, considerable uncertainty attends the outlook, making it prudent to await the accumulation of additional information.

Although the moderation in the growth of aggregate demand should help to limit inflation pressures over time, the Committee judges that some inflation risks remain. The extent and timing of any additional firming that may be needed to address these risks will depend on the evolution of the outlook for both inflation and economic growth, as determined by incoming information.

In order to foster price stability and sustainable economic growth, the Committee seeks a medium-term decline in core inflation from its recent elevated levels. The Committee judges that some further policy firming may yet be needed to accomplish this outcome. The extent and timing of any such firming will depend importantly on the evolution of the economic outlook as implied by incoming information.

Assessment of Risk

5. In any event, the Committee will respond to changes in economic prospects as needed to support the attainment of its objectives.

[None.]

In any event, the Committee will respond to changes in economic prospects as needed to support the attainment of **its objectives**.

[None.]

[▲ Return to top](#)