

**FRBNY Blackbook**

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**RESEARCH AND STATISTICS GROUP**

**FOMC Background Material**  
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# FRBNY BLACKBOOK

September 2005

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## 1. Overview

Our baseline forecast and risk assessment remain consistent with a 25 basis point increase in the target rate at the upcoming meeting. At the moment, there is insufficient evidence to justify altering the medium-term signal of a FFR target around 4.5% in 2006. At this juncture our assessment of the path is above that currently priced into markets, but the importance of the difference is difficult to interpret in light of the recent increase in uncertainty. The short-run signal about policy for the remaining meetings of 2005 should be modified to reflect this increased uncertainty.

The main change in our baseline forecast is a reduction in output growth in the second half of 2005. In addition, we see increased downside risk to that forecast compared to last cycle. The Greenbook has a similar, albeit larger drop in projected growth in the second half of 2005. Our baseline forecast for inflation in 2006 and 2007 is little changed. In contrast the Greenbook has raised the inflation profile in 2006 and is projecting core inflation to be 2% in 2007. This is the first cycle for some time in which our baseline inflation forecast is significantly below that of the Greenbook. However, the upside risk to the FRBNY inflation forecast has increased substantially, so both FRBNY and the Greenbook attach considerable probability to inflation exceeding implicit targets by uncomfortably large margins.

Our medium term risk assessment remains consistent with a continued removal of policy accommodation along a path that may take the target rate above that implied by our estimate of neutral, with a terminal value for the target falling somewhere between 4.25% and 4.75%. In the event that the uncertainty surrounding real activity is resolved favorably in the short-run, a clear signal should be given that the FFR target might go to the higher part of this range.

Measures of long-run inflation expectations derived from financial markets remain well contained. At the same time, however, recent consumer survey measures of inflation expectations and manufacturers' surveys of prices paid have moved up strongly

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particularly at short horizons. The behavior of inflation expectations derived from financial market instruments should be monitored very closely in the coming weeks.

Despite the increase in short-run uncertainty, the overall uncertainty around our inflation and output forecast remains very low compared to historical experience. This is consistent with financial market indicators such as risk spreads and equity prices, as well as implied volatility measures from equity markets and long-term interest rates. Nonetheless, the balance of risks underlying the uncertainty has moved in an unfavorable direction for monetary policymakers: more upside inflation risk, more downside output risk in the face of what appears to be a more permanent increase in energy prices.

## 2. Recent Developments

### U.S.

*Summary.* The data released since the last FOMC meeting largely predate any influence from Hurricane Katrina. On balance, they showed somewhat less near-term momentum in real activity than we had expected and slower growth in core inflation measures, suggesting greater downside risk to growth and reduced near-term upside risk to core inflation, although there remains risk of inflation exceeding the 1½% implicit target over the medium term. Nonetheless, revised data continued to show fairly brisk growth in labor costs, suggesting potential upward pressure on core prices or downward pressure on profits. The data showed steady gains in employment and continued strong growth in household spending in August; however, business spending on new capital and inventories continued to be fairly sluggish, and the turnaround in industrial activity appeared to be less pronounced than anticipated. Consumer sentiment fell sharply while business survey measures declined more moderately in the aftermath of Katrina.

*Inflation.* Recent core inflation numbers on balance have been lower than earlier in the year [see Exhibit A-6]. Core CPI rose only 0.1% for a fourth straight month in August, though the 12-month gain edged up to 2.2%. A sharp rise in the core finished goods PPI for July was offset by no change in August, leaving higher frequency growth rates fairly

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low; however, the 12-month change in this index was a rather high 2½%. The core PCE index rose slightly in July. The 12-month gain in this index stayed at 1.8%, but 3- and 6-month growth rates fell to 1½% or less after being well above 2% earlier in the year (“market-based” core PCE behaved similarly). Finally, even with the run-up in energy and other commodity prices, our underlying inflation gauge changed little on net during the period, indicating little change in the assessment of inflationary pressures from the data [see Exhibit A-7].

Of course, the rise in energy prices since July boosted the headline price numbers. However, the actual outcomes have not been that poor: the 3-month change of the finished goods PPI through August was 6.7% (annual rate), well under last November’s recent peak of 10.1%; and that for the CPI was 4.2%. In general, prices outside of energy have decelerated recently, apparently only partly due to special factors such as auto “employee pricing” discounts.

*Real activity.* Revisions to Q2 GDP were minor: the overall growth rate was 3.3% (annual rate), compared to the initial 3.4% estimate. Prior to Hurricane Katrina the notable developments were, first, continued strength in household spending: motor vehicle sales averaged about 18¾ million (annual rate) in July and August, non-auto, non-gas retail sales rose 0.5% in August, and July starts and sales of single-family homes set or remained near record highs.

In contrast, business spending was lackluster: July orders and shipments of nondefense capital goods less aircraft were both lower than they were in June, maintaining a basically flat path from the first half of the year. Private nonresidential construction spending in July also was little changed. Finally, the anticipated turnaround in inventories has not yet emerged. Manufacturers inventories rose in July, but inventories declined at the wholesale and retail levels (the latter heavily influenced by the surge in car sales). Partly as a result of the fairly tepid inventory reversal, manufacturing output rose only moderately in August. Though the disruption caused by Katrina depressed production some, taking a longer perspective recent factory production has been trending up about

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3½% (annual rate), a fairly sluggish recovery after the declines in the spring. In contrast, our Tech Pulse index continues to show robust growth similar to that of the past year.

*Labor market.* The pre-Katrina labor market continued to show sustained improvement. Nonfarm payroll employment rose 169,000 in August, with upward revisions to June and July. The household survey continued to show even stronger growth, with overall employment rising robustly and the unemployment rate slipping a notch to 4.9%. The labor force participation rate rose to 66.2%, its highest since late 2003 and 0.4 percentage point above its Q1 low. In some of the early data affected by Katrina, new claims for unemployment insurance shot up 71,000 in the second week of September: the Labor Department estimated 68,000 new claims were related to the hurricane.

Despite the gains in employment and drop in the unemployment rate, hourly wage increases were basically stable with the 12-month change remaining near 2¾%. In contrast, recent data on labor costs from the productivity report have been less favorable than anticipated. Growth in nonfarm business productivity in Q2 was marked down to a 1.8% annual rate. With an upward revision to compensation in Q2, unit labor costs now show a 2.5% rate of growth in Q2, and their four-quarter growth rate was a high 4.2%. The somewhat more elevated profile for labor costs creates the potential for some combination of firmer trend inflation or lower profits.

*Surveys.* Survey evidence from business and consumers suggests some impact, possibly sharp, from Katrina. Manufacturing surveys generally, but not universally, stayed at a level suggesting continued expansion. The ISM index slipped in August, reversing July's increase, but remained at a level consistent with some growth. Our September Empire State index, which in principle reflects conditions after Katrina's arrival, fell, but its level was consistent with further growth. The prices paid index rose sharply and there was some retreat in six-month expectations. In contrast, the Philadelphia Fed index (compiled over a similar period as the Empire State), fell to a level that typically signals minimal growth; the expectations index also fell sharply. The Chicago Purchasing Managers index also skidded in August to a level indicating no growth. Outside of manufacturing,

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the ISM service index rose in August to its highest value in almost one year. The University of Michigan's Index of Consumer Sentiment fell sharply in August and in early September, reflecting a combination of higher energy prices and the impact of Katrina. If the early September reading holds, the monthly decline would match the largest monthly drop ever seen in the index, and the two-month drop would be the largest such decline. Consumer's assessment of price increases over the next 12 months soared 1.5 percentage points to 4.6%; the long-term (five-year) expectations increased from 2.8% to 3.1%, the last time they were higher was January 1997.

## **Global**

Foreign GDP is projected to increase 2.6 percent (Q4/Q4) in 2005, essentially matching last year's growth rate. Growth in the first half of 2005 turned out to be stronger than we expected in August, largely because of revisions to Japanese GDP data for Q2. For the second half of 2005, the outlook has Japanese economy slowing as a payback for the unsustainable growth in 2005H1, while the euro area continues to grow at slightly below its potential rate. China is expected to slow to closer to its potential rate, while Mexico looks to rebound after its output fell in Q2.

*Industrial Countries.* Based on mixed recent data, we project growth in both the euro area and Japan to be fairly modest in Q3. Euro area production in June was weak, but June industrial orders, June exports, and July unemployment were all fairly encouraging. The index of industrial confidence was unchanged in August after two months of improvement. Data for Japanese production and shipments suggest payback for the rapid GDP growth in the first half of the year. Employment, though, remains on its recent positive trend. Recent data show that the UK economy may be stabilizing after a year-long slowdown.

*Emerging Economies.* The growth forecast for China remains at 8.9 percent (Q4/Q4) in 2005. Growth is expected to slow towards 8 percent (annual rate) in the second half of 2005 and in 2006, which is near the country's potential pace. Recent monthly data

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suggest that the risks to the forecast may be tilted to the upside. Industrial production, imports, money, and loan growth have accelerated in recent months after a slowdown in the first quarter. Recent monthly data show generally solid gains in exports and production in Korea, while data for Taiwan suggest that the economy continues to lag.

Mexican GDP disappointed in Q2, shrinking 1.7 percent (annual rate) because of weak domestic demand and a large drop in auto exports. Significant improvement is expected during the second half of 2005, in part from a rebound in exports. Brazil's growth was stronger than expected in Q2, helped by a snapback in investment. The ongoing political scandal does not appear to be adversely affecting confidence and growth.

### **Trade**

The U.S. trade deficit narrowed to \$57.9 billion in July from \$59.6 billion in June due to a fall in imports. The monthly deficit readings have been relatively stable since November 2004. Over this period, import growth has been surprisingly soft given the overall strength of the U.S. economy. In July, a decline in capital and consumer goods imports accounted for the bulk of the fall-off in total imports. Oil imports were up roughly \$1 billion because of another rise in oil prices; oil import volume was flat. Exports were unchanged in July but were still up at a healthy rate over year-ago levels. Exports sales to Canada and Europe continued to be strong, while those to Asia outside of China remained soft.

Going forward, the outlook is for a 0.2 percentage point drag on GDP in Q3 as non-oil imports rebound in line with the underlying strength of the U.S. economy. This represents only a modest payback, which we expect to continue into Q4, after net exports contributed 1.2 percentage points to GDP growth in Q2.



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## Financial

### *Domestic markets*

The market appeared to convince itself during the inter-meeting period that the FOMC would tighten at a slower pace for the rest of 2005, and that it would stop raising rates at a point 25 bp lower in 2006 than was previously expected. Calculations by the Cleveland Fed indicate that following the August 5 FOMC meeting, the Fed funds futures market was putting an 80 percent probability that the FOMC would raise rates to 4.00 percent by the November meeting. Katrina sharply reduced that probability to around 25 percent. Market expectations subsequently reversed themselves to put roughly equal odds on rates rising to either 3.75 or 4.00 percent by the time of the November meeting.

A similar swing in sentiment characterized bond and stock markets. Prior to Katrina, yields on the 10-year Treasury had fallen over 25 bp on weakening growth expectations and benign inflation reports. They fell another 10 bp following Katrina, apparently on expectations that higher oil prices would weigh more heavily on aggregate demand than on supply. Since Katrina, however, long-term yields have regained about 20 bp to end at 4.30 on Sept 15, as worst-case scenarios have failed to materialize. The yield curve is now lower across board – by 16, 27, 28, and 19 bp at the one, two, five, and 10-year horizons. The S&P 500 had fallen about one percent before Katrina, but has since made that up to end flat over the period.

The post-Katrina rebound in expectations about both near-term Fed policy and forward nominal rates undoubtedly reflects the fact that Katrina's worst-case scenarios have not appeared to come to pass. It may also reflect in part the robust fiscal response that is expected from the federal government. But trends over the last few weeks reflect the "rebound" from Katrina and therefore should not be allowed to obscure the inter-meeting shift in bond market sentiment that was emerging pre-Katrina. Namely, markets are now expecting a substantially more benign interest rate environment over the near-term horizon. Specifically, the "U-shaped" drop in yields across the curve reflects a 40 bp drop in the (one-year) forward rate one year out and a 20 bp drop in the forward rate five

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years out. Such a revision in expectations could reflect a more benign appraisal of recent inflation due to previously unrecognized productivity gains, but given recent events, a weaker aggregate demand environment seems the more likely interpretation of the market's view.

The drop in forward rates has been largely real rather than nominal. Yields on 5 and 10-year TIPS, in particular, reveal stable or slightly higher expected inflation. This evidence further supports the interpretation that markets have revised downward their expectations of future aggregate demand conditions.

Market indicators of expected volatility and default risk were essentially unchanged over the inter-meeting period.

### *Oil Markets*

During the inter-meeting period global asset markets were scarred by the effects of developments in energy markets, which exposed the global economy's vulnerability to shocks to both demand and supply of energy products. After trending up through most of August, the WTI spot price peaked at \$69.82/barrel on August 30, when Katrina exacerbated pre-existing rigidities in both oil extraction and refinery capacity. On impact, Katrina is estimated to have reduced global oil production by 1.5 mb/day, a gap falling to 0.8 mb/d on September 15; the Department of Energy also estimated about 5 percent of U.S. refining capacity has been lost for an "extended" period of time. Oil prices have since retreated, but the September 15 price of WTI, at \$64.75/barrel, is still 8.5 percent above its average in the three months preceding Katrina.

Although much of the damage inflicted by Katrina to oil production is temporary, spare production capacity remains limited. For 2005 as a whole, global oil production is expected to grow at half the rate of the previous year, contributing to persistent tight conditions in oil markets. Refinery capacity also is emerging as a key bottleneck for the availability of final oil products. FRBNY assumptions, based on recent behavior of

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futures prices, are that WTI prices will be \$65.00 in Q4 2005 and \$66.00 in Q4 2006. (At the time of the last FOMC meeting, the prices assumed for Q4 2005 and 2006 were \$61.00 and \$61.50, respectively.)

### *Global Equity and Bond Markets*

During the last FOMC cycle, most sovereign yields moved to offset the rise experienced during the previous cycle, bolstered by expectations of less aggressive U.S. monetary tightening ahead. The yield on the 10-year German bund fell to new lows in the aftermath of Hurricane Katrina, lifting the spread between long-dated U.S. and European yields to multi-year highs. Japanese yields also declined sharply in the aftermath of Hurricane Katrina, although they were supported by news about the country's strengthening recovery and by PM Koizumi's convincing electoral victory. Yields on emerging markets' debt fell disproportionately, in accord with historical experience: the spread of the EMBI+ index over U.S. treasuries narrowed by more than 20 basis points by early September, pushing emerging debt prices to near record levels.

The decline in bond yields sustained equity markets. Euro area stocks were essentially unchanged over the inter-meeting period, showing resilience to the impact of mixed economic news and higher energy prices, and benefiting from strong corporate profits and gains in U.S. and Japanese equities. European financial markets are drawing uncertainty from the upcoming German elections (scheduled for September 18): the expected win by Angela Merkel is supporting equity prices, but the possibility of a post-election grand coalition, which may dilute some of the structural reforms advocated by Merkel, is weighing against further gains. The Nikkei performed strongly, gaining 8 percent over the period, in part because of continued sizable foreign purchases of Japanese equities. Investor appetite for other Emerging Market stocks remains strong, with the MSCI local-currency Emerging Asia index rising over 1 percent, and shares of Mexican companies likely to benefit from the reconstruction efforts in the Southern United States gaining substantially.

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*Monetary Policy.* Euro area interest rate developments mostly reflect waning optimism about a brisk economic rebound in the euro area. Despite fear that higher oil prices might eventually spur inflation, mixed data releases and the negative demand impact of higher energy prices have pushed expectations of policy tightening in the euro area back towards the second half of 2006. After cutting rates in August, the Bank of England stayed on hold at its September meeting, and may not cut rates again before end-2005. The Bank of Japan is keeping quantitative easing in place for the time being. Upbeat comments from the Bank of Japan, and its September forecast that consumer price inflation may turn positive around year-end, have strengthened markets' beliefs that the Bank might shift away from quantitative easing in 2006. The Bank of Canada raised its target overnight rate to 2.75 percent in September, aiming for a stance more consistent with potential inflationary pressures in the pipeline. Policy in Brazil and Mexico has emerged from a tightening cycle and is currently on hold. Policy tightening may be needed in Argentina to forestall double-digit inflation, but is unlikely before mid-term elections this fall.

*Exchange Rates and Capital Flows.* The dollar weakened slightly (about 1 percent against major currencies) over the inter-meeting period, with expected future volatility little changed since the last FOMC meeting. The dollar/euro rate traded aimlessly within the \$1.21 - \$1.25 range. The euro was supported by weakening expectations of U.S. policy tightening ahead, especially in the aftermath of Hurricane Katrina, but later weakened, in response to mixed euro area data and uncertainty over political developments in Germany. The yen traded near the 110 level for much of the inter-meeting period, pressured down by the rise in oil prices, but appreciating in response to political developments and favorable economic data. Emerging Asia's currencies mostly weakened, as concern grew that elevated oil prices might affect disproportionately the region's net fuel importers and expose their vulnerability to global growth. The Brazilian real depreciated sharply in response to domestic political concerns but later recovered.

Markets are growing increasingly comfortable with China's reform of its exchange rate regime on July 21. The People's Bank of China has made little use of the flexibility offered by the new regime, and kept the yuan/dollar rate close to its post-reform level of

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8.11. This stance has dampened expectations of further RMB appreciation, and kept the prices of near-dated Chinese NDF contracts closer to those prevailing before July 21.

