

**FRBNY Blackbook**

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**RESEARCH AND STATISTICS GROUP**

**FOMC Background Material**

**June 2005**

**Class II FOMC – Restricted FR**

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# FRBNY BLACKBOOK

June 2005

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## 1. Overview

Readings on inflation in the second quarter have led us to raise our forecast of inflation. The increase is of a similar magnitude to that in Greenbook and both forecasts have core PCE inflation at 1.9% in 2006. We now assess the short term risks around this forecast as balanced although the longer term risks are now skewed down due to the introduction of a global deflation scenario. Thus, in the short run there is still considerable risk of inflation exceeding implicit targets by uncomfortably large margins.

The weakness in manufacturing in the late winter to early spring appears to have been an inventory cycle rather than a harbinger of weaker growth. Thus, as in the Greenbook our real activity forecast is little changed. Unlike the Greenbook, however, we do not believe that remaining margins of slack will put any meaningful downward pressure on inflation over the next year.

Therefore, our central projection remains consistent with a continued removal of policy accommodation with a terminal value of the FFR between 3.5 and 4.5%. Unless inflation comes down closer to implicit targets, it might make sense for the FFR to go to the higher part of this range. This would be well above the path currently priced into markets.

Consumer survey measures of inflation expectations have moved down, possibly reflecting May's drop in energy prices. Breakeven CPI inflation rates in the TIPS market have also fallen. If these forward-looking measures stay near recent levels in the wake of the recent firming of oil prices it would be a further sign of well-contained expectations of underlying inflation. Other financial market indicators are consistent either with long run inflation remaining well-contained or an increased but still small risk of global deflation.

The overall uncertainty assessed around our inflation and output forecast remains very low compared to historical experience. The stability of the recent GDP growth numbers has been unprecedented. The standard deviation of real GDP growth over the last six

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quarters (2003Q4-2005Q1) has been 0.4 percentage points, 0.5 percentage point less than any other six-quarter period in the entire history of the series. Financial markets quickly shrugged off the hedge fund worries of the early spring and our benign assessment of the risks is once again reflected in the historically low implied volatility and risk premia priced into financial markets. While the market is placing about 90% probability on an interval for the funds rate from 2.25% to 5.25% in March 2007, our forecast distribution and policy rules produce a slightly wider interval at this horizon.

## 2. Recent Developments

### U.S.

*Summary.* The data released since the last FOMC meeting indicate continued upside risk of underlying inflation exceeding the implicit target and balanced risks to real activity. Core inflation measures moderated in April and May, but remain elevated compared to implicit goals. Real GDP growth in 2005Q1 was revised upward to 3.5%, near our estimate of potential GDP growth. Indicators suggest weaker GDP growth and soft production growth in the current quarter. Payroll employment growth was strong in April and rather soft in May, but abstracting from such short-term fluctuations, the indicators remain consistent with the labor market near trend.

*Inflation.* Core inflation measures moderated in April and May. Although the 3-, 6-, and 12-month changes in core CPI fell from earlier levels, they all remain above the implicit FOMC goals. Core goods inflation was little changed, remaining modestly positive, while core services inflation moderated some. Energy price fluctuations continue to influence overall inflation: the recent rise in oil prices would portend higher headline inflation in coming months. Intermediate and crude goods PPI declined in May, an indication of a softer global industrial sector, but not necessarily a precursor to lower consumer inflation. The 12-month change in the core PCE deflator, available through April only, was little changed from that of previous months at a level slightly above the 1½% implicit target. However, shorter-term changes were more substantially above the target. [See Exhibit A-6 for further data on inflation measures.] Our underlying inflation gauge changed little during the inter-meeting period, indicating little change in the

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overall assessment of inflationary pressures from the data [see Exhibit A-7]. The recent data thus suggest continued risks of underlying inflation exceeding the implicit goal of the FOMC. After rising to the higher end of their recent prevailing ranges in April, near-term and long-term inflation expectations in the Michigan survey declined in May and the first half of June.

*Real activity.* Real GDP growth in 2005Q1 was revised upward to 3.5%, in part reflecting a downward revision in import growth. Recent revisions to the monthly data suggest it may be revised up further.

Consumer spending appears to have been maintained through the first part of 2005Q2. Real PCE rose moderately in April, held down in part by soft spending on utilities. Auto sales in April and May have been at a stronger pace than that of 2005Q1. Non-auto retail sales fell modestly in May after a strong April. Overall, real consumption growth appears to be around 3¼% (annual rate), a little slower than growth in recent quarters, but still a decent pace. The housing market continued to be robust: housing starts rebounded in April and May from a weak March. Home sales remained at a high level in April and May, and purchase mortgage applications data suggest continued brisk sales.

Business production and spending indicators remain rather tepid. Manufacturing production rebounded in May after declining the two previous months; still, the 12-month change of production has moderated considerably from the second half of 2004. There also has been a divergence between high-tech and low-tech sectors, with the high-tech sector sustaining a robust pace while the low-tech sector, particularly motor vehicles, has slowed considerably. Consistent with the strength of high-tech production, the 12-month change in our Tech Pulse index continued to be high. Shipments and orders for nondefense capital goods excluding aircraft rebounded moderately in April after two rather soft months, suggesting that equipment spending growth may remain on a moderate pace. Inventory accumulation slowed and inventories-sales ratios declined in April, which is consistent with our expectation of an inventory correction in 2005Q2.

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*Employment.* Monthly payroll growth remained erratic, rising a strong 274,000 in April and a tepid 78,000 in May. Still, looking at changes over longer horizons, payroll growth has averaged 150,000-175,000 per month, at or slightly above trend employment growth. Other indicators are consistent with little change or some slight improvement in the fundamentals. Initial claims for unemployment insurance remain near the levels that have prevailed since last fall. The index of aggregate hours in April and May was considerably above the 2005Q1 average: given our forecast for output growth in the quarter, productivity growth may be rather weak. Data from the household survey was fairly robust. The unemployment rate fell to 5.1% in May, and the prime-age male unemployment rate remained low at 4%. The labor force participation rate and the employment-population ratio both increased. Labor compensation data provided differing pictures: average hourly earnings and the Employment Cost Index rose moderately, while compensation per hour and unit labor costs rose more strongly. The stronger growth of compensation per hour appears to be related to greater realizations of stock options and other incentive pay programs. The implications of such increases for labor cost and inflation pressures are uncertain at this time [see the Special Topic box for more on the rise in compensation per hour and unit labor costs].

*Surveys.* Consistent with the recent tone of production data, manufacturing survey data were rather soft. The ISM manufacturing index fell in May and its level is consistent with continued sluggish growth in manufacturing. The Empire State index was negative in May and positive in June while the Philadelphia Fed index had the opposite pattern. Overall, these two indices are also consistent with continued tepid manufacturing growth. Although the ISM non-manufacturing index also fell in May, its level remained consistent with healthy growth in that sector. With energy prices falling in May, consumer confidence measures rebounded. The Conference Board measure remained solidly with its recent narrow prevailing range. The Michigan index, in contrast, rebounded from fairly low levels according to the preliminary June release.

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## Global

Foreign GDP is projected to increase 2.4 percent (Q4/Q4) in 2005; an upgrade from the previous cycle's forecast of 2.2 percent. Stronger-than-expected GDP data for Japan in Q1 were largely responsible for the upgrade. After Q1, the outlook is essentially the same as the last FOMC forecast.

*Industrial Countries.* The euro area forecast for 2005 remains unchanged at 1.5 percent (Q4/Q4). Relatively strong euro area GDP growth in Q1 (2.0 percent, saar) is not expected to be sustained as industrial production, orders and exports were largely flat in April while industrial confidence in May faltered for the sixth consecutive month. One bright spot was fairly good employment growth in Q1. Japan's GDP growth was very strong in Q1, up 4.9 percent (saar), leading us to raise the 2005 growth forecast to 1.7 percent (Q4/Q4). Other indicators of activity are not as strong, leading us to project a significant payback for the Q1 strength. Japan's April data on shipments and exports were soft; the Tankan business confidence index fell in Q1, albeit from a high level; while April retail sales were fairly strong. Recent data confirm a slowdown in the U.K. economy, with industrial production down sharply in Q1 and May retail sales quite weak. Mortgage lending and housing prices continue to decelerate.

*Emerging Economies.* China's 2005 growth forecast was upgraded slightly, reflecting stronger-than-expected growth in Q1. Somewhat worryingly, Q1 growth was driven by a fall-off in imports. However, data through May point to an upturn in domestic momentum, with industrial production, retail sales, and investment spending all posting fairly robust readings. Loan growth is the chief exception to the strengthening trend, although this slowdown likely reflects recent measures to curtail property speculation rather than a drop in loan demand. The outlook remains mixed elsewhere in Emerging Asia, with generally strong exports matched by weak industrial production data.

Growth in Latin America is decelerating, with first quarter GDP lower than expected in all three of the region's major countries. Calendar effects have made the data more

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difficult to assess, but weak economic indicators have prompted a lowering in the growth projections for Argentina, Brazil, and Mexico.

## **Trade**

The trade deficit in April increased to \$57.0 billion from the March level of \$53.6 billion (revised). The April level was below the 2005Q1 average, confirming for the moment an easing in the rate of deterioration of the trade balance. In real terms, exports were up 9 percent in April over year-ago levels, while imports were up 10 percent.

Net exports are now estimated to have taken 0.7 percentage point off GDP growth in 2005Q1, a substantial improvement from the advance release. Strong export data in March and April produce a projection that net exports will **add** 0.5 percentage points to GDP growth in Q2. The net exports component is projected to be only a modest drag in the second half of 2005.

## **Financial**

### *Domestic markets*

Since the last FOMC meeting, implied inflation from TIPS contracts declined 40 to 60 basis points to about 2.3 percent across the 2- to 5-year maturity [Exhibits B-1 and B-2]. In addition, implied inflation at longer horizons appears somewhat less correlated with oil price futures movements than previously was the case. The decline of TIPS-implied inflation is consistent with a slight decline in the Michigan survey of inflation expectations, with a reduction of uncertainty about the future path of inflation, as well as with the global deflation scenario discussed in the “scenarios and risk” section below.

Matching the flattening of break-even TIPS-implied inflation, Treasury yields declined for all maturities above one year, and increased slightly for one-year notes and shorter-term bills [Exhibit B-4]. These developments led to an overall flattening of the yield curve: the ten-year / three-month spread declined from 137 basis points on the day of the last FOMC to 100 basis points. Although this spread has declined considerably in recent



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months – consistently with a view of falling inflation expectations and inflation risk – it is not unusually low by historical standards.

Three main hypotheses have been put forth to explain this sharp flattening of yield curve and the term-structure conundrum: a temporary distortion due to financial market disturbances, a weak economic outlook, and low future short-term interest rates due to global factors. Regarding the first hypothesis, there is little evidence of technical factors temporarily distorting the bond market: liquidity measures have been stable, Treasury volatility (both implied and actual) has been low by historical standards, and credit spreads have come back down. In regard to the second hypothesis, the economic outlook both in terms of inflation and growth has improved since the last meeting. However, going forward, low long-term yields are consistent with slower-than-expected growth and low inflation.

Under our central scenario, shared by most forecasters, the most likely explanation of the fall in longer-term forward rates since the beginning of the tightening cycle is that real future short-rates are expected to remain low. While there is little consensus on estimates of the natural real rate of interest, most available estimates suggest that the natural real rate has fallen over the past 2-3 years. A lower level of the long-term rate is also consistent with the “global savings glut” hypothesis, possibly combined with lower global inflation expectations and risk premia.

At the beginning of the inter-meeting period, credit spreads and equity volatility increased while the S&P500 index declined [Exhibit B-3], in part reflecting the downgrade of GM and Ford debt and concerns about hedge funds’ losses. Both actual and implied volatilities in stocks and bonds, as well as credit spreads, have since decreased and are now lower than at the time of the last FOMC meeting, while the S&P 500 has recovered. Even though some market participants attributed the increases in credit spreads and a temporary drop in longer-term Treasury rates to flight-to-quality effects, liquidity indicators, such as the on-the-run / off-the-run spread, have stayed roughly constant during the inter-meeting period.

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Fed funds rates implied in October and December 2005 by futures contracts have fallen slightly, while implied rates for longer maturities (such as the February 2007 contract) have declined 25 basis points [Exhibit B-5 and B-7]. As a result, the implied Fed funds yield curve has steepened at the shorter end and flattened at the longer end, while implied skewness and volatility of fed funds futures declined slightly [Exhibit B-6]. Altogether, the evolution of fed funds futures during the inter-meeting period suggests an expected pause in rate increases toward the end of the year.

#### *Global Equity and Bond Markets*

Global equity markets strengthened broadly during the inter-meeting period. Both the FTSE-100 and the Nikkei gained 4 percent through June 27, reflecting both strengthening corporate balance sheets and falling long-term rates. Indeed, declines in bond yields have been widespread. Long-term euro-area sovereign yields have fallen to their lowest levels on record (3.15 percent), while Japanese yields have continued the slide that started in mid-2004, falling to 1.25 percent, despite an improvement in Japan's outlook. As is historically the case, a benign global interest rate environment benefited emerging market debt disproportionately. This also appeased earlier concerns about hedge funds' losses and other negative credit developments, and caused EMBI+ spreads over Treasuries to narrow.

*Monetary Policy.* Continued weaker-than-expected economic data in the euro area muted expectations that the ECB might tighten monetary policy next year. In fact, despite official commentary to the contrary, expectations have strengthened that the next policy move might be a rate cut: the cash EONIA swaps curve became slightly inverted through end-2005, suggesting that a rate decrease is more likely than a rate increase over that time frame. The policy rate was cut in Sweden, and expectations for an impending rate cut by the Bank of England have also strengthened, especially after minutes of the last meeting revealed two MPC members to have voted in favor of an immediate cut. Bank of Japan Board members continue to debate a reduction in the target level of banks' reserve balances. At its May 20 meeting, the Board decided to allow balances to fall temporarily

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below their target range – possibly a compromise solution with some members advocating an outright reduction of the target and a rapid resumption of positive interest rates. Elsewhere, monetary tightening has come to an end in Brazil and Mexico, while Argentina’s central bank continues its sterilized purchase of dollars.

*Exchange Rates and Capital Flows.* The main inter-meeting development in foreign currency markets was the continued appreciation of the dollar, which benefited from favorable macroeconomic news in the United States – especially relative to Europe – and fading expectations of policy tightening abroad. During the inter-meeting period, the dollar gained almost 6 percent on the euro, 3.5 percent on the yen, and 3 percent in (nominal) effective terms. Since the beginning of the year, when the dollar’s recent strengthening cycle took hold, the dollar has gained 10 percent on the euro, 6 percent on the yen, and 6.5 percent in (nominal) effective terms. The sharp decline of the euro, now trading near its end-2003 levels against the dollar, reflects both recent downbeat data from the euro area as well as the negative sentiment generated by the recent French and Dutch referenda on the European Constitution. The dollar also strengthened relative to Emerging Asia’s currencies, in part because of reduced speculation about a near-term revaluation of the Chinese RMB. Indeed, discounts on Chinese NDFs have narrowed from their peaks in the previous FOMC cycle. A notable development was the introduction of a trading band in Hong Kong that will allow its currency to appreciate up to HK\$7.75/US\$ before requiring intervention.

Foreign interest in U.S. assets continues despite a decline in net changes in both external assets and liabilities in Q1 2005. In fact, the declines were essentially accounted for by usually-volatile inter-bank flows, while foreign purchases of U.S. bonds remained at high levels, and foreign purchases of U.S. equities and direct investment remained steady (albeit at a relatively minor level). For 2005 as a whole, the capital inflows required to finance the U.S. current account deficit will be matched mainly by surplus savings in Japan and major developing Asian economies (projected at about \$390 billion), in the fifteen major Western European countries and Canada (\$100 billion), and in Russia and

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other oil-producing countries (\$250 billion). Inflows from Asia continue to be the major source for funding U.S. public debt.

### *Oil Markets*

UK Brent oil prices rose sharply, reaching \$57.21 on June 24, up from \$49.11 on May 3. (The spot price for West Texas Intermediate, the other commonly cited oil price, rose to above \$60 during the day on June 27.) Futures prices rose in tandem, with the December 2006 contract rising from \$50.10 to \$57.92 over the same period, with slight solace deriving from a flattening futures price curve. While oil prices have recently been volatile, limited excess production is likely to continue supporting prices in the future. (Based on recent oil futures prices, FRBNY assumptions of oil prices for Q4 2005 and Q4 2006 are \$57.25 and \$56.25 respectively.)

### **Second District**

Our Indexes of Coincident Economic Indicators for May signal a pronounced slowing in growth in both New York State and New Jersey, though New York City continues to register brisk growth [Exhibit E-1]. Looking ahead to the next 9 months, our leading indexes predict more of a divergence, with growth projected to slow to about 2% in New Jersey, but to accelerate to above 5% in New York State and slightly over 7% in New York City [Exhibit E-2]. Consumer price inflation in metropolitan New York City slowed in May, as the overall CPI rose 3.4% from a year earlier, while the core CPI rose 2.8%—in both cases, about ½ point above their national counterparts. An unusual spike in shelter costs, which had accounted for much of an uptick in local inflation in March, was largely reversed in April and May. A modest rollback in the New York State's sales tax rate this month is likely to have a modest dampening effect on June's CPI figures.

*Labor Markets.* Regional payroll employment grew at a moderate pace in May, while unemployment rates were steady to lower. Private-sector employment in the region rose at a 1.2% annual pace in May—a bit faster in New Jersey; a bit slower in New York. While last month's job growth was a bit stronger regionally than nationally, growth over the past three months, at 1.5%, has been right in line with the U.S. Year-over-year, though, private-sector employment, which rose 1.7% nationwide, was up by slightly over

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1.0% in both the New York-New Jersey region and New York City [Exhibit E-3]. In contrast, unemployment rates have fallen more steeply regionally than nationally over the past year. New Jersey's rate fell 0.3 points to 3.9% in May, and is down a full point over the past 12 months. Although New York State's rate edged up 0.1 point in May to 5.0%, it is down 0.8 points over the past year, and New York City's rate, at 5.9%, is down sharply from 7.1% a year earlier [Exhibit E-4]. New Jersey's manufacturing sector has been notably weak in 2005, which is most evident in a precipitous drop in average weekly hours; this, in turn, accounts for much of the recent weakness in New Jersey's composite index noted earlier.

*Real Estate.* Construction activity and real estate markets across the district seem to be showing persistent strength again in the second quarter. While single-family housing permits have weakened modestly thus far in 2005, the number of multi-family units authorized has surged, mostly in the New York City metro area, to levels not seen since the mid-1980s. Year-to-date, multi-family permits are running 40% ahead of 2004 levels, whereas single-family permits are down 6%. Home price appreciation over the past year continues to run well over 10% across much of the region. Office markets in metropolitan New York City were steady to stronger in April and May.

*Surveys and Other Business Activity.* Recent surveys of businesses and consumers have given tepid signals on the regional economy. Our June Empire State Manufacturing Survey indicates some rebound in manufacturing activity following a pullback in May, though current index readings remain well below the levels that prevailed throughout 2004 and in early 2005. June's survey also suggests a further deceleration in both prices received and prices paid; this contrasts with May surveys of purchasing managers, which had suggested some pickup in price pressures. Consumer confidence surveys showed mixed results in May: Siena College's latest survey of New York State residents showed a modest increase in confidence, but the Conference Board's index, covering New York, New Jersey and Pennsylvania, slipped to a six-month low.

