

**FRBNY Blackbook**

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**RESEARCH AND STATISTICS GROUP**

**FOMC Background Material**

**August 2006**

CONFIDENTIAL(FR) Class II FOMC

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# FRBNY BLACKBOOK

## August 2006

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## 1. Overview

Our outlook is for real GDP to grow near potential in 2006, 2007, and 2008, though we have lowered our estimate of potential growth from 3.3% to around 3.0%. The Greenbook undertook a similar magnitude reduction in its potential growth rate assumption, moving from 3.2% to 2.9%, but it has a path for real output growth below potential in both 2006 and 2007. Our assumed path for core PCE inflation over the forecast horizon has not changed markedly since the last Blackbook, with 2.4% core PCE inflation in 2006, 2.0% in 2007, and 1.9% in 2008. Despite the relatively weak path for real output growth in the Greenbook, the Board has a higher profile for core PCE inflation than we are expecting.

Our outlook is consistent with maintenance of a 5.25% FFR at this meeting, but the risks to the outlook suggest that the FOMC should leave market participants expecting some additional firming in the policy rate if the inflation pressures about which we are now concerned do not diminish.

In June our central policy path was very similar to that priced into markets. However, in the last six weeks, markets have begun placing greater weight on the possibility of cuts in the target rate in 2007. For the first time since we have been making these comparisons, our probabilistic metrics suggest that there are significant differences between the path priced into markets and our assessment. At the same time, however, for all the policy rules we examine, the risks around our central forecast imply a slightly firmer path of policy than simply maintaining the FFR at 5.25%. This latter fact makes us reluctant to lower our assessment of the appropriate path at this time.

Some of the data we have seen over the recent period has made us less confident in our central forecast scenario; we have projected a moderation in aggregate demand driven by a combination of a slowdown in the rapid growth of residential investment that is offset largely, but not entirely, by fairly robust growth in equipment and software.

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The annual NIPA benchmark revisions revealed a trajectory for real growth in information processing equipment and software expenditures over the past three years that is substantially below what had earlier been reported. It is difficult to know whether this is a harbinger of further weakness in this sector, but it raises the strong possibility that there has been some erosion in the growth potential of the economy relative to what we had been assuming. At this stage we have chosen to reduce our estimate of potential, while at the same time lowering our estimate of actual growth going forward by the same amount, effectively leaving the output gap unchanged and close to zero. However, there is the possibility that the recent behavior of equipment and software is more cyclical and likely to weaken further than we are currently expecting. Thus, we could be understating the output gap by understating potential on the basis of these revisions, or, as suggested in the Greenbook outlook, growth may weaken more than we anticipate, even relative to our new lower path.

Some of the other implications of lowering our estimate of potential growth are also worth noting. This downward revision now implies less of cyclical downturn than would otherwise be suggested by our forecast for real growth; however, it also exacerbates some of the longer-run challenges the U.S. economy faces, including the current account deficit and the fiscal deficit.

Furthermore, while the housing market is not substantially weaker than we had been projecting, some of the deceleration in recent indicators raises the concern that the adjustment in housing may be less smooth, and more profound in its impact on aggregate activity, than we have been expecting.

Our inclination still is to avoid citing significant wealth or home equity withdrawal spending effects in characterizing the downside risks associated with our assumed path for home prices and their impact on the economy. However, we now know that, throughout the course of this tightening cycle, the longer-term policy path expectations held by markets built in far less tightening than has been realized. Furthermore, we know that the expectations for the future path of policy affect the term structure of interest

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rates, as well as consumption and investment decisions. We now cannot dismiss the possibility that our policy over the past few years—the primary purpose of which was to avoid the potentially destructive impact of deflation on the economy—may have led to certain distortions in asset prices and associated inter-temporal consumption and investment decisions. The potential for such distortions seems even greater when we consider the downward pressure that dollar reserve accumulation, particularly by exchange-rate-targeting central banks and oil-exporting nations, may have placed on world interest rates over this period. While the current policy implications of this scenario are not obvious, it should move us in the direction of being alert to the potential for a more substantial movement in certain asset prices, including home prices and the dollar. These movements may in turn be associated with a sharper retrenchment in consumer optimism and spending than we are currently anticipating.

We also see some possibility that the strength in domestic demand conditions around the world provides some upside risk to U.S. real growth through a pickup in exports. The strength of import prices recently points provide some evidence of continued robustness in global demand growth.

Regarding core PCE inflation, we are reluctant to ascribe as substantial role to energy price pass-through as seems to be implicit in the Greenbook. We believe we have no way to distinguish confidently in the data between energy price pass-through and a more broad-based inflationary impulse. While the stability in breakeven TIPS inflation rates is reassuring, assessing the reliability of this signal is difficult given the relative newness of this market. In any case, stable inflation expectations are necessary, but likely not sufficient, for dismissing the possibility that we are behind the curve on inflation.

In addition, we see other reasons to place less weight on an energy price pass-through story. For one, the rebound in core inflation arguably began at the end of 2003, well in advance of some of the more extreme movements in energy prices and overall inflation. Indeed, stronger core inflation was driven by a combination of a sharp reversal in late

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2003 in the core goods deflation that had started back in 2000, as well as by the preemption in early 2004 of any further disinflation in core services.

In addition, the more recent run-up in core inflation may now be linked more closely to strength in unit labor cost growth than prior to recent data revisions. The implications of this connection for our inflation outlook are unclear. On the one hand, continued strength in nominal compensation growth raises the specter of a wage-price spiral if firms try to protect profit margins going forward. On the other hand, it suggests that at least some of the adjustment in labor share has already taken place without precipitating a significant burst of inflation.

Other than the decline in policy rate expectations, which may be associated with a decline in growth expectations, there were no significant financial market developments. Inflation expectations increased only modestly over the inter-meeting period, and Treasury yields declined across the curve, driven by the decrease in policy rate and growth expectations. Measures of policy uncertainty rose slightly over the inter-meeting period, peaking in mid July around the time of the PPI and CPI releases and the Chairman's Congressional testimony, but declining again more recently.

## 2. Recent Developments

### U.S.

*Summary.* Measures of underlying inflation remained high and continued to show signs of some further increases, indicating continued upside risk to implicit targets. Real GDP growth in 2006Q2 was below our projection. Growth in previous years was revised downward; one consequence of this is a downward revision in our estimate of the potential growth rate. Equipment and software expenditures were weak in 2006Q2 and were revised downward in prior years, contributing to increased downside risk to the real activity outlook. Payroll growth and other labor market indicators were consistent with a

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somewhat softer tone in the market. Consumer and business survey indices generally were solid, but the business surveys indicated continued price pressures.

*Inflation.* Core inflation measures remain elevated compared to desired levels, with recent reports continuing to show signs of some firming, thereby prompting greater concerns about the future inflation outlook [Exhibit A-6]. The (annualized) monthly change in the core PCE deflator was 2.8% in May and 2.9% in June, up from 2.7% in April. Longer horizon changes based on the June data also show a pattern of firming, with an increase of 2.4% on a 12-month basis, 2.7% (annual rate) on a 6-month basis, and 2.8% (annual rate) on a 3-month basis. The core CPI rose 3.6% (annual rate) in June for a third straight month. As has been the case for the last few months, brisk growth in owners' equivalent rent, the largest component of the index, was a key factor in the increase. As with the core PCE deflator, longer-horizon changes also showed a pattern of firming with 12-, 6-, and 3-month changes of 2.7%, 3.2%, and 3.6% (annual rates), respectively.