Foreign capital continues to flow smoothly to the United States. By year's end, the United States is expected to borrow in excess of \$800 billion, half of which is expected to be provided by Japan and the ten major developing Asian economies, and a third of which should be provided by Russia and other oil-producing countries. Flows from emerging Asia continue to take mostly an "official" form, with regional central banks increasing foreign currency reserves by \$160 billion in the first half of 2005. (China alone increased its holdings by \$110 billion.) Most of these purchases likely were of U.S. official assets.

### **Second District**

Our Indexes of Coincident Economic Indicators for July signal a slight downturn in activity in New Jersey and New York City, and a modest deceleration in New York State [Exhibit E-1]. Looking ahead to the next 9 months, our leading indexes predict that all three economies will show little or no growth: New Jersey's economy is projected to expand slightly over 1%, but activity is expected to decline roughly 1% in New York State and New York City [Exhibit E-2]. Inflation in metropolitan New York City increased in August as the Consumer Price Index (CPI) rose 4.1% from a year earlier, led by surging energy prices. The core CPI rose 3.2%—up from 2.6% in July and over a point above the U.S. rate. Part of the recent re-acceleration reflects the end of a temporary (two-month) reduction in cable TV charges. Over the past year, most categories of goods and services have registered somewhat larger price rises locally than nationally, particularly apparel prices, which were virtually unchanged nationally but were up 8% in the New York City metro area. This was partly offset by medical costs, which have risen less locally than nationally.

*Labor Markets.* In August, private-sector employment in the region grew at a moderate 0.8% annual rate, about the same as in July but well below the second-quarter pace. Job growth was faster in New York and in New York City, but barely positive in New Jersey.

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Year-over-year, private-sector employment was up 1.2% in the New York-New Jersey region and 1.4% in New York City, somewhat less than the 1.9% national increase [Exhibit E-3]. In August, New York State's jobless rate fell 0.4 points to 4.7%, while New York City's tumbled 0.6 points to 5.1%, its lowest level in 17 years; however, New Jersey's rate edged up to 4.2% from 4.1% in July and 4.0% in June [Exhibit E-4]. Although district job growth has been running about ½ percentage point below the U.S. rate, population and labor force growth also have been slower. Thus, regional unemployment rates have been below the U.S. average for several months for the first time since the late 1980s.

*Real Estate.* Construction activity across the district dipped in July, led by a substantial pullback in the multi-family sector. Compared with a year earlier, single-family housing permits were still slightly ahead, but multi-family permits, which had been robust in the first half of the year, were down about 6%. Much of the recent drop reflects a pullback in permits in New York City area—especially Long Island and northern New Jersey—where apartment construction had been exceptionally strong. Home prices across most of the region remain well ahead of a year ago, but the number of transactions has ebbed. Office markets in metropolitan New York City continued to strengthen in August, though there have been scattered signs of softening in industrial markets in both the Albany area and parts of metropolitan New York City.

*Surveys and Other Business Activity.* Recent surveys of businesses and consumers suggest some softening in the regional economy. Our September Empire State Manufacturing Survey [one of the first post-Katrina indicators available] indicates that activity continued to expand in recent weeks, though at a somewhat slower pace than in July and August; shipments accelerated but both new and unfilled orders weakened noticeably, and expectations weakened across the board. Survey results also indicated an upturn in prices received and prices paid, and widespread expectations of further increases. Just prior to Katrina, consumer confidence in the region fell sharply in August, based on two separate surveys. The Conference Board's index, covering New York, New

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Jersey and Pennsylvania, slipped to a three-month low, while Siena College's measure, based on surveys of New York State residents, fell to a nearly two-year low.

### 3. Outlook

#### FRBNY's Central Forecast

*Real Activity.* Our central forecast has changed little, as we expect Hurricane Katrina to have only modest effects on the aggregate economy over the medium term. The incoming data had suggested some trimming in the near-term momentum and the disruptions associated with the storm suggest further modest adjustments (the Boeing strike, if prolonged, also has the potential to reduce near-term growth). However, we still expect real growth to stay around 3½%. Rebuilding from the storm—which will, among other things, imply substantially higher federal outlays—along with a pickup in inventory accumulation could push growth slightly higher in late 2005 or early 2006. In contrast, continued high energy costs will weigh on consumer spending, and some retrenchment in housing is likely. These trends will become more evident as the re-equipment of households, businesses, and governments in the ravaged region ends. The fundamentals—low real interest rates, firm final demand, and high profits—continue to support brisk growth of capital spending. As the forecast horizon stretches into 2007, we see some of the special factors supporting growth (especially the rebuilding process and the housing boom) starting to fade and the cumulative effect of the monetary tightening process taking hold. Consequently, growth drifts down closer to 3%, at or slightly below potential. In this scenario unemployment would be little changed from its current rate of around 5%.

*Inflation.* The fundamental driving force in our inflation outlook continues to be our belief that there is little slack and that growth will be around its potential rate. Therefore, absent more monetary constraint, there would be no strong reason for the underlying inflation trend to change greatly. The continued low core inflation data confirm our earlier view that the Q1 pickup in core inflation was somewhat ephemeral; however, the most recent numbers also may be misleadingly low. In an environment of substantial

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flexibility in labor and product markets along with maintained Federal Reserve credibility, energy price increases need not systematically spread to other goods and services (aside from energy-intensive items such as air fares). The upshot is that we think that core PCE inflation will remain near its recent rate of around 2% through 2006. In 2007, we see the slightly softer path for the economy and continued monetary policy action if necessary, moving core PCE inflation downward towards 1.75%.

### **Comparison with Greenbook Forecasts**

*GDP and Inflation Forecast.* [See Exhibit A-2.] The forecast profiles for output across the two models are similar in 2005 and 2006, but the Greenbook (GB) has a weaker outlook for 2007. Given the GB estimate of potential of 3.1% and our estimate of 3.3%, we are predicting the economy to grow roughly at potential for the next three years, while the GB has it above potential in 2005 and 2006 and below in 2007. Our forecast for core PCE inflation matches the GB in 2005, but is lower in 2006 and 2007—we have core falling in 2007 from 2.0% to 1.8%, while the GB has it falling from 2.1% to 2.0%. At the same time our forecast for overall PCE is lower than the GB in 2005, but higher in 2006 and 2007. The GB text describes the assumption regarding pass through from energy prices as follows: 0.2% in 2006 and little effect in 2007. Thus the forecast of 2.0% for core in 2007 in the GB is not a function of higher energy prices. An important assumption for the difference between the GB and our path for inflation (both core and overall) seems to be the amount of slack in the labor market and the (assumed) pressure on output prices coming from rising compensation growth and unit labor costs. In particular, the GB has the labor market operating closer to trend over this period. With roughly similar aggregate demand conditions and productivity assumptions through 2006, this leads to stronger growth in compensation per hour in the GB and higher unit labor costs. This appears to be the mechanism by which the GB has higher core inflation through 2006. In 2007, the GB has demand conditions deteriorate absolutely and relative to our forecast, while growth in output per hour rises absolutely and relative to our forecast. Along with the increase in productivity and the weakening of demand conditions, however, there is a drop in the participation rate and a further acceleration in compensation per hour. The GB assumption for unit labor costs is about half a percent



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higher than ours in 2007, and compensation per hour is nearly a full percentage point higher. The GB assumption for the unemployment rate remains fixed at 5.0% over all three years, our forecast is 4.8% in 2006 and 2007, and 4.9% in 2005. The assumed path for the FF rate is the same in both forecasts (4.25% in 2006 and 2007).

*Alternative Board Scenarios.* The GB considers four alternative scenarios for the outlook: for each scenario, one simulation is done assuming no change in the policy path and one assumes a policy response based on a standard Taylor rule formula. The sentiment slump scenario generates a near-term softening in output and then little effect thereafter. The two scenarios that alter the assumption about underlying inflation expectations seem the most interesting. In the case in which inflation expectations are high relative to the baseline, core inflation runs at about 2.7 in 06 and 2.4 in 07. Alternatively, in the “low inflation” scenario, inflation runs above what might be considered the implicit inflation target through the end of 06, and then reaches that 1.5 target in 07. Thus “low inflation” is the case that in which inflation doesn’t meet the implicit inflation target until 07.

*Scenario 1: Sentiment slump*

**Assumptions:** The GB assumes that Michigan confidence falls about ten points in September and stays low through November, at which time it bounces back. The alternative assumes a larger drop (14 points on quarterly average) that lingers longer. Because confidence does not influence consumption in FBR/US, a reduced form specification is used to calculate the consumption response. This response is then added exogenously to FRB/US to determine aggregate responses. In addition, some drop in residential investment is implied by the fall in confidence as well.

**Summary:** This scenario produces a modest slowdown in output and increase in unemployment relative to the baseline in the second half of 2005 and through 2006 (even with the policy response). The scenario has little effect on core inflation, thus implying it would still run above 2.0% in 2006 and only fall modestly below that in 2007.

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*Scenarios 2: Deteriorating inflation expectations*

**Assumptions:** The current surge in energy prices and past elevated rates of headline inflation cause expectations to rise 0.5 percentage points relative to the baseline assumption (in which case they rise 0.5 percentage points through the end of the forecast period). Thus agents in this economy are gradually raising their estimate of “trend” inflation over this period.

**Summary:** This scenario has little effect on output and unemployment, but pushes core inflation up to 2.7% in the first half of 2006, and to 2.5% in 2007. The monetary policy response has very little impact on inflation, only shaving a little off in 2007 to leave it at 2.4% rather than 2.5%, but it pushes output below potential and unemployment above the baseline.

*Scenario 3: Buoyant households*

**Assumptions:** Housing market continues to “sizzle” in the absence of any rise in mortgage rates, and the broader pace of household spending is less restrained. Specifically, the rate of increase of real estate values slows only to 10% by 2007, pushing the level of home prices 16% above the baseline late that year. The personal saving rate edges up to only 1% by 2007, which is 0.75% below the baseline.

**Summary:** This scenario generates growth well above the baseline and the Board’s assumed rate of potential. The unemployment rate drops below the baseline. This scenario generates no effect on inflation relative to the baseline, a result that makes it difficult to find this a very convincing/useful scenario.

*Scenarios 4: Low inflation*

**Assumptions:** Here it is assumed that instead of the 0.5% deterioration in inflation expectations assumed in the baseline, inflation expectations have been stable since 2003 and continue to be through the end of the forecast period.

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**Summary:** This scenario generates output growth slightly above potential in early 2006, but then below potential and below the baseline in 2007 either with or without a policy response. Unemployment doesn't change until 2007, when it is above the baseline in the case of no policy response and below in the case in which policy responds. Inflation grows less robustly than in the baseline or any of the other scenarios, but is only at 1.5% in 2007.

*Foreign Outlook.* The major differences with the Board's global outlook for the second half of 2005 are largely offsetting. For Japan, both forecasts have a slowdown from the 4.5 percent (saar) growth rate achieved in 2005H1. Our slowdown is marginally steeper, with growth expecting to average 0.75 percent (saar) in H2, while the Board expects growth to average 1.35 percent. Our outlooks for China and Mexico are more optimistic. The Board has China growing 8.1 percent (Q4/Q4) in 2005, while we have 8.9 percent growth. A key difference is that the Board estimates a much lower seasonally adjusted growth rate in Q2, which we do not see as justified given other output indicators. Both forecasts expect Mexico to recover from a very weak performance in 2005H1. We project growth significantly above potential in H2, bringing growth for the year back to near potential. The Board has growth returning to near potential in H2, with the economy not making up for lost output in H1.

*U.S. Trade.* The difference between our forecast and the Board's is largely limited to projections for Q3. We have net exports being a 0.2 percentage-point drag on GDP while the Board has them as a 0.3 percentage-point contribution. The difference is in the size of the rebound in imports following unusually weak data for Q2 as well as in the projected growth in exports. The Board has real non-oil imports growing at a 1.0 percent rate in Q3, while we have a 4.5 percent increase. Our forecast is based on the assumption of relatively robust domestic demand in the quarter. In addition, the Board forecasts another decline in the volume of oil imports while we have a small increase. For the year as a whole, the Board has oil imports unchanged, while we have oil imports up 3 percent, in line with recent trends and the strength of the economy. For real non-agricultural exports, the Board forecasts a Q3 growth rate of 4.1 percent while we anticipate a growth

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rate of 8.3 percent. One difference is that the Board makes a major adjustment to exports because of the Boeing strike, while we did not. A second is that the Board assumes the rapid Q2 growth in computer and semiconductor exports will fall off in Q3, while we assume it will remain on trend.

### **Comparison with Other Forecasts**

[see Exhibit A-5.] There is general agreement across the forecasts on output through the end of 2005. One notable exception to this is the PSI model, which is the forecast generated on the basis of lagged GDP growth and business sentiment indices. This model is calling for considerably weaker growth in Q3 and Q4 of this year. Much of this weakness seems to be driven by the Goldman Sachs Surprise Index, though we have not investigated precisely what is causing the weakness in that index (the data used to produce the index was updated to include the Michigan confidence release on 9/16, but this release alone cannot explain the negative influence of the Surprise index on the PSI forecast). The large discrepancy between the PSI forecast and the others suggests the potential for downside risks to the forecasts made using more judgmental or structural model based approaches.

The FRBNY forecast for overall PCE inflation is the lowest, though both the Blue Chip and Macro Advisors forecasts were made in early September when the situation with energy prices seemed worse than it currently appears. Our forecast of core PCE inflation agrees with Macro Advisors.

### **Alternative Scenarios and Risks**

*Alternative 1: Global Deflation.* 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 shifts has been unambiguous

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in terms of lowering inflation and lowering long-term yields. These developments have been supportive of recent growth in the US but the downside risk in this scenario comes from an abrupt slowdown in Chinese growth without a compensating increase in Europe or Japan, thus generating a bad deflationary shock to the world economy.

*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 have given reduced support for this scenario: the four-quarter average of productivity growth has fallen well below 3% and unit labor costs have increased. Further, business investment continues to be weaker than expected.

*2.b Slower Productivity Growth*

Recent productivity revisions provide more evidence of a slowdown in productivity growth. Our central projection continues to assume that this is only a temporary cyclical moderation in productivity growth, but there is downside risk to this assessment. Further, the persistent increase in the level and volatility of energy prices also could be associated with a fall in labor productivity.

*Alternative 3: Overheating.* The extremely accommodative policy followed in the US and other countries since the global slowdown of 2000-2003 may produce a persistent move in inflation above implicit targets with an abrupt slowdown in real output growth starting in late 2005/early 2006. 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

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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 core inflation reports recently has not been supportive of this viewpoint, although total inflation is still high. TIPS implied inflation rates give no indication that markets are pricing in a large increase in underlying inflation. However, long-term household inflation expectations have moved up as retail gasoline prices spiked.

*Alternative 4: Hurricane.* This scenario captures the increased uncertainty associated with the hurricane. This scenario assumes that the hurricane causes an abrupt slowdown in real activity, followed by a sharp snapback. It is agnostic on the inflation implications.

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*

*Foreign Outlook.* The ability of foreign economies to cope with high energy prices remains the key risk to the foreign outlook. The downside risk is that the recent jump in energy prices, evident before Katrina, will begin to have a more tangible impact on output and core inflation than has been evident so far. There are, though, some upside risks to the foreign outlook. In the euro area, low long-term rates matched by accelerating growth in loans to non-financial firms may be a precursor of greater-than-expected growth. Japan's economy was remarkably strong in the first half of 2005. The forecast is for a significant amount of payback in 2005H2, but the recent GDP data and higher equity values may indicate that Japan finally has turned the corner and thus economy is set to slow less than expected. In support of this view, the Japanese labor market continues to improve and investment spending is being supported by rising profits. In Asia, a major downside risk is that investment in China continues to grow at an unsustainable pace. As a consequence, China remains vulnerable to an abrupt slowdown with unwelcome spillover effects for the rest of Asia. Another unknown is how long countries such as Japan, China, and others in the region can continue to shield

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consumers from higher energy prices. In Latin America, mid-term elections this fall in Argentina and presidential elections next year in Brazil and Mexico may be disruptive and damage confidence.

*U.S. Trade Forecast.* The near-term impact of Hurricane Katrina on net exports is difficult to estimate. In Q3 and Q4, both exports and imports are likely to decline because of the destruction of ports on the Gulf Coast, which would have ambiguous effects on the trade deficit. At the same time, rebuilding efforts may lead to a surge in imports of building materials and the like, causing the trade deficit to deteriorate. More generally, the unusually soft import numbers in Q2 are viewed as a temporary phenomenon, but it is possible they represent a more lasting trend in U.S. demand for imported goods.

*Quantifying the Risks.* The incoming data, except for the large persistent increase in energy prices, were generally consistent with our central scenario before Katrina. Katrina adds considerable short-run uncertainty to the outlook but does not affect the long-run balance of the risks. We are lowering the current probability assessment of the central scenario to 64% (it was 67% for the August FOMC). **We are changing the balance of risks** by placing less weight on the overheating and productivity surge scenarios and more weight on the productivity slowdown. The global deflation scenario is also increased slightly because of the possible effects of higher energy prices on China and the signal from the drop in real rates in financial markets before Katrina. The combination of these changes produces **more downside risk to the output forecast in 2006 and 2007. For inflation although the probability of exceeding implicit target ranges has not changed, the size of the possible excess continues to increase (see Exhibit C-4).**

We assume that the most likely alternative scenario is now the productivity slowdown at 12% (8% in August), next is overheating at 8% (12% in August), then the new hurricane scenario at 5%, followed by continued productivity surge at 4% (6% in August), and global deflation at 4% (3% in August). The remaining 3% covering the additional uncertainties is all on the upside. The implied dynamic balance of risks is shown in Exhibit C-1.