# Special Topic

## The Role of Employee Stock Options in the Acceleration of Labor Income: 2004Q4 – 2005Q1

June 22, 2005

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The objective of this note is to estimate the magnitude of stock option realizations for 2004 Q4 and 2005 Q1. The issue is to what degree option income can explain the revision to the income estimates for these two quarters. The table below summarizes our findings.

The degree to which our estimate of the income derived from the exercise of stock options accounts for the income revisions depends on the assumed level of option income in the initial income estimates. The contribution of option

income to the revision would be given by our reported option income estimates less the assumed magnitude for each quarter. One possibility is to assume that the initial option income equaled the magnitude of option income for 2003 Q4. We estimate this to be \$39.0 billion. This would imply “unanticipated” option income of \$9.9 billion in 2004 Q4 and \$4.2 billion in 2005 Q1, which suggests that the exercise of stock options may have accounted for approximately half of the 2004 Q4 income revision.

	2004 Q4 (\$B)	2005 Q1 (\$B)
Initial Income Estimate (annualized)	6,772.5	6,868.7
Revised Income Estimate (annualized)	6,848.6	6,967.0
Revision	19.0	24.6
Estimated Income from Stock Option Realizations	48.9	43.2

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### 3. Outlook

#### FRBNY's Central Forecast

*Real Activity.* There is little indication at this time that GDP growth will veer far from its recent tight path of around 3½%. Q2 growth looks like it will be slightly less than that, reflecting a mild adjustment in production as firms seek to avoid any excess inventory buildup (especially in motor vehicles) as well as a sluggish period for defense spending. The fundamentals of our outlook over the rest of the forecast horizon are unchanged from the last cycle: Consumer spending is expected to continue to grow steadily; the removal of stimulus from tax cuts and continued high energy prices are being offset by the improvements in the labor market and the associated firmer wage and salary growth. Business spending on equipment and software, after a muted Q1, is projected to return to a low double-digit growth rate as business steps up the growth of capacity to meet demand, though the April and May capital goods orders and shipments data were disappointing. We still anticipate that housing will begin to fade as a source of growth, as mortgage rates begin to rise slightly, and federal spending looks to be drifting down to a slower growth path. Offsetting these negatives are an anticipated revival of nonresidential building outlays, a strengthening of state and local government outlays (reflecting their greatly improved finances), and a bit less drag from the external sector as the depreciation of the dollar over the past year takes hold. We assume that firms will continue to desire to keep inventory-sales ratios near their current low levels.

*Inflation.* With real output projected to grow near our estimate of potential, and no sign of any marked slack in the economy, there is no strong reason to assume that core PCE inflation will veer much from its recent pace. We believe the recent high frequency numbers showing inflation above 2% overstate the underlying trend, and that inflation should stabilize a bit under that mark. The recent sharp increase in unit labor costs might suggest some new upside risk, but we think the cost boost—apparently stemming from option realizations and other bonus payments—is likely to be ephemeral. Moreover,

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profit margins are sufficiently large and competitive pressures sufficiently intense to make it somewhat doubtful that higher cost growth will be passed on to faster inflation in the near term. The continuing drop in the unemployment rate, particularly for prime-age males, does arguably suggest that inflation could rise. However, the recent moderation of many price measures and of many proxies for inflation expectations suggests that there is some underlying resistance to higher inflation that should be incorporated into the outlook.

### **Comparison with Greenbook Forecasts**

*GDP and Inflation Forecast.* The Greenbook's baseline path of the federal funds rate in 2005 is now consistent with ours, at 3½% by year-end, but it is lower than ours in 2006, where the endpoint is 3¾% versus 4% in our forecast.

The projections for GDP and inflation are consistent with our staff forecast for the current year. For 2006, however, the Greenbook forecast for the GDP growth rate is below our forecast due to a larger drag from the external sector and a slower growth of business fixed investment. For the near term, the Greenbook lowered its forecast of GDP growth for 2005Q2 from April's forecast of 3.6% to 3%, mainly because of a sharper than anticipated slowdown in inventory investment. As in our staff forecast, the Greenbook forecast has a rebound in the GDP growth rate for 2005H2 to around 3.7%.

The inflation forecast of the Greenbook is similar to our staff forecast for 2005, but it is slightly lower for 2006, both for the total PCE inflation (1.7% vs. 2.2%) and for the GDP deflator inflation (1.9% vs. 2.3%). The Greenbook raised its core PCE inflation forecast for 2006 from April's forecast of 1.7% to 1.9%, which is the same as in our staff forecast.

Despite similar inflation projections, some differences are evident between the Greenbook and our forecast in the labor market projections, especially for 2006. Our forecast maintains the April Blackbook forecast for the growth of compensation per hour at 3.9% in 2005 and 3.6% in 2006; the Greenbook lowered its forecast for 2005 from 4.4% to 4%, but raised that for 2006 from 4.7% to 5%, evidently anticipating a larger



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effect of lagged inflation for labor compensation. Since the outlook for productivity growth remains higher in the Greenbook forecast than in ours, 2.5% vs. 2.3%, the forecasts of unit labor cost growth are only mildly different for this year. In 2006, however, the sharper increase of compensation in the Greenbook forecast leads to a projection of a 2.3% increase in unit labor costs vs. our more modest 1.1%.

The Greenbook employment forecast is essentially the same as our staff projection. Structural labor productivity has been revised up to 3% for 2005 and 3.1% for 2006, with potential GDP growth at 3.2% and 3.4% respectively. The unemployment rate, projected to be 5.2% in 2005Q4 and 5.1% in 2006Q4, remains, as in the April forecast, just 0.1% above our forecast.

*Alternative Board Scenarios.* The Greenbook discusses several risks to the current forecast, two related to a possible decline in housing prices and another five coming from the demand side, the supply side, and from changes in financial and monetary policy conditions.

The simulation of the downturn in housing prices replaces the baseline projection of a mild 5% increase in housing prices by the end of 2006 with a fall of 10% by late 2006 and a further fall of 5% in 2007. Two possible outcomes are considered: one with a wealth effect of a magnitude standard in Board models, in which the saving rate rise one percentage point above baseline; and the other with a stronger wealth effect combined with a decrease in consumer confidence, in which the savings rate raises about 2 percentage points above the baseline. For both cases, the outcome depends upon whether there is monetary policy accommodation to the macroeconomic effects of the home price decline.

In the more benign case of a mild wealth effect, the impact of the housing price fall would begin to be seen only in 2006, with a quarter point decline in real GDP and a 0.1 percentage point increase in the unemployment rate. In 2007, the drag on GDP would be of 0.5 percentage points and the increase in the unemployment rate would be 0.3

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percentage point. There is virtually no impact on inflation. In this scenario an accommodative monetary policy response, that would progressively cut the federal funds rate of about 50 basis points relative to baseline, would mitigate those effects and keep GDP growth largely unchanged in 2007.

In contrast, with a “heightened spending response” to the decline in housing prices, GDP growth would decline almost 1 percentage point, the unemployment rate would rise about 1¼ percentage points, and inflation would decline 0.4 percentage point. In this case, a larger drop in the funds rate would be necessary to mitigate the GDP slowdown.

As for the other scenarios, the Greenbook considers the cases of stronger demand, stronger compensation pressures, faster productivity growth, higher bond premia, and faster policy tightening.

If “stronger demand” would arise for reasons related to the housing market, business investment and dollar depreciation, the equilibrium real rate would be higher than that implicit in the staff projections. This increase would boost output growth to 4½% and reduce unemployment below 4½% by late 2006. Inflation, though, would increase only marginally in 2006.

The “stronger compensation pressures” scenario considers the effect of an increase in compensation of about a percentage point faster than in the baseline case. This increase is projected to have its effects mostly on inflation because firms are assumed to have sufficient pricing power to maintain their profit margins despite the higher labor costs. PCE inflation is projected to be 2.7% in the second half of 2005 and 3% in 2006. This pickup in inflation, while generating a fall in the real fed funds rate, would also lead market participants to expect that the Fed will eventually tighten: bond yields would then go up and real output and unemployment would remain essentially unaffected.

Turning to the “faster productivity growth” scenario, we observe a higher growth in GDP of 4.1% and 4.3% respectively in 2005H2 and 2006, fostered by gains in consumer

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spending and business investment. The more modest increase in unit labor costs in this scenario would allow core PCE inflation to be 1.9% in 2005Q2, and move down to 1½% in 2006.

In the “higher bond premia” scenario far-forward rates are assumed to retrace their decline of the past year. Risk spreads widen, the economy weakens, and yields on private bonds rise by larger amounts. The effect is to restrain consumption and investment, which causes real GDP growth to slow to about 2¼% in 2006. Unemployment rises to 5.7%, and inflation moderates to just below 2% in 2005H2 and to 1.7% in 2006.

Finally, while in all the above scenarios the path of the fed funds rate was kept as in the baseline (3½% by the end of 2005, 3¾% by the end of 2006), the last scenario considers a faster tightening path, with the funds rate rising 25 basis points at each of the next four meetings, and remaining at 4% thereafter. The faster tightening is interpreted by investors in the model as a higher long-run path of the fed funds rate; this raises bond yields by about 15 basis point above baseline, and moderates GDP growth to 3.1% in 2006. However, the new path has a minimal effect on the forecast of unemployment and inflation, and its overall effect may be mitigated if investors perceive the new path as a short term departure from the expected path.

In summary, the scenarios that generate the most noticeable real effects are the high bond premia scenario, with a negative effect on both output and employment, and the stronger demand scenario, with a positive effect on both GDP growth and unemployment. The inflation forecast changes significantly only under the scenario of stronger compensation pressures, when it rises to 2.7% and 3.1% respectively this year and the next.

*Foreign Outlook.* The Board’s foreign outlook is very similar to ours, with the notable exception being the Q2 growth projections for the euro area and Japan. In both regions, the GDP data were stronger than expected in Q1. The Greenbook has growth returning to just under the Board’s estimate of potential in the quarter, while our forecasts assume a more substantial dip to near zero as payback for the strong Q1 growth.

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*U.S. Trade.* Our forecast for net exports is very similar to the Board's forecast. The Greenbook has a contribution of 0.6 percentage point for Q2, while we project a 0.5 percentage point contribution. Going forward, the net export forecasts are roughly the same, with net exports expected to take 0.3 percentage point off growth in 2006.

### **Comparison with Other Forecasts**

*Other Internal Forecasts.* In addition to the baseline forecast, the NY Fed staff is now routinely producing two alternative inflation forecasts, one labeled UIG (Underlying Inflation Gauge), and one based on TIPS. The UIG is a measure of inflation obtained from a dynamic factor model that combines information from a large number of nominal and real variables (a non-technical description of its construction is in the Appendix to Exhibit A-7). The TIPS inflation forecast is estimates of the inflation expectations derived from TIPS and nominal Treasury securities, not accounting for risk premia or other technical factors (a non-technical description of its construction is in the Appendix to Exhibit B-1).

A chart comparing these two measures of underlying inflation is in Exhibit A-7. The chart shows that medium term inflation expectations – the average over 2-3 and over 3-5 years – declined substantially and implied inflation from the TIPS has moved towards the UIG measure over these horizons.

*Private Sector Forecasts.* Real GDP forecasts of other private sector forecasters are in rough agreement with the staff forecast for 2005Q2, but slightly below for the rest of the year. The one exception is the Macroeconomic Advisers forecast, which has a higher second quarter growth forecast and ends 2005 slightly higher than the staff forecast.

CPI inflation forecasts of the private sector are lower than the staff forecast for all quarters of 2005, but show the same pattern of declining inflation from the second quarter on. Macroeconomic Advisers, however, forecast core CPI inflation about 0.2 percentage point higher than the New York Fed staff.

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## Alternative Scenarios and Risks

*Alternative 1: Global Deflation.* This is a new scenario and replaces *extinguishing a low burning candle*. We have introduced this scenario as one possible explanation of the sizable declines in forward nominal interest rates at longer horizons. The scenario is related to changes in the world economy, particularly the growth of the Chinese economy and the stagnation of the economies of Europe and Japan. The Chinese growth represents a shift in the aggregate supply curve, leading to higher growth and lower inflation in the US, while the European and Japanese stagnation represent a shift in the aggregate demand curve, leading to lower inflation and lower growth in the US. The net effect of these deflationary shocks is unambiguous in terms of lowering inflation, but might lead to either higher or lower US and global growth. It unambiguously lowers long-term yields.

*Alternative 2: Productivity.* In the post-war era, the United States has experienced three productivity epochs (pre-1973, High I; 1973 to mid-1990s, Low I; and mid-1990s on, High II). Our current central projection for productivity in the medium term assumes a growth rate similar to the pre-1973 epoch. There are two alternatives to this projection.

### *2a. Continued Surge*

The developments in the labor market and continued strength of labor productivity over the longer term (despite the recent short-term moderation) suggest that firms have become more efficient in using labor. As such, strong productivity growth could persist. This would imply that the potential growth rate is higher than our current estimates. In addition, strong productivity growth would limit labor cost pressures, and inflation thus would remain subdued. Incoming data that would support this scenario would be continued upside surprises in labor productivity growth that bring the four-quarter average back above 3%, continued strength in consumption, and continued falls in the price of investment goods. Since the last FOMC, consumption has remained fairly strong; the tech sector, unlike traditional manufacturing, has experienced robust growth; and there have been large falls in the prices of some tech goods.

### *2.b Slower Productivity Growth*

There is now some evidence of a slowdown in productivity growth in 2004Q4 and 2005Q1. Further, 2005Q2 might have very low productivity growth. Our central

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projection assumes this is only temporary cyclical moderation in productivity growth, but there is downside risk to this assessment. Incoming data supporting increasing this risk would be a drop in the four-quarter productivity average below 2%, a slowdown in consumption growth, and a firming in the price of investment goods. If the increase in the level and volatility of commodity prices represents a shift in demand outside the US, this could also produce a fall in labor productivity.

*Alternative 3: Overheating.* The extremely accommodative policy followed both in the US and in other countries since the global slowdown in 2000-2003 produces a persistent move in inflation above implicit targets with an abrupt slowdown in real output growth starting in late 2005. There are two potential connected channels at work here. The first is a continued underestimate of the equilibrium real rate (i.e., an overestimate of slack in the economy) and the second is higher energy prices. Sustaining the real policy rate below the equilibrium rate for a long time will tend to switch the impact of monetary policy from increasing real output to raising inflation as inflation expectations increase. The evidence from housing, commodity prices, implied inflation rates from TIPS, and inflation reports since the last FOMC meeting have been mixed in this regard.

TIPS implied inflation rates have fallen significantly but part of this fall appears to be related to technical factors. While core inflation has appeared to moderate from the spring, total inflation continues to be high, oil prices are again at record highs and forecasts of core inflation in 2006 are moving up. Housing continues to be very strong with price increases perhaps even accelerating. In addition, rising home prices may eventually lead to an increase in rental prices, which would have a direct impact on inflation. The increase in housing prices and the expected rise in rental prices might, however, be a permanent adjustment to the lower equilibrium real rate.

Exhibits C-2 and C-3 show the path of inflation and output under the alternative scenarios compared to the Bank's central scenario forecast.

#### *Additional Uncertainties*

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*Foreign Outlook.* The ability of foreign economies to absorb higher energy prices remains the key risk to the outlook. The dollar's rise over the inter-meeting period improves the competitiveness of Europe and Japan, but it also boosts the price of oil when denominated in local currency terms. In the euro area, faltering business confidence needs to stabilize soon in response to the somewhat weaker euro and lower long-term interest rates to be consistent with the forecast. Japan needs its exports to recover since domestic demand has not been sufficient in recent history to sustain solid growth.

The extraordinarily high share of investment spending in Chinese GDP risks an eventual hard landing, with significant spillover to the rest of Emerging Asia. The timing and magnitude of a potential Chinese revaluation represents another wild card for both China and the rest of Emerging Asia.

In Latin America, currencies and local financial conditions remain vulnerable to U.S. financial markets. Political developments could also be a source of asset weakness, with an emerging bribery scandal weakening the government in Brazil, and presidential elections looming in 2006 for Brazil and Mexico. Brazil remains one of the countries most sensitive to global financial conditions.

*U.S. Trade Forecast.* The forecast relies on the dollar's depreciation and moderation in domestic demand growth to rein in import growth over the rest of 2005.

The extent of the boost to exports from the weak dollar is one source of uncertainty in the forecast. If import price inflation starts to accelerate from its recent modest level, the nominal trade deficit could deteriorate further in the medium run.

The behavior of oil prices is another source of uncertainty. The forecast assumes a very low price elasticity on oil import demand. A more aggressive response to high energy prices would reduce the drag from higher import volumes on GDP.

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*Quantifying the Risks.* The incoming data have been consistent with our central scenario but reactions of long-term interest rates have been less so. We are increasing the current probability assessment of the central scenario to 67% (it was 59% for the May FOMC).

**Further, we are changing the balance of risks.** In May we had upside risk to the central projection of inflation and downside risk to output. The introduction of the global deflation scenario produces a more complex balance of risks. The scenario has a very low probability but is assumed to be very persistent as it represents a structural change in the world economy. It produces downside risk to the forecast in late 2006 and 2007. Over the earlier period the risks to the forecast are approximately balanced albeit along a higher inflation path than in May.

Financial market developments reviewed above support our view of a change in the balance of risks. We assume that the most likely alternative scenario is now overheating at 10% (14% in May), next is a productivity slowdown at 8% (10% in May), followed by continued productivity surge at 8% (8% in May) and global deflation at 3%. The remaining 4% covering the additional uncertainties is split 2% (May 2%) to the upside and 2% (May 2%) to the downside. The implied dynamic balance of risks is shown in Exhibit C-1.

The forecast distributions for core PCE inflation and GDP growth produced by these risk assessments are shown in Exhibits C-4 and C-5. The higher central inflation path keeps the probability at 55% (55%) that core PCE inflation will exceed 2.5% in the next 12 quarters (this probability is produced by considering the share of inflation paths that exceed 2.5% and can not be obtained directly from the forecast distribution presented in Exhibit C-4). The probability that the expansion continues through the end of 2007 is 95% (92% in May) as we have removed some of the downside risk to output in 2005 and 2006. The FRBNY “confidence intervals” are similar to those in the Greenbook. The main difference is that we are slightly more confident in the output forecast and slightly less confident in the inflation forecast than the Greenbook.



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## 4. Policy Alternatives

Our baseline forecast and risk assessment are consistent with a 25 basis point increase in the target rate at present and a maintained signal of further future increases. Exhibit D-1 shows the effects of assuming different policy rules on the path of FFR after the June meeting. For this cycle we consider three variations on our standard gradual policy rule: measured ends at neutral; measured ends in August; and, inflation hawk. The exact details of these rules are discussed in the preamble to the Section D exhibits. The main change in our risk assessment this cycle is the introduction of the global deflation scenario. Although it has a small probability, it effectively counteracts the effect of the higher inflation profile in our central scenario on the nominal FFR.