Overall inflation rates showed the effect of a drop in energy prices in June. The growth in the total PCE deflator declined to 2.1% (annual rate) in June from 4.6% (annual rate) in May, while the CPI rose 2.4% (annual rate) in June. We view this restraining effect of energy prices as only a temporary development. With the exception of our smoothed inflation measures, other alternative measures of "core" inflation have continued their recent upturn [Exhibit A-7]. There is now more of a convergence between the traditional core measures of inflation and these alternative measures, although they all remain above the upper end of the acceptable range. In contrast, forward-looking measures of inflation remain stable. Inflation predicted by our underlying inflation gauge (UIG) has shown very little change at the short (2-year) horizon, as well as at the 2-3 and 3-5 year horizons [Exhibit A-8]. Similarly, financial markets' inflation expectations at the two-year horizon as well as the longer-term horizons showed little change during the inter-meeting period. Household survey expectations mirrored those in financial markets by remaining fairly steady. The median expected one-year-ahead inflation rate moved from 3.3% in early June to 3.2% in late July, while the expected 5-year-ahead rate remained unchanged at 2.9% over the same period.

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*Real activity.* Real GDP growth in 2006Q2 was 2.5% (annual rate), below our projection, as well as the consensus of private forecasts, prior to the release. A major factor behind the weaker-than-expected growth was a decline in expenditures for equipment and software. Real GDP growth since 2003 was revised to reflect newly available source data; for 2003-2005, average growth was revised downward about ¼ percentage point. The downward revision in GDP growth has led us to move down our estimate of potential GDP growth from about 3¼% to 3%.

Real PCE growth in 2006Q2 was 2.5% (annual rate), confirming expectations of moderate growth in the quarter. The June data on real PCE indicated that consumption growth ended the quarter on about that pace. The initial indications for July suggest that consumption growth could pick up somewhat. Auto sales in July rose significantly from their Q2 pace, and preliminary credit card data for July point to somewhat stronger growth in retail sales excluding autos (although part of the growth probably reflects rising gasoline prices rather than a real increase). Furthermore, income growth was solid in June, but persistent high energy prices may continue to subdue growth.

To this point, housing indicators remained consistent with an orderly slowing in the market. Real residential investment fell 6.3% (annual rate) in 2006Q2 as demand for housing cooled. Housing starts and building permits fell in June; their decline since the housing market peak in 2005Q3 is roughly consistent with the housing market slowdowns in the late 1980s and mid-1990s. The recent behavior of new and existing home sales is also consistent with those previous episodes. However, after being fairly stable in the previous five months, mortgage applications fell somewhat in July, which could portend some further declines in sales. The new home inventories-sales ratio rose in June and remains elevated compared to its level of the past several years. Home price appreciation also has shown significant moderation in the past quarter; the four-quarter change in the Census constant-quality index has fallen from about 8½% in 2005Q2 to 4½% in 2006Q2. Median sales prices have displayed greater moderation in their deceleration, although this may reflect a changing mix in sales.



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Business spending measures were mixed in 2006Q2. Real expenditures for equipment and software fell 1.0% (annual rate) in the quarter. The decline was led by sharp drops in a number of volatile components of transportation equipment. Nevertheless, expenditures slowed notably for information equipment and software, including computers. These expenditures also were revised downward significantly for 2003-2005, particularly for information equipment, indicating a more modest recovery from the investment bust earlier in the decade (see the special topic *The Revision in Information-Processing Investment* for more details and analysis). In contrast, expenditures on nonresidential structures increased a robust 12.7% (annual rate) in 2006Q2, and nonresidential construction increased sharply in June, indicating a more substantial rebound in this sector. Inventory investment provided a small positive contribution to GDP growth in 2006Q2, even as firms kept inventories-sales ratios low and stable. Manufacturing production had a robust gain in June, and its 12-month change remains near the upper end of its range over the past two years. The capacity utilization rate in June was at its highest since mid-2000. IT production remains notably strong, which is consistent with the recent growth in our Tech Pulse index (despite downward revisions in prior years). Both of these indicators suggest greater strength in IT equipment and software expenditures going forward.

*Labor market.* Payroll growth remained subdued, and other indicators were consistent with a somewhat softer tone in the labor market. In the three months through July, payroll growth averaged 112,000 per month, compared to 144,000 in the first half of 2006 and 165,000 in 2005. The temporary help services sector again was weak, which typically suggests soft payroll growth in the second half. Although the growth of aggregate hours in 2006Q2 was close to recent levels, it slowed in July. The unemployment rate increased to 4.8% in July. The labor force participation rate remained slightly above its levels from earlier in the year, while the employment-population ratio was virtually unchanged from recent prevailing levels. Initial claims for unemployment insurance have been relatively stable, indicating little deterioration in the labor market. Measures of labor compensation indicate the labor market is still

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sufficiently tight to induce somewhat stronger wage growth. The four-quarter change in the employment cost index (ECI) rose in 2006Q2 from its low level in the previous quarter, primarily because of stronger wage growth. In contrast to previous quarters, the rise in the ECI was consistent with the behavior of average hourly earnings, for which the 12-month change in July was near its highest level since mid-2001.

*Surveys.* After rebounding in June, consumer confidence measures remained relatively steady at favorable levels through July. There is, however, a growing divergence in sentiment across income groups, with the current gap between the more optimistic high-income households and the less-confident low-income households the largest in two decades. Abstracting from monthly fluctuations, business survey indices generally have remained at levels that indicate continued steady growth in the manufacturing sector. Unfortunately, the surveys also are showing a uniform reading with regard to price pressures. The Chicago Purchasing Managers Index, the ISM Manufacturing and Non-Manufacturing Indices, as well as the Philadelphia Fed Index, indicate persistent widespread increases in prices paid sub-indices, although the pressures do not appear to have intensified in July.

# Special Topic

## The Revision in Information-Processing Investment

August 4th, 2006  
 Bart Hobijn<sup>Redacted</sup> and Charles Steindel<sup>Redacted</sup>

One notable feature of the revision to GDP was the altered path for investment in information-processing equipment and software. Real growth for spending on this form of capital over the last year was cut nearly in half [Figure 1]; this cut reflected lower numbers for nominal outlays. The revised data now show that technology spending has not yet surpassed its 2000 peak [Figure 2]; the pre-revision data suggested that this peak had been surpassed in 2005Q2.

The main source of the revision is new data from the Annual Survey of Manufacturers, released in May, on shipments of technology equipment. This more complete data reported markedly lower levels than had been suggested previously by the monthly dollar data on computer shipments; this shipment data had been the main input used by the BEA to estimate hardware spending. Figure 3 plots the nominal computer shipments data for 2003-2005 pre- and post-revision. The extent of the revision has led the BEA to announce that it will reduce its reliance on the monthly computer shipments data. The BEA's new procedure for the construction of ongoing expenditure estimates will give the growth of monthly computer shipments only a 25% weight; the balance will be derived from the Industrial Production series on the output of these products. (The Industrial Production numbers rely on industry information.)

The revised numbers still show rapid growth, relative to overall growth in real activity, in

information-processing investment; growth rates generally fall between 5-10% (annual rate), with some quarters seeing growth rates as high as 20%. However, the average growth is much lower than in the 1990s. From 1994Q1 through 2000Q4 the real growth rate of investment in information-processing equipment was less than 10% in only three quarters. Since the start of 2003, the real growth rate has been above 10% in only four quarters. Our real Tech Pulse index also has been revised downward as a result of these revisions [Figure 4].

The lower numbers for information-processing investment have three potential implications for longer-term growth:

1. The lower path for IT investment is a major part of the downward adjustment in overall investment levels in the revision. Lower investment suggests slower growth in the capital stock, slower growth in the capital input, and a modestly lower estimate of growth in potential output.
2. For many IT products, the investment decision now appears to be fairly routine (for instance, replacement of PCs and upgrades of their software). Lower levels of investment for these items could suggest a more cautious attitude that extends beyond IT spending to include capital spending overall.
3. If the new numbers on IT reveal general business investment attitudes, they point to softer underlying capital demand. It thus could offer evidence consistent with the "savings glut" explanation for the low levels of long-term interest rates.