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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 relatively high central inflation path keeps the probability at 70% (70% in August) of core PCE inflation exceeding 2.5% by the end of 2007 (this probability is produced by considering the share of inflation paths that exceed 2.5% and cannot be obtained directly from the forecast distribution presented in Exhibit C-4). The probability that the expansion continues through the end of 2007 is unchanged at 95%. The FRBNY “confidence intervals” are very similar to those presented in the Greenbook for 2005. There are differences in 2006 and 2007. We are more confident in the output forecast in 2006 and less confident on the inflation forecast than is the Greenbook. Further, we have more upside risk to inflation and more downside risk to output than the Greenbook in 2006. For 2007 we are very similar on inflation but are still more confident on output. Most of the difference appears to be due to the use of historical errors in the Greenbook compared to our subjective assessment calibrated by implied volatility.

#### 4. Policy Alternatives

Our baseline forecast and risk assessment remain consistent with a 25 basis point increase in the target rate at the upcoming meeting. At the moment, there is insufficient evidence to alter the medium-term signal of the FFR increasing to around 4.5% in 2006. However, the short-run signal about policy for the remaining meetings in 2005 should be modified to reflect increased uncertainty. In comparison, at the last cycle the appropriate monetary policy signal for the next three meetings was judged to be further measured increases to bring the FFR to 4.25% by the end of 2005; afterwards the medium-term signal was to have a positive slope to the futures curve in 2006 from the initial position of 4.25%.

For the first time since late spring 2004, there is significant uncertainty in the markets about the short-term path of monetary policy. Given the large increase in uncertainty about real activity in the short run and the stage of the tightening cycle, it is appropriate that the short-run outlook for policy has become more data dependent.



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At the same time the fundamentals of our outlook have not changed sufficiently to alter our medium-term assessment. This assessment is consistent with the small reaction of risk spreads and equity markets to the disruption caused by Katrina. This conclusion is further supported by the analysis provided in Box A: monetary policy should not react to large supply disruptions unless there are additional spillovers to demand not warranted by the initial shock. Of course it is difficult at the present to assess whether such spillovers might occur, thus the change in our confidence concerning the precision of short-term signal. Ultimately, any clear signal of short-run sensitivity of monetary policy to unwarranted weaknesses in demand caused by the supply disruption must also re-emphasize the importance of price stability and that measures will be taken to ensure it if necessary.

We consider three possible signals in our policy alternative exercises:

1. *Pause and respond (Below short-run market expectation, above expectation by end of 2006).* No increase in September and a very data dependent signal until the hurricane uncertainty is resolved. Signal some possibility of a rate cut in Q4. A continued signal of aggressive future response to higher inflation/inflation expectations in 2006; in particular, a 50 bp increase might be required in 2006.
2. *Raise and wait (At short-run market expectation, above expectation in 2006).* Increase 25 bp in September and a data dependent signal with no hint of the possibility of a cut in Q4 unless conditions substantially deteriorate. Continued signal of aggressive future response to higher inflation/inflation expectations in 2006.
3. *Inflation Hawk (Above short run market expectation, above expectation in 2006).* Increase 25 bp with a signal of little sensitivity to the noisy activity data and more sensitivity to inflation data and expectations. This comes closest to the old signal of “measured ends past neutral.”

Exhibit D-1 contains the results of implementing these three different signals by amending the behavior of our gradual policy rule in the short-run. It shows the implied (quarterly average path) of FFR through the end of 2006 compared to that currently priced into markets.

All three policy rules produce a higher level for the FFR at the end of 2006 than presently is priced into financial markets. This is similar to the situation in the last cycle but the gap

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is less significant given the greater uncertainty in our forecast. Box B discusses some methods of quantifying the differences between our assessment and that priced into markets. Using metric 1 given in Box B the *Pause and Respond* signal is at the 62<sup>nd</sup> percentile, the *Raise and Wait* signal at 67<sup>th</sup> percentile, the *Inflation Hawk* signal is at the 72<sup>nd</sup> percentile of the of the market distribution respectively. Using metric 2 the market **expectation at the end of 2006Q1** is at the 90<sup>th</sup> percentile of the *Pause and Respond* signal distribution, the 60<sup>th</sup> percentile of the *Raise and Wait* signal distribution and the 53<sup>th</sup> percentile of the *Inflation Hawk* signal distribution. Note that this indicates some positive skewness in the distribution of FFR implied by our rules (that is, the expected value is above the median). There is no evidence that such positive skewness is priced into markets [see Exhibit B-5].

If we focus on the signal that appears to be most consistent with market expectations for the next few meetings, *Raise and Wait*, then the alternative scenarios of overheating and global deflation continue to have very different implications for policy in 2006 and 2007. Exhibit D-2 contains the path of the nominal FFR and Exhibit D-3 that of the real FFR for the alternative scenarios.

As seen in Exhibit D-2, 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 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. These two scenarios are very easy to distinguish because they move output and inflation in opposite directions in the short run [see Exhibits C-2 and C-3]. However, the new hurricane scenario complicates the situation, since in the short run it would produce a drop in output similar to the global deflation and productivity slowdown scenarios but its effects on inflation are less striking. Its policy implications are quite different from the other scenarios as seen in Exhibit D-2.

One explanation of the difference between the market-implied path and the path that we view as consistent with FOMC objectives is differing views of the (implicit) inflation

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target. The new Exhibit D-4 shows the result of running our standard policy rule (setting the initial FFR at its value in 2004Q4) with a 1.5% inflation target and with a 1.75% inflation target. The path derived from the 1.5% target follows quite closely the actual FFR increases in 2005 albeit with less steepness to its slope. The endpoint is very similar to our three policy rules discussed above. In contrast, the path of the FFR in 2005 under the higher inflation target is considerably lower than the actual path but the endpoint is similar to that priced into markets. One tentative conclusion from this analysis is that the markets either have a more sanguine view of inflation than currently embedded in our forecast and/or we have a more sanguine view of real activity going forward than priced into markets.

# Special Topic 1

## The Policy Response to Supply Shocks

September 16, 2005

Jim Kahn Redacted

The response of monetary policy to perceived changes in the level of economic activity depends crucially on whether the change is primarily supply- or demand-driven. Whereas countercyclical policy can be effective in muting the effects of demand shocks, its role is more limited in the case of relative price shocks such as an energy price increase, or any other supply shock, unless there is some kind of financial market disruption or spillover effect into aggregate demand. A practical reason for this is that supply shocks have opposite effects on output and inflation; therefore an attempt to offset one effect (say an output decline) will likely result in exacerbating the other effect (inflation). A deeper reason is that supply shocks call for resource reallocations that monetary policy should not hinder. In particular, potential and actual output typically move together in response to a supply shock, whereas sticky prices and other rigidities result in a systematic divergence between potential and actual output in response to demand shocks.

One aspect of supply shocks that may merit the attention of policymakers is their impact on the equilibrium real interest rate. A temporary adverse supply shock would normally increase this rate, as efforts to smooth consumption come up against temporarily diminished resources. (It should be noted that this effect is likely to be small in an open economy, and would be accompanied by an increase in

the current account.) At the same time, however, the behavior of inflation and inflation expectations is likely to raise this rate without active intervention by policymakers: the shock will lead to a temporary increase in the price level, which increases current inflation but *reduces* expected future inflation, which in turn increases the real interest rate.

Complicating this analysis, however, is that price responses will depend on expectations of the policy response. Absent credible commitment to a path for the price level, this automatic adjustment of the real rate might not take place. (Note that this requires inflation to fall back below its pre-shock path to offset the transitory increase.) Moreover, it is important to gauge where policy and the economy were headed prior to the shock. At the onset of a sustained period of tightening, policy will be less sensitive to incoming data than it will be as it nears neutrality. In the latter case, unusual shocks can make incoming data more difficult to interpret, and thus could merit caution by policymakers.

Finally, policymakers might want to lean toward tighter or looser policy in response to a persistent energy price increase depending on initial conditions. If the shock hits when inflation is already above its target, but output is close to potential, it could call for somewhat tighter policy than if, for example, inflation were at its target but output well below potential. The latter scenario could call for lower rates, as the cost of further weakening of output might be viewed as more costly than an increase in inflation.

## Special Topic 2

### **Measuring the Importance of the difference between the market implied path and FRBNY implied path**

September 16, 2005

Simon Potter

Redacted

For a number of FOMC cycles our forecast combined with a standard policy rule (a neutral policy rate of 4%, an inflation target of 1.5% and coefficients of 1.5 on inflation divergences from target and 0.5 on output gap deviations) has implied a higher endpoint for this tightening cycle than that priced into markets. Of course, neither the markets nor FRBNY can be certain about the state of the economy in 2006 and 2007. Hence, both implied paths are expectations that are unlikely to be realized exactly. An alternative method of measuring the gap between the market's and the FRBNY view of the future FFR is to consider the uncertainty around the respective paths. For example, consider two cases where the gap between the market and FRBNY is 100 bp. In the first case FRBNY has a 90% probability interval of 75 bp around its forecast of the FFR. In the second case, the 90% probability interval is 200 bp. Clearly, in the FRBNY assessment of the divergence between the two, the gap is more significant (relative to our uncertainty) in the first case than it is in the second. We can use option market data to assess the uncertainty around the implied market path and the exercise

discussed above can be done from the point of view of the market. This leads to two metrics for measuring the distance:

1. The percentile of the market distribution of the prediction from our policy rule.
2. The percentile of our policy rule distribution of the expected path priced into markets.

There are many other sources of differences between the two paths. One important consideration is the adjustment for risk in constructing the market path. We use an adjustment from the Board that is constant over time but there is some evidence that the adjustment may be time varying. Furthermore, the market faces uncertainty over the policies and targets used by the FOMC. We can attempt to capture this uncertainty but again it might vary over time.

The new Exhibit D-5 provides additional information about the uncertainty surrounding the expected interest rate paths derived from our forecast distribution and policy rules. This is in the form of a boxplot: the box represents the interquartile range (50% probability interval), the line in box represents the median, the tails represent the 5<sup>th</sup> and 95<sup>th</sup> percentiles, and the triangles represent the pattern of interest rates outside the 90% probability interval. Details of its construction are given in the preamble to D Exhibits.

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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: 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, FRBNY 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			
	Jun05	Aug05	Sep05	Jun05	Aug05	Sep05	Jun05	Aug05	Sep05	Jun05	Aug05	Sep05	Jun05	Aug05	Sep05	
2005 Q1	3.5	3.8	3.8	3.2	3.1	3.1	2.1	2.3	2.3	2.2	2.4	2.4	5.3	5.3	5.3	
2005 Q2	3.2	3.4	3.3	1.6	2.4	2.4	3.7	3.3	3.2	2.0	1.7	1.6	5.2	5.1	5.1	
2005 Q3	4.1	4.0	3.5	1.9	1.6	2.6	2.1	2.4	3.6	1.9	1.8	1.4	5.1	5.0	4.9	
2005 Q4	3.5	3.9	3.3	2.3	1.6	1.4	2.2	2.2	1.7	1.9	1.9	1.8	5.1	5.0	4.9	
2006 Q1	3.4	3.5	3.4	2.6	2.6	2.5	2.2	2.2	2.2	1.9	2.0	1.9	5.1	4.9	4.8	
2006 Q2	3.6	3.5	3.3	2.2	2.2	2.2	2.2	2.2	2.2	1.9	2.0	2.0	5.1	4.8	4.8	
2006 Q3	3.6	3.5	3.2	2.2	2.3	2.2	2.2	2.3	2.3	1.9	2.1	2.1	5.0	4.8	4.8	
2006 Q4	3.7	3.5	3.2	2.3	2.2	2.2	2.2	2.3	2.3	1.9	2.1	2.1	5.0	4.7	4.8	
2007 Q1	N/A	3.3	3.3	N/A	2.6	2.2	N/A	2.2	2.2	N/A	2.0	2.0	N/A	4.7	4.8	
2007 Q2	N/A	3.3	3.4	N/A	2.1	2.1	N/A	2.1	2.1	N/A	2.0	1.9	N/A	4.7	4.8	
2007 Q3	N/A	3.3	3.3	N/A	2.0	2.0	N/A	2.0	2.0	N/A	1.7	1.8	N/A	4.7	4.8	
2007 Q4	N/A	3.3	3.3	N/A	1.9	2.0	N/A	1.9	1.9	N/A	1.7	1.7	N/A	4.7	4.8	
2003 Q4 to 2004 Q4	3.9	3.8	3.8	2.4	2.9	2.9	2.6	3.1	3.1	1.6	2.2	2.2	-0.4	-0.4	-0.4	*
2004 Q4 to 2005 Q4	3.6	3.8	3.5	2.2	2.2	2.4	2.5	2.5	2.7	2.0	2.0	1.8	-0.3	-0.4	-0.5	*
2005 Q4 to 2006 Q4	3.6	3.5	3.3	2.3	2.3	2.3	2.2	2.3	2.2	1.9	2.0	2.0	-0.1	-0.3	-0.1	*
2006 Q4 to 2007 Q4	N/A	3.3	3.3	N/A	2.2	2.1	N/A	2.0	2.0	N/A	1.8	1.8	N/A	0.0	0.0	

\* 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		2007		2005		2006		2007
	AUG	SEP	AUG	SEP	AUG	SEP	AUG	SEP	AUG	SEP	SEP
REAL GDP (Q4/Q4)	3.8	3.5	3.5	3.3	3.3	3.3	3.9	3.5	3.1	3.4	2.9
GROWTH CONTRIBUTIONS(Q4/Q4)											
FINAL SALES TO DOMESTIC PURCHASERS	3.9	3.6	3.9	3.6	3.4	3.6	3.8	3.5	3.5	3.9	3.0
CONSUMPTION	2.4	2.3	2.3	2.3	2.1	2.2	2.4	2.1	2.3	2.5	2.2
BFI	1.0	0.7	1.1	0.9	1.0	1.0	0.6	0.5	0.8	0.9	0.6
STRUCTURES	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
EQUIPMENT & SOFTWARE	1.0	0.7	1.0	0.8	0.9	0.8	0.6	0.5	0.7	0.7	0.5
RESIDENTIAL INVESTMENT	0.1	0.2	-0.1	-0.1	-0.1	-0.1	0.3	0.4	0.0	0.1	-0.1
GOVERNMENT	0.5	0.4	0.6	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.3
FEDERAL	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.1	0.1	0.0
STATE & LOCAL	0.3	0.3	0.4	0.4	0.3	0.4	0.2	0.3	0.3	0.3	0.3
INVENTORY INVESTMENT	0.0	-0.1	0.0	0.1	-0.1	0.1	0.0	-0.1	-0.1	-0.1	0.3
NET EXPORTS	-0.1	0.0	-0.3	-0.5	0.0	-0.4	0.1	0.1	-0.4	-0.4	-0.4
INFLATION/PRODUCTIVITY/WAGES (Q4/Q4)											
GDP DEFLATOR	2.2	2.4	2.3	2.3	2.2	2.1	2.3	2.7	2.1	2.0	2.1
PCE	2.5	2.7	2.3	2.2	2.0	2.0	2.6	3.2	2.1	1.9	1.8
CORE PCE	2.0	1.8	2.0	2.0	1.8	1.8	2.0	1.9	2.1	2.3	2.0
COMPENSATION PER HOUR	5.2	4.8	4.4	4.4	4.1	4.2	4.6	4.7	5.2	5.4	5.1
OUTPUT PER HOUR	2.4	2.4	2.2	2.2	2.2	2.2	2.9	2.8	2.1	2.2	2.5
UNIT LABOR COSTS	2.8	2.4	2.2	2.2	1.9	2.0	1.6	1.8	3.1	3.1	2.5
EMPLOYMENT VARIABLES											
UNEMPLOYMENT RATE (Q4 LEVEL)	5.0	4.9	4.7	4.8	4.7	4.8	5.0	5.0	5.0	5.0	5.0
PARTICIPATION RATE (Q4 LEVEL)	66.1	66.2	66.1	66.2	66.1	66.2	66.0	66.1	66.0	66.0	65.9
NONFARM PAYROLL EMPLOYMENT (Q4/Q4 CHANGE)											
TOTAL, IN THOUSANDS	2038	2107	2018	1741	1788	1765	2200	2000	1800	2000	1100
AVERAGE PER MONTH, IN THOUSANDS	170	176	168	145	149	147	183	167	150	167	92
FINANCIAL MARKET VARIABLES											
FED FUNDS RATE (PERCENT)	3.92	3.92	4.25	4.25	4.25	4.25	4.00	4.00	4.25	4.25	4.25
BAA BOND YIELD (PERCENT)	6.2	6.1	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.1
EFFECTIVE EXCHANGE RATE (Q4/Q4 % CHANGE)	-1.2	-2.5	-3.0	-1.5	N/A	N/A	0.8	1.3	-1.3	-1.7	N/A