All three policy rules produce a higher level for the FFR in 2006 than presently priced into financial markets. This is similar to the situation in the last cycle but the gap is larger because of the fall in the implied market path since the last FOMC. The reaction of financial markets to Fed comments in the inter-meeting period and fall in forward one year rates at long horizons suggest that, unless financial markets place a much higher weight on a global deflation than we currently do, there is greater evidence that the neutral rate is more likely between 3.5 to 4% than 4 to 4.5%.

Measured ends in August and the inflation hawk rules also produce considerably more volatility than is currently priced into options markets at longer horizons as can be seen in Exhibit D-2.

If we focus on the rule that appears to be most consistent with market expectations for the next few meetings, measured ends at neutral, then the alternative scenarios of overheating and global deflation have very different implications for policy in 2006 and 2007. Exhibit D-3 contains the path of the nominal FFR and Exhibit D-4 the real FFR.

As seen in Exhibit D-3, the projected path of the FFR is much higher under the overheating scenario in 2006 than in either our central projection or the market implied

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path. The path of the FFR under the global deflation scenario is very different from the other paths as the Fed reacts quickly to signs of deflationary pressures. As can be seen in Exhibit D-4 this does not prevent the real rate from becoming quite high in late 2005, in contrast to the overheating scenario where the real rate remains too low.

Finally we combine the different policy rules to produce an expected path and volatility of the FFR to compare to that priced into markets. The gap in the expected path is large in 2006 and increases to over 50 basis points in 2007. We ran an alternative simulation with the inflation target in the policy rule set at 1.75% and a large initial output gap. This produces an expected path from the forecast distribution averaged over the policy rules that is much closer to the market expected path as can be seen in Exhibit D-5. However, the implied volatility around this path is higher than currently priced into markets by mid 2006. In contrast, using our standard assumptions the implied volatility is below the market implied path until the end of 2006.

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## A. Forecast Details

### **Exhibit A-1. Actual and Projected Percentage Changes in GDP, Prices, and the Unemployment Rate**

Summary of the FRBNY forecast for the current FOMC cycle as well as the previous two cycles. Provides the forecasts of real GDP growth, change in the GDP deflator, change in the PCE deflator, the change in core PCE deflator, and the level of the unemployment rate. Data frequencies are both quarterly and yearly over the forecast horizon.

Source: Macroeconomic and Monetary Studies (MMS) Function, FRBNY

### **Exhibit A-2. Detailed Comparison of FRBNY and Greenbook Forecasts**

Summary of the baseline FRBNY and Board forecasts for the current FOMC cycle as well as the previous cycle. Besides variables included in Exhibit A-1, there are forecasts for some broad components of GDP, some measures of productivity and wages, labor force participation, payroll employment growth, and some financial market variables.

Source: MMS Function, FRBNY; Board staff

### **Exhibit A-3. Judgement Table**

History and forecasts of the primary variables in the FRBNY forecast. This includes the detailed judgements, such as those for interest rates, profit growth, productivity, and real activity, that are behind our forecasts for aggregates such as real GDP and inflation.

Source: MMS Function, FRBNY

### **Exhibit A-4. Real GDP and components (growth contributions)**

History and forecasts of the contributions to real GDP growth of the broad components of expenditures. Growth contributions are in percentage points.

Source: MMS Function, FRBNY

### **Exhibit A-5. Alternative GDP and Inflation Forecasts**

Real GDP growth and CPI inflation forecasts from a variety of sources. Besides the FRBNY forecast, the table includes the medians from two surveys of forecasters (Blue Chip and Survey of Professional Forecasters [SPF]), the forecasts from Macroeconomic

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Advisors, and the forecast from a small model (PSI model) that uses business activity and sentiment as the primary independent variables.

Source: MMS Function, FRBNY; Blue Chip Economic Indicators; FRB Philadelphia Survey of Professional Forecasters; Macroeconomic Advisors

**Exhibit A-6 (1, 2, & 3). Recent Behavior of Inflation**

The three tables in this exhibit are included as reference: they show the actual changes in inflation over 3, 6, 12, and 24 months.

Source: Bureau of Economic Analysis, Bureau of Labor Statistics

**Exhibit A-7. Underlying Inflation Gauge (UIG) and Implied Inflation from the TIPS**

The chart displays measures of inflation expectations from the UIG, and compares them to the TIPS measure over the same horizon (a non –technical description of the construction of this measure is in Appendix to Exhibit A-7 below. A non –technical description of the construction of inflation expectations from the TIPS is in Appendix to Exhibit B-1).

Source: MMS Function and Swiss National Bank.

**Appendix to Exhibit A-7. Construction of UIG (Underlying Inflation Gauge)**

The Underlying Inflation Gauge is a measure of underlying inflation that incorporates information from a very broad set of nominal and real variables. It is constructed using a dynamic factor model to extract a common component from the chosen set of variables, and then removes the high frequency movements (fluctuations whose frequency is up to one year) from this component. This filtering reflects our view that monetary policy is primarily interested in shocks with a medium-term impact on inflation. In terms of units, the UIG maps into a measure of consumer price index.

We use this factor model to determine the oscillations of the UIG about its long-term level. Assuming that long-term expectations are well anchored, we set the long-term level of the UIG to 2.25%, the average inflation rate since 1994, which can be interpreted as an implicit inflation target.

## A. Forecast Details

**Exhibit A-1: Actual and Projected Percentage Changes of GDP, Prices, and the Unemployment Rate**

	Chain Type															
	Real GDP			GDP Price Index			PCE Deflator			Core PCE			Unemployment Rate			
	Mar05	Apr05	Jun05	Mar05	Apr05	Jun05	Mar05	Apr05	Jun05	Mar05	Apr05	Jun05	Mar05	Apr05	Jun05	
2004 Q1	4.5	4.5	4.5	2.8	2.8	2.8	3.3	3.3	3.3	2.1	2.1	2.1	5.7	5.7	5.7	
2004 Q2	3.3	3.3	3.3	3.2	3.2	3.2	3.1	3.1	3.1	1.7	1.7	1.7	5.6	5.6	5.6	
2004 Q3	4.0	4.0	4.0	1.4	1.4	1.4	1.3	1.3	1.3	0.9	0.9	0.9	5.4	5.4	5.4	
2004 Q4	3.8	3.8	3.8	2.1	2.3	2.3	2.5	2.7	2.7	1.6	1.7	1.7	5.4	5.4	5.4	
2005 Q1	4.5	3.1	3.5	2.5	3.3	3.2	1.8	2.1	2.1	1.7	2.2	2.2	5.3	5.3	5.3	
2005 Q2	4.4	3.6	3.2	3.2	1.2	1.6	3.0	3.0	3.7	1.5	1.8	2.0	5.2	5.2	5.2	
2005 Q3	3.9	3.9	4.1	2.3	2.0	1.9	2.0	1.9	2.1	1.5	1.8	1.9	5.1	5.2	5.1	
2005 Q4	3.4	3.5	3.5	2.2	2.3	2.3	2.0	2.1	2.2	1.6	1.8	1.9	5.0	5.2	5.1	
2006 Q1	3.4	3.6	3.4	2.6	2.6	2.6	2.0	2.1	2.2	1.7	1.8	1.9	5.0	5.2	5.1	
2006 Q2	3.5	3.6	3.6	2.1	2.1	2.2	2.0	2.1	2.2	1.7	1.8	1.9	5.0	5.2	5.1	
2006 Q3	3.6	3.6	3.6	2.2	2.2	2.2	2.1	2.2	2.2	1.8	1.9	1.9	5.0	5.2	5.0	
2006 Q4	3.7	3.7	3.7	2.3	2.3	2.3	2.1	2.2	2.2	1.8	1.9	1.9	5.0	5.2	5.0	
2002 Q4 to 2003 Q4	4.4	4.4	4.4	1.7	1.7	1.7	1.7	1.7	1.7	1.2	1.2	1.2	0.0	0.0	0.0	*
2003 Q4 to 2004 Q4	3.9	3.9	3.9	2.4	2.4	2.4	2.5	2.6	2.6	1.6	1.6	1.6	-0.4	-0.4	-0.4	*
2004 Q4 to 2005 Q4	4.0	3.5	3.6	2.5	2.2	2.2	2.2	2.3	2.5	1.6	1.9	2.0	-0.4	-0.2	-0.3	*
2005 Q4 to 2006 Q4	3.5	3.6	3.6	2.3	2.3	2.3	2.0	2.1	2.2	1.7	1.8	1.9	0.0	0.0	-0.1	*

\* Q4 to Q4 absolute change

Notes: Columns reflect the date of a forecast. Italics indicate a data release prior to date of a forecast

## A. Forecast Details

### Exhibit A-2: Detailed Comparison of FRBNY and Greenbook Forecasts

	FRBNY				Board			
	2005		2006		2005		2006	
	APR	JUN	APR	JUN	APR	JUN	APR	JUN
REAL GDP (Q4/Q4)	3.5	3.6	3.6	3.6	3.6	3.6	3.5	3.4
GROWTH CONTRIBUTIONS(Q4/Q4)								
FINAL SALES TO DOMESTIC PURCHASERS	3.9	3.7	3.9	3.9	3.6	3.7	3.5	3.4
CONSUMPTION	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.5
BFI	0.9	0.8	1.2	1.1	0.9	0.9	0.9	0.9
STRUCTURES	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
EQUIPMENT & SOFTWARE	0.8	0.8	1.0	1.0	0.8	0.8	0.8	0.8
RESIDENTIAL INVESTMENT	0.2	0.1	-0.1	-0.1	0.2	0.3	0.0	0.0
GOVERNMENT	0.5	0.4	0.6	0.6	0.4	0.4	0.4	0.4
FEDERAL	0.3	0.2	0.2	0.2	0.3	0.2	0.1	0.1
STATE & LOCAL	0.2	0.2	0.4	0.3	0.2	0.2	0.3	0.3
INVENTORY INVESTMENT	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0
NET EXPORTS	-0.4	-0.1	-0.2	-0.2	-0.3	-0.1	-0.3	-0.4
INFLATION/PRODUCTIVITY/WAGES (Q4/Q4)								
GDP DEFLATOR	2.2	2.2	2.3	2.3	2.1	2.3	1.8	1.9
PCE	2.3	2.5	2.1	2.2	2.1	2.5	1.6	1.7
CORE PCE	1.9	2.0	1.8	1.9	1.9	2.1	1.7	1.9
COMPENSATION PER HOUR	3.9	5.1	3.6	4.1	4.4	4.0	4.7	5.0
OUTPUT PER HOUR	2.3	2.1	2.5	2.5	2.2	2.5	2.7	2.6
UNIT LABOR COSTS	1.6	3.0	1.1	1.6	2.1	1.5	1.9	2.3
UNEMPLOYMENT RATE (Q4 LEVEL)	5.2	5.1	5.2	5.0	5.3	5.2	5.3	5.1
PARTICIPATION RATE (Q4 LEVEL)	65.9	66.1	65.9	66.1	65.9	66.0	65.9	66.0
NONFARM PAYROLL EMPLOYMENT (Q4/Q4 CHANGE)								
TOTAL, IN THOUSANDS	2015	1962	1809	1779	2000	2100	1800	1900
AVERAGE PER MONTH, IN THOUSANDS	168	164	151	148	167	175	150	158
FINANCIAL MARKET VARIABLES								
FED FUNDS RATE (PERCENT)	3.5	3.5	4.0	4.0	3.3	3.5	3.8	3.8
BAA BOND YIELD (PERCENT)	6.3	6.2	6.8	6.6	6.0	6.0	6.0	6.0
EFFECTIVE EXCHANGE RATE (Q4/Q4 % CHANGE)	-1.2	-1.2	-1.6	-3.0	-0.7	-1.0	-1.3	-1.2

# A. Forecast Details

## Exhibit A-3: Judgment Table

	2004:01	2004:02	2004:03	2004:04	2005:01	2005:02	2005:03	2005:04	2006:01	2006:02	2006:03	2006:04	Q4/Q4 % CHANGE/Q4 LEVEL		
													2004	2005	2006
<b>REAL GDP AND COMPONENTS (% Change, AR)</b>															
GDP.....	4.5	3.3	4.0	3.8	3.5	3.2	4.1	3.5	3.4	3.6	3.6	3.7	3.9	3.6	3.6
CHANGE IN INVENTORIES (GROWTH CONTRIBUTION) 1\.....	1.2	0.8	-1.0	0.5	0.8	-1.1	0.4	0.1	-0.3	-0.1	-0.1	0.0	0.4	0.0	-0.1
DOMESTIC PURCHASES.....	5.0	4.2	3.9	5.0	4.0	2.6	3.9	3.5	3.4	3.6	3.7	3.7	4.5	3.5	3.6
CONSUMPTION EXPENDITURES.....	4.1	1.6	5.1	4.2	3.6	3.2	3.3	3.4	3.1	3.3	3.4	3.3	3.8	3.4	3.3
BUSINESS FIXED INVESTMENT.....	4.2	12.4	13.0	14.5	3.5	6.8	9.7	10.2	10.2	10.6	10.7	10.7	11.0	7.5	10.5
RESIDENTIAL INVESTMENT.....	5.0	16.5	1.6	3.4	8.8	10.0	-5.5	-8.0	-2.0	-2.0	-2.0	-2.0	6.5	1.0	-2.0
NET EXPORTS (GROWTH CONTRIBUTION) 1\.....	-0.8	-1.1	-0.1	-1.4	-0.7	0.4	0.0	-0.2	-0.2	-0.2	-0.2	-0.2	-0.8	-0.1	-0.2
EXPORTS .....	7.3	7.3	6.0	3.2	7.2	8.0	8.4	7.3	7.5	5.2	6.0	6.7	5.9	7.7	6.3
IMPORTS .....	10.6	12.6	4.6	11.4	9.1	2.5	5.5	6.1	6.2	4.9	5.4	5.3	9.8	5.8	5.4
FEDERAL GOVERNMENT.....	7.1	2.7	4.8	1.2	0.4	2.0	7.0	5.0	5.3	3.0	2.8	2.7	3.9	3.6	3.5
STATE & LOCAL GOVERNMENTS.....	0.0	1.9	-1.7	0.6	-0.5	1.8	2.5	2.5	3.0	3.0	3.0	3.0	0.2	1.5	3.0
<b>INTEREST RATE ASSUMPTIONS (%)</b>															
FEDERAL FUNDS RATE (TARGET) 2\.....	1.00	1.00	1.42	1.94	2.44	2.90	3.38	3.50	3.63	3.75	3.88	4.00	1.94	3.50	4.00
YIELD ON 10-YR GOVERNMENT.....	4.0	4.6	4.3	4.2	4.3	4.2	4.3	4.4	4.4	4.4	4.5	4.5	4.2	4.4	4.5
BAA BOND YIELD.....	6.3	6.7	6.5	6.2	6.0	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.2	6.2	6.6
<b>INCOME (% Change, AR)</b>															
PERSONAL INCOME.....	5.0	6.4	4.6	13.9	3.2	4.9	6.3	6.2	7.0	6.4	6.6	6.7	7.4	5.1	6.6
REAL PERSONAL DISPOSABLE INCOME.....	2.4	2.8	2.9	10.8	-1.2	1.9	4.2	3.9	4.8	4.2	4.2	4.4	4.7	2.2	4.4
PERSONAL SAVING RATE (% OF DPI).....	1.0	1.3	0.7	2.2	0.9	0.6	0.7	0.7	0.9	1.0	1.1	1.2	1.3	0.7	1.0
CORPORATE PROFITS BEFORE TAXES.....	13.6	2.9	-17.7	65.9	13.1	1.0	2.2	1.4	-2.5	1.7	1.8	2.0	12.4	4.3	0.8
<b>PRICES &amp; PRODUCTIVITY (% Change, AR)</b>															
GDP IMPLICIT DEFLATOR.....	2.8	3.2	1.4	2.3	3.2	1.6	1.9	2.3	2.6	2.2	2.2	2.3	2.4	2.2	2.3
PERSONAL CONSUMPTION EXPENDITURES.....	3.3	3.1	1.3	2.7	2.1	3.7	2.1	2.2	2.2	2.2	2.2	2.2	2.6	2.5	2.2
CORE PERSONAL CONSUMPTION EXPENDITURES.....	2.1	1.7	0.9	1.7	2.2	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.6	2.0	1.9
CONSUMER PRICE INDEX.....	3.9	4.4	1.6	3.6	2.4	4.6	2.4	2.5	2.4	2.5	2.5	2.5	3.4	3.0	2.4
CORE CONSUMER PRICE INDEX.....	1.9	2.6	1.7	2.3	2.6	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.1	2.3	2.3
COMPENSATION PER HOUR (NONFARM BUSINESS).....	3.8	3.7	3.4	4.2	4.0	5.2	4.5	4.5	4.4	4.2	3.9	4.0	5.8	5.1	4.1
OUTPUT PER HOUR (NONFARM BUSINESS).....	4.0	4.0	0.9	2.4	2.7	0.8	2.5	2.5	2.5	2.5	2.5	2.5	2.8	2.1	2.5
UNIT LABOR COST (NONFARM BUSINESS).....	-0.2	-0.3	2.5	1.8	1.3	4.4	2.0	2.0	1.9	1.7	1.4	1.5	3.0	3.0	1.6
<b>REAL ACTIVITY</b>															
CAPACITY UTILIZATION (MANUFACTURING, %).....	75.6	76.5	77.0	77.6	78.1	78.2	78.8	79.3	79.8	80.1	80.4	80.7	76.7	78.6	80.3
CIVILIAN UNEMP RATE (%).....	5.7	5.6	5.4	5.4	5.3	5.2	5.1	5.1	5.1	5.1	5.0	5.0	5.4	5.1	5.0
PRIVATE HOUSING STARTS (THOUS, AR).....	1929	1923	1974	1973	2083	2026	1995	1950	1930	1900	1880	1880	1950	2014	1898
LIGHT VEHICLE SALES (MIL\$, AR) 3\.....	16.5	16.5	17.1	17.2	16.4	17.2	17.0	17.0	17.0	17.1	17.1	17.1	16.8	16.9	17.1
FEDERAL SURPLUS/DEFICIT (Unified Basis, Bil\$, NSA) 4\.....	-164.4	581.9	-239.6	-129.6	-234.1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	-412.1	-377.1	-301.5

NOTE: Forecast of Federal Surplus/Deficit is as of May 2005. All series other than interest rates and the federal deficit are seasonally adjusted. Italics indicates a reported value.

1\ Growth contribution to real GDP 2\ Annual values are end of Q4 levels 3\ Includes domestic and foreign auto and light truck sales 4\ Yearly numbers are based on the fiscal year.