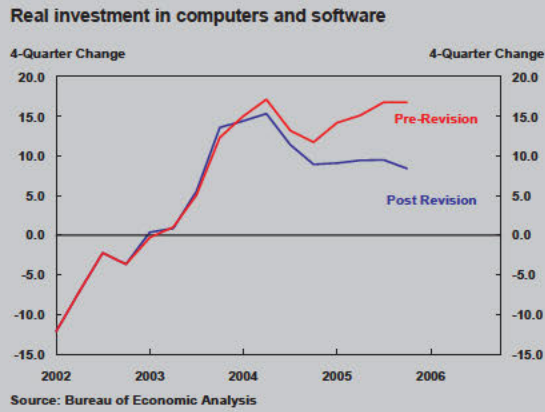


Figure 1.

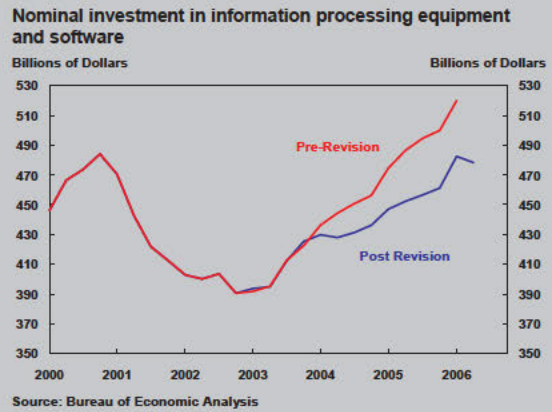


Figure 2.

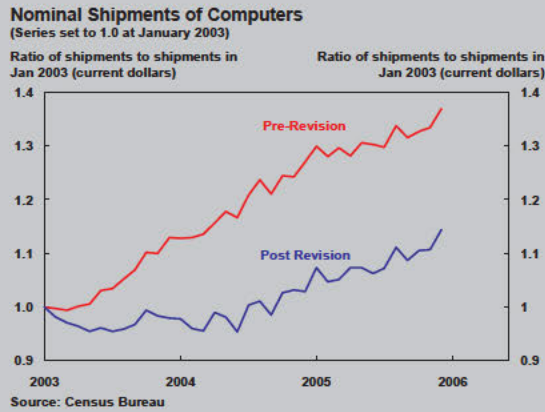


Figure 3.

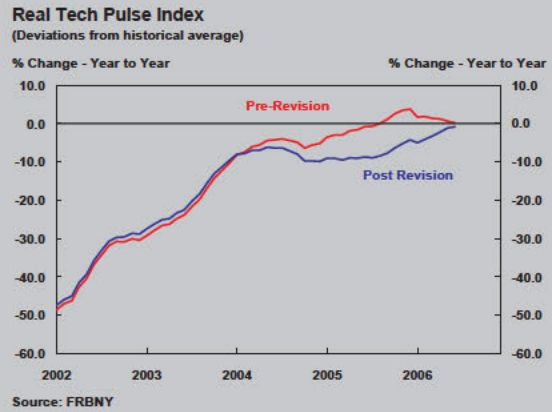


Figure 4.

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## Global

Foreign growth in 2006 is projected to match last year's pace of 3.3 percent (Q4/Q4). All regions are doing well, with acceleration in Europe matching a modest deceleration of growth in Asia outside of China. The outlook is more positive than in June, largely because of upward revisions to expected growth in Europe and China.

*Industrial Countries.* Data for the euro area continue to be encouraging, with growth expected to stay near 2.5 percent in 2006. Industrial production was up 5 percent over the prior year in May and has been averaging a solid 3-4 percent growth rate so far in 2006. Growth in orders and exports in the month were up over 10 percent. The industrial confidence index continues to climb, moving well above its long-run average in June. The unemployment rate fell to 7.8 percent in June, continuing its steady decline from its late 2003 level of 8.9 percent. The number of unemployed was down 9 percent over the prior year. Overall consumer prices were up 2.5 percent over the prior year in June, while core inflation rose only 1.5 percent, near the pace it has maintained since early 2005.

The Japanese economy appears to have moderated to around 2.5 percent growth in the second quarter. Industrial production was quite strong, up almost 5 percent over the prior year in June, while service output in May was up 3.1 percent in the year. The labor market deteriorated slightly in June, although it still looks to have a fairly positive trend, with employment up 0.3 percent over a year ago. Business confidence in June held steady and at a high level. Consumer prices, excluding the volatile fresh food component, were up 0.6 percent over the prior year in June. A re-basing of the consumer price index in August, however, is expected to reduce the inflation reading by 0.2 percentage points. Inflation is forecast to remain around a half of a percent in 2006 and 2007.

The Canadian economy is expected to maintain steady growth in 2006, while the outlook for the U.K. was revised up after surprisingly strong GDP growth in the second quarter.



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*Emerging Economies.* China's GDP forecast for 2006 was upgraded following torrid 11.3 percent growth in the second quarter. Data for June, including production, retail sales, and investment spending, were especially strong. China's trade surplus climbed in June to \$14.5 billion, its second consecutive all-time high. Lending and M2 growth showed signs of moderation in June but are still increasing at an uncomfortably high rate. A number of steps have been taken to stave off overheating, including higher required bank reserve ratios, stricter "window guidance" for banks, larger sterilization operations, and strengthened central government oversight of provincial land sales. Recent speeches by senior leaders suggest that additional measures to slow the economy will be forthcoming. Growth in the second quarter for Korea and Singapore, meanwhile, was somewhat slower than expected.

Latin America weathered the period of increased market volatility in May and June with relative ease. In general, external balances are positive, inflationary pressures are modest (except for Argentina) and domestic demand is the principal driver of growth. In Mexico, data indicate that output growth was strong in the second quarter, and the economy will enter the second half of the year on firm footing. Wholesale and retail sales data point to domestic demand strengthening while external demand moderates. The Brazilian economy is on track for output growth near potential in 2006. Robust consumer demand and business investment have combined with increased industrial production and rising imports. While real net exports will be a drag on growth this year, strong commodity prices are helping the current account remain in surplus. Argentina's economic activity also remains strong.

### **Trade**

The U.S. trade deficit widened to \$63.8 billion in May from \$63.3 billion in April. The real non-petroleum trade balance, though, narrowed 8 percent relative to April, its largest monthly percentage drop since January 2003. The initial estimate, based on April and May data, has the net exports component of GDP contributing 0.3 percentage points to GDP growth in Q2.

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The patterns in the May data were consistent with the revised GDP data showing less drag from trade on GDP growth in recent quarters than previously reported. The biggest changes were for 2005Q4 (-1.1 percentage point contribution rather than -1.4), due to an upward revision in exports, and in 2006Q1 (-0.0 percentage point contribution rather than -0.2), due to a downward revision in imports.

The net export forecast for the rest of 2006 predicts that real exports will continue their strong growth, while demand for real non-oil imports is forecast to remain relatively soft. As a result, net exports are projected to be essentially neutral for GDP growth in 2006Q3 and for 2006 as a whole.

The current account deficit was \$835 billion in 2006Q1 (SAAR) and is projected to reach \$930 billion, 6.8 percent of nominal GDP, by the end of 2006. We expect higher import prices, largely from rising energy prices, to cause the current account to deteriorate, even though the forecast projects stability in real net exports. In addition, the net income component of the current account is projected to worsen in 2006 and 2007, as higher interest rates applied to the ever-increasing stock of U.S. interest-sensitive liabilities offset the net surplus on foreign direct investment.