# A. Forecast Details

## Exhibit A-3: Judgment Table

	2005:01	2005:02	2005:03	2005:04	2006:01	2006:02	2006:03	2006:04	2007:01	2007:02	2007:03	2007:04	Q4/Q4 % CHANGE/Q4 LEVEL			
													2004	2005	2006	2007
<b>REAL GDP AND COMPONENTS (% Change, AR)</b>																
GDP.....	3.8	3.3	3.5	3.3	3.4	3.3	3.2	3.2	3.3	3.4	3.3	3.3	3.8	3.5	3.3	3.3
CHANGE IN INVENTORIES (GROWTH CONTRIBUTION) 1\.....	0.3	-2.0	0.1	1.1	0.0	0.3	0.0	0.1	-0.1	0.2	0.2	0.1	0.2	-0.1	0.1	0.1
DOMESTIC PRIVATE PURCHASES.....	4.0	1.9	3.5	3.8	3.6	3.6	3.5	3.5	3.5	3.5	3.5	3.5	4.5	3.3	3.5	3.5
CONSUMPTION EXPENDITURES.....	3.5	3.0	3.4	3.0	3.1	3.3	3.4	3.3	3.1	3.1	3.2	3.2	3.8	3.2	3.3	3.1
BUSINESS FIXED INVESTMENT.....	5.7	8.4	6.0	8.0	8.5	8.5	8.5	8.5	8.8	8.8	8.8	8.8	10.9	7.0	8.5	8.8
RESIDENTIAL INVESTMENT.....	9.5	9.8	3.0	-8.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	6.6	3.3	-2.0	-2.0
NET EXPORTS (GROWTH CONTRIBUTION) 1\.....	-0.4	1.2	-0.2	-0.7	-0.3	-0.5	-0.5	-0.5	-0.4	-0.4	-0.4	-0.4	-0.9	0.0	-0.5	-0.4
EXPORTS .....	7.5	13.2	8.3	9.4	9.5	7.0	6.7	6.6	6.6	6.6	6.6	6.6	6.1	9.6	7.4	6.6
IMPORTS .....	7.4	0.5	6.5	10.6	8.1	7.3	7.5	7.4	6.5	6.5	6.5	6.5	10.6	6.2	7.6	6.5
FEDERAL GOVERNMENT.....	2.3	1.6	3.0	3.3	6.0	1.0	2.2	1.8	5.5	1.7	1.7	1.7	4.2	2.6	2.7	2.6
STATE & LOCAL GOVERNMENTS.....	1.6	3.4	1.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.9	2.2	3.0	3.0
<b>INTEREST RATE ASSUMPTIONS (%)</b>																
FEDERAL FUNDS RATE (TARGET).....	2.44	2.92	3.44	3.92	4.00	4.00	4.25	4.25	4.25	4.25	4.50	4.50	1.94	3.92	4.25	4.5
YIELD ON 10-YR GOVERNMENT.....	4.3	4.2	4.2	4.4	4.4	4.4	4.6	4.6	4.6	4.6	4.7	4.7	4.2	4.4	4.6	4.7
BAA BOND YIELD.....	6.0	6.0	6.0	6.1	6.2	6.3	6.4	6.5	6.5	6.5	6.6	6.6	6.2	6.1	6.5	6.6
<b>INCOME (% Change, AR)</b>																
PERSONAL INCOME.....	2.0	6.3	6.5	5.0	6.7	6.5	6.5	5.8	6.8	6.6	6.8	5.8	7.5	4.9	6.4	6.5
REAL PERSONAL DISPOSABLE INCOME.....	-3.4	2.0	2.8	3.2	4.5	4.2	4.1	3.4	4.8	4.4	4.8	3.8	4.1	1.1	4.1	4.4
PERSONAL SAVING RATE (% OF DPI).....	0.5	0.3	0.0	0.0	0.2	0.4	0.4	0.4	0.6	0.8	1.0	1.0	1.7	0.2	0.4	0.9
CORPORATE PROFITS BEFORE TAXES.....	24.5	22.1	2.3	1.7	-1.7	1.2	1.2	1.1	-2.2	2.1	2.0	1.9	9.6	12.1	0.4	0.9
<b>PRICES &amp; PRODUCTIVITY (% Change, AR)</b>																
GDP IMPLICIT DEFLATOR.....	3.1	2.4	2.6	1.4	2.5	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.9	2.4	2.3	2.1
PERSONAL CONSUMPTION EXPENDITURES.....	2.3	3.2	3.6	1.7	2.2	2.2	2.3	2.3	2.2	2.1	2.0	1.9	3.1	2.7	2.2	2.0
CORE PERSONAL CONSUMPTION EXPENDITURES.....	2.4	1.6	1.4	1.8	1.9	2.0	2.1	2.1	2.0	1.9	1.8	1.7	2.2	1.8	2.0	1.8
CONSUMER PRICE INDEX.....	2.4	4.2	3.8	2.5	2.4	2.4	2.4	2.4	2.3	2.2	2.1	2.0	3.4	3.2	2.4	2.2
CORE CONSUMER PRICE INDEX.....	2.6	2.0	1.5	2.4	2.3	2.3	2.4	2.4	2.2	2.1	2.0	1.9	2.1	2.1	2.3	2.0
COMPENSATION PER HOUR (NONFARM BUSINESS).....	5.6	4.5	4.5	4.7	4.6	4.5	4.2	4.2	4.3	4.1	4.1	4.1	5.8	4.8	4.4	4.2
OUTPUT PER HOUR (NONFARM BUSINESS).....	3.0	1.8	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.4	2.2	2.2
UNIT LABOR COST (NONFARM BUSINESS).....	2.5	2.7	2.0	2.5	2.4	2.3	2.0	2.0	2.1	1.9	1.9	1.9	3.2	2.4	2.2	2.0
<b>REAL ACTIVITY</b>																
CAPACITY UTILIZATION (MANUFACTURING, %).....	78.2	78.1	78.3	78.5	79.2	79.7	80.0	80.2	80.5	80.7	81.0	81.1	76.7	78.3	79.8	80.8
CIVILIAN UNEMP RATE (%) 2\.....	5.3	5.1	4.9	4.9	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	5.4	4.9	4.8	4.8
PRIVATE HOUSING STARTS (THOUS, AR).....	2083	2038	1980	2000	2000	1970	1940	1920	1905	1890	1875	1870	1950	2025	1958	1885
LIGHT VEHICLE SALES (MILS, AR) 3\.....	16.5	17.2	17.8	16.6	17.1	17.1	17.2	17.2	17.3	17.3	17.3	17.3	16.9	17.0	17.1	17.3
FEDERAL SURPLUS/DEFICIT (Unified Basis, Bil\$, NSA) 4\.....	-234.1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	-412.1	-377.1	-301.5	#N/A

NOTE: 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)

	2005				2006				2007				Q4/Q4 % CHANGE/Q4 LEVEL			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2004	2005	2006	2007
<b>REAL GDP (Growth, Annual Rate).....</b>	<b>3.8</b>	<b>3.3</b>	<b>3.5</b>	<b>3.3</b>	<b>3.4</b>	<b>3.3</b>	<b>3.2</b>	<b>3.2</b>	<b>3.3</b>	<b>3.4</b>	<b>3.3</b>	<b>3.3</b>	<b>3.8</b>	<b>3.5</b>	<b>3.3</b>	<b>3.3</b>
<i>Contributions to GDP growth:</i>																
<b>FINAL SALES TO DOMESTIC PURCHASERS.....</b>	<b>3.9</b>	<b>4.1</b>	<b>3.6</b>	<b>2.9</b>	<b>3.7</b>	<b>3.5</b>	<b>3.6</b>	<b>3.5</b>	<b>3.8</b>	<b>3.5</b>	<b>3.5</b>	<b>3.5</b>	<b>4.5</b>	<b>3.6</b>	<b>3.6</b>	<b>3.6</b>
CONSUMPTION EXPENDITURES.....	2.4	2.1	2.4	2.1	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.7	2.3	2.3	2.2
BUSINESS FIXED INVESTMENT.....	0.6	0.9	0.6	0.8	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.1	0.7	0.9	1.0
RESIDENTIAL INVESTMENT.....	0.5	0.6	0.2	-0.5	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.4	0.2	-0.1	-0.1
FEDERAL GOVERNMENT.....	0.2	0.1	0.2	0.2	0.4	0.1	0.2	0.1	0.4	0.1	0.1	0.1	0.3	0.2	0.2	0.2
STATE & LOCAL GOVERNMENTS.....	0.2	0.4	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.1	0.3	0.4	0.4
<b>NET EXPORTS.....</b>	<b>-0.4</b>	<b>1.2</b>	<b>-0.2</b>	<b>-0.7</b>	<b>-0.3</b>	<b>-0.5</b>	<b>-0.5</b>	<b>-0.5</b>	<b>-0.4</b>	<b>-0.4</b>	<b>-0.4</b>	<b>-0.4</b>	<b>-0.9</b>	<b>0.0</b>	<b>-0.5</b>	<b>-0.4</b>
EXPORTS.....	0.7	1.3	0.9	1.0	1.0	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.6	1.0	0.8	0.7
IMPORTS.....	-1.1	-0.1	-1.0	-1.7	-1.3	-1.2	-1.3	-1.2	-1.1	-1.1	-1.1	-1.1	-1.5	-1.0	-1.3	-1.1
<b>CHANGE IN INVENTORIES.....</b>	<b>0.3</b>	<b>-2.0</b>	<b>0.1</b>	<b>1.1</b>	<b>0.0</b>	<b>0.3</b>	<b>0.0</b>	<b>0.1</b>	<b>-0.1</b>	<b>0.2</b>	<b>0.2</b>	<b>0.1</b>	<b>0.2</b>	<b>-0.1</b>	<b>0.1</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	
		<u>Prev*</u>	<u>Sep</u>	<u>Prev*</u>	<u>Sep</u>	<u>Prev*</u>	<u>Sep</u>
<b>FRBNY</b>	9/15/2005	3.4	3.3	4.0	3.5	3.9	3.3
<b>PSI Model</b>	9/15/2005	--	--	3.4	2.7	3.2	2.7
<b>Blue Chip</b>	9/10/2005	3.4	3.3	3.9	3.6	3.3	3.0
<b>Median SPF</b>	8/15/2005	3.0	3.0	3.5	4.2	3.4	3.6
<b>Macro Advisers</b>	9/6/2005	3.4	3.3	4.6	4.0	3.6	3.3

#### CPI

	Release Date	2005-Q2		2005-Q3		2005-Q4	
		<u>Prev*</u>	<u>Sep</u>	<u>Prev*</u>	<u>Sep</u>	<u>Prev*</u>	<u>Sep</u>
<b>FRBNY</b>	9/15/2005	--	--	2.4	3.8	2.5	2.5
<b>Blue Chip</b>	9/10/2005	--	--	2.5	3.4	2.4	2.8
<b>Median SPF</b>	8/15/2005	--	--	2.3	2.8	2.4	2.4
<b>Macro Advisers</b>	9/6/2005	--	--	2.5	5.9	1.9	2.7

#### Core CPI

	Release Date	2005-Q2		2005-Q3		2005-Q4	
		<u>Prev*</u>	<u>Sep</u>	<u>Prev*</u>	<u>Sep</u>	<u>Prev*</u>	<u>Sep</u>
<b>FRBNY</b>	9/15/2005	--	--	1.8	1.5	2.3	2.4
<b>Macro Advisers</b>	9/6/2005	--	--	2.0	1.9	1.9	2.3

*Note: Previous release for all forecasts except Median SPF is August; Median SPF is May. Macro Advisers Q3 GDP forecast is as of 9/14.*

## A. Forecast Details

**Exhibit A-6: Reference Table 1 - CONSUMER PRICE INDEX DATA AS OF AUGUST 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>	3.1	3.6	4.3	4.2	6.3	100.00	
<b>Energy</b>	15.2	20.3	33.4	38.2	79.6	7.08	
<b>All Items Ex Energy</b>	2.1	2.2	1.9	1.2	1.2		
Food	2.9	2.2	2.5	1.1	0.0	14.38	
Food Away From Home	3.1	3.1	2.9	3.4	3.8	6.13	
<b>All Items Ex Food and Energy</b>	1.9	2.2	1.8	1.4	1.2	78.54	100.00
Core Chain-Weight CPI (NSA)	1.6	1.8	1.3	0.0	2.2		
<b>Core Goods</b>	-0.2	0.7	-0.4	-1.4	1.7	22.25	28.34
Apparel	-0.5	-0.6	-1.0	-2.6	12.9	3.98	5.06
Medical Care Commodities	4.2	4.0	3.4	2.6	0.4	1.50	1.91
Durable Goods	-1.0	0.6	-1.5	-2.4	-2.1	11.28	14.36
New Vehicles	-0.6	0.1	-3.7	-5.9	-6.0	4.82	6.13
Used Vehicles	-0.5	6.1	6.5	9.5	8.9	2.01	2.56
<b>Core Services</b>	2.8	2.7	2.7	2.4	1.0	56.28	71.66
Rent of Primary Residence	2.9	3.0	3.3	3.6	3.4	6.16	7.84
Owners' Equivalent Rent	2.4	2.3	2.5	2.3	2.1	23.38	29.77
Lodging Away from Home	3.6	2.9	-0.5	-1.8	-17.6	2.95	3.76
Medical Care Services	4.8	4.5	3.8	2.6	-0.4	4.58	5.83
Transportation Services	2.3	2.8	4.4	4.5	4.9	6.32	8.05

## A. Forecast Details

**Exhibit A-6: Reference Table 2 - PCE DEFLATOR DATA AS OF JULY 2005**

	Annualized Percent Change Over Indicated Interval				
	24 Month	12 Month	6 Month	3 Month	1 Month
<b>PCE Deflator</b>	2.7	2.5	2.8	1.3	3.6
<b>Market Based PCE Deflator</b>	2.5	2.5	3.0	1.4	4.0
<b>Durable Goods</b>	-1.2	-0.6	-1.8	-2.6	-5.6
Motor Vehicles and Parts	0.3	2.0	-0.9	-2.3	-8.9
<b>Nondurable Goods</b>	3.6	3.3	5.0	0.3	9.0
Clothing and Shoes	-1.1	-2.1	-3.4	-6.8	-11.7
<b>Services</b>	3.0	2.8	2.8	2.7	3.0
Housing	2.6	2.5	2.9	2.4	3.5
Transportation	2.8	3.4	5.8	6.6	7.8
Medical Care	3.2	2.9	2.5	3.4	2.3
<b>PCE Deflator Ex Food and Energy</b>	1.9	1.8	1.5	1.2	0.7
<b>Market Based Core PCE Deflator</b>	1.5	1.6	1.4	1.3	0.5
Personal Business Services-Market Based	3.1	2.7	2.1	2.4	1.1
Personal Business Services-Not Market Based	3.0	1.5	0.8	0.8	1.3

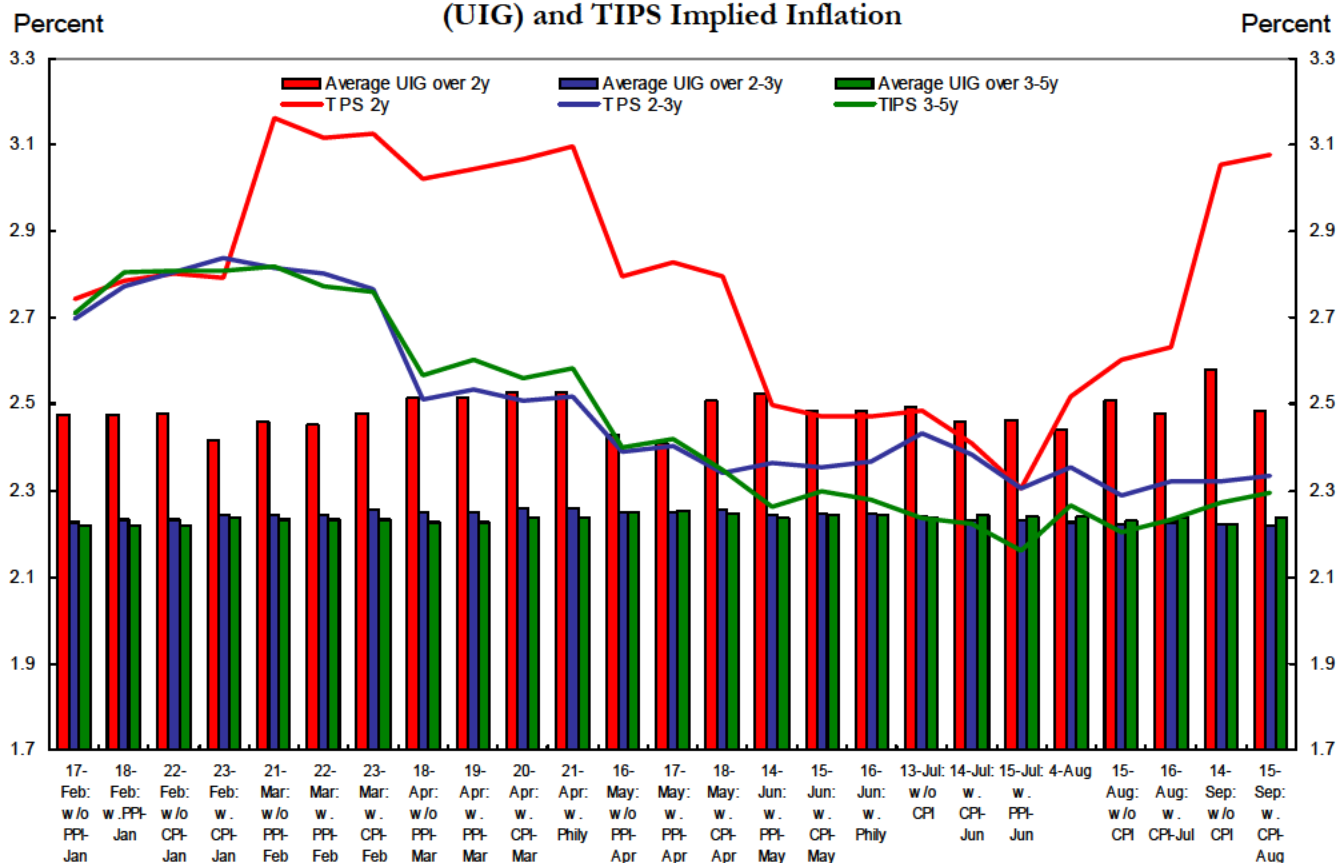
## A. Forecast Details

**Exhibit A-6: Reference Table 3 - PRODUCER PRICE DATA AS OF AUGUST 2005**

	Annualized Percent Change Over Indicated Interval				
	24 Month	12 Month	6 Month	3 Month	1 Month
<b>Finished Goods</b>	4.2	5.1	4.6	6.7	7.2
<b>Finished Consumer Goods</b>	5.1	6.1	5.8	9.2	10.2
Finished Consumer Goods Ex Food	6.0	8.0	9.2	15.6	15.9
Nondurables Ex Food	8.0	10.8	12.9	22.2	24.1
Durables	1.4	1.3	0.6	0.3	-1.7
Capital Equipment	1.8	2.2	1.7	0.8	-0.8
Electronic Computers (NSA)	-16.7	-21.6	-22.2	-12.7	-5.0
Communication and Related Equipment (NSA)	-1.3	-1.1	-1.0	-1.2	-3.5
<b>Finished Goods Ex Food and Energy</b>	2.0	2.5	1.7	1.3	0.0
<b>Finished Consumer Goods Ex Food and Energy</b>	2.1	2.6	1.5	1.0	-0.7
<b>Intermediate Materials</b>	7.0	6.1	5.9	7.4	8.2
Intermediate Materials Ex Food and Energy	5.1	3.2	-0.3	-1.3	-0.8
<b>Crude Materials</b>	17.3	11.4	22.3	24.2	31.9
Crude Materials Ex Food and Energy	14.8	-0.1	1.5	13.4	71.7

## 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 August 9th to September 16th, 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. 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

### Exhibit B-4. 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. 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; Monetary Affairs, BofG data

### Exhibit B-5. 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 a tightening (easing) surprise around expected rate is expected to be larger than an easing

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(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-6. 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 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

#### **Exhibit B-7. 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 depreciation 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-8. 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

#### **Exhibit B-9. Energy Futures Curves**

This exhibit contains charts showing futures curves for gasoline, heating oil, natural gas, and crude oil. August 26 represents the state of the futures markets just before Hurricane

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Katrina. The next date represents the post-Katrina peak in energy markets. September 15 represents current data.