## A. Forecast Details

### Exhibit A-4: Real GDP and Components (Growth Contributions)

	2004				2005				2006				Q4/Q4 % CHANGE/Q4 LEVEL			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2003	2004	2005	2006
<b>REAL GDP (Growth, Annual Rate).....</b>	<b>4.5</b>	<b>3.3</b>	<b>4.0</b>	<b>3.8</b>	<b>3.5</b>	<b>3.2</b>	<b>4.1</b>	<b>3.5</b>	<b>3.4</b>	<b>3.6</b>	<b>3.6</b>	<b>3.7</b>	<b>4.4</b>	<b>3.9</b>	<b>3.6</b>	<b>3.6</b>
<i>Contributions to GDP growth:</i>																
<b>FINAL SALES TO DOMESTIC PURCHASERS...</b>	<b>4.1</b>	<b>3.6</b>	<b>5.1</b>	<b>4.7</b>	<b>3.4</b>	<b>3.9</b>	<b>3.7</b>	<b>3.6</b>	<b>3.9</b>	<b>3.9</b>	<b>3.9</b>	<b>3.9</b>	<b>4.6</b>	<b>4.4</b>	<b>3.7</b>	<b>3.9</b>
CONSUMPTION EXPENDITURES.....	2.9	1.1	3.6	2.9	2.5	2.3	2.3	2.4	2.2	2.3	2.3	2.3	2.7	2.6	2.4	2.3
BUSINESS FIXED INVESTMENT.....	0.4	1.2	1.3	1.5	0.4	0.7	1.0	1.1	1.1	1.1	1.2	1.2	0.9	1.1	0.8	1.1
RESIDENTIAL INVESTMENT.....	0.3	0.9	0.1	0.2	0.5	0.6	-0.3	-0.5	-0.1	-0.1	-0.1	-0.1	0.6	0.4	0.1	-0.1
FEDERAL GOVERNMENT.....	0.5	0.2	0.3	0.1	0.0	0.1	0.5	0.3	0.4	0.2	0.2	0.2	0.4	0.3	0.2	0.2
STATE & LOCAL GOVERNMENTS.....	0.0	0.2	-0.2	0.1	-0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.0	0.2	0.3
<b>NET EXPORTS.....</b>	<b>-0.8</b>	<b>-1.1</b>	<b>-0.1</b>	<b>-1.4</b>	<b>-0.7</b>	<b>0.4</b>	<b>0.0</b>	<b>-0.2</b>	<b>-0.2</b>	<b>-0.2</b>	<b>-0.2</b>	<b>-0.2</b>	<b>-0.1</b>	<b>-0.8</b>	<b>-0.1</b>	<b>-0.2</b>
EXPORTS.....	0.7	0.7	0.6	0.3	0.7	0.8	0.8	0.7	0.8	0.5	0.6	0.7	0.6	0.6	0.8	0.7
IMPORTS.....	-1.5	-1.8	-0.7	-1.7	-1.4	-0.4	-0.9	-1.0	-1.0	-0.8	-0.9	-0.9	-0.7	-1.4	-0.9	-0.9
<b>CHANGE IN INVENTORIES.....</b>	<b>1.2</b>	<b>0.8</b>	<b>-1.0</b>	<b>0.5</b>	<b>0.8</b>	<b>-1.1</b>	<b>0.4</b>	<b>0.1</b>	<b>-0.3</b>	<b>-0.1</b>	<b>-0.1</b>	<b>0.0</b>	<b>-0.1</b>	<b>0.4</b>	<b>0.0</b>	<b>-0.1</b>

*Note: Contributions may not add up to GDP growth due to rounding.*



## A. Forecast Details

### Exhibit A-5: Alternative GDP and Inflation Forecasts

#### GDP

	Release Date	2005-Q2		2005-Q3		2005-Q4	
		Prev*	Jun	Prev*	Jun	Prev*	Jun
FRBNY	6/24/2005	3.6	3.2	3.9	4.1	3.5	3.5
PSI Model	6/21/2005	3.8	3.3	3.8	3.3	--	--
Blue Chip	6/10/2005	3.0	3.2	3.4	3.3	3.3	3.3
Median SPF	5/16/2005	3.7	3.0	3.3	3.5	3.4	3.4
Macro Advisers	6/16/2005**	2.9	3.5	3.7	3.7	3.8	3.7

#### CPI

	Release Date	2005-Q2		2005-Q3		2005-Q4	
		Prev*	Jun	Prev*	Jun	Prev*	Jun
FRBNY	6/24/2005	3.5	4.6	2.4	2.4	2.5	2.5
Blue Chip	6/10/2005	3.3	3.9	2.3	2.1	2.4	2.4
Median SPF	5/16/2005	2.2	3.3	2.2	2.3	2.3	2.4
Macro Advisers	6/1/2005	4.4	4.0	2.3	1.7	2.0	2.3

#### Core CPI

	Release Date	2005-Q2		2005-Q3		2005-Q4	
		Prev*	Jun	Prev*	Jun	Prev*	Jun
FRBNY	6/24/2005	2.3	2.2	2.4	2.3	2.4	2.3
Macro Advisers	6/1/2005	2.7	2.4	2.3	2.4	2.4	2.5

\*Previous release date of all forecasts except for the SPF is May. The previous release of the SPF was in February.

\*\*Macro Advisers Forecasts for Q3 and Q4 GDP are as of 6/1/05

## A. Forecast Details

**Exhibit A-6: Reference Table 1 – Consumer Price Data as of May 2005**

	Annualized Percent Change Over Indicated Interval					Weights (December 2003)	
	24 Month	12 Month	6 Month	3 Month	1 Month	Total	Core
<b>Consumer Price Index</b>	2.9	2.8	3.1	4.4	-0.6	100.00	
<b>Energy</b>	12.3	9.8	12.3	28.7	-21.9	7.08	
<b>All Items Ex Energy</b>	2.2	2.2	2.3	2.7	1.8		
Food	3.2	2.4	2.2	3.9	1.3	14.38	
Food Away From Home	3.0	3.2	3.2	2.5	3.2	6.13	
<b>All Items Ex Food and Energy</b>	2.0	2.2	2.3	2.2	1.8	78.54	100.00
Core Chain-Weight CPI (NSA)	1.7	1.8	2.4	2.6	-1.1		
<b>Core Goods</b>	-0.2	0.6	0.9	0.6	2.6	22.25	28.34
Apparel	0.0	-0.8	-0.3	0.7	0.0	3.98	5.06
Medical Care Commodities	4.4	4.3	4.7	4.2	4.2	1.50	1.91
Durable Goods	-1.2	0.9	0.7	-0.7	3.2	11.28	14.36
New Vehicles	0.2	0.9	1.6	-1.4	0.9	4.82	6.13
Used Vehicles	-3.1	5.3	3.1	3.5	6.3	2.01	2.56
<b>Core Services</b>	2.8	2.7	2.9	2.9	1.0	56.28	71.66
Rent of Primary Residence	2.8	2.9	3.1	3.0	2.2	6.16	7.84
Owners' Equivalent Rent	2.3	2.3	2.7	2.7	3.2	23.38	29.77
Lodging Away from Home	4.0	2.7	1.9	0.9	-25.4	2.95	3.76
Medical Care Services	5.1	5.0	5.5	4.9	3.3	4.58	5.83
Transportation Services	2.0	2.3	1.6	4.2	3.3	6.32	8.05

## A. Forecast Details

**Exhibit A-6: Reference Table 2 – PCE Deflator as of April 2005**

	Annualized Percent Change Over Indicated Interval				
	24 Month	12 Month	6 Month	3 Month	1 Month
<b>PCE Deflator</b>	2.3	2.7	3.0	4.7	5.2
<b>Market Based PCE Deflator</b>	2.4	2.8	3.0	4.9	5.5
<b>Durable Goods</b>	-1.7	-0.7	0.2	-0.7	-0.7
Motor Vehicles and Parts	-0.2	1.8	4.0	1.1	0.7
<b>Nondurable Goods</b>	3.5	4.3	4.0	9.6	11.7
Clothing and Shoes	-0.2	-0.6	-0.1	0.1	-8.0
<b>Services</b>	2.6	2.6	3.0	3.5	3.3
Housing	2.5	2.5	2.7	3.2	1.6
Transportation	2.0	1.7	3.9	4.8	5.5
Medical Care	3.0	2.5	2.8	4.0	2.0
<b>PCE Deflator Ex Food and Energy</b>	1.6	1.6	2.0	2.2	1.2
<b>Market Based Core PCE Deflator</b>	1.5	1.6	1.9	1.9	0.8
Personal Business Services-Market Based	3.2	2.9	3.9	3.1	2.3
Personal Business Services-Not Market Based	0.7	-0.2	-0.1	0.3	-0.5

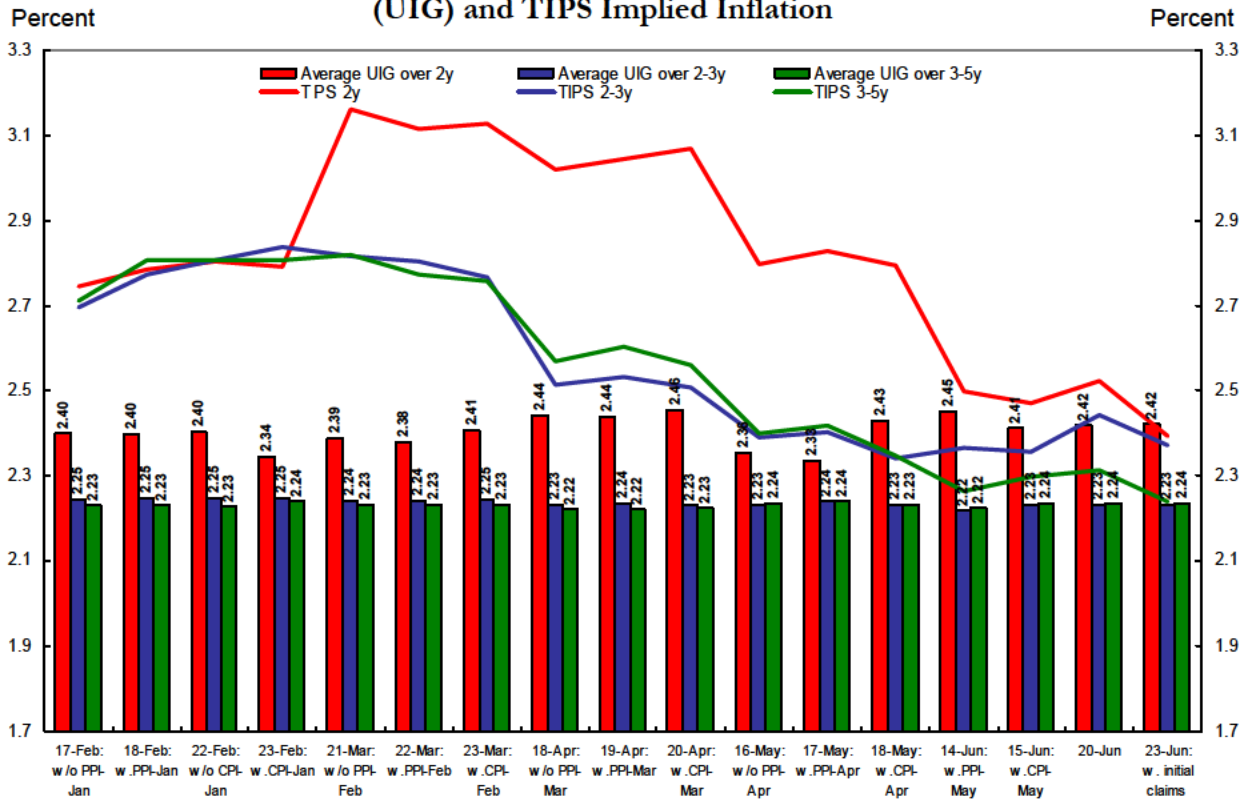
## A. Forecast Details

**Exhibit A-6: Reference Table 3 – Producer Price Data as of May 2005**

	Annualized Percent Change Over Indicated Interval				
	24 Month	12 Month	6 Month	3 Month	1 Month
<b>Finished Goods</b>	4.1	3.5	1.8	2.6	-7.5
<b>Finished Consumer Goods</b>	4.8	3.8	1.5	2.3	-10.8
Finished Consumer Goods Ex Food	5.1	5.0	1.8	3.4	-13.4
Nondurables Ex Food	6.6	6.5	2.2	4.7	-17.1
Durables	1.6	1.3	0.9	0.3	-1.7
Capital Equipment	1.9	2.6	2.5	2.2	0.8
Electronic Computers (NSA)	-17.0	-21.6	-26.5	-30.7	-44.3
Communication and Related Equipment (NSA)	-1.8	-1.0	-1.4	-1.2	-1.2
<b>Finished Goods Ex Food and Energy</b>	2.0	2.6	2.7	1.6	0.8
<b>Finished Consumer Goods Ex Food and Energy</b>	2.1	2.6	3.1	1.7	1.5
<b>Intermediate Materials</b>	6.7	6.4	4.1	4.4	-8.4
Intermediate Materials Ex Food and Energy	5.3	5.4	3.8	0.8	-3.8
<b>Crude Materials</b>	14.5	6.1	-3.0	21.5	-21.1
Crude Materials Ex Food and Energy	15.3	9.5	-16.9	-7.5	-35.9

# A. Forecast Details

## Exhibit A-7: Underlying Inflation Gauge (UIG) and TIPS Implied Inflation



Source: Bloomberg, 8:40AM quotes, MMS Function (FRBNY)

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## B. Financial Markets

### **Exhibit B-1. TIIS Implied Inflation at Various Horizons**

The first chart in this exhibit gives the time series of implied expected CPI inflation from the TIIS market. (a non –technical description of the construction of this measure is in Appendix to Exhibit B-1 below). The second chart shows the computed change in the various measures from May 2nd to June 23rd, 2005

Source: Capital Markets Function FRBNY

### **Exhibit B-2. Breakeven Inflation Table**

The breakeven inflation table reports yields on the most recently issued five- and ten-year nominal Treasury securities and Treasury inflation indexed securities as well as the spreads between comparable maturities.

Source: Capital Markets Function FRBNY

### **Exhibit B-3. Treasury Yield and S&P 500 Index Levels and Volatility**

The first chart in this exhibit plots estimates of daily Treasury and equity volatility. Treasury volatility is estimated from daily changes of the 10-year constant maturity Treasury yield. Equity volatility is estimated from daily S&P 500 index returns. The figure also plots the long-run average of the Treasury and equity volatilities, computed since 1/1/1988. All volatilities are annualized. Treasury volatility is on the left axis in basis points, equity volatility is on the right axis in percent.

The second chart in the exhibit plots the level of the 10-year Treasury constant maturity yield (left axis) and the S&P 500 total return index (right axis).

Source: Capital Markets Function FRBNY and Bloomberg

### **Exhibit B-4. Smoothed Treasury Yield Curve and Implied Forward Rate Curve**

The charts in this exhibit show the change in the smoothed (off the run) Treasury yield curve since the day before the last FOMC meeting and the implied forward rate curve.

Source: Monetary Affairs BofG

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### **Exhibit B-5. Expected Path of Fed Funds Target Rate Derived from Futures**

The chart in this exhibit shows the changes in expected path of the Fed Funds target rate since the last FOMC meeting, derived from Fed Funds and Eurodollar futures. Market participants were very sensitive to data and comments by FOMC members during the period. The chart shows the high point of expectations for the funds rate (May 9th), following the April employment report ; and the low point of expectations (June 1st), when comments from President Fisher and weak economic data lowered market expectations of the end of the tightening phase to 3.5%.

A constant term premium risk adjustment is made in these calculations but there is no allowance for time-varying risk.

Source: MMS Function, FRBNY chart from Monetary Affairs BofG data

### **Exhibit B-6. Implied Skewness and Implied volatility (percentages)**

The chart in this exhibit shows the recent behavior of a measure of implied skewness derived from Eurodollar options. Positive (negative ) implied skewness means that tightening (easing) surprise around expected rate is expected to be larger than easing (tightening) surprise. In addition implied volatility in percentages is plotted. Both measures are averages of 3, 6 and 9 month values. No risk adjustment is made.

Source: Capital Markets, FRBNY

### **Exhibit B-7. Implied Volatility on Eurodollar Options (Basis Points)**

The charts in this exhibit show the current and historical behavior of the 90% confidence interval (i.e., financial markets expect 90% of the time the actual FFR at the specified date will be in this interval) for the Fed Funds Target implied from financial markets options. The first two set of charts show how the 90% confidence interval has changed since the last FOMC meeting. The next chart shows the current confidence interval around the expected path. The final two charts show a long history of the behavior of the confidence interval at the 6 and 12 month horizon. No risk adjustment is made.

Source: Monetary Affairs, BofG

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### **Exhibit B-8. Dollar Exchange rates**

This exhibit contains 4 charts showing the behavior of the dollar in the last 10 years. All series are defined so that a decline in the index represents a weakening of the dollar. Effective rates are computed by the Board of Governors using a “narrow” set of weights, for 16 major exchange rates.

Source: BofG, BIS, International Research Function FRBNY

### **Exhibit B-9. Implied volatility on Yen/Dollar and Euro/Dollar Exchange Rates**

The first set of charts in this exhibit contains the one month ahead implied volatility on Yen/Dollar and Euro/Dollar exchange rates normalized to the width of a 90 percent confidence interval. The second set of charts show the change in the expected implied volatility over the next six months.

Source: Markets Group FRBNY, Reuters

### **Appendix to Exhibit B-1. Construction of Implied Inflation from TIPS**

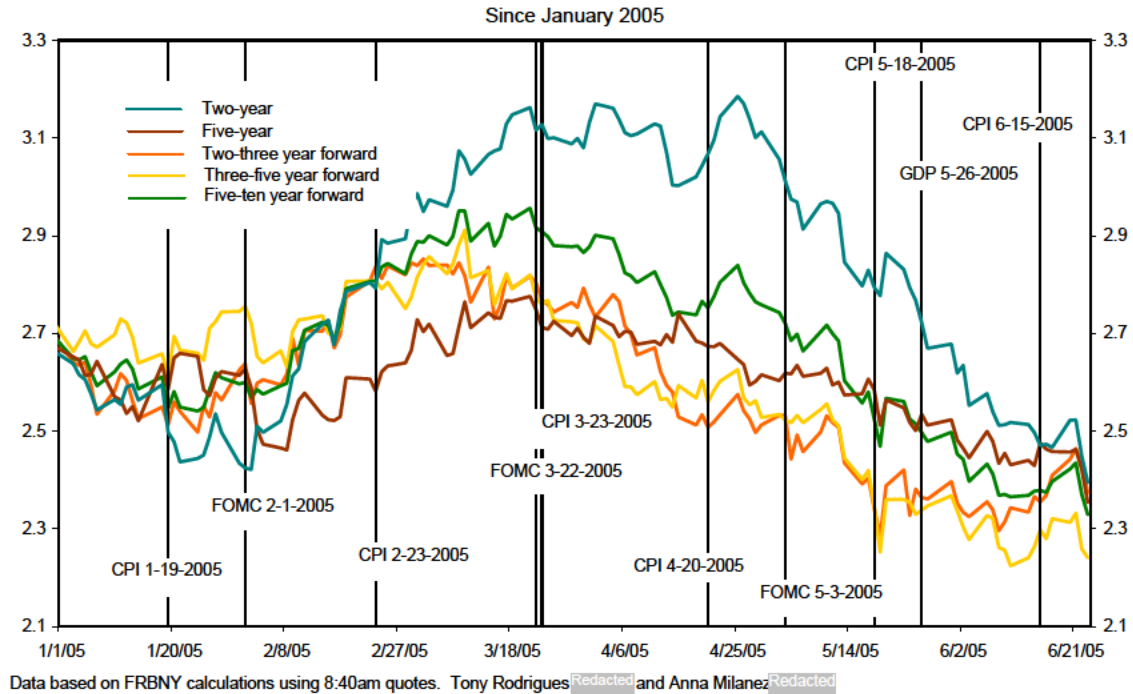
The implied inflation series are estimates of the inflation expectations derived from TIPS and nominal Treasury securities, not accounting for risk premia or other technical factors. They differ from the simpler breakeven inflation rates which just subtract the real yield on TIPS securities from the on-the-run treasury yield with the same maturity. For each individual TIPS, we solve for the inflation rate that equates the discounted payments of the TIPS to its price, where the discount rates are derived from off-the-run nominal Treasury securities. We then calculate two-, three-, and five-year inflation rates as the inflation rate corresponding to a TIPS with duration of two, three or five years respectively. Finally, we compute approximate forward rates from the rates at the shorter and longer dated durations. For example, the two-to-three year forward rate is computed from the two-year and three-year implied inflation values. The five-to-ten year forward rate uses the five-year implied inflation value and the implied inflation rate on the most recently issued ten-year TIPS.