## **Financial**

*Domestic Markets.* Federal Reserve commentary and weaker-than-expected economic announcements caused market participants to lower their policy rate and growth expectations over the inter-meeting period, leading to lower Treasury yields.

Policy rate expectations declined over the inter-meeting period in response to Fed commentary and weaker-than-expected economic announcements [Exhibit B-4]. On net, the implied August fed funds rate has declined 13 basis points since June 28, with the implied probability of a 25 basis point increase at the August meeting about 10% as of midday August 4. Policy rate expectations beyond the next meeting declined more

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sharply, with the expected August 2007 rate, for example, declining 35 basis points between June 28 and August 3 to 5.06%.

As the decline in policy rate expectations was accompanied by a decline in growth expectations, inflation expectations increased only modestly over the inter-meeting period [Exhibit B-2]. Carry-adjusted implied inflation rose 7 basis points at the 0-5 year horizon to 2.61% and 1 basis point at the 5-10 year horizon to 2.68%.

Treasury yields declined across the curve over the inter-meeting period, driven by the decrease in policy rate and growth expectations [Exhibit B-1]. The 2-year yield fell 37 basis points to 4.91% and the 10-year yield fell 35 basis points to 4.90%. The sharpest declines in the 2-year yield came on the days of the FOMC statement (June 29, -9 basis points), Chairman Bernanke's Congressional testimony (July 19, -8 basis points), the July Employment Report (August 4, -8 basis points), and the GDP release (July 28, -7 basis points).

Measures of policy uncertainty rose over the inter-meeting period, generally peaking in mid July around the time of the PPI and CPI releases and the Chairman's Congressional testimony [Exhibit B-5]. The range within which the 3-month Eurodollar rate is expected to remain over the next 3 months, for example, widened 25 basis points between June 28 and July 19 but narrowed 10 basis points between July 19 and August 3.

Corporate credit spreads were little changed over the inter-meeting period [Exhibit B-8]. The single A spread widened 1 basis point to 90 basis points, and the 10-year swap spread narrowed 2 basis points to 57 basis points.

Signals from equity markets were mixed over the inter-meeting period, with the Dow Jones and S&P 500 indices rising 2.5% and 2.8%, respectively, but the NASDAQ Composite falling 0.9% [Exhibit B-7]. Equity implied volatilities rose sharply in mid July but have declined since then to end the inter-meeting period down slightly. One-



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month S&P 500 implied volatility, for example, rose from 15.8% on June 28 to 18.6% on July 17 but fell to 14.5% on August 3.

*Monetary Policy and Global Bond Markets.* Global financial markets returned to more typical conditions after the turbulent May-June period, aided by signs of less aggressive monetary tightening in industrial areas.

After raising its policy rate in June to 2.75%, the ECB tightened again to 3% on August 3<sup>rd</sup>. The ECB is poised to raise rates again, likely in October, although the pace of subsequent tightening will hinge on incoming macroeconomic news. Weaker U.S. data may dampen the ECB's eagerness to tighten, although the wording in the ECB's August 3<sup>rd</sup> press release signals the Bank's concern about ongoing price developments. In Japan, the central bank ended its five-year zero-interest-rate policy on July 14, lifting its key policy rate to 0.25%. While the Bank of Japan is expected to tighten further, official statements by Bank officials have convinced markets that rate hikes will be more gradual than previously anticipated. Indeed, the next rate hike is not expected until the end of the year.

These developments, along with the reassessment of the near-term path of monetary policy in the U.S., have caused medium- and long-term rates to fall in the main industrial areas since the last FOMC meeting [Exhibit B-10]. In the euro area, implied rates on euribor interest rate futures have declined by 6 basis points since the last FOMC meeting, flattening the yield curve. Japanese rates moved little over the period as a whole, rising before the zero-interest policy was abandoned and falling afterwards.

While downward movements in nominal yields were common to industrial countries, the split between their real and inflation components was not [Exhibit B-10]. Data from inflation-linked bonds indicate that lower real yields drove changes in Europe (including in the United Kingdom), where inflation expectations held up firmly. Canada and the U.S. both recorded declines in both real rates and expected inflation, while Japan showed marginal changes in both the real and nominal components of long-term yields.

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Elsewhere, policy continues on a clear tightening path in China, where the central bank has responded to accelerating growth with a number of credit-control and other administrative measures. After pausing for one year following its last rate cut, on August 3<sup>rd</sup> the Bank of England increased its policy rate 25 basis points to 4.75% in response to second quarter output and price data. By contrast, the Bank of Canada has reached the end of its tightening cycle, while several central banks in emerging Asia (outside China) are approaching the end of theirs. Notable exceptions to the tightening cycle are found in Indonesia and Brazil, where central banks are on an easing trend, while Mexico's easing cycle likely ended in April.

As it is usually the case, the fall in industrial countries' long-term rates was accompanied by falling spreads of emerging country debt over comparable Treasury yields, causing EMBI+ spreads to fall again to near historical lows [Exhibit B-9].

*Foreign Equity Markets.* European equity markets have rebounded somewhat after reaching a low in mid-June [Exhibit B-9]. Over the inter-meeting period, the Euro Stoxx index rose 3 percent, and the FTSE index rose 2.5 percent, supported by robust corporate fundamentals and lowered expectations of U.S. policy rates.

Japanese equity indices have followed a similar pattern, falling early in the period in response to concerns about slower U.S. growth and rising more recently, as investors priced in less U.S. policy tightening, Japanese companies reported solid earnings, and macroeconomic data pointed to a continued domestic expansion. By the end of the period, Japanese equities were up 2 percent from their level at the last FOMC meeting, though still well below their year-to-date highs.

Asset prices in emerging markets strengthened. Latin American stocks, in particular, appreciated significantly after the battering of the previous months. The Mexico's Bolsa and the Brazil's Bovespa rose 11 and 7 percent since the June FOMC, respectively, reversing much of their decline between the May and June FOMC meetings. Emerging

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Asia equities also recovered some of their May and June losses, with the MSCI Emerging Asia index increasing 3 percent since the end of June.

*Exchange Rates and Capital Flows.* Major exchange rates were little changed during the period, as interest rate differentials between the main areas remained stable. Option-implied volatility of currency pairs moved within low ranges after the spike recorded during the previous period [Exhibit B-9]. The dollar lost one percent on the euro, was unchanged on the yen, and lost 1.2 percent in effective terms, as higher-risk currencies recovered from their losses in the previous cycle. The Philippine peso, Indonesian rupiah, and Thai baht, in particular, outperformed other Asian currencies against the dollar, amidst signs that risk appetite among investors was recovering from the May-June risk-reduction phase. The Chinese yuan also moved higher on the dollar. Further yuan appreciation could be part of the Chinese authorities' effort to address excess liquidity in the domestic financial system. Elsewhere, the Mexican peso and the Brazilian real appreciated five and two percent, respectively.

Capital flows to the U.S. continue at a smooth pace. Reflecting downward adjustments to U.S. growth forecasts since the last FOMC, net flows from the rest of the world to the U.S. are now expected to reach \$870 billion in 2006. (The June forecast was \$915 billion.) Reserve purchases by China and Emerging Asia remain sizeable, although the pace slowed during the May spike in emerging market volatility.

*Energy Market Developments.* Oil prices remained in the range of \$70-\$75 a barrel during the inter-meeting period, with WTI prices averaging \$74.51 in July. Market conditions are expected to remain tight, despite a second consecutive year of slow oil demand from the U.S.. China's demand for oil continues to edge up; China is now expected to account for a third of global demand growth in 2005. Demand in the Middle East is also expected to be quite strong, while no growth in demand is projected in Europe and Japan.