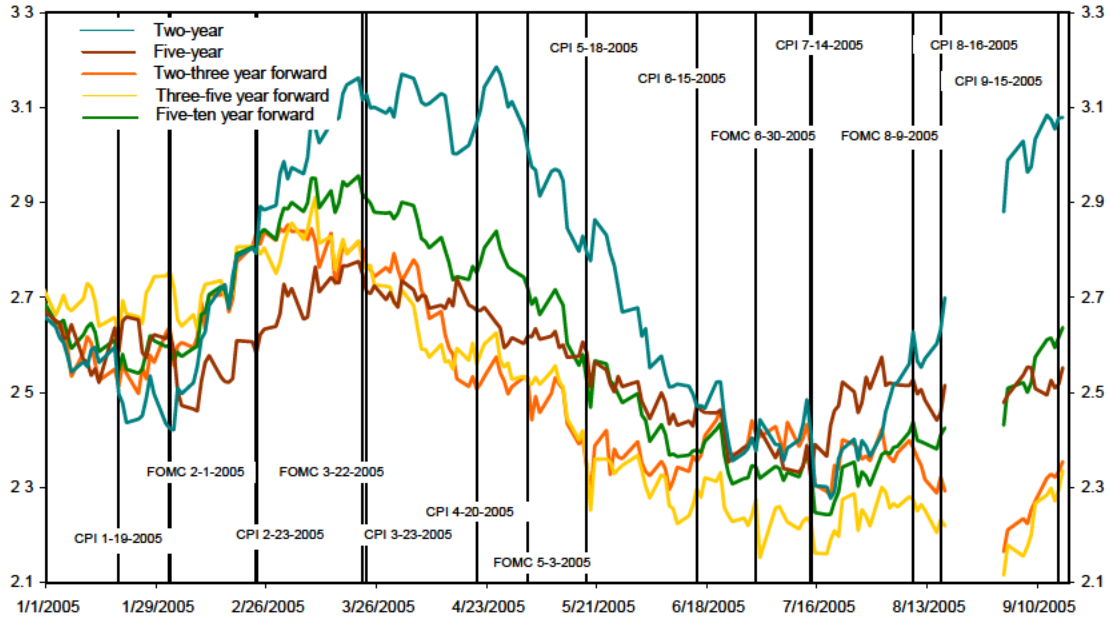
Source: Bloomberg.

#### **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.

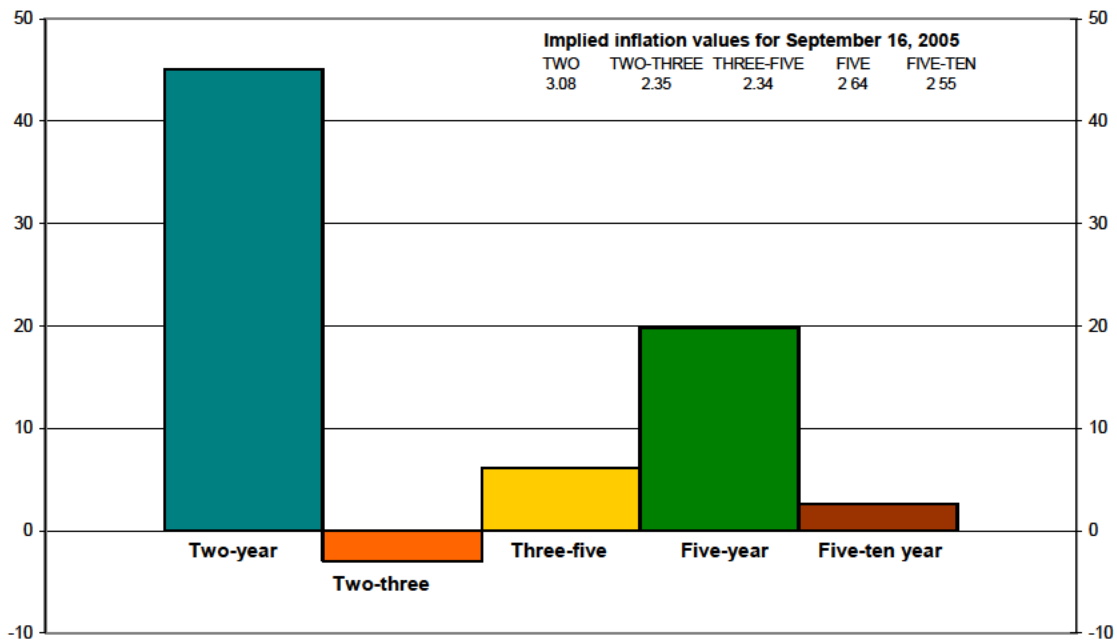
## B. Financial Markets

**Exhibit B-1:  
TIPS Implied Inflation at Various Horizons**  
Since January 2005, Updated September 16th



Implied inflation values between 8-18 and 8-31 are not reported because of data reliability problems.  
Data based on FRBNY calculations using 8:40am quotes. Tony Rodriguez Redacted and Anna Milanez Redacted

Basis points      **Change in implied inflation measure from August 9, 2005 to September 16, 2005**      Basis points



Source: FRBNY

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## B. Financial Markets

### Exhibit B-2: Breakeven Inflation Table

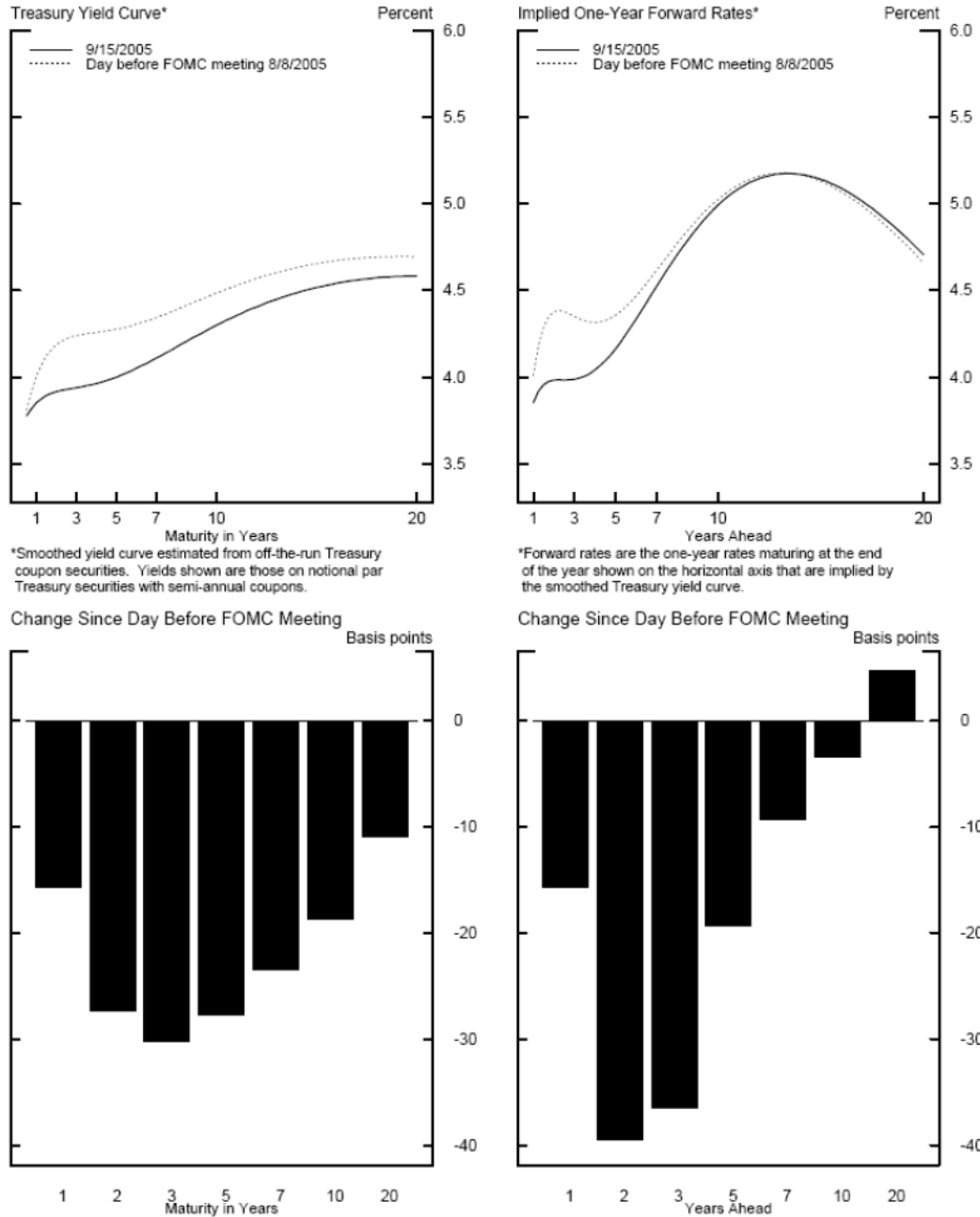
Real and Nominal Yield Spreads	31-Jan-05	18-Feb-05	21-Mar-05	29-Apr-05	27-May-05*	23-Jun-05	29-Jul-05*	26-Aug-05*	16-Sep-05
Five-year Spread (%)	2.540	2.710	2.903	2.765	2.490	2.354	2.373	2.457	2.660
Ten-year Spread	2.487	2.579	2.756	2.618	2.425	2.287	2.381	2.388	2.521
Five-year Real Yield (%)	1.172	1.113	1.289	1.113	1.320	1.380	1.750	1.631	1.336
Ten-year Real Yield	1.661	1.659	1.771	1.568	1.648	1.664	1.897	1.800	1.704
Five-year Nominal Yield	3.712	3.823	4.192	3.878	3.810	3.734	4.123	4.088	3.996
Ten-year Nominal Yield	4.148	4.238	4.527	4.186	4.073	3.951	4.278	4.188	4.225

Source: Bloomberg. 8:40am quotes. \*End of day quote.