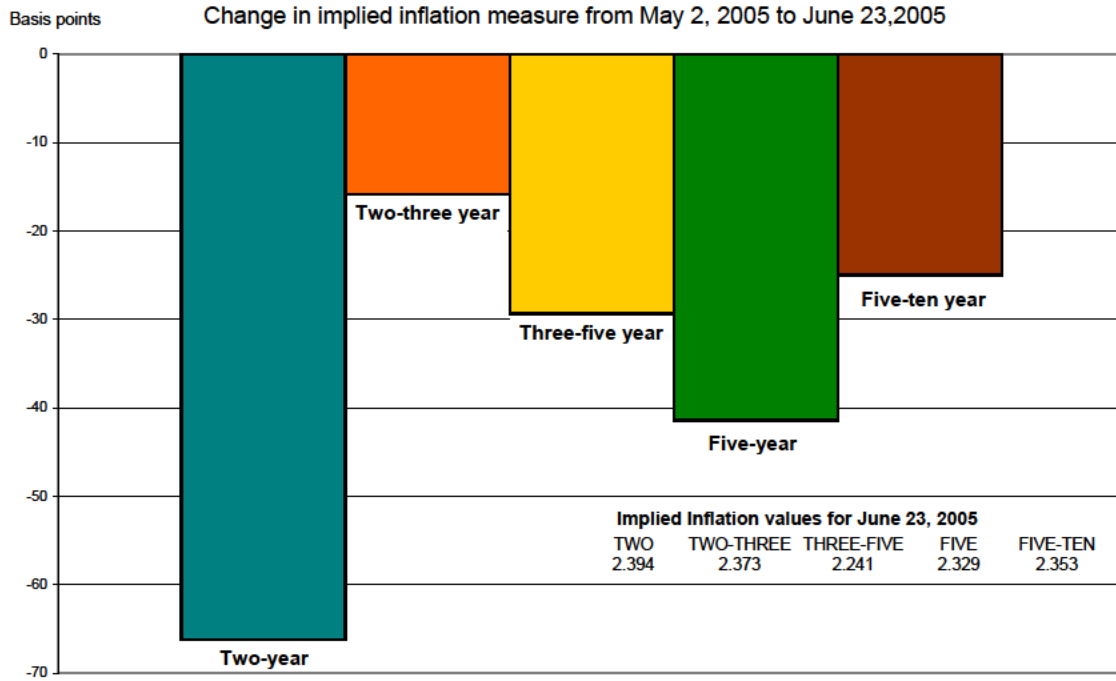
## B. Financial Markets

Exhibit B-1:

### TIPS Implied Inflation at Various Horizons



### TIPS Implied Inflation



Source: FRBNY

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## B. Financial Markets

### Exhibit B-2: Breakeven Inflation Table

#### Real and Nominal Yield Spreads

	23-Nov-04	30-Dec-04	31-Jan-05	18-Feb-05	21-Mar-05	15-Apr-05	29-Apr-05	23-Jun-05
Five-year Spread (%)	2.593	2.593	2.540	2.710	2.903	2.684	2.765	2.354
Ten-year Spread	2.589	2.620	2.487	2.579	2.756	2.604	2.618	2.287
Five-year Real Yield (	0.993	1.088	1.172	1.113	1.289	1.189	1.113	1.380
Ten-year Real Yield	1.607	1.693	1.661	1.659	1.771	1.639	1.568	1.664
Five-year Nominal Yie	3.586	3.681	3.712	3.823	4.192	3.873	3.878	3.734
Ten-year Nominal Yie	4.196	4.313	4.148	4.238	4.527	4.243	4.186	3.951

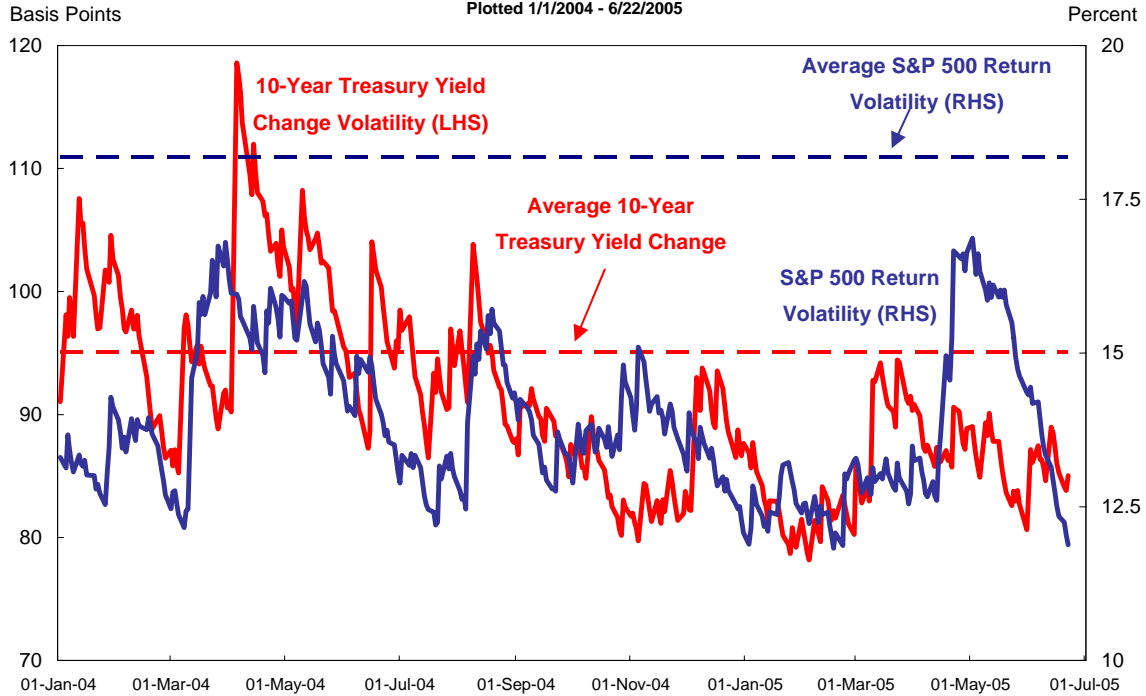
Source: Bloomberg. 8:40am quotes.

## B. Financial Markets

Exhibit B-3:

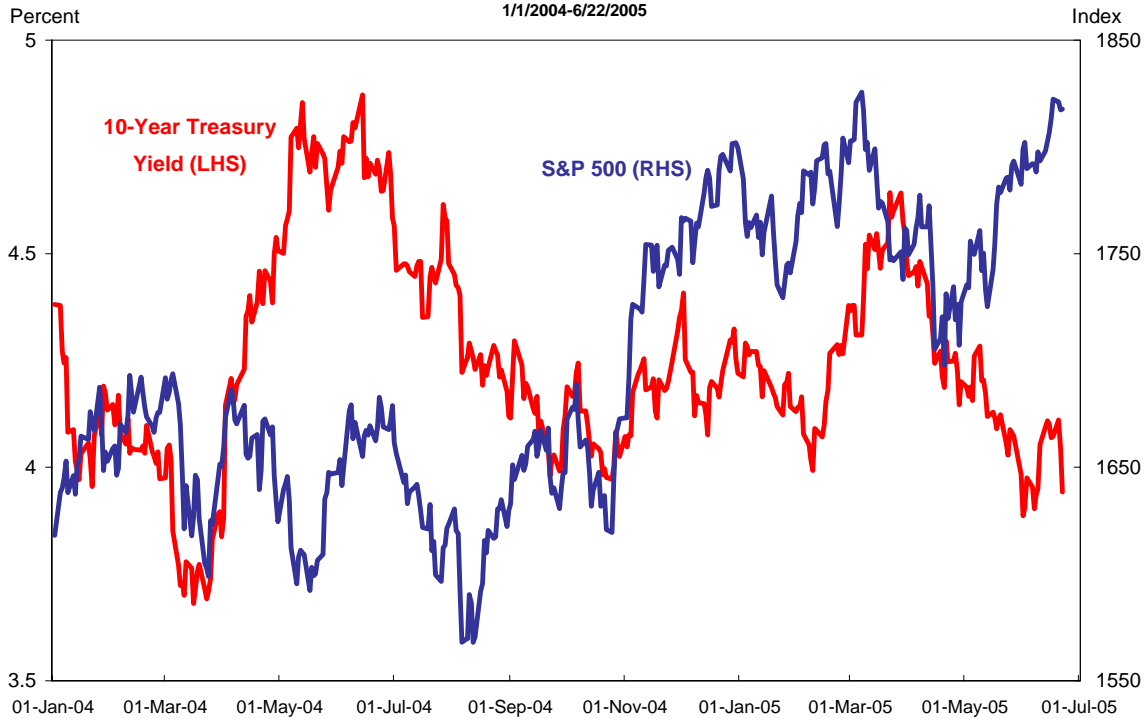
### Treasury and Equity Volatility

Daily, estimated 1/1/1988 - 6/22/2005  
Plotted 1/1/2004 - 6/22/2005



### Treasury Yield and S&P 500 Index

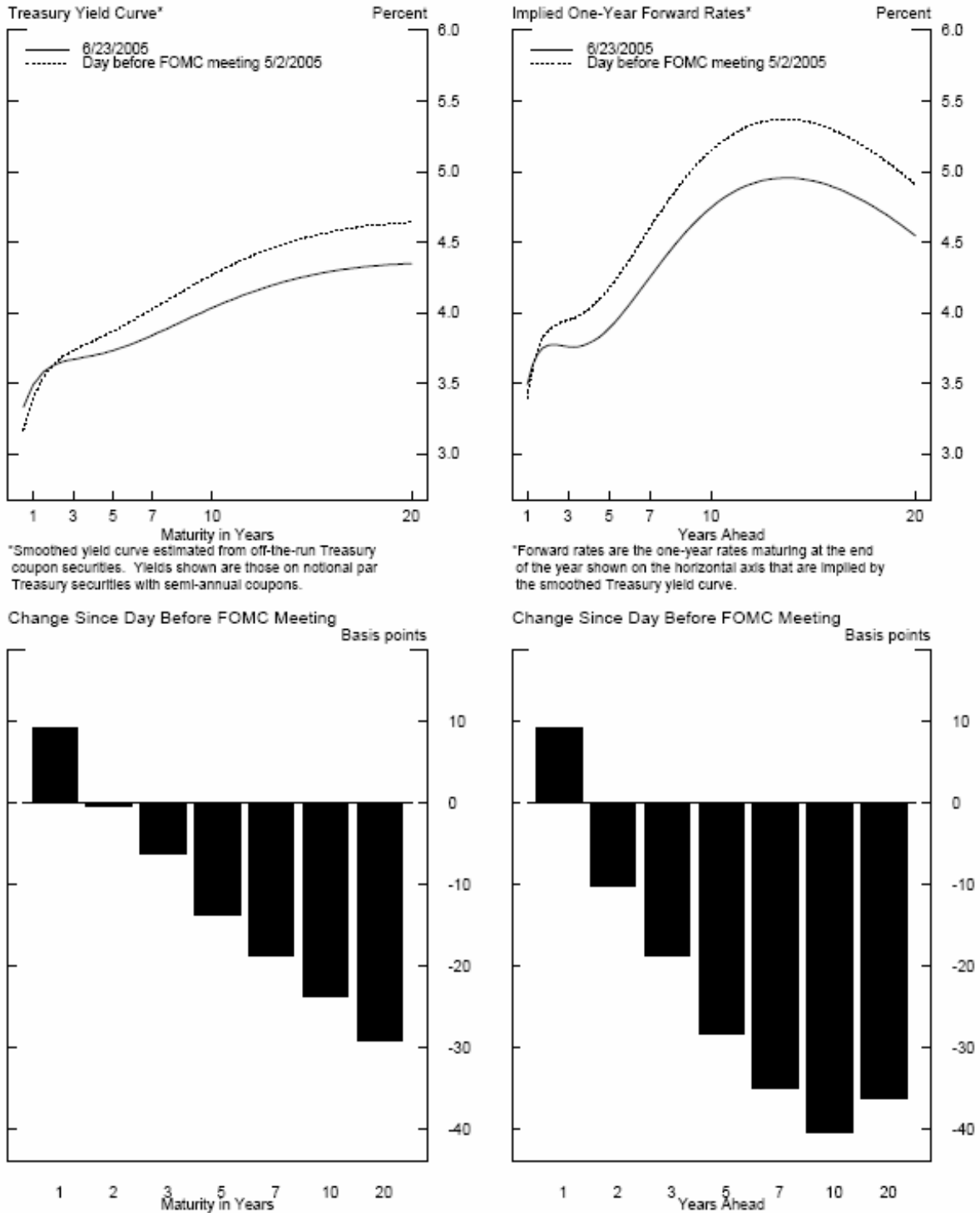
1/1/2004-6/22/2005



## B. Financial Markets

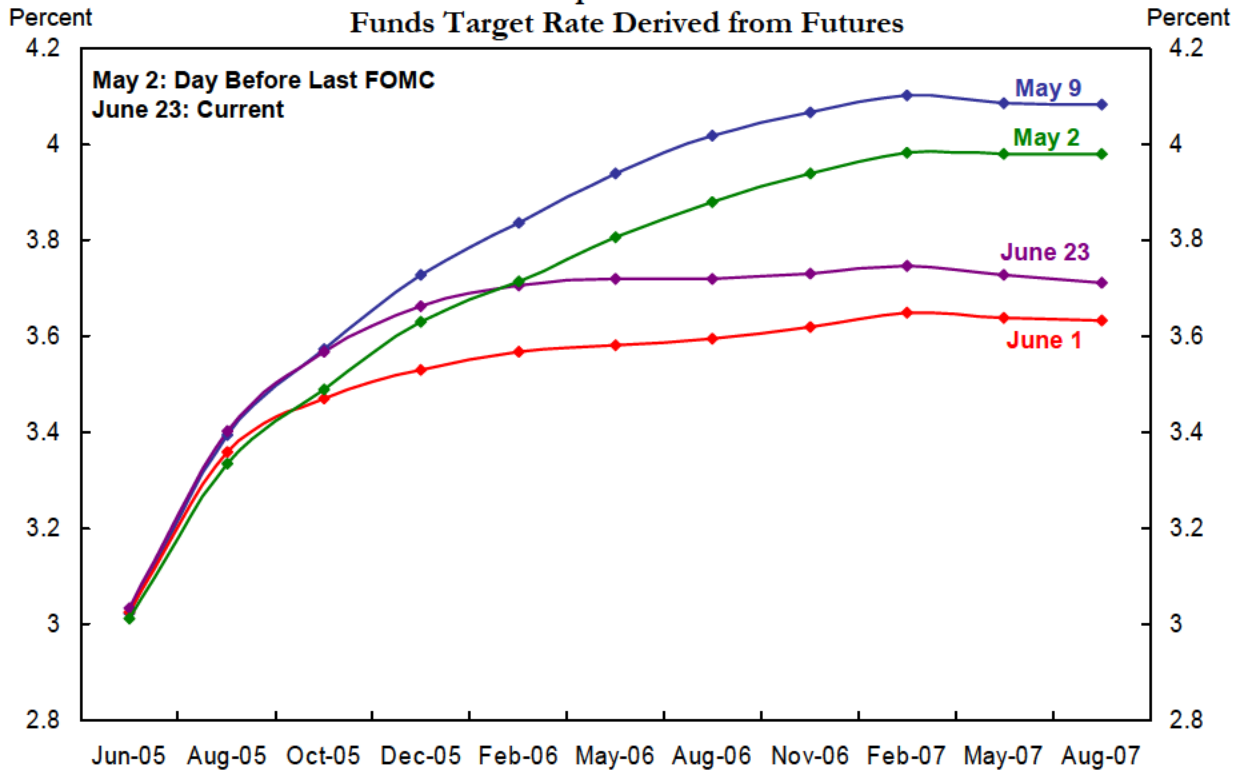
**Exhibit B-4:**

### Treasury Yield Curve



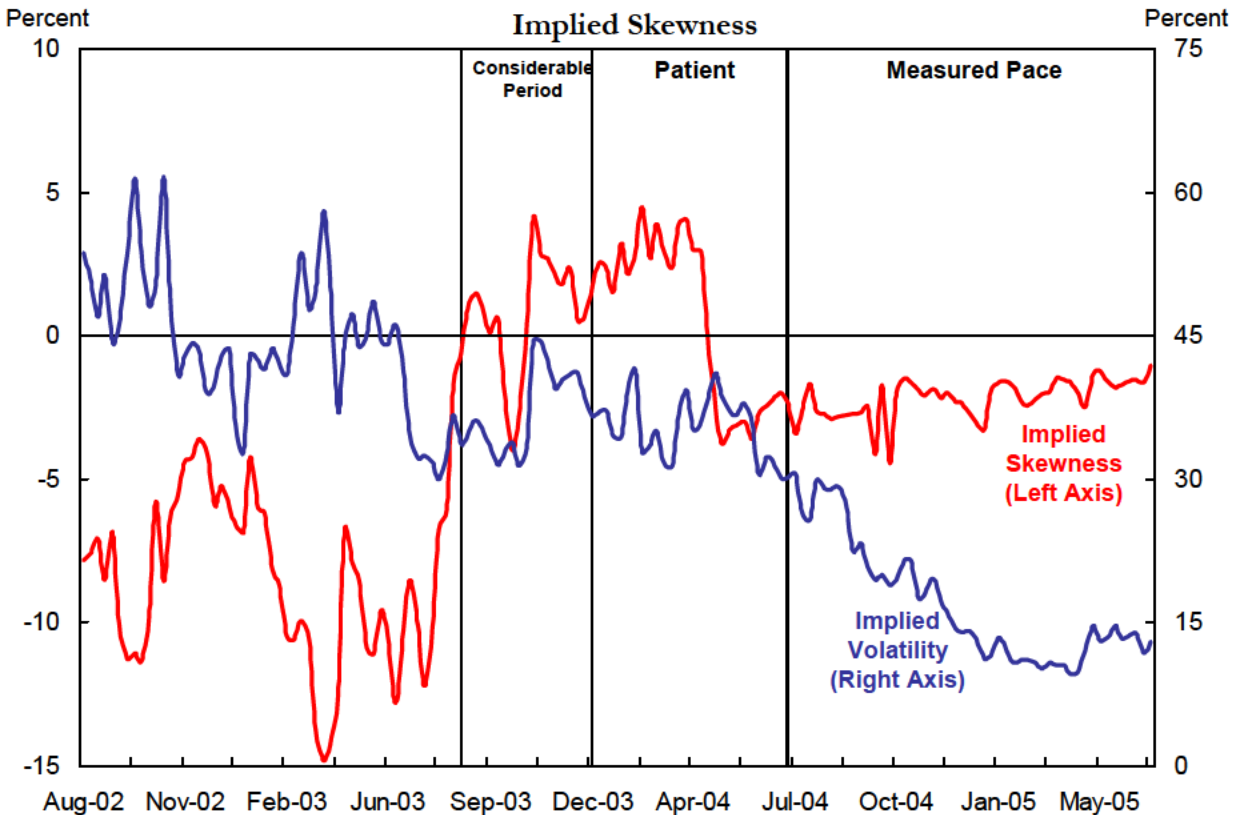
## B. Financial Markets

**Exhibit B-5: Expected Path of the Fed Funds Target Rate Derived from Futures**



Source: Federal Reserve Board

**Exhibit B-6: Implied Skewness**



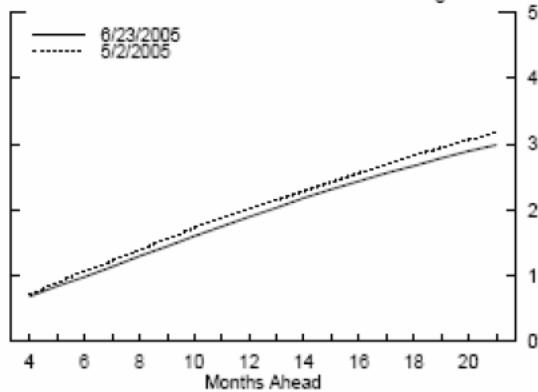
Source: CME, Author's Calculations

Joshua Rosenberg Redacted

## B. Financial Markets

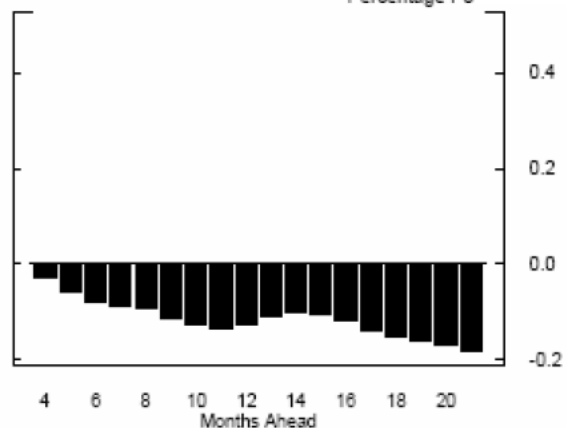
### Exhibit B-7: Implied Volatility on Fed Funds Options