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World oil production is expected to grow modestly this year, with new fields in the Former Soviet Union (FSU) and Africa coming on line in the second half of 2006; OPEC production, however, is projected to be flat in 2006.

WTI prices are currently assumed to stabilize at \$72 through 2007Q4, about \$1 more than expected at the time of the last FOMC cycle.

### **Second District**

Our Indexes of Coincident Economic Indicators for June indicate continued brisk economic growth in New York State and especially New York City, but a flat economy in New Jersey [Exhibit E-1]. Looking ahead to the next nine months, our leading indexes continue to predict growth of roughly 4½% (annual rate) for New York City and close to 3% for New York State; New Jersey's index, however, predicts a marginal decline in economic activity [Exhibit E-2]. Local-area inflation increased further on a year-over-year basis: the 12-month change in metropolitan New York City's consumer price index (CPI) was 5.6% in June, up from 4.8% in May and 3.6% in April and more than a full percentage point above the U.S. rate. Similarly, the 12-month change in the core CPI climbed to 4.6% from 3.9% in May and 2.8% in April, which is two full percentage points above the U.S. rate. Both overall and core inflation are at their highest level in more than 14 years. Much of the divergence between local and national core inflation reflects local shelter costs, which rose 6.9% over the past 12 months, roughly double the nationwide rate.

*Labor Markets.* The district's labor markets remained tight in June, though job creation slackened. Private-sector employment in the New York-New Jersey region slowed to a 0.6% annual rate in June, down from 2% in May and 1.7% in April; over the past year, job growth has averaged roughly 0.9% in both states [Exhibit E-3]. New York City has shown particular strength, with private-sector employment expanding by roughly 2% over the past 12 months. Labor force data have been mixed but are, on balance, positive. New York State's unemployment rate held steady at a 5-year low of 4.6% in June, while New York City's rate edged up to 5.1% from May's 18-year low of 5.0%; New Jersey's

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rate edged down 0.1 percentage point in June to 4.9%, but it remains more than ½ point higher than it was at this time last year [Exhibit E-4].

*Real Estate.* Commercial real estate markets across the New York metro area mostly strengthened in the second quarter. Office vacancy rates continued to decline throughout Manhattan and on Long Island, and office rents in these areas were up 5-10% from a year earlier. In northern New Jersey, Westchester, and Fairfield County, Connecticut, both vacancy rates and asking rents were little changed. Industrial markets were more mixed. Long Island's industrial vacancy rate edged down to a 6-year low of 4.2%, while Westchester's rate edged down to 12.3%. In contrast, New Jersey's rate edged up to 8.4%, the highest in almost 10 years. Housing markets were mixed in June and for the second quarter as a whole. The New York Association of Realtors reported that sales of single-family homes were fairly strong in June, while prices were up more than 10% from a year earlier. Sales of Manhattan apartments were reported to be sluggish in the second quarter, while prices were up moderately from a year earlier.

*Surveys and Other Business Activity.* Recent surveys suggest some softening in both business and consumer sentiment. Although July surveys of purchasing managers in the New York and Buffalo areas indicate a pickup in activity, preliminary results from the August Empire State Manufacturing Survey suggest further slowing in the manufacturing sector, along with continued widespread price pressures. Similarly, non-manufacturing firms in the second district, surveyed in early August, expressed less enthusiasm about current business conditions than in a number of months. July consumer surveys, from both the Conference Board and Siena College, indicate a modest pullback in consumer confidence. Finally, tourism activity remains at a high level but has shown some signs of slowing recently. Broadway theater attendance slipped in July and was down roughly 8% from a year earlier. Manhattan hotels reported that occupancy rates, though still exceptionally high in June, were slightly lower than a year earlier.

### 3. Outlook

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## FRBNY's Central Forecast

There are three fundamental factors behind our central projection [Exhibits A-1 to A-5].

1. Inflation expectations are expected to remain contained.
2. There is little, if any, slack remaining in resource utilization. Therefore, if there are no large shocks, and if fiscal and monetary policies maintain a near-neutral stance, then growth over the medium term will be near its potential rate of approximately 3% (2% long-run productivity growth [GDP basis] plus 1% labor force growth).
3. The term premium is expected to remain low.

These underlying assumptions for the central forecast are generally similar to those of the last Blackbook, with the exception of our having reduced the estimate of the potential GDP growth rate from 3.3% to 3%. This adjustment reflects the downward revision in GDP growth over the past three years. We remain reasonably confident about these assumptions. Longer-term inflation expectations in financial markets and household surveys have remained relatively stable during the inter-meeting period, suggesting that they remain contained. The slowdown in 2006Q2 was relatively moderate and thus consistent with future growth remaining near its potential rate. However, a flat-to-inverted yield curve and continued volatility in financial markets may signal a more persistent slowdown, and the uncertainty around our forecast has increased over the inter-meeting period.

As far as the monetary policy path, our forecast is consistent with a Fed funds target rate of 5¼% through 2007Q3, and a modest decline at the end of 2007 to 5%. This path is similar to that underlying the Greenbook forecast except for the decline in late 2007.

*Inflation.* Monthly changes in core price indices were again high in June, and oil prices remain elevated. [Overall inflation measures moderated in June due to a temporary decline in energy prices that has already been reversed.] These developments were largely as anticipated. We thus have made little change in our inflation forecast over the forecast horizon. The Q4/Q4 change in the core PCE deflator is still expected to be

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almost 2½%, with the overall deflator expected to rise somewhat more. We see this relatively high rate as temporary because we anticipate little change in oil prices over the forecast horizon and only a modest effect from previous energy price increases on the prices of other goods and services; we base this assumption of moderate impact on flexible product and labor markets as well as continued FOMC credibility. Furthermore, previous monetary tightening should begin to have more impact on inflation over the next several quarters. Therefore, we expect inflation to decline in 2007, as core PCE inflation falls toward 2%. The gradual decline should continue in 2008, with the inflation rate moving toward the implicit target.

*Real Activity.* We expect the economy to grow fairly close to its potential rate, which we now estimate to be 3%, over most of the forecast horizon. In the second half of 2006, growth is expected to be slightly below this level, as the continued moderation in the housing market hinders growth. Counteracting this source of deceleration is fairly strong business investment, maintained consumer spending, and a rebound in federal government spending after a weak second quarter. Beyond 2006, with the housing slowdown expected to be near its end and no other factors expected to push the economy off path, our forecast is for growth to be at its potential rate in 2007 and 2008. Because average real growth remains close to its potential rate, we expect little change in the unemployment rate.

### **Comparison with Greenbook Forecasts**

*GDP and Inflation Forecast.* The Greenbook baseline forecast is conditioned on a policy path unchanged from June; the policy rate is expected to stay at 5.25% at the August meeting and to remain at that level through the end of 2007. There are significant changes in the conditioning assumptions on energy prices and housing prices. The path of energy prices has been revised upwards, reflecting the rise in spot and future oil prices during the inter-meeting period (mainly the result of tensions in the Middle East). Residential real estate prices are projected to decelerate faster than expected in May, with negative



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consequences for aggregate demand. There are only very minor changes in the conditioning assumptions for long-term interest rates, equity prices, and the dollar.

Other major features of the current Greenbook forecast are the following:

- Compared to the June Greenbook, core PCE inflation in 2006 (Q4/Q4) has been revised up 0.1 percentage points to 2.5% (2.5% for 2006H2), and 0.1 percentage points in 2007 to 2.3%.
- The real GDP growth forecast for 2006 is 3.2%, the same as in June, but it is only 2.1% 2006H2, down from 2.7% in June. Real GDP growth for 2007 is 2.3%, revised down 0.4 percentage points from June.
- Potential GDP growth is projected at 2.9% for both 2006 and 2007, revised down 0.3 percentage points from June.
- Relative to the June projections, output per hour is revised down by 0.2 percentage points for 2006 and by 0.4 percentage points for 2007. This is consistent with a revision downward of structural labor productivity of 0.3 percentage points for both 2006 and 2007, but it does not fully account for the projected decline in output growth.
- The forecast for employment is about the same as in the June Greenbook. The unemployment rate is expected to increase to 5.25% in 2007.