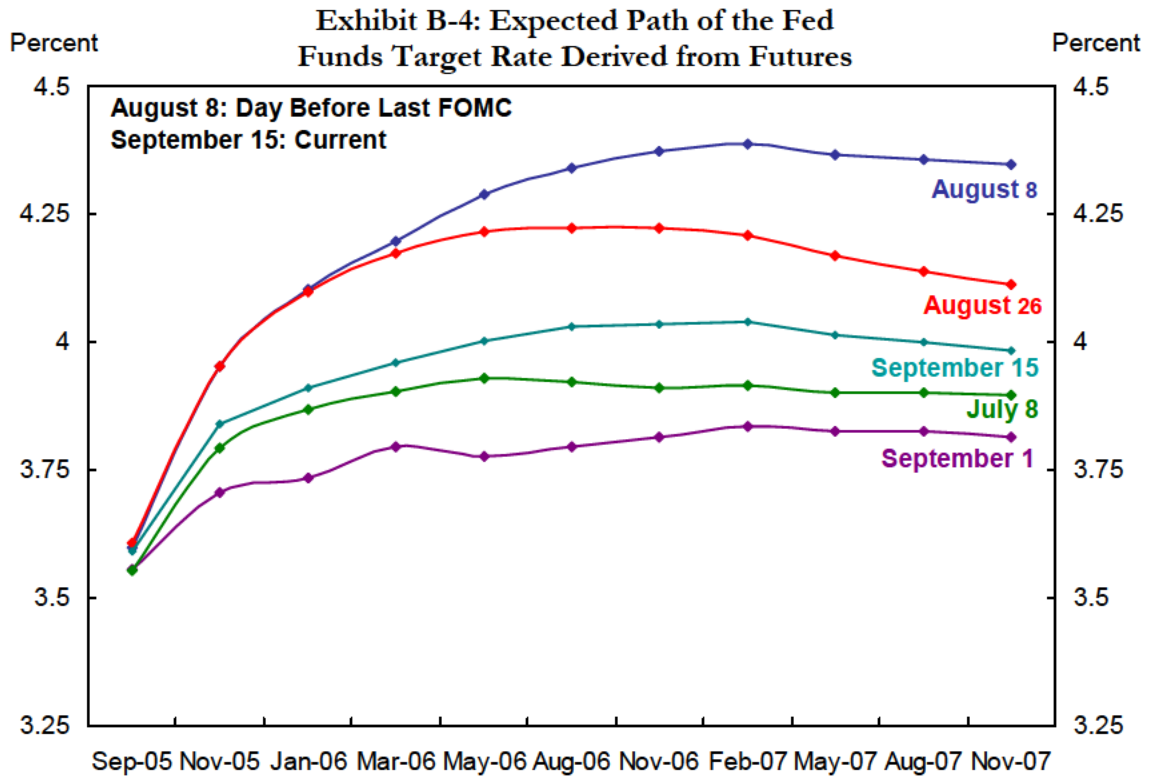
## B. Financial Markets

**Exhibit B-3:**

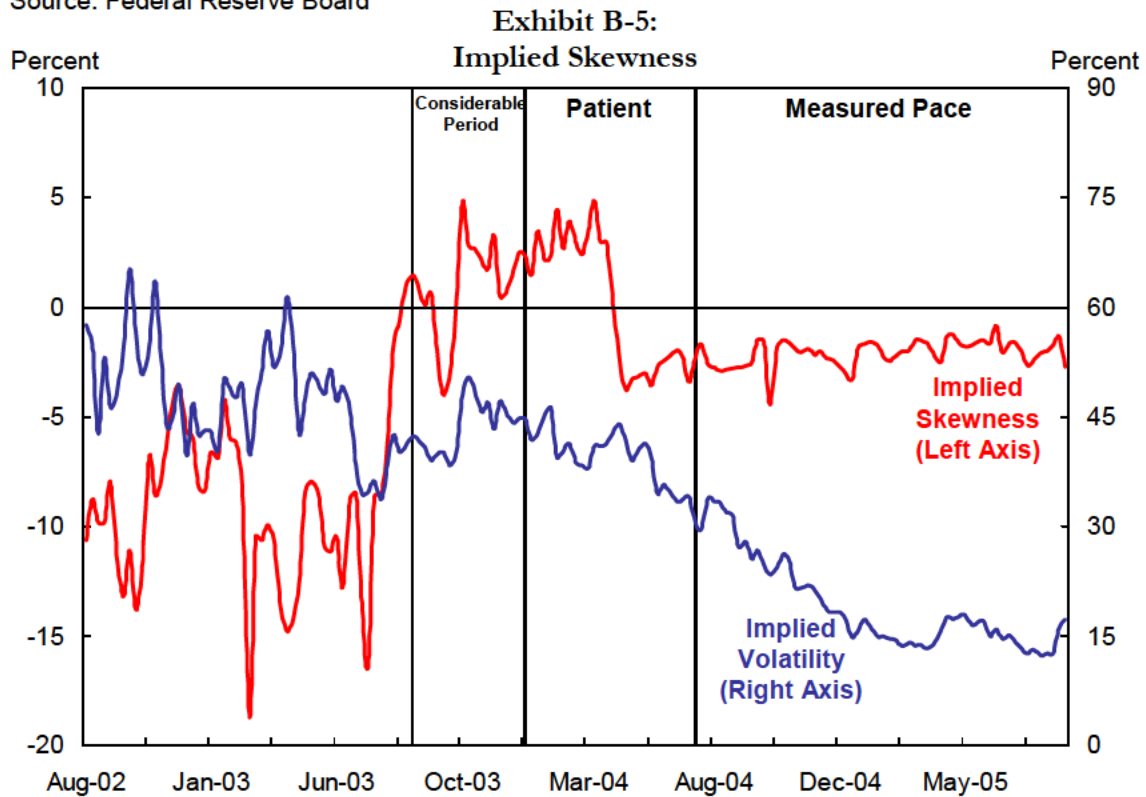
### Treasury Yield Curve



## B. Financial Markets



Source: Federal Reserve Board

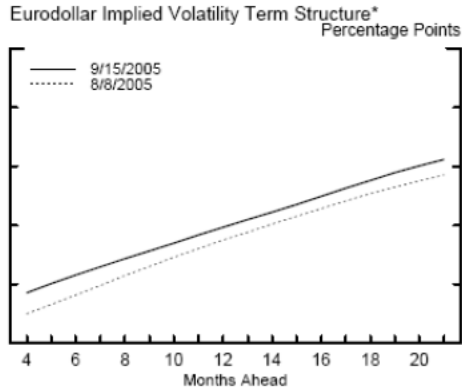


Source: CME and Author's Calculations

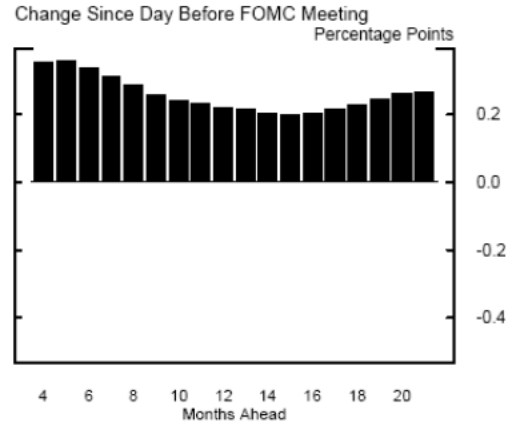
Joshua Rosenberg Redacted

## B. Financial Markets

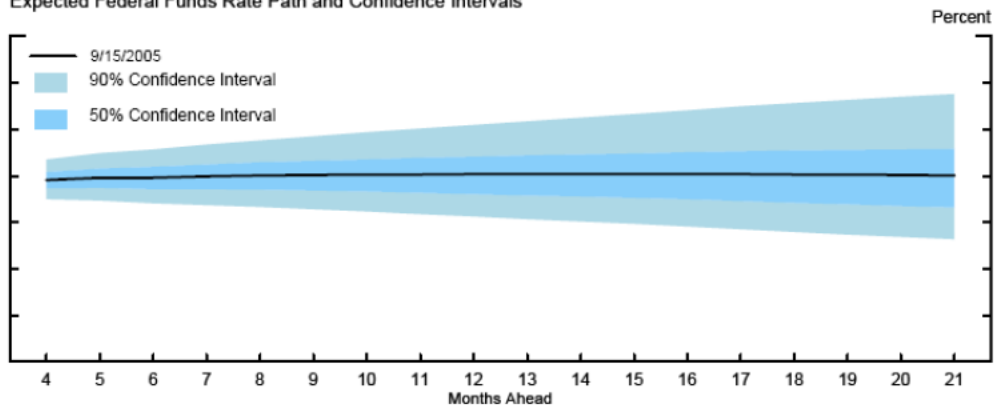
### Exhibit B-6: Implied Volatility on Fed Funds Options



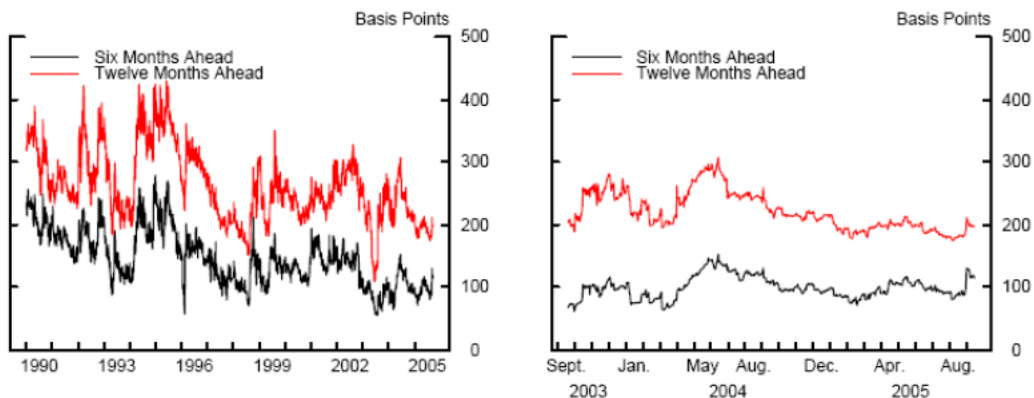
\*Width of a 90 percent confidence interval computed from the term structures for the expected federal funds rate and implied volatility.



**Expected Federal Funds Rate Path and Confidence Intervals**



**Eurodollar Implied Volatility at Selected Maturities\***



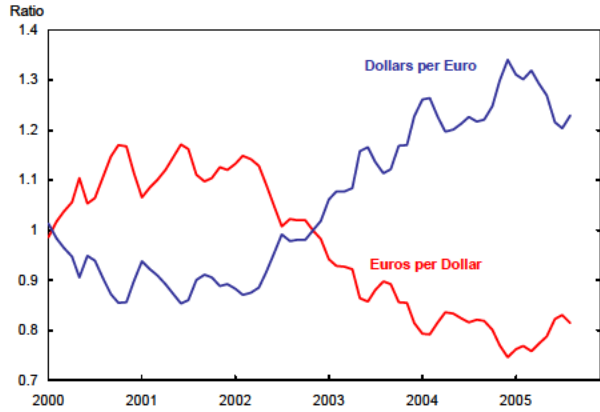
\*Width of a 90 percent confidence interval computed from the term structures for the expected federal funds rate and implied volatility.



## B. Financial Markets

### Exhibit B-7: United States Exchange Rates

Dollar-Euro Exchange Rates



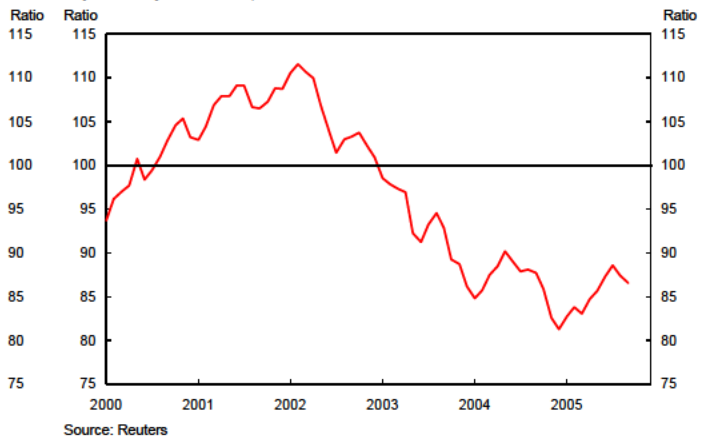
Yen per Dollar



Nominal Effective Exchange Rate  
Major Currency Narrow Index, 2000=100



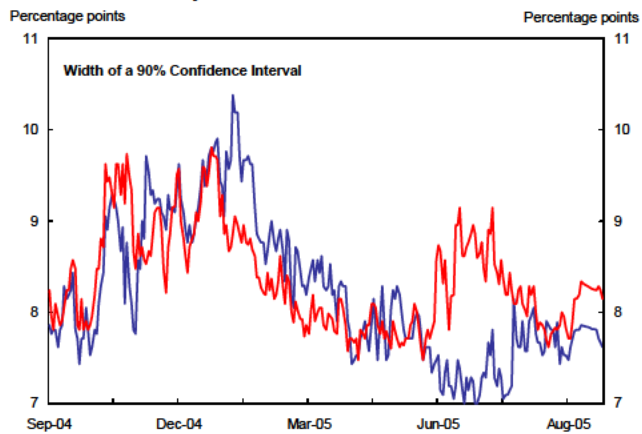
Real Effective Exchange Rate  
Major Currency Narrow Index, 2000=100



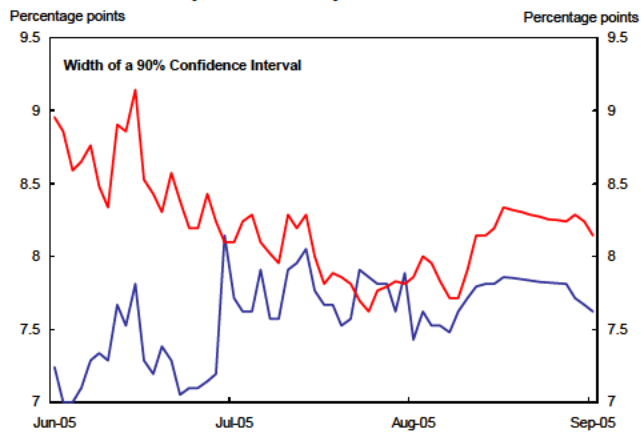
## B. Financial Markets

**Exhibit B-8:**  
**Euro and Yen Implied Option Volatility**  
**Euro options are in red and Yen options are in blue**

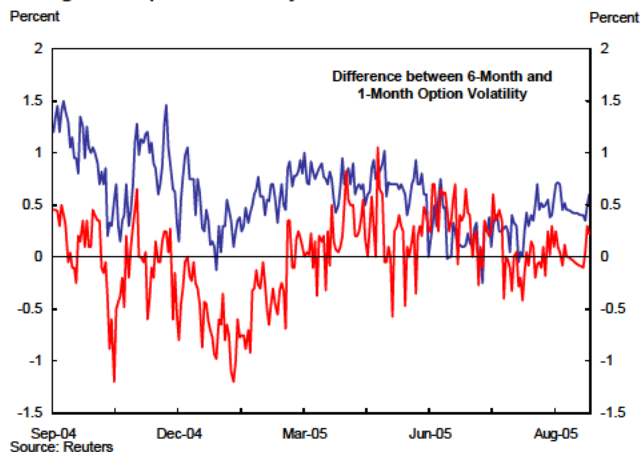
**One-Month Volatility – Past Year**



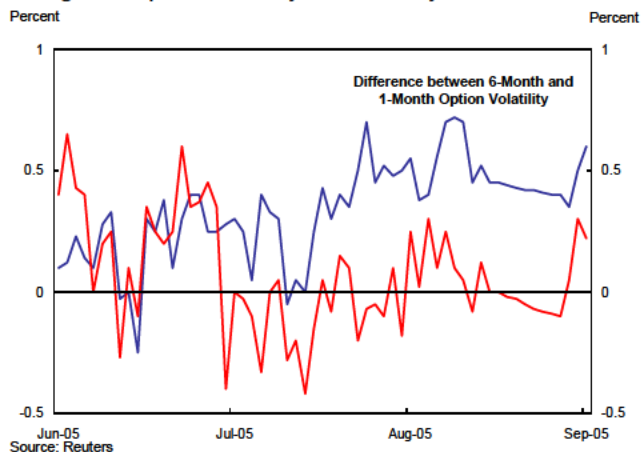
**One-Month Volatility – Past 60 Days**



**Changes in Expected Volatility – Past Year**



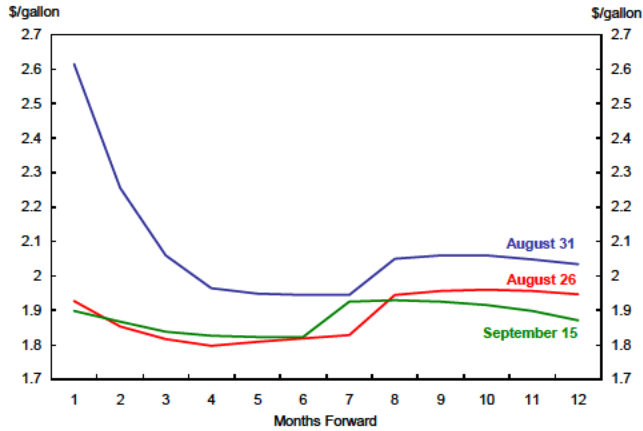
**Changes in Expected Volatility – Past 60 Days**



## B. Financial Markets

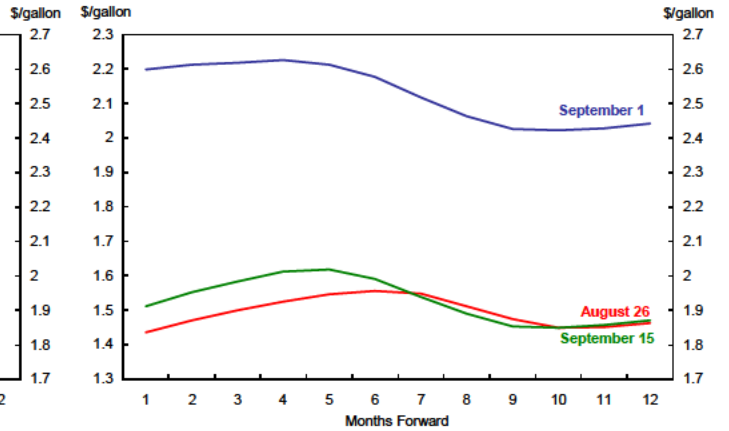
**Exhibit B-9:  
Energy Futures Curves**

**Gasoline Futures**



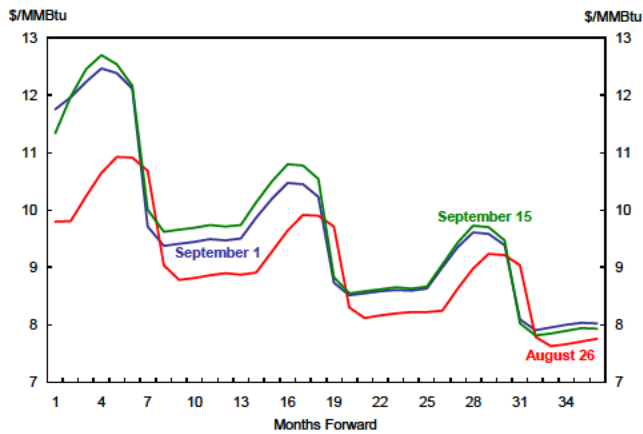
Source: Bloomberg

**Heating Oil Futures**



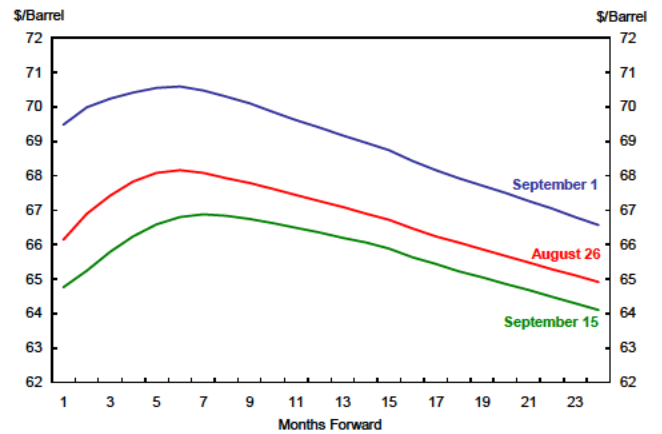
Source: Bloomberg

**Natural Gas Futures**



Source: Bloomberg

**Crude Oil Futures**



Source: Bloomberg

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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.

---

### **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. The hurricane scenario assumes an initial large fall in output followed by a bounceback.

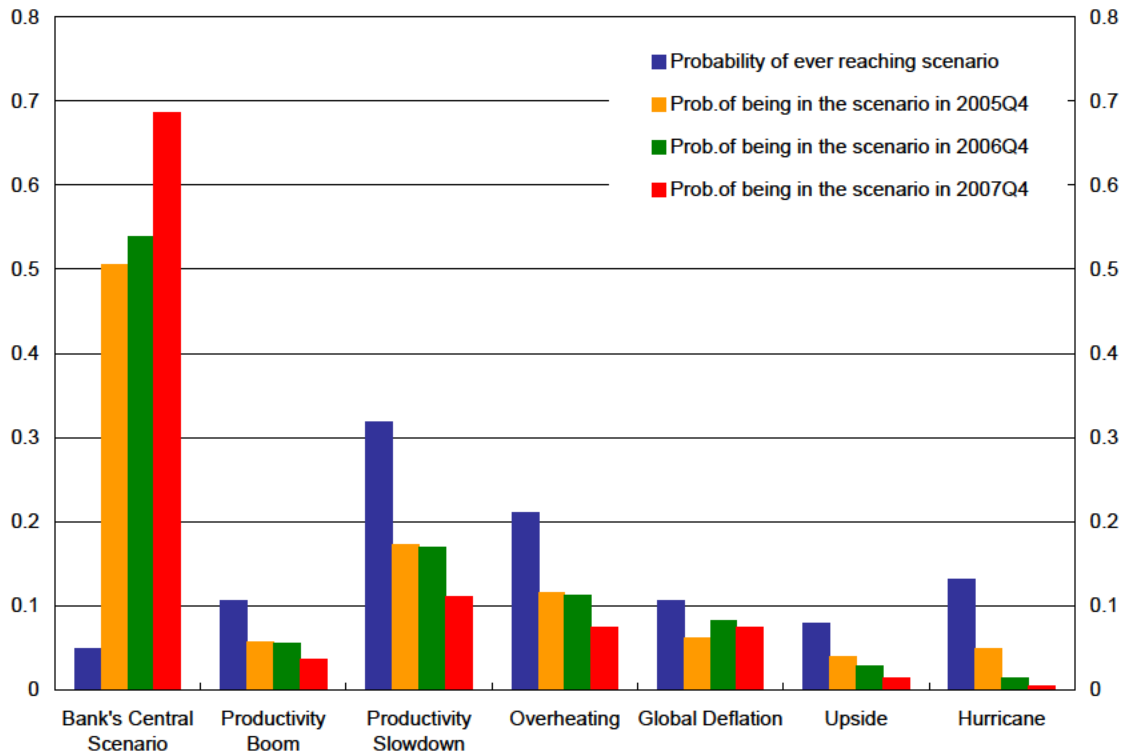
### **Exhibit C-4 & C-5: Fan Charts**

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.