Eurodollar Implied Volatility Term Structure\*  
Percentage Points

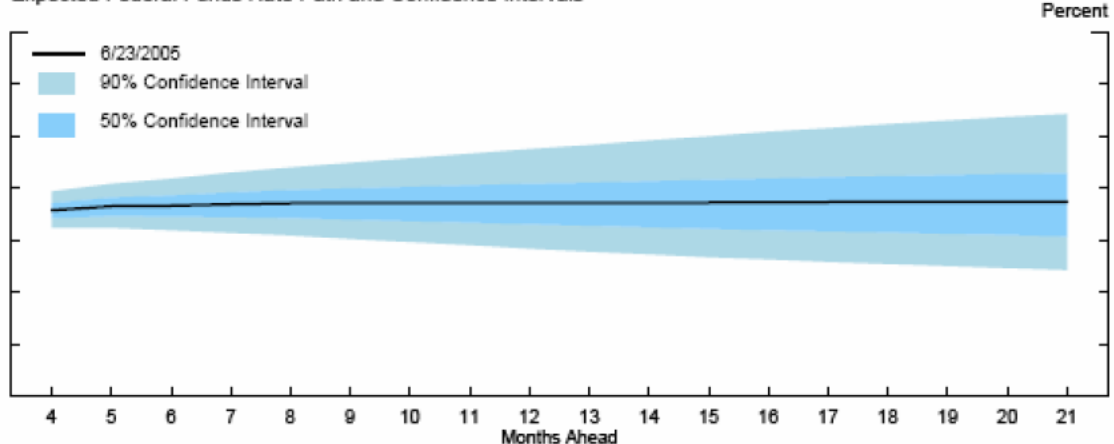


\*Width of a 90 percent confidence interval computed from the term structures for the expected federal funds rate and implied volatility.

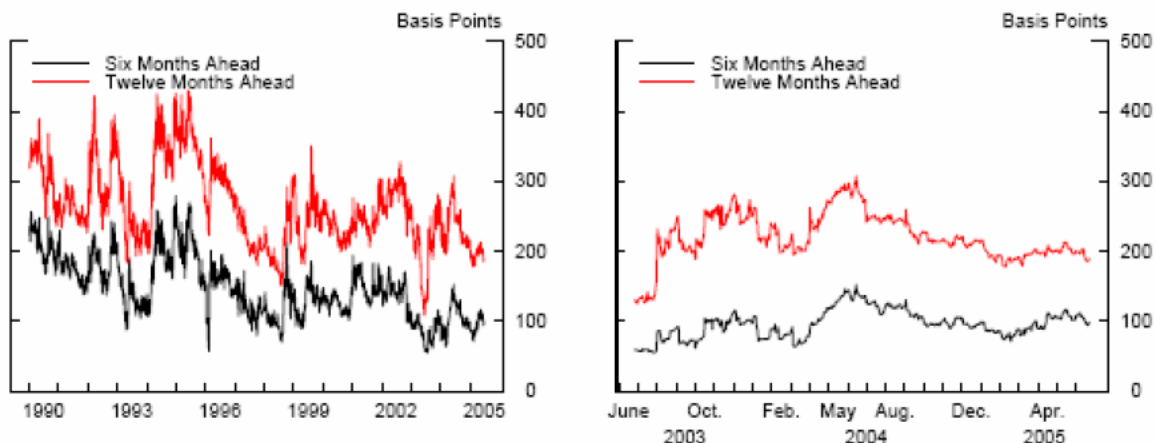
Change Since Day Before FOMC Meeting  
Percentage Po



Expected Federal Funds Rate Path and Confidence Intervals



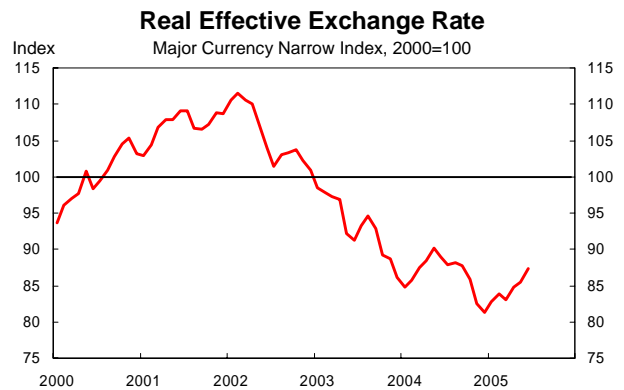
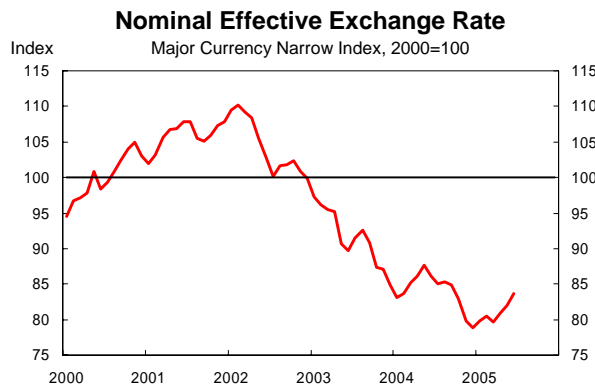
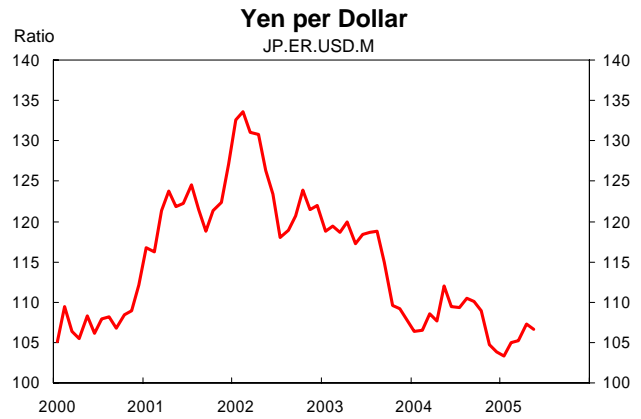
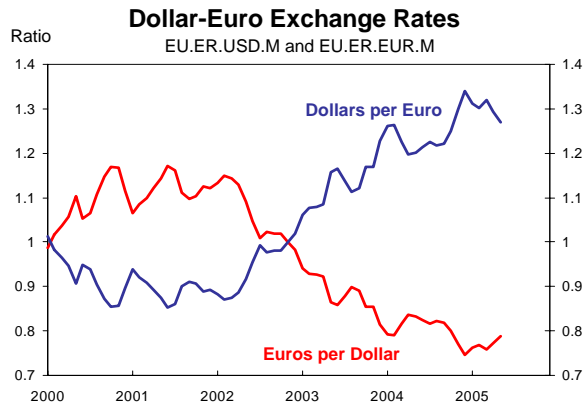
Eurodollar Implied Volatility at Selected Maturities\*



\*Width of a 90 percent confidence interval computed from the term structures for the expected federal funds rate and implied volatility.

## B. Financial Markets

### Exhibit B-8: United States Exchange Rates



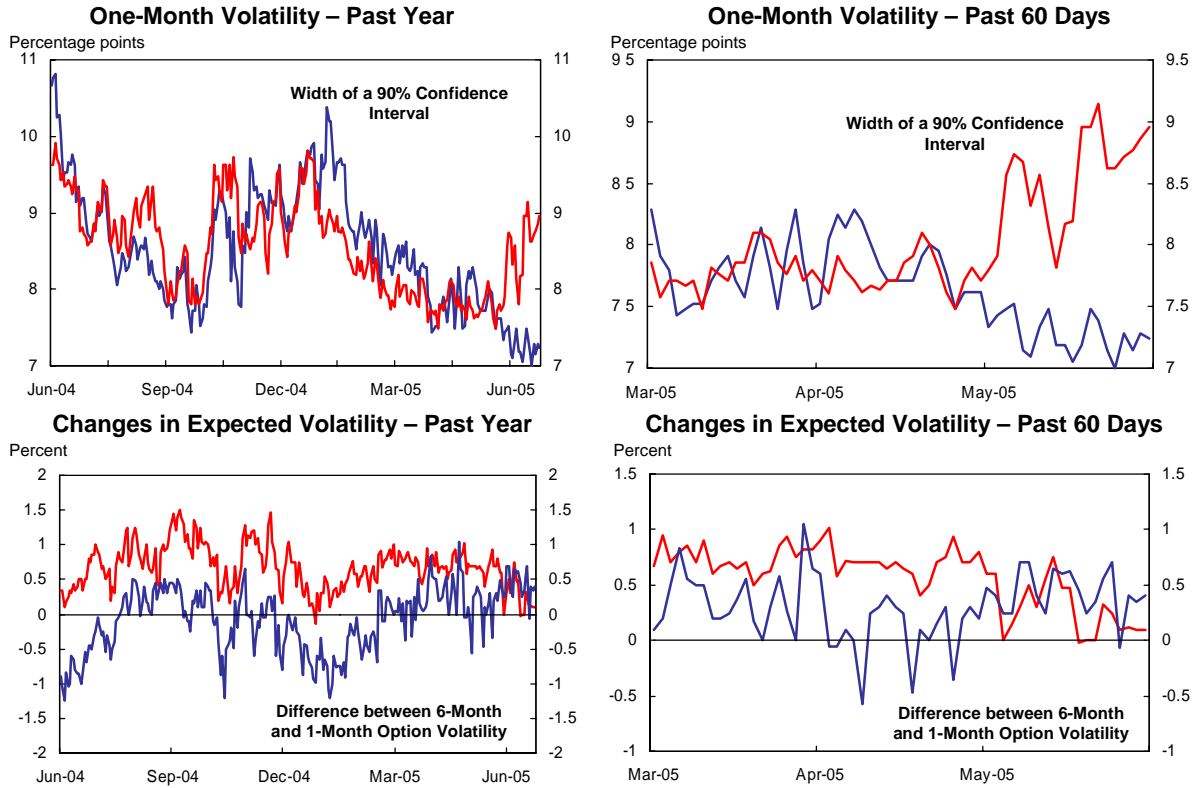
Source: Reuters

## B. Financial Markets

Exhibit B-9:

### Euro and Yen Implied Option Volatility

Euro options are in red and Yen options are in blue.





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## C. FRBNY Forecast Distributions

### Background

The FRBNY forecast distributions are a generalization of techniques used at the Bank of England and other central banks to show future uncertainties and the balance of risks. The generalization allows for a dynamic balance of risks that is jointly assessed over inflation and output. There are two classes of shocks to current central projections that are of interest to central banks: supply shocks, which move inflation and output in opposite directions, and demand shocks, which move inflation and output in the same direction. Instead of providing a static assessment of the risks we use a dynamic one that allows the probability of a deviation to build over time. After a deviation, it is assumed that the economy returns to its average long run behavior centered at the implicit inflation target and potential growth. Although this is not a substitute for a dynamic model with an explicit transmission mechanism for monetary policy, it can have good properties in mimicking the behavior of an economy where the central bank has sufficient credibility to achieve its long run inflation target while pursuing short run stabilization policy.

### Exhibit C-1. Risks

This exhibit shows the “balance of risks” for the individual scenarios and the central scenario contained in the Bank’s forecast. Two types of measures of the balance of risk are shown. One type indicates the probability of being in a particular scenario at a specific date. These scenarios are mutually exclusive so at any specific date they add up to one.

A second type calculates the probability of ever being in a particular scenario through 2007, with the exception of the central scenario where the probability shown is for not deviating from this scenario through 2007. Hence, one minus this probability is the risk of deviating from the central scenario at some point over the forecast horizon and this is equal to the sum of the probabilities of the other scenarios occurring.

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### **Exhibit C-2 & C-3. Alternative Scenarios**

These exhibits take the balance of risks for each scenario and show their implications for GDP growth and core PCE inflation. They plot the expected path (calculated by averaging all paths that have at least one quarter in that scenario) of 4-quarter changes in the core PCE deflator and real GDP under the central scenario and the alternative scenarios.

The global deflation scenario assumes that output is slower than the central scenario and inflation is dramatically lower. The overheating scenario assumes that for 2 quarters the economy grows quicker than expected under the central scenario, with both inflation and output higher than our central forecast. Then the real economy slows dramatically but inflation continues to be above the central forecast.

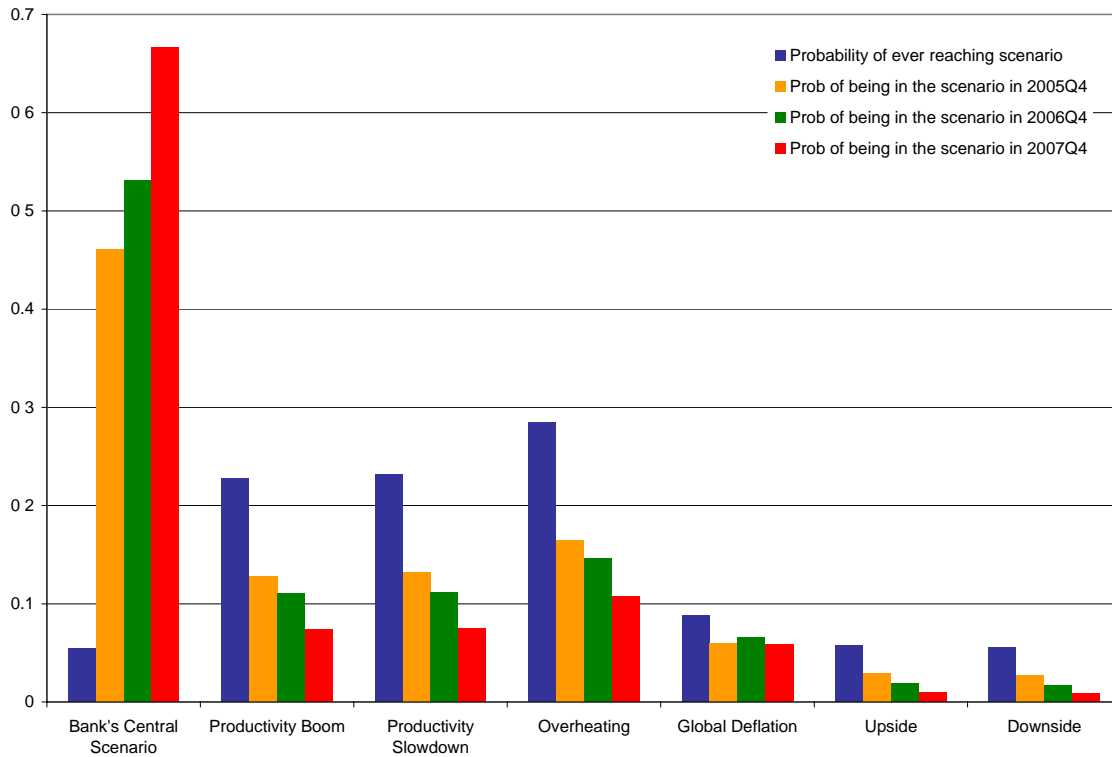
### **Exhibit C-4 & C-5. Fan Charts**

Fan charts are shown for the core PCE deflator (Exhibit C-4) and real GDP (Exhibit C-5). These charts are constructed to represent the overall uncertainty contained in our main scenario and our alternative scenarios. They combine the information contained in the previous exhibits with the additional uncertainty that we cannot predict perfectly the path of the economy, even if we knew which scenario were true. The amount of total uncertainty in the forecast distributions is now calibrated to imply fundamental interest rate volatility lower than that given by the implied Eurodollar forward volatility curve averaged across possible policy rules from a market perspective (see the text for Exhibit D-4 ). In addition the expected value for each of the two forecast distributions is included in the fan chart. These expected values are computed as averages over the realizations across all possible scenarios considered in Exhibit C-1. The difference between this profile and the central bank scenario is another measure of the balance of risks. If they are equal the risks are balanced; if the expected value is above the central bank scenario, there is upside risk; if it is below, there is downside risk.