Our staff forecast of real GDP growth differs significantly from the Greenbook forecast [Exhibit A-2]. In particular, our projection for GDP growth for both the second half of 2006 (2.8% vs. 2.1%) and 2007 (3% vs. 2.3%) is 0.7 percentage points above the Greenbook projection.

The slowdown projected by the Greenbook for the second half of 2006 and for 2007 primarily reflects a large decline in residential investment in 2006H2 and a significant slowing of personal consumption expenditures through 2007. In particular, the Greenbook forecasts residential investment to decline 14% in 2006H2, for a -0.9% GDP growth contribution, while it decreases less than 10% in our staff forecast (for a -0.6% growth contribution). The GDP growth contribution of personal consumption expenditures is 0.2 percentage points lower in the Greenbook than in our staff forecast. Finally, the Greenbook forecast projects lower inventories, but the impact on real GDP growth is mitigated by an offset from a positive contribution of net exports to GDP growth.



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For inflation, our staff forecast is in line with the Greenbook for 2006. For 2007, our forecast for PCE is 0.1 percentage points higher than the Greenbook (2.2% vs. 2.1%), while our forecast for core PCE is 0.3 percentage points lower (2% vs. 2.3%). The difference in the Greenbook's forecast for PCE and core PCE is somewhat surprising, given the Greenbook's projection of higher energy prices and slower growth in its baseline scenario. It would appear that the Board staff regards inflation as more inertial than we do. (One implicit assumption behind our forecast is that the continued credibility of the FOMC will ensure that inflation expectations are contained and that inflation will not remain outside of comfort zones too long under the "correct" policy path.)

In contrast with the last few FOMC cycles, our outlook for unit labor costs and compensation per hour is similar to the Greenbook's. This reflects an upward revision in our staff projections in light of the revisions to the NIPA.

*Alternative Greenbook forecasting scenarios.* As usual, these simulations are constructed using the FRB-US model (after its residuals have been adjusted to match the Greenbook forecast). Unlike the baseline scenario, these projections are not conditioned on an assumed exogenous path for the federal funds rate; the path of the target rate is instead simultaneously generated by the policy rule incorporated in the model, which is the Bluebook-estimated version of the Taylor rule.

The June Greenbook describes four alternative scenarios. Two of them use different assumptions about the supply side of the economy. The other two are concerned with the demand side.

The "inflation persistence" scenario describes a more persistent increase in energy prices than in the baseline scenario. Persistent upward pressure in energy prices leads to a gradual increase in inflation expectations, with adverse consequences for inflation stabilization. In response to higher inflation expectations the federal funds rate is higher

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than baseline (almost 6% in 2007). Inflation increases to 3% in 2006 and stays unchanged in 2007, despite lower energy prices. Real activity growth is slightly lower than in the baseline because of tighter monetary policy. It is worth noting that this scenario implies considerable pass-through from energy prices into core goods, and, consequently, monetary policy has to respond to what starts out as a pure supply shock.

The “lower NAIRU” scenario is designed to acknowledge the considerable uncertainty about the current level of the output gap. It assumes that the natural rate of unemployment has been 4.25% since the beginning of 2005 (as compared to 5% in the baseline). The slack resource constraint allows policy to follow a lower path through 2007, with both higher output growth and lower inflation as a consequence. This is best viewed as a permanent reassessment of potential output that implies weaker demand (relative to supply) and results in a substantial reduction of inflationary pressures.

In the “no slowdown” scenario, non-residential investment keeps growing at a sustained pace, moderating the slowdown in economic activity. Output growth still declines in the second half of 2006 but rebounds in 2007 (together with lower unemployment). The higher pace of economic growth leads to an increase in the policy rate, which contains inflationary pressures, leaving the inflation rate at baseline.

In the “housing slump” scenario home prices drastically fall, leading to a more severe decline in real residential investment and a reduction in consumer spending driven by the negative wealth effect. As a result, real activity slows considerably (below 2% for both 2006 and 2007), while the policy rate is reduced to 4.4% in 2007. Despite the decline in output and employment, inflation is not projected to be lower than baseline.

*Foreign Outlook.* Our 2006 foreign growth forecast differs from the Board’s forecast for Japan and Canada. With Japan, the Board has taken strong 2006Q2 data and projected 4.0 percent (SAAR) growth for the quarter, while we take a more cautious stance with a forecast of 2.5 percent. The two forecasts for Japan are similar for the second half of the year. The Board is less optimistic about Canada than we are, with the Board seeing the

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U.S. slowdown as a significant drag on Canadian growth. The two forecasts for China are similar for 2006, as the strong Q2 GDP data caused the Board's forecast to move closer to our forecast.

Notable differences for the 2007 forecasts include the Board's more optimistic outlook for Japan and more pessimistic outlook for the euro area. The difference for Japan is largely due to the Board having a higher estimate of Japan's potential growth rate. For the euro area, the Board differs by expecting a significant drag in 2007Q1 from an increase in German taxes. The two forecasts for China also diverge with the Board expecting more of an impact from China's efforts to restrain growth.

*U.S. Trade.* For 2006 as a whole, our forecast for the net export contribution to GDP growth is very similar to the Board's forecast. For 2007, we anticipate a slightly higher drag from net exports, 0.3 percentage point rather than 0.1 percentage point, primarily because we expect stronger import growth from our stronger domestic demand growth assumption.

### **Comparison with Private Forecasters**

Our staff forecast for real GDP growth is somewhat different from the private sector. We project GDP growth somewhat above private forecasters for 2006Q3. For 2006Q4 we expect a lower growth rate than private forecasters, with the exception of our PSI model. On the inflation front, the FRBNY forecast for CPI is roughly in line with private sector forecasts for 2006Q3. For 2006Q4 the FRBNY forecast is the same as for Macro Advisors but higher than both Blue Chip and the median of SPF. For 2006 we project core CPI to be higher than Macro Advisors.

### **FRBNY Alternative Scenarios and Risks**

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In addition to the central projection discussed at the beginning of this section, we consider a number of alternative scenarios that have different implications for monetary policy. Our approach differs from the one in the Greenbook in that we attach probabilities to our alternative scenarios and usually maintain the same scenarios across FOMC cycles. This allows us to interpret more easily the forecast distribution for output and inflation, as well as analyze the impact from variation in the probabilities over time. Once introduced, we retain an alternative scenario until its likelihood is assessed to be minimal; for example, in the last Blackbook we removed the global deflation scenario introduced in May of 2005 and replaced it with an over-tightening scenario.

We also can generate (when necessary) other forecast distributions that place a greater probability on a specific alternative scenario in order to examine its implications for policy. This was done in January 2006 in response to the near inversion of the yield curve and the surprisingly low advance reading on 2005Q4 GDP growth. To capture these developments, we produced a forecast distribution where we doubled the probability of a productivity slowdown.

We describe some features of the scenarios next. In these descriptions we continue to spend more time on the overheating scenario because it has the most significant consequences for appropriate policy.