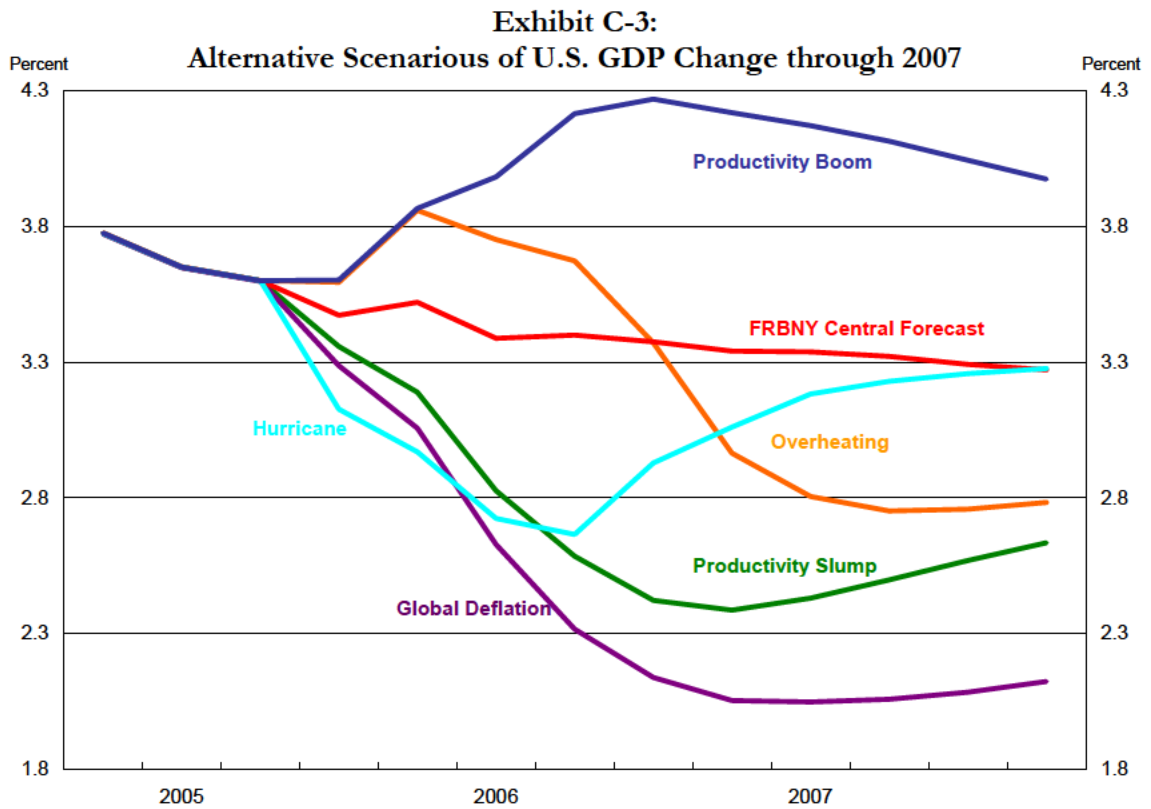
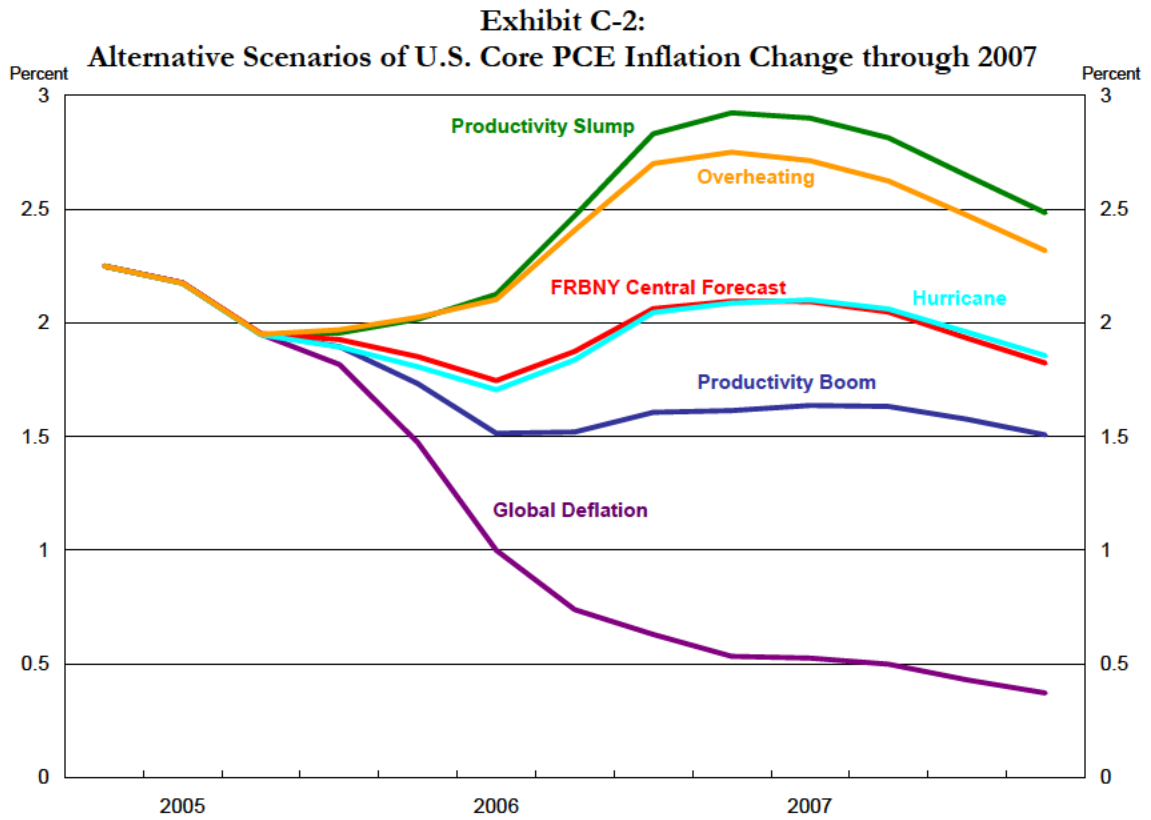
Source: MMS Function, FRBNY

## C. FRBNY Forecast Distributions

Exhibit C-1:  
Risks

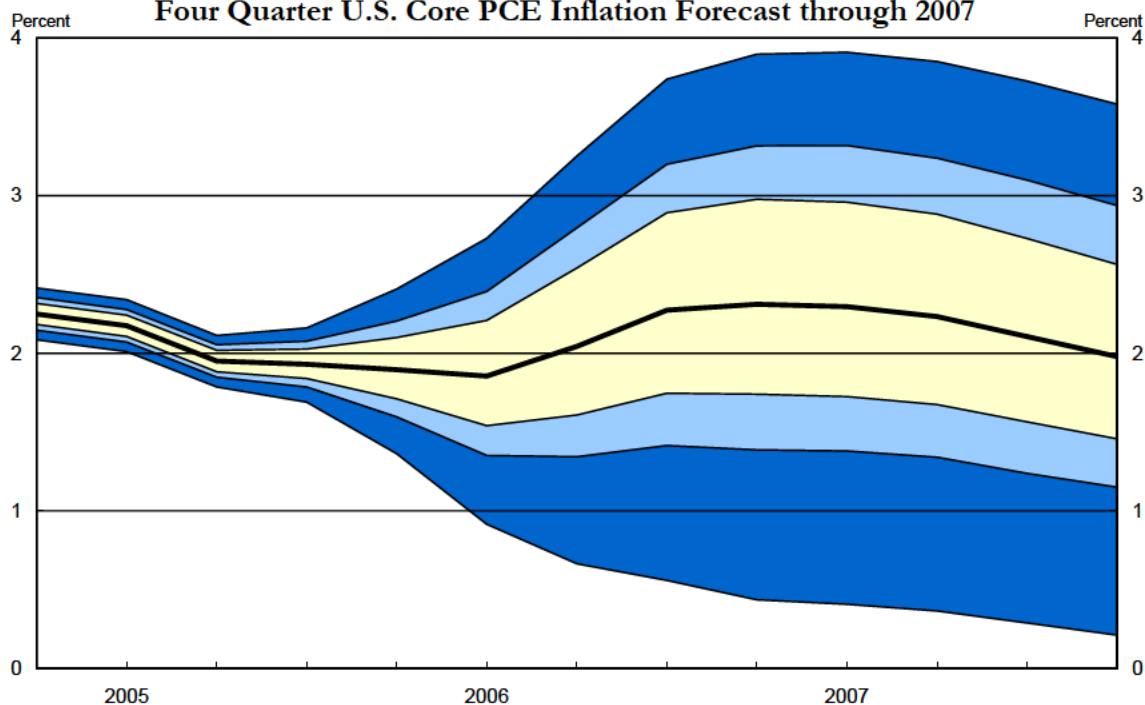


## C. FRBNY Forecast Distributions



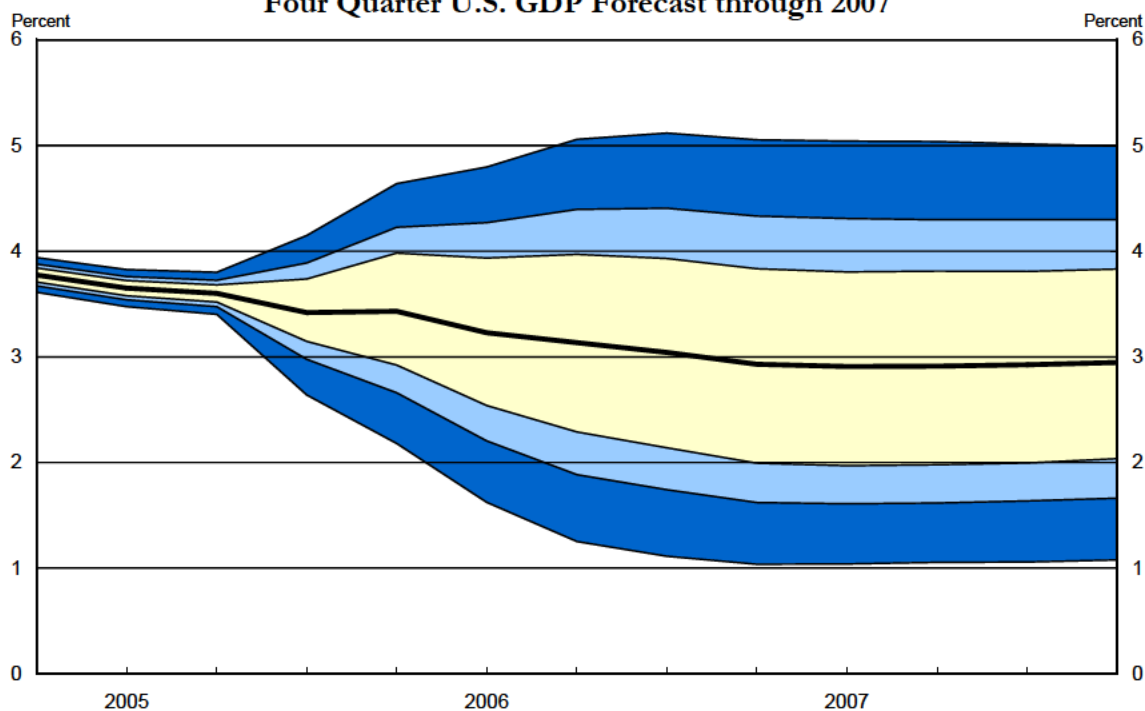
## C. FRBNY Forecast Distributions

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



The probability interval shows the 50, 75, and 90 percent chance that the four quarter change in Core PCE will be within the respective range. The thick black line represents the expected value of the forecast.

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



The probability interval shows the 50, 75, and 90 percent chance that quarterly GDP change will be within the respective range. The thick black line represents the expected value of the forecast.



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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.

We consider 3 different short-run restrictions to our standard policy rule in this cycle.

1. *Pause and respond.* No increase in September and a very data dependent signal until the hurricane uncertainty is resolved. Some possibility of a rate cut in Q4. Continued signal of aggressive possible future response to higher inflation/ inflation expectations in 2006. In particular a 50bp increase might be required in 2006.
2. *Raise and wait (At short-run market expectation, above in 2006).* Increase 25 bp in September and a data dependent signal but no hint of the possibility of a cut in Q4 unless conditions substantially deteriorate. Continued signal of aggressive possible future response to higher inflation/inflation expectations in 2006.
3. *Inflation Hawk (Above short run market expectation, above in 2006).* Increase 25 bp with a signal of little sensitivity to the noisy activity data and more sensitivity to inflation data and expectations. This is closest to the old signal of “measured continues past neutral.”

### Exhibit D-1: 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. The results are compared to the most recent implied market path from Exhibit B-5.

### Exhibit D-2 & D-3: Alternative Forecast Scenarios: Nominal and Real Federal Funds Rate

In these exhibits, we focus on the policy rule “raise and wait” and evaluate it at the Bank’s central projection, hurricane, productivity slowdown, 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.

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#### **Exhibit D-4: Implications of Different Inflation Targets**

This exhibit shows the effect of different inflation targets and gives a measure of how the recent actual path of the FFR has differed from the prescription of our policy rule. The policy rule paths are calculated using the actual FFR at the end of 2004. It also plots an average over the three rules evaluated this cycle, with weights of 0.1, 0.7 and 0.2 respectively.

#### **Exhibit D-5: FFR Distributions**

In this exhibit we examine the distribution of the FFR under the 3 different policy rules through the end of 2006. We also include the market distribution by assuming it has a normal distribution centered at the market path from Exhibit B-5 with a standard deviation derived from Exhibit B-6. The distribution is represented by a boxplot because this allows more direct comparison of the implications of different policy rules. It replaces the previous exhibits that showed the market volatility term structure compared to one derived from the combination of our policy rules with the forecast distribution.

Source: MMS Function, FRBNY

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*Policy Rule: Baseline Specification*