Source: MMS function, FRBNY

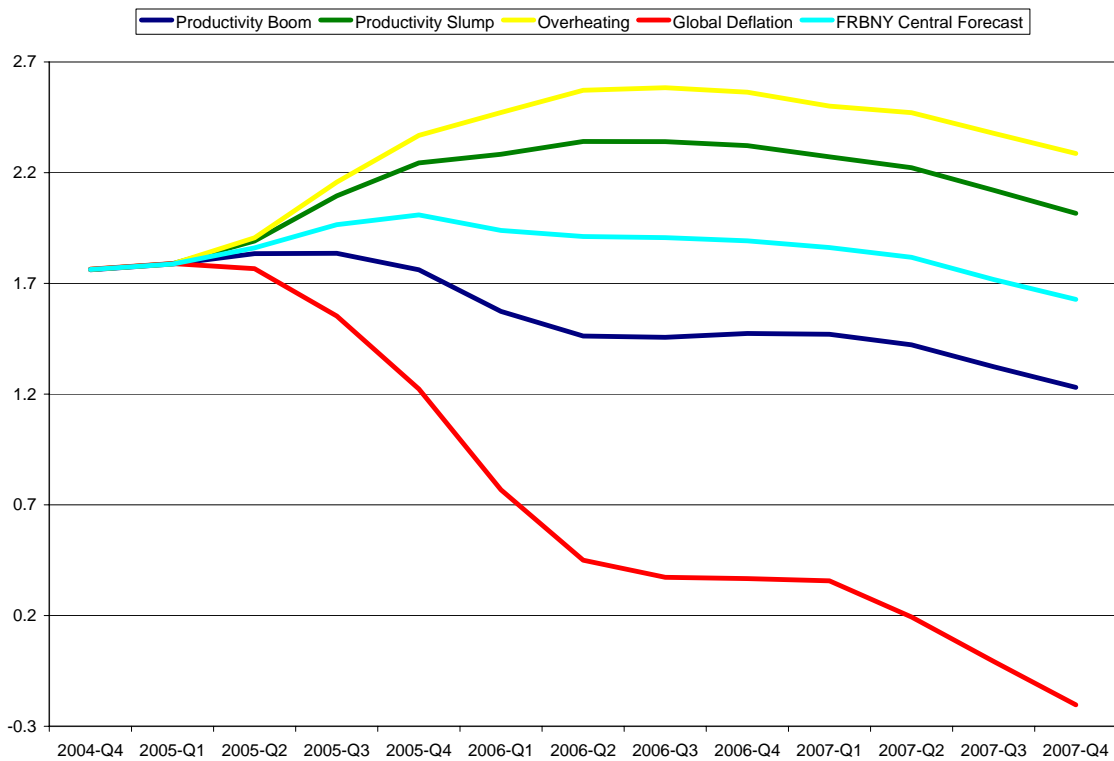
## C. FRBNY Forecast Distributions

Exhibit C-1:  
Risks

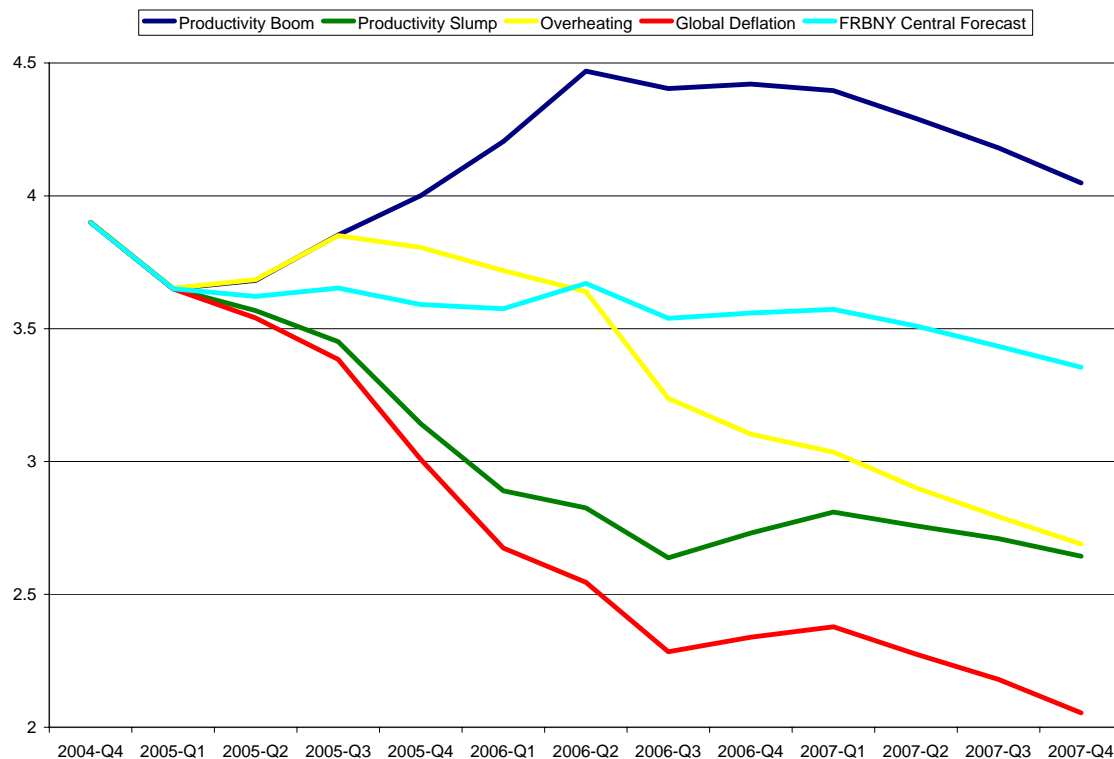


## C. FRBNY Forecast Distributions

**Exhibit C-2:  
Alternative Scenarios for PCE Inflation through 2007**



**Exhibit C-3:  
Alternative Scenarios for GDP Growth through 2007**



## C. FRBNY Forecast Distributions

Exhibit C-4:  
Four Quarter U.S. PCE Inflation Forecast through 2007

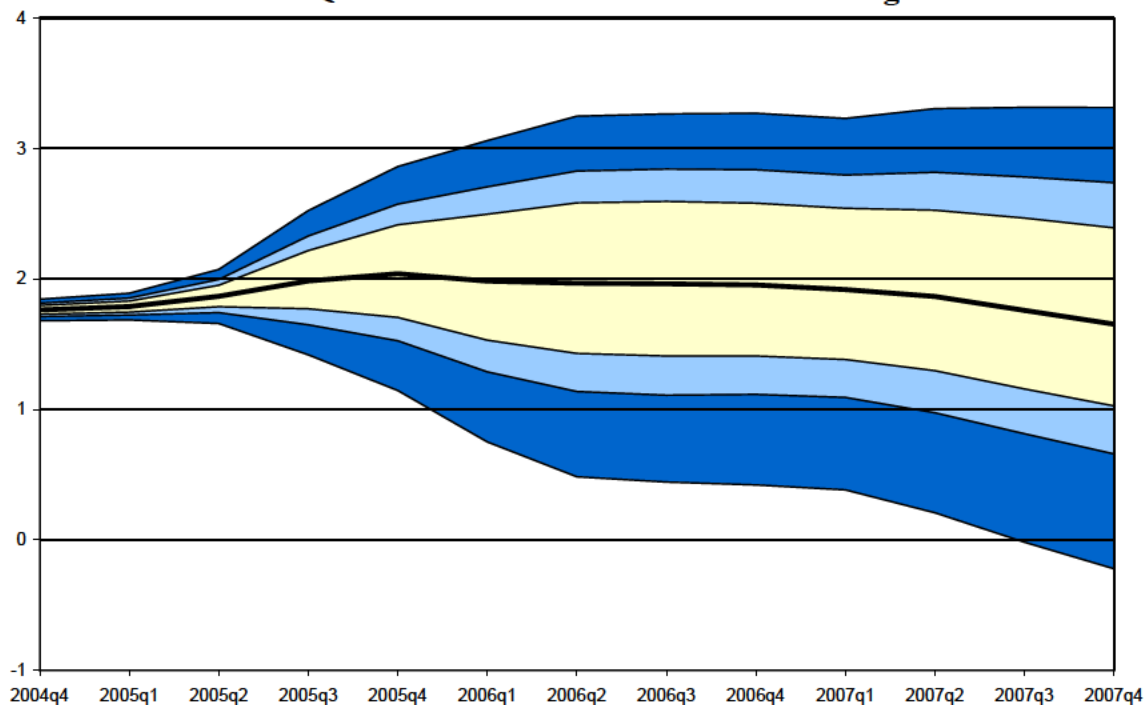
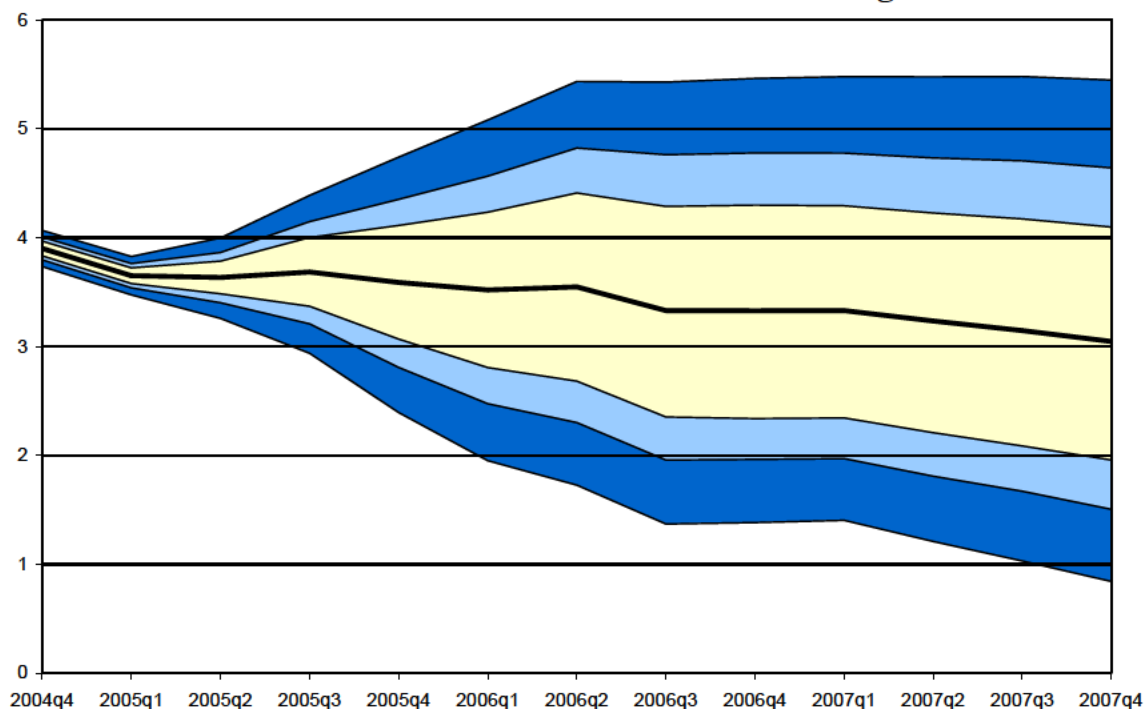


Exhibit C-5:  
Four Quarter U.S. GDP Growth Forecast through 2007



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## D. FRBNY Fed Funds Rate Projections

The exhibits in this section are constructed using the policy rules given below, the Bank forecast distribution, and information from Fed Funds futures and Eurodollar futures. The policy rules convert the uncertainty over future inflation and output into uncertainty about future values of the Fed Funds rate. This allows us to use information from financial markets to calibrate the type and amount of uncertainty.

There are two types of policy uncertainty examined: the policy rule that will be followed and, given a particular policy rule, uncertainty over the parameters of the rule. Combined with the uncertainty in the bank forecast distribution, we calibrate the overall average (averaging over forecast distribution and policy rules) to be close to the expected market path (at most a 50 basis point deviation is allowed). We also calibrate the overall average volatility to be at or below the market implied volatility term structure curve. This calibration might affect the policy rule and/or the forecast distribution.

For this cycle we are using 3 different policy rules. Throughout we assume that the neutral policy rate is uniformly distributed between 3.5 and 4.5.

1. *Measured ends at neutral.* A steady 25 basis point increase continues until until FFR hits neutral, and then FFR is held at neutral through mid 2006 unless there is a large shock. This is a pattern consistent with the last year (25 basis points at each meeting) and the periods after previous tightening cycles. At the end of 2006, the FFR reverts to the prescription of the baseline policy rule (see specification below).
2. *Measured ends at August FOMC.* The FFR is increased to 3.5% at the August FOMC and then policy is determined by use of the baseline policy rule.
3. *Inflation hawk.* The FFR is raised 50 basis points each quarter as long as quarterly core PCE inflation is high relative to target (2.4 in 2005Q2, two quarter average of 2.35 in 2005Q3, three quarter average of 2.3 in 2005Q4 and a four quarter average of 2.25 in 2006Q1).

In the overall averaging, we use weights of 0.7 on “measured ends at neutral”, 0.2 on “measured ends in August,” and 0.1 on “inflation hawk.”

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### **Exhibit D-1 & D-2. Implications of Different Policy Rules for Nominal Fed Funds Rate**

Exhibit D-1 evaluates the three different policy rules at each of the draws from the forecast distribution of output and inflation and then averages them to produce an expected path if the rule is followed. This policy specific average is then used to construct a measure of the implied volatility of each policy rule as shown in Exhibit D-2. The results are compared to the most recent implied market path from Exhibit B-6 and Exhibit B-7.

### **Exhibit D-3 & D-4. Alternative Forecast Scenarios: Nominal and Real Federal Funds Rate**

In these exhibits, we focus on the policy rule “measured ends at neutral” and evaluate it at the Bank’s central projection and at the overheating and global deflation scenarios. Exhibit D-3 presents the average of FFR over paths containing these scenarios. Exhibit D-4 presents the average ex post real rate obtained by subtracting the 4 quarter lagged change of core PCE inflation from the paths of the nominal rate.

### **Exhibit D-5 & D-6. Average FFR and volatility**

In these exhibits we present overall averages for the path of the FFR and its volatility. We also present results under an alternative assumption for the implicit inflation target of 1.75% and a larger initial output gap. These results are compared to market implied paths. In Exhibit D-5 the level of the FFR is shown and in Exhibit D-6 its volatility.

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*Policy Rule: Baseline Specification*

$$i_t = \rho i_{t-1} + (1 - \rho) [i^* + \varphi_\pi (\pi_t - \pi^*) + \varphi_x x_t]$$