*FRBNY Alternative 1: Overheating.* There are two potentially connected forms of this alternative. The first is a more standard scenario in which the extremely accommodative policy stance adopted in the U.S. and other countries in response to the global slowdown of 2000-2003 produces a persistent move in inflation above implicit targets with an abrupt slowdown in real output growth starting in mid-2006. If central banks have consistently underestimated the equilibrium real rate (i.e., overestimated the slack in the global economy), this will lead to excess aggregate demand growth and, ultimately, to an increase in inflation and inflation expectations. The repeated surges of energy prices in particular and of commodity prices in general support this sort of global overheating scenario. Also, the combination of the rise of core and most other measures of

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underlying inflation above the “comfort zone” of U.S. policymakers and the NIPA revisions—particularly lower real GDP growth, higher inflation, and faster growth in labor compensation—have increased the likelihood of this scenario.

The second form of this scenario (described in the special topic *The Free Lunch* in the May Blackbook) highlights the possibility that the U.S. economy could be overheating but that the overheating might not manifest itself immediately in high domestic consumer inflation rates (i.e., a rate well in excess of the FOMC’s implicit target). If the dollar is not freely floating and, moreover, if the dollar is being boosted by capital inflows designed to strengthen it relative to other currencies, then it is possible that market interest rates could be held below what might be reasonably viewed as the equilibrium rate for a significant period of time.

There is now less evidence suggesting that the U.S. is over-consuming today at the expense of future consumption. The most direct evidence in favor of this view was the apparent non-sustainability of the U.S. current account deficit in general, its fiscal imbalances, and the large increases in house prices. The recent stabilization of the U.S. real trade deficit, the short-run improvement in the fiscal position, and the thus-far orderly slowing of the U.S. housing market all point to less weight being placed on this version of the scenario.

*FRBNY Alternative 2: Productivity Shifts.* 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 onward, High II). The NIPA revisions have produced a drop in the estimate of potential in our central forecast. Therefore, our current central projection for productivity in the medium-term assumes a growth rate slightly lower than that of the pre-1973 epoch. There are two alternatives to this projection.

*2a. Productivity Boom.* The developments in the labor market and the continued strength of labor productivity over the longer term suggest that firms have become more efficient in using labor. As such, strong productivity growth could persist, which would imply

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that the potential growth rate is higher than our current estimate. Strong productivity growth would also limit labor cost pressures and thereby help to keep inflation subdued. The NIPA revisions and the negative growth of equipment and software investment in 2006Q2 have lowered the probability of this scenario. However, this scenario continues to receive some support from alternative indicators, such as the continued strength in IT industrial production growth and the FRBNY Tech Pulse index. As discussed in the special topic *The Revision in Information-Processing Investment*, this argument has recently grown less strong, as the Tech Pulse now shows considerably less robust growth for the recent period relative to the 1990s.

*2b. Productivity Slowdown.* It is possible that the upswing in productivity starting in the early 2000s may not be sustained. Furthermore, the persistent increases in the level and volatility of energy and commodity prices also could result in lower labor productivity growth. The recent NIPA revisions imply less robust productivity growth over the last three years and a higher profile for the growth of unit labor costs. This pattern provides support for the view that more of the productivity growth in the last few years was cyclical, meaning that total factor productivity growth has not been as robust. Thus, we have raised the probability of a productivity slowdown.

*FRBNY Alternative 3: Over-Tightening.* Our outlook is based on the assumption that the neutral policy rate is between 4% and 4.25%, with an implicit target for the core PCE of 1.5%. We have lowered the neutral rate slightly from the June Blackbook because of our lower estimate of potential growth. Recent inflation data have core PCE inflation running above 2%. If sustained, this development is consistent with a Fed Funds rate above 5%. However, there is a risk that the recent acceleration in inflation is a lagging indicator of demand pressures and the economy will slow below potential. This view is supported by the fact that inflation expectations remain contained despite a long period of headline inflation running at 3% or more. Furthermore, the Fed has been increasing the FFR for two years, with a cumulative increase of 425bp. While there has been the risk of a yield curve inversion for most of the past six months, its implications had been discounted because of the low level of long forward rates. Long forward rates have since increased,

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and the situation now seems more reminiscent of prior periods when the Fed induced a yield curve inversion. Finally, the recent jump in stock market volatility suggests increased fears among market participants of a policy-induced decline in real activity.

### *Additional Uncertainties*

*Foreign Outlook.* The euro area forecast does not project growth above 2.5 percent, although various indices, such as industrial confidence and the unemployment rate, continue to improve and may foreshadow unexpected strength in both business and consumer spending. Downside risks include the drag on growth from high oil prices and the tightening of monetary policies in both the euro area and in some of its main trading partners. It is also worrisome that the recovery has occurred without any pickup in productivity growth, suggesting that the region's potential growth rate remains modest at around 2.0 percent. In Japan, the gradual increase in inflation remains fragile. Seasonally adjusted core prices increased a mere 0.2 percent at an annual rate between January and June 2006, with prices experiencing a small decline in June. The future conduct of monetary policy remains uncertain; given the Bank's previous aggressive behavior, there is some risk that tightening could occur too early. For example, the draining of excess bank reserves was quicker than initially expected.

Emerging Asia is highly geared to the global cycle, so a sharper-than-expected slowdown in U.S. growth is a key risk to the region. On the positive side, solid fundamentals leave Emerging Asia less vulnerable than most other emerging market (EM) countries to cycles in global risk appetite. Countries in the region could weather a renewed spell of global and EM volatility without significant financial duress, although Indonesia and the Philippines may be exceptions. For China, investment is unsustainably high as a share of GDP and is still rising. It remains uncertain how soon and how effectively official measures to reign in overheated investment will gain traction. As a result, China could cycle from boom to bust, with unwelcome spillover effects for the rest of Asia.

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A contentious political environment prevails in Mexico, with a September 6th deadline for the electoral court to rule on challenges to the election result. In Brazil, President Lula's polling lead in the October 2006 presidential race has begun to shrink, and, though he remains the clear frontrunner, a close election would increase doubts about the prospects for reforms in 2007 and beyond. In Argentina, inflation and the government's heterodox policy response remain central concerns.

*U.S. Trade Forecast.* The trade forecast assumes import volumes will grow somewhat slowly relative to domestic demand growth. If import demand reverts to its historical relationship to domestic demand and strengthens in 2006 and 2007, the drag from net exports on real GDP growth will be greater than currently anticipated. On the positive side, domestic demand may rise more rapidly than currently forecast in Europe, Canada, and Japan, giving a greater-than-expected boost to U.S. exports in the rest of 2006 and into 2007.

*Quantifying the Risks.* The inflation data over the inter-meeting period have been broadly consistent with our central scenario, while the real activity data have been roughly consistent with a soft landing contained within our central scenario. However, our confidence in this outcome has been reduced because of the NIPA revisions and acceleration of the decline in housing activity. Therefore, we have lowered the likelihood of the central scenario to 65% (it was 71% for the June FOMC). The decrease in the probability associated with the central scenario is the result of an increase in the weight placed on the over-tightening, overheating, and productivity slowdown scenarios. We assume that the most likely alternative scenario is over-tightening at 10% (5% in June), followed by the productivity slowdown at 9% (8% in June), overheating at 7% (5% in June), and lastly the productivity boom at 6% (8% in June). The remaining 3% (3% in June) is split evenly between upside and downside risks. The implied dynamic balance of risks is shown in Exhibit C-1.

The forecast distributions for core PCE inflation and GDP growth produced by the standard risk assessments are shown in Exhibits C-4 and C-5. The Bank forecast projects



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through the end of 2009 under the assumptions that output grows at the potential rate of 3.0% and core PCE inflation eventually converges back to the implicit inflation target of 1.5%. We discussed the assumption behind this extension in the special topic *Forecast Errors and Implications for Policy* in the June Blackbook.