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

$$\rho = 0.8$$

$$i_{2005Q2} = 2.91$$

$$i^* = 4.0$$

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

$$\pi^* = 1.5$$

$$\varphi_\pi = 1.5$$

$$\varphi_x = 0.5$$

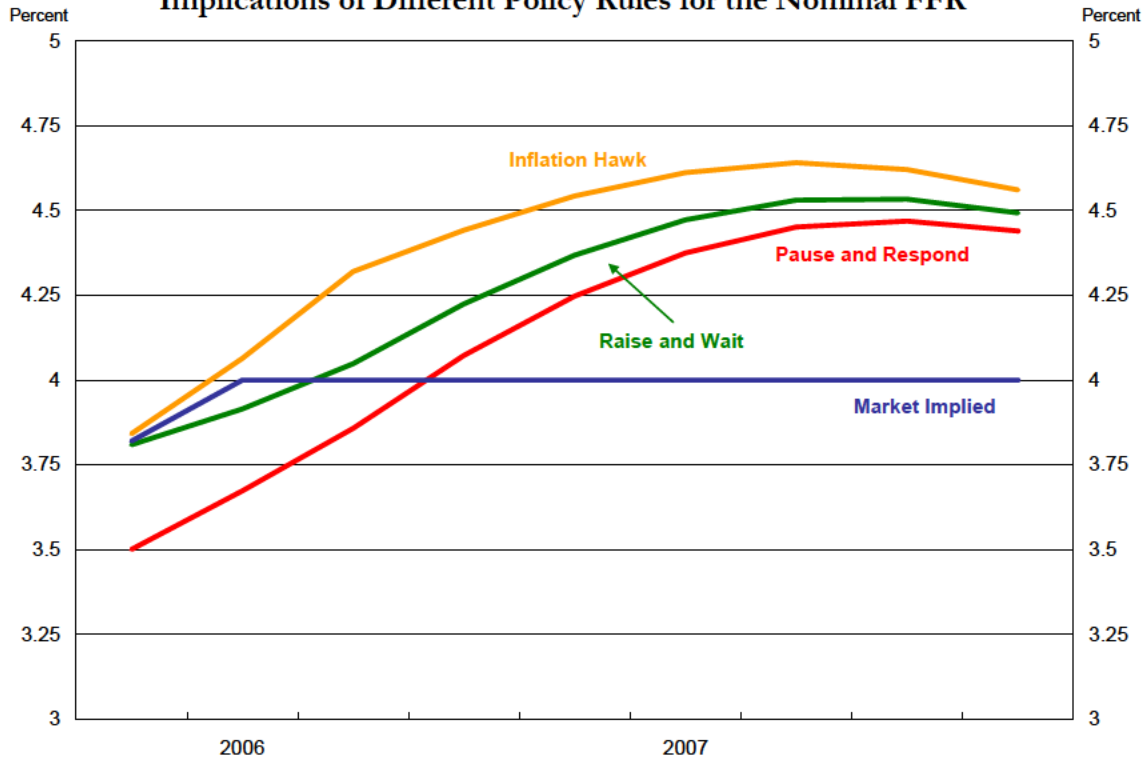
$$\pi_t : \text{Core PCE y/y}$$

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

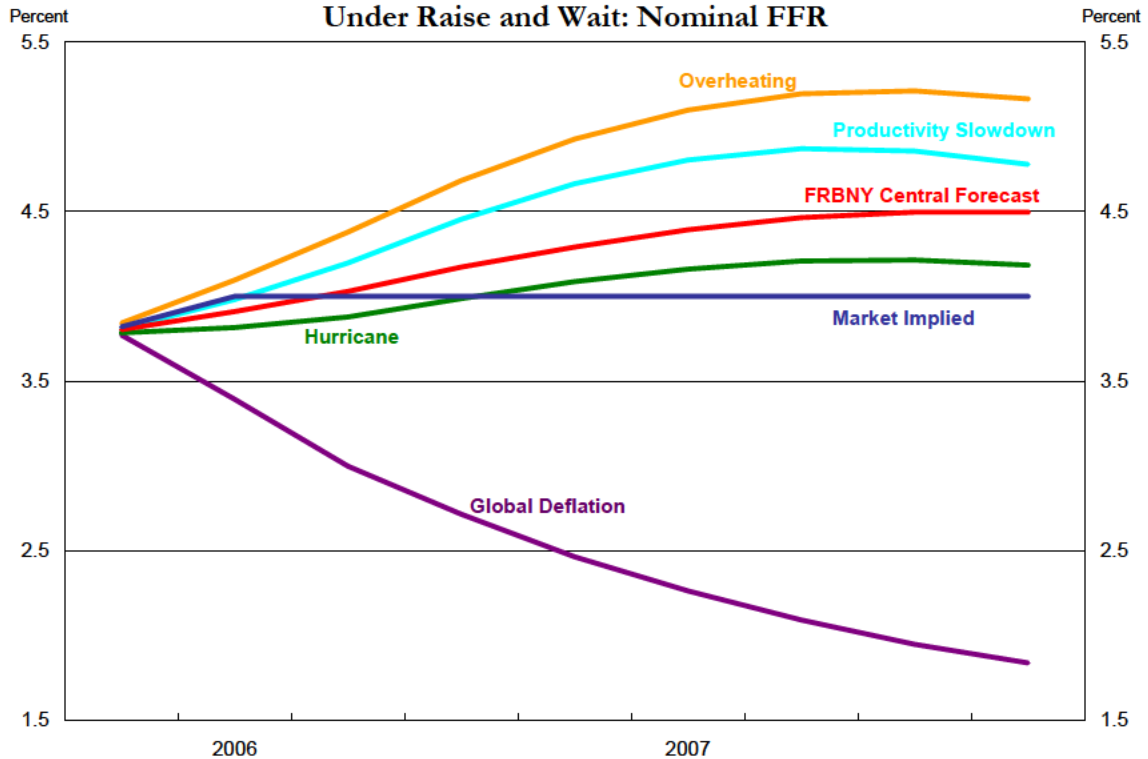
Source: MMS function, FRBNY

## D. FRBNY Fed Funds Rate Projections

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

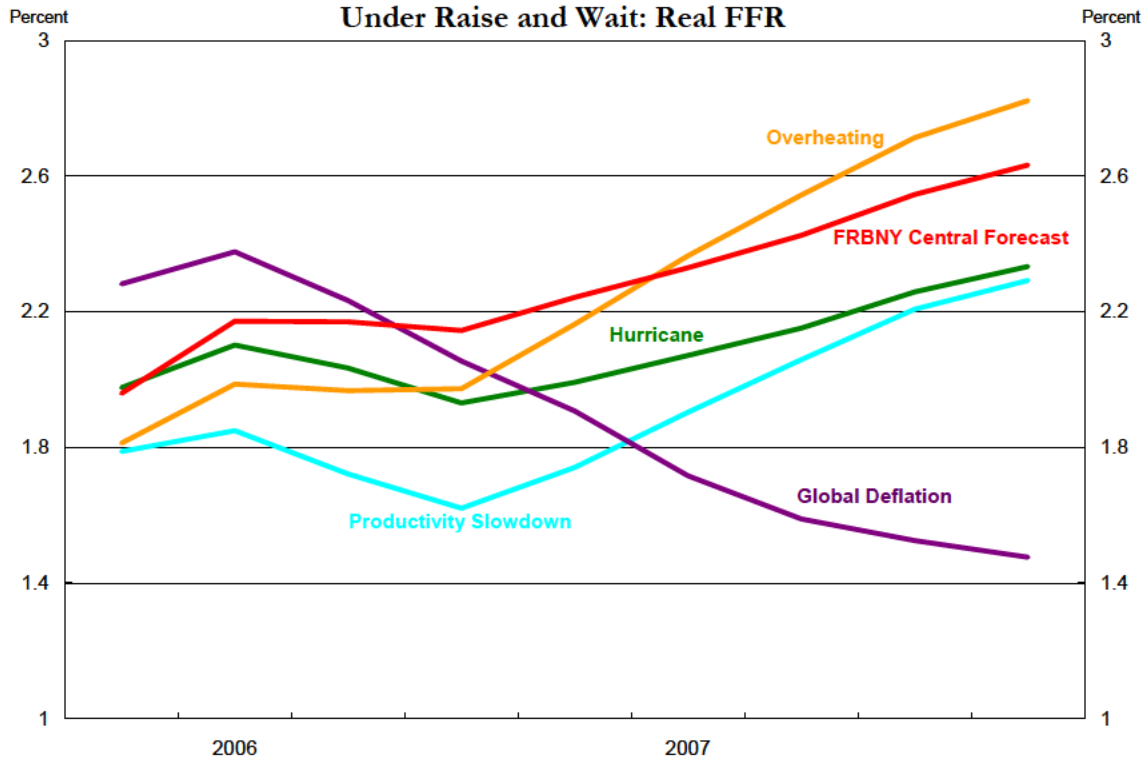


**Exhibit D-2:  
Alternative Forecast Scenarios  
Under Raise and Wait: Nominal FFR**

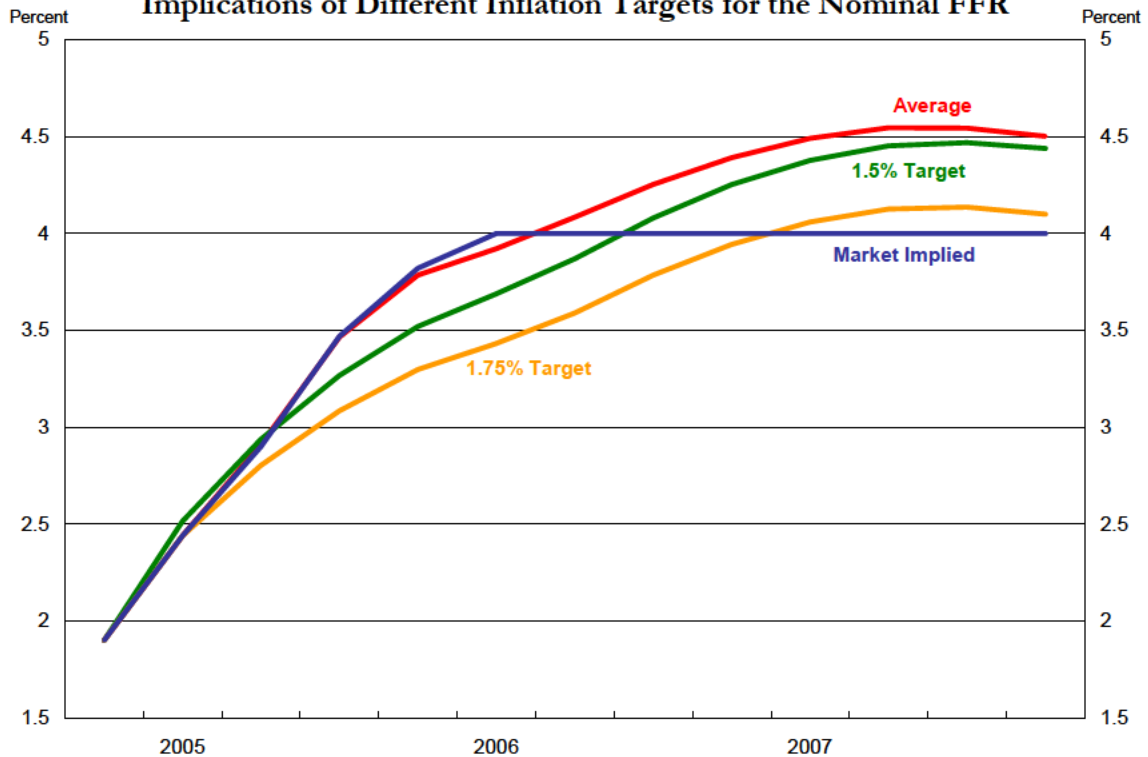


## D. FRBNY Fed Funds Rate Projections

**Exhibit D-3:  
Alternative Forecast Scenarios  
Under Raise and Wait: Real FFR**

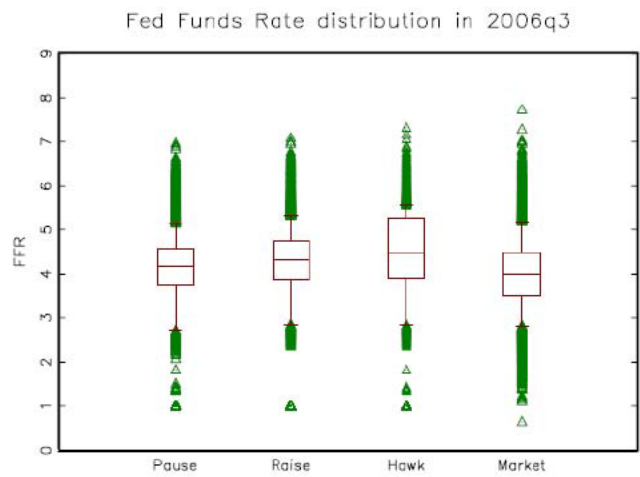
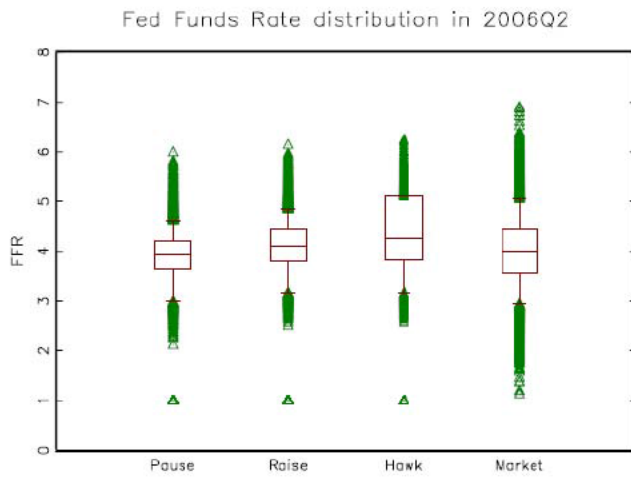
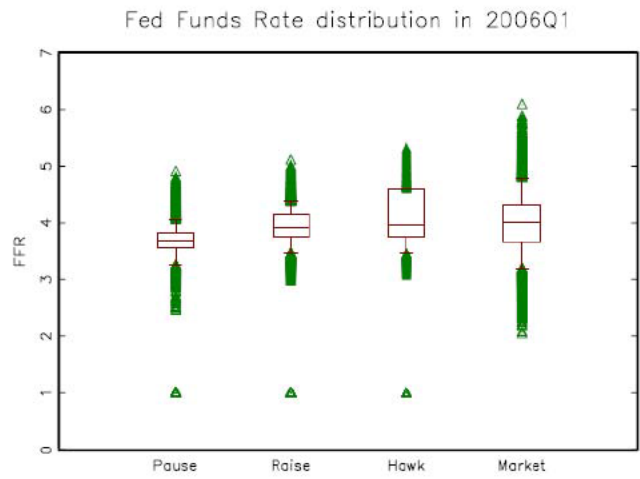
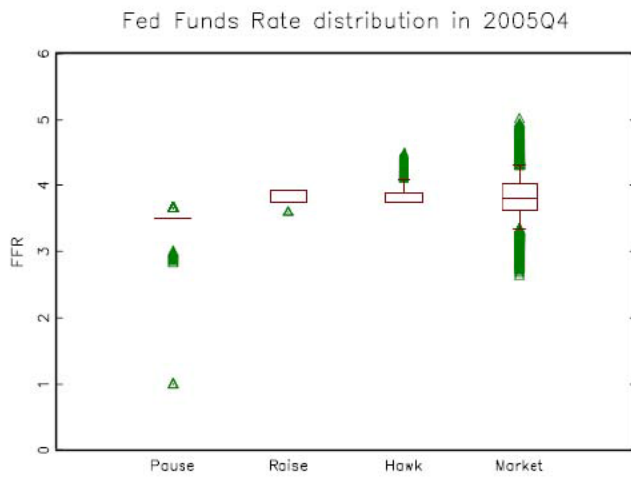


**Exhibit D-4:  
Implications of Different Inflation Targets for the Nominal FFR**



## D. FRBNY Fed Funds Rate Projections

### Exhibit D-5: Fed Funds Rate Distributions



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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 July 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: MaRS Function, 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 July 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: MaRS Function, 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:

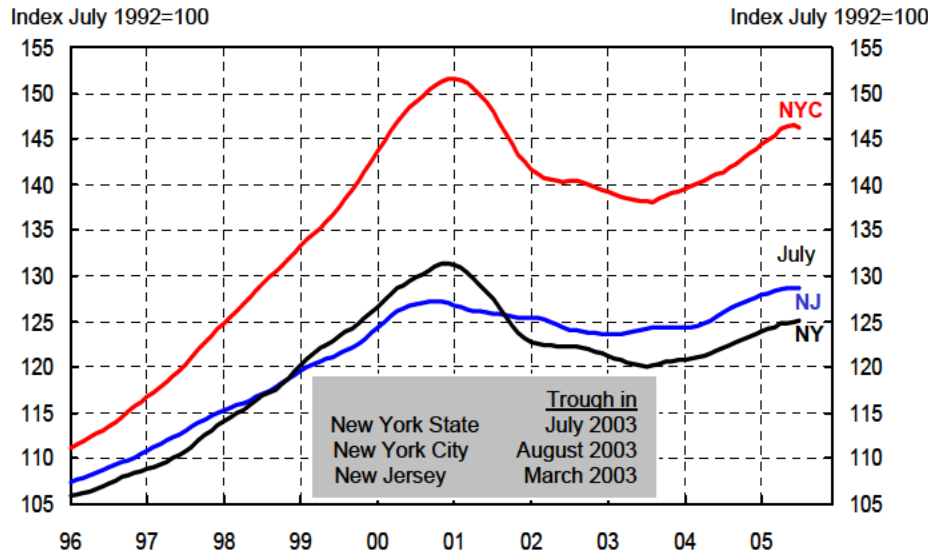
<http://www.labor.state.ny.us/agency/pressrel/pruistat.htm>

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

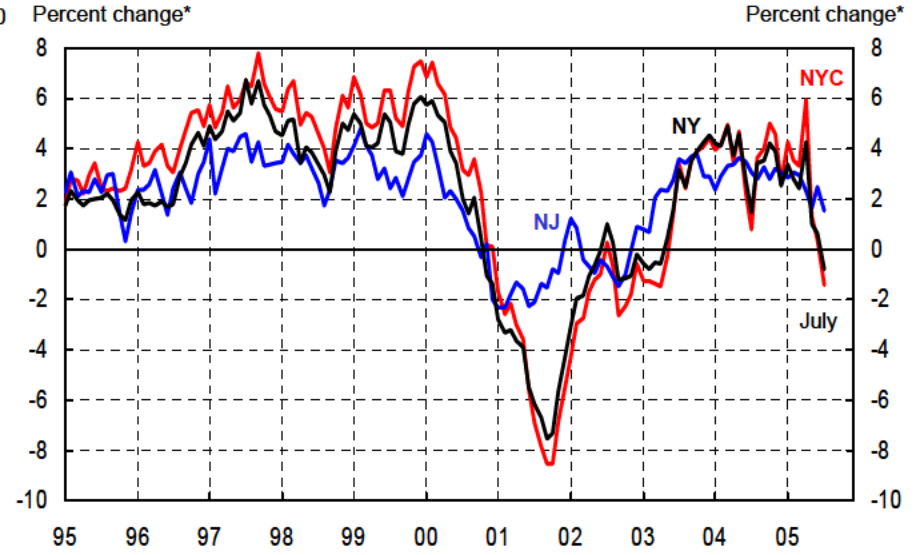


## E. Regional Charts

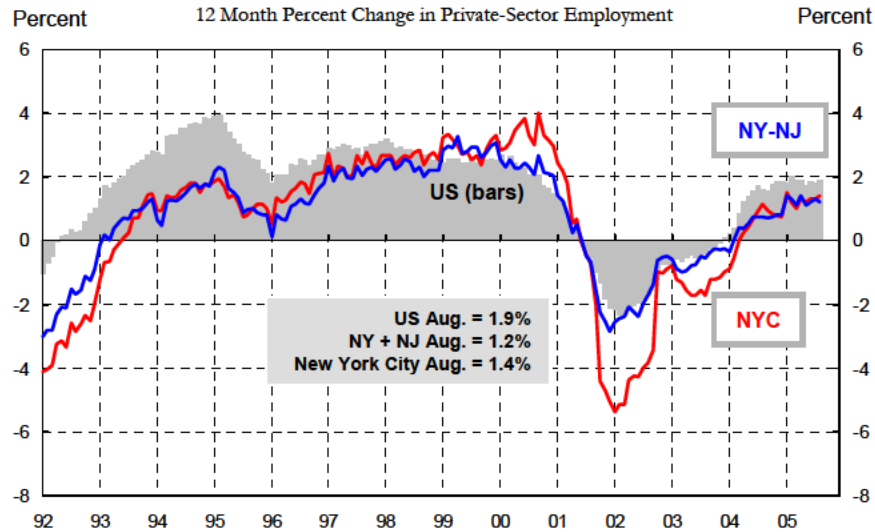
**E1: INDEX OF COINCIDENT ECONOMIC INDICATORS**



**E2: INDEX OF LEADING ECONOMIC INDICATORS**



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



**E4: UNEMPLOYMENT RATES**