$$\rho = 0.8$$

$$i_{2004Q4} = 1.75$$

$$i^* = 4.0$$

$$\pi = 1.5 \text{ (Core PCE y/y)}$$

$$\pi^* = 1.5$$

$$\varphi_\pi = 1.5$$

$$\varphi_x = 0.5$$

$$\pi_t : \text{Core PCE y/y}$$

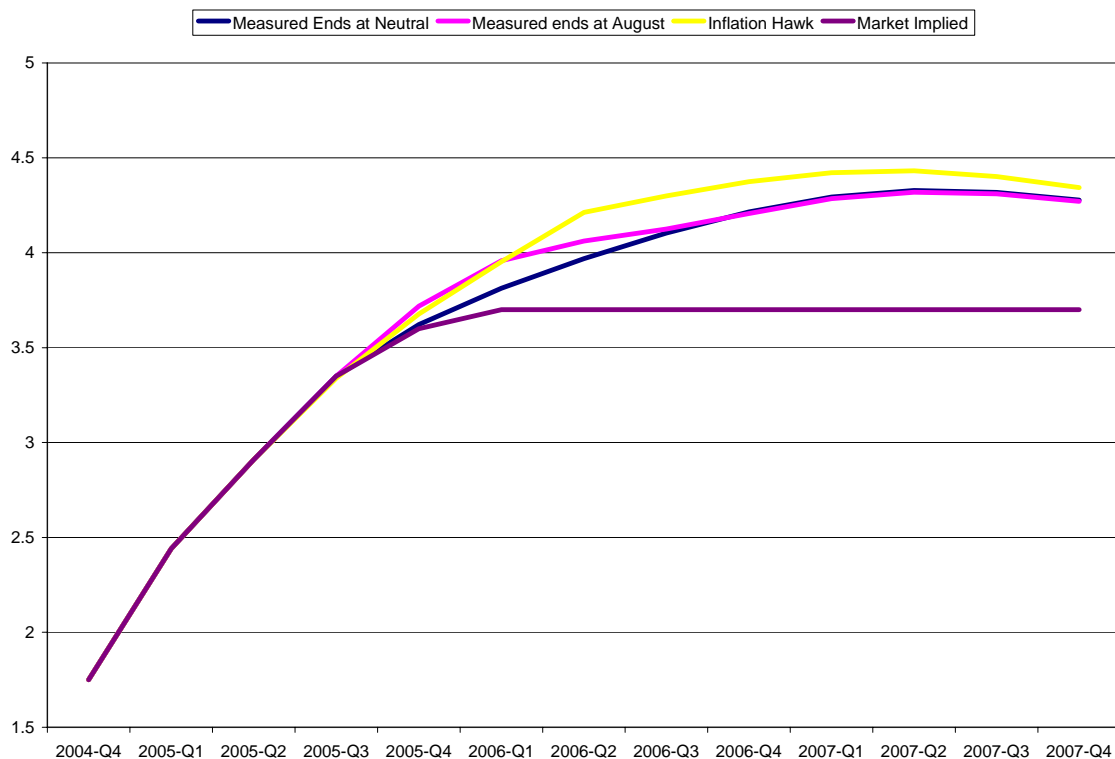
$$x_t : \text{Output Gap}$$

Source: MMS function, FRBNY

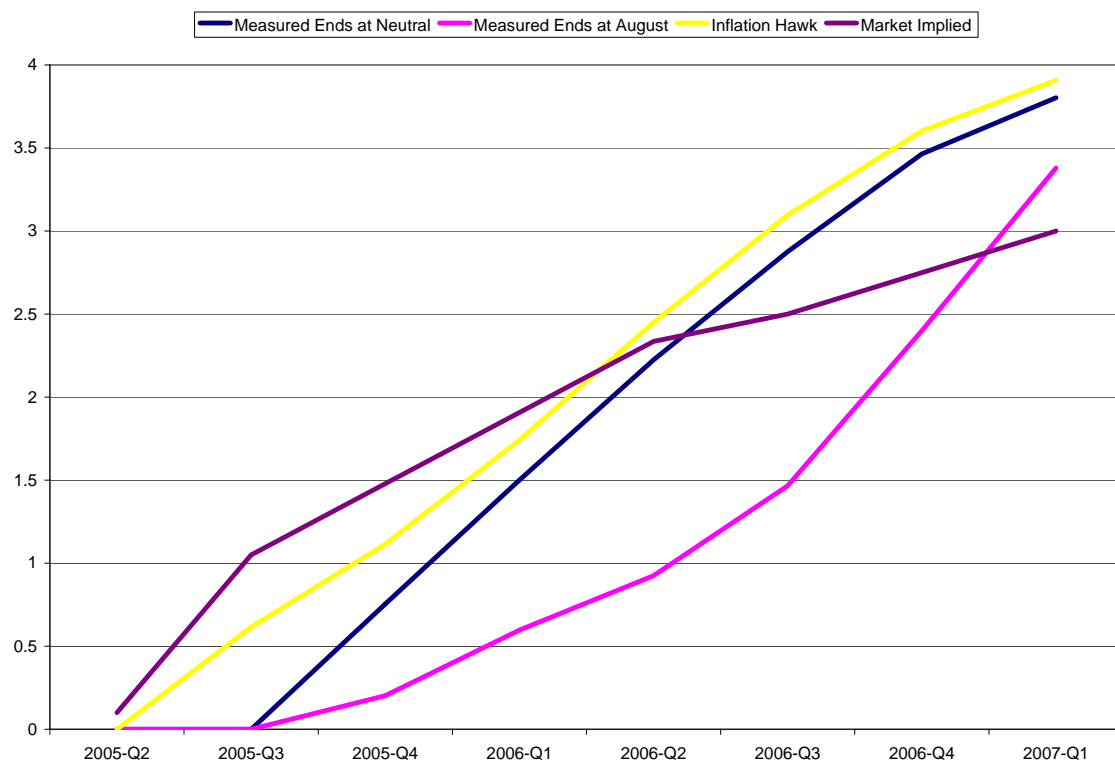


## D. FRBNY Fed Funds Rate Projections

**Exhibit D-1: Implications of Different Policy Rules for the Nominal FFR**

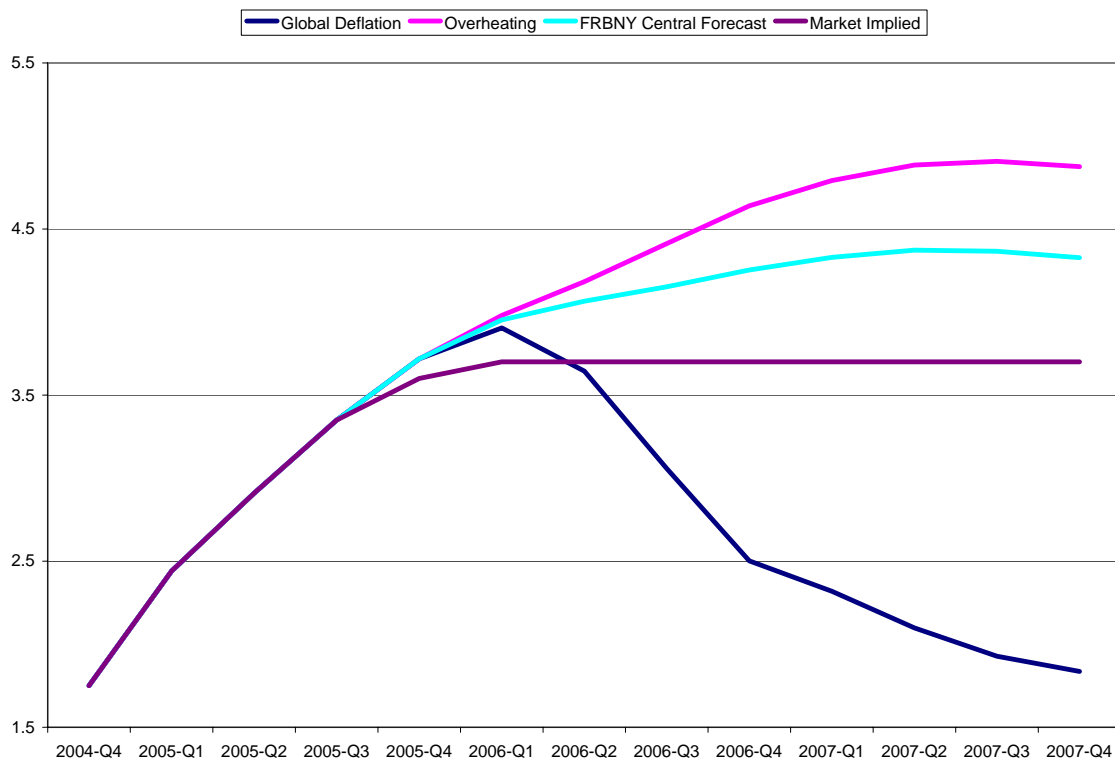


**Exhibit D-2: Implied Nominal FFR Volatility from Different Policy Rules**

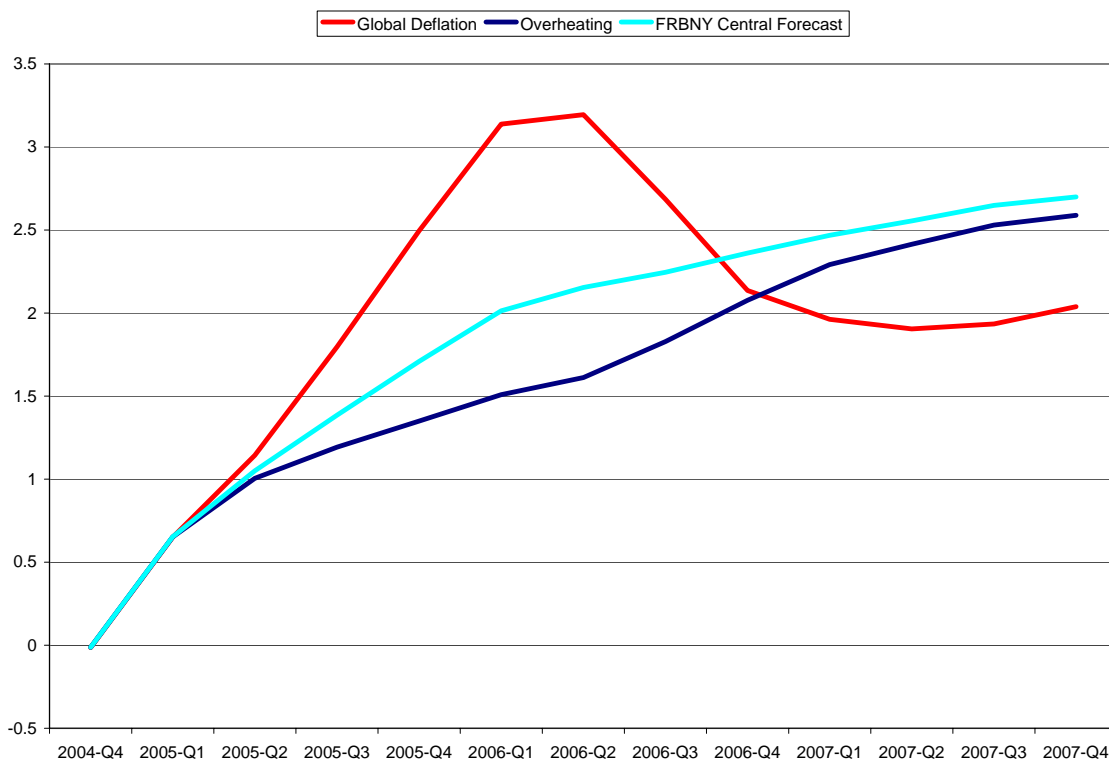


## D. FRBNY Fed Funds Rate Projections

**Exhibit D-3: Alternative Forecast Scenarios: Nominal FFR**



**Exhibit D-4: Alternative Forecast Scenarios: Real FFR**



## D. FRBNY Fed Funds Rate Projections

Exhibit D-5: Average FFR

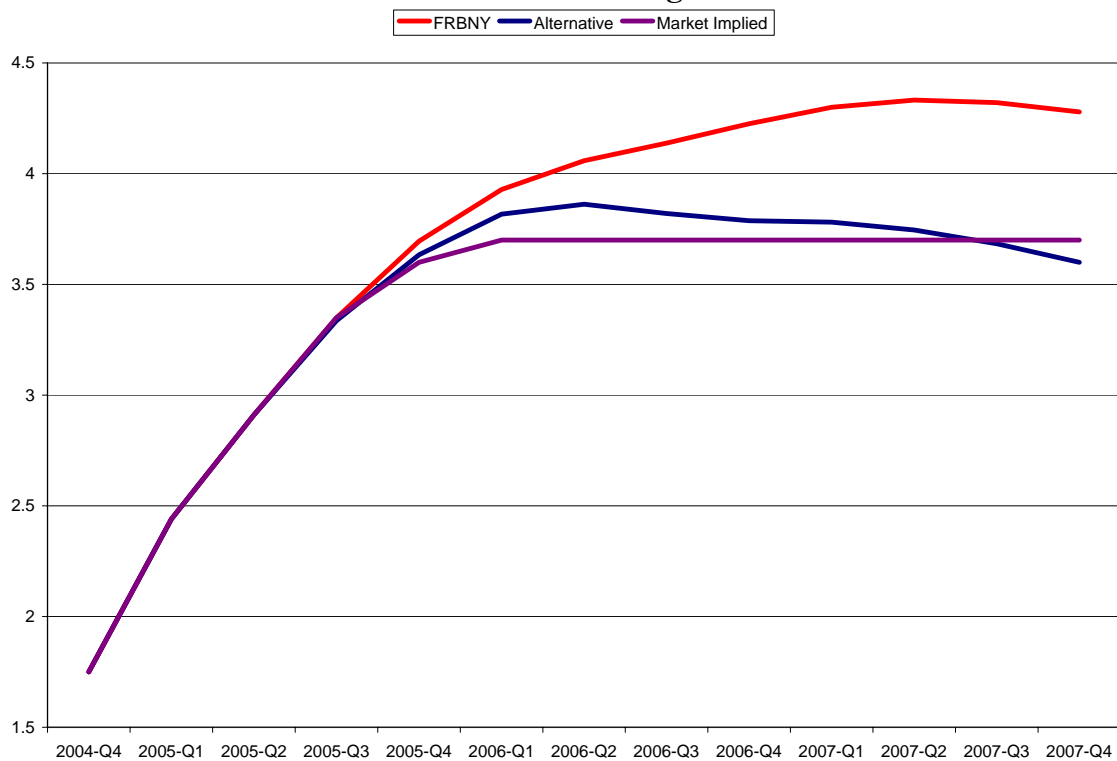
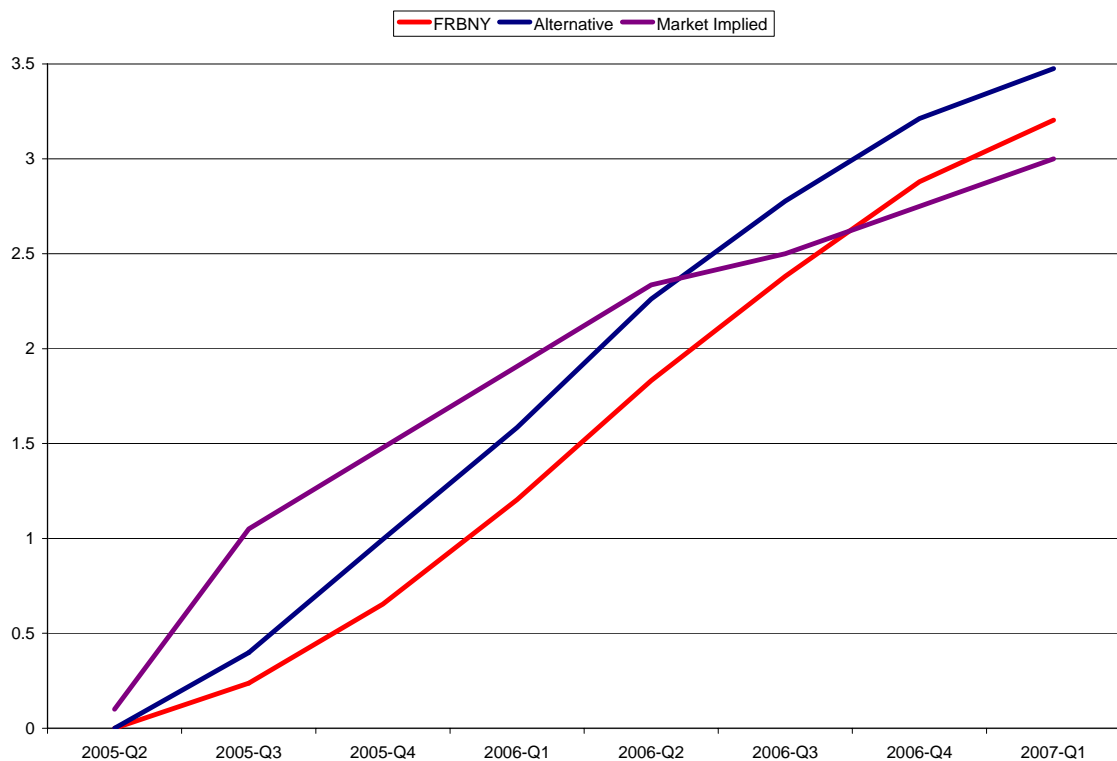


Exhibit D-6: Average Volatility of the FFR



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## E. Regional Charts

### **Exhibit E-1. Federal Reserve Bank of New York's Indexes of Coincident Economic Indicators**

The chart in this exhibit shows our monthly coincident indexes for New York, New Jersey and New York City up through May 2005. The indexes are a composite of 4 economic indicators: payroll employment, unemployment rate, average weekly hours in manufacturing, and real wage & salary earnings.

More details on the methodology and construction of these indexes can be found at [http://www.ny.frb.org/research/regional\\_economy/coincident\\_summary.html](http://www.ny.frb.org/research/regional_economy/coincident_summary.html)

Source: FRBNY

### **Exhibit E-2. Federal Reserve Bank of New York's Indexes of Leading Economic Indicators**

This chart shows the growth in our monthly leading indexes for New York, New Jersey and New York City up through April 2005. The growth in the index for a given month represents a forecast of the growth in the coincident index 9 months ahead. The components used in these three indexes differ slightly, but include: housing permits, stock prices, the national leading index, the lagged coincident index.

*[NOTE: This index is not released publicly.]*

More details on the methodology and construction of these indexes can be found at: [http://www.ny.frb.org/research/regional\\_economy/coincident\\_summary.html](http://www.ny.frb.org/research/regional_economy/coincident_summary.html)

Source: FRBNY

### **Exhibit E-3. Private-Sector Job Growth in the U.S. and the Region**

This chart shows the 12-month growth rate of private-sector employment for New York-New Jersey (combined), New York City, and the U.S. (bars). Underlying data can be found at:

<http://stats.bls.gov/news.release/laus.t06.htm> and  
<http://stats.bls.gov/news.release/metro.t02.htm>

Source: U.S. Bureau of Labor Statistics

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#### **Exhibit E-4. Unemployment Rates**

This chart shows the monthly unemployment rate for New York State, New Jersey, New York City, and the U.S. from 1992 to present.

Source: U.S. Bureau of Labor Statistics, New York State Dept. of Labor and the New Jersey Department of Labor.

Data can be found at:

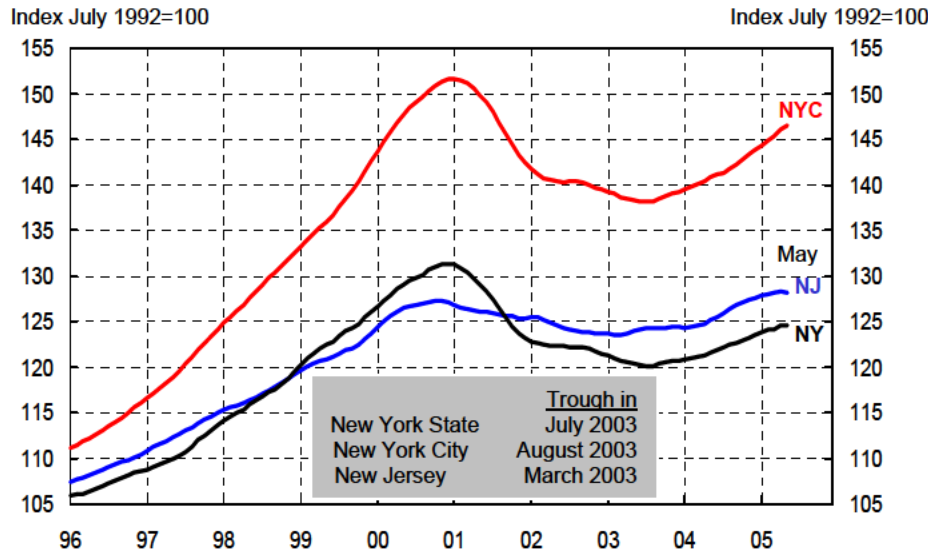
<http://www.labor.state.ny.us/agency/pressrel/pruistat.htm>

<http://www.wnjpin.net/OneStopCareerCenter/LaborMarketInformation/lmi16/release1.htm>

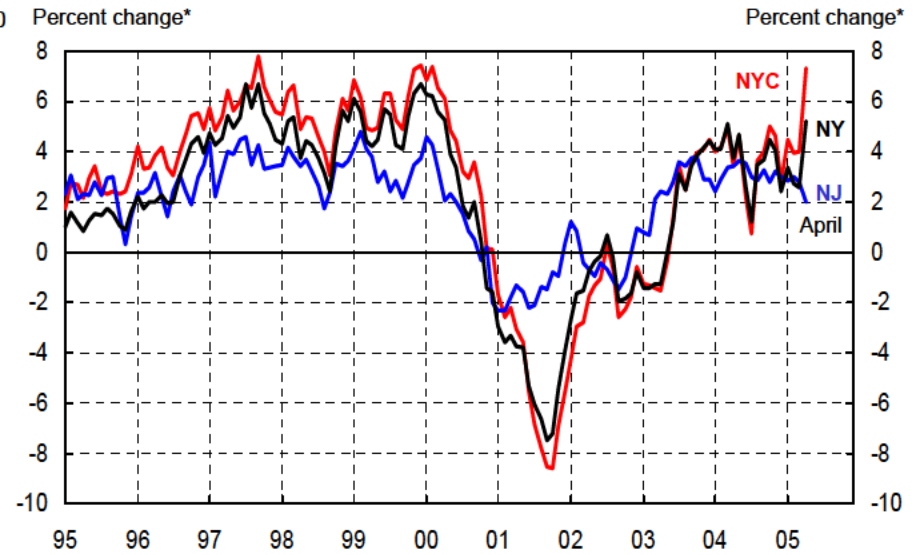
Sources: U.S. Bureau of the Census, NYC Rent Guidelines Board, Federal Reserve Bank of New York calculations.

## E. Regional Charts

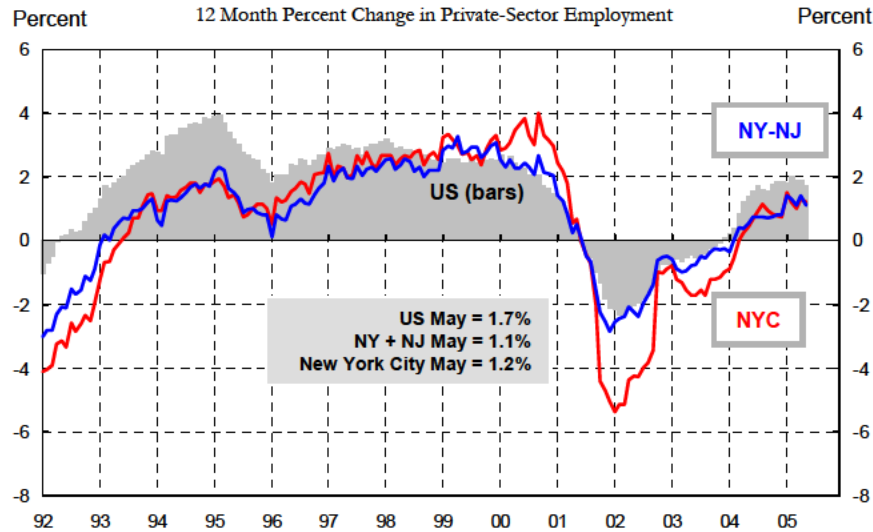
### E1: INDEX OF COINCIDENT ECONOMIC INDICATORS



### E2: INDEX OF LEADING ECONOMIC INDICATORS



### E3: PRIVATE-SECTOR JOB GROWTH: U.S. AND THE REGION



### E4: UNEMPLOYMENT RATES