The probability of core PCE inflation exceeding 2.5% during any quarter through the end of 2008 is now 75% (70% in June); this probability is produced by considering the share of inflation paths that have at least one four-quarter inflation rate exceeding 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 2008 is 83% (93% in June). This increase in downside risk is produced by the additional weight placed on the over-tightening scenario.

The FRBNY “confidence intervals” can be compared to those presented in the Greenbook. In general we have a similar level of confidence for 2006 as the Board but less confidence in 2007 on inflation. For example, the Greenbook has a 70% probability interval of width 1.5 for core PCE inflation in 2007, while our interval has width 1.8. The source of the wider interval is the weight we place on our alternative scenarios. These scenarios do not receive the same weight in the historical data since 1986, from which the Greenbook derives its forecast errors.

## 4. Policy Alternatives

Under our main forecast and risk assessment, the target FFR should remain at 5.25%, but the statement should give a clear signal of possible future increases if inflationary pressures do not diminish. Although we have lowered the path for real activity in our central forecast, we have not changed the expected path of the output gap; thus, the policy path underlying our central forecast remains the same as in June and maintains the FFR at 5.25% through the end of 2007Q3. We have slightly reduced our estimate of the neutral rate. Thus, the maintained policy path implies slightly tighter policy than in June.

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In June our central policy path was similar to that priced into markets. However, in the last six weeks, markets have begun placing greater weight on the possibility of cuts in the target rate in 2007. At the same time, for all the policy rules we examine, the risks around our central forecast imply a slightly firmer policy path than one maintaining the FFR at 5.25%. Using the probabilistic metrics of Exhibits D-5 and D-6, we find the differences between the path priced into markets and our assessment to be significant.

One explanation of this divergence related to the outlook is that market participants are placing more weight on the over-tightening scenario. Indeed, if we increase the weight on the over-tightening scenario, the differences between the paths become less significant. However, this explanation is problematic for two reasons. First, the Desk's survey of primary dealers, which should reflect (risk-neutral) view of the policy path similar to that of market participants, produces a path for the FFR more similar to our assessment than that priced into markets. Second, if greater weight is placed on the over-tightening scenario, it then would be expected that risk-averse investors would require compensation for the additional risk they were holding. This greater compensation would imply that the path priced into markets should be above that produced from the dealer survey (and our assessment) rather than below. Therefore, we are placing some weight on the market mispricing future FOMC actions relative to the policy rules we consider. Below we discuss another explanation based on the market perceiving a policy rule different from the ones we consider in this section.

Our confidence in the policy path underlying our central forecast has been reduced. In the special topic *The Case for Hiking 25bps*, we examine the case for an increase at the August meeting. The principal arguments in favor of pausing in August are the additional time gained to assess the effects of the 17 consecutive increases in the FFR and the absence of a substantive change in our central forecast.

To provide a quantitative analysis of the germane policy alternatives, we examine the prescriptions implied by three policy rules:

1. *Baseline Policy Rule (at near-term market expectations)*. Hold at 5.25% in August and send a mild positive signal regarding future actions. Closest to the path underlying our forecast.
2. *Opportunistic Disinflation Rule (at near-term market expectation)*. No clear prescription for August and clear signal of tighter policy until four-quarter core PCE inflation drops below 2%.
3. *Inflation Hawk Rule (above near-term market expectations)*. Increase by 25 basis points in August and strongly signal increase in the fall of 2006 unless core inflation readings are lower than they were in the spring.

The preamble to the Section D Exhibits has a description of how the various rules react to incoming data.

Both the *Inflation Hawk* and *Opportunistic Disinflation* rules are designed to provide information on the FFR path profile of policymakers who want to signal a more aggressive stance on core inflation. They differ in that the *Inflation Hawk* policymaker responds aggressively to monthly inflation above the target zone, whereas the *Opportunistic Disinflation* policymaker lowers the FFR more slowly than the *Baseline Rule* prescribes, which keeps the real rate higher for longer.

Exhibit D-1 contains the prescriptions implied by each of these three rules when averaging over the Bank's forecast distribution; the prescriptions thus reflect the range of our alternative scenarios, as well as to the probabilities we attach to those scenarios. The figure shows the implied (quarterly average path) of FFR through the end of 2009 for each rule and for the path currently priced into markets. The *Inflation Hawk* and *Opportunistic Disinflation* rules both produce a maximum nominal FF rate of 5.5% over the forecast horizon; the *Inflation Hawk* rule achieves this outcome in 2007 and lowers the rate fairly rapidly after that, while the *Opportunistic Disinflation* rule holds the nominal rate high through 2008 and only lowers it slightly in 2009. (If we consider two policymakers, both with the same preferences, but one exogenously assigned perfect credibility while the other has to "earn" it, then the policymaker with the luxury of not having to ensure against a loss of credibility would be more likely choose the

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*Opportunistic Disinflation* rule). The *Baseline* policy is less aggressive than the other two alternatives.

Exhibit D-2 and Exhibit D-3 show, respectively, the nominal and real FFR implied by our alternative scenarios under the *Baseline Rule*. The scenarios that imply significantly different paths from what is currently priced into markets are the over-tightening (below) and overheating/productivity slowdown (above) scenarios. This dichotomy between the paths implied by different scenarios is also present for the other two rules (not pictured), albeit with high levels of FFR under the overheating and productivity slowdown scenarios. The differences in inflation outcomes among these scenarios are clear, as shown in Exhibit C-2, and thus incoming inflation data will be particularly important in determining the likelihood of these alternative scenarios going forward.

Exhibit D-4 shows the result of running our *Baseline Rule* from 2004Q4 to the present—setting the initial FFR at its average value of 1.9% in 2004Q4—with a 1.5% inflation target and a 2.0% inflation target (see the preamble to Exhibit D for more information on the standard policy rules as well as this exercise). The path derived from the 1.5% target and 2.0% target both follow the actual FFR path closely until the middle of 2005. After this, the slope of actual policy has been considerably steeper than that implied by the *Baseline Rule* under either target. While the policy rule with the 1.5% inflation target is closer to the implied market path at the end of 2007 than is the rule with the 2.0% target, neither target implies policy as tight (or a terminal rate as high) as that which is currently priced into markets. In fact, at the end of 2006 and into 2007, the market path is around 50 basis points higher than either path. The exhibit also includes the implications of averaging our three policy rules, where the weights for average were chosen to match the market-implied expected path as closely as possible.

Exhibit D-5 contains a probabilistic metric for comparing the market-implied paths of the FFR with those of our policy rules at the end of 2007Q2. For the first time since introducing the metrics we find a significant difference between our views and those priced into the market. Besides the possibility that the market is mis-pricing future

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FOMC actions relative to the three policy rules we consider, an explanation for some of the difference is that official commentary since the June FOMC meeting has lowered the market's weight on the more aggressive rules and raised the market's weight on rules that imply policy sensitivity to weakness in real activity. This is consistent with the prediction from the June Blackbook that the market path would be very sensitive to any re-evaluation of the FOMC's aggressiveness towards inflation. Exhibit D-6 compares the implied distributions of FFR from the three rules and the average across rules with the distribution currently priced into markets. Again, our forecast distribution and policy rules imply a higher path for the FFR than the market in 2007.



# Special Topic

## The Case for Hiking 25 bps

August 4th, 2006  
Paolo Pesenti <sup>Redacted</sup>

This special topic discusses the reasons why some additional firming of the monetary stance may be appropriate in the current environment.

Inflation fundamentals have worsened recently, raising the upside risks. The June core PCE deflator roughly matched its largest year-on-year gain in eleven years (2.4 percent). The 12-month change in core CPI is also near its highest levels of the past decade. Part of the reason for the rise in core inflation is that owners' equivalent rent (OER) has risen rapidly. Because of its large weight in price indices and its persistence, the rise in OER probably signals the continuation of elevated inflation levels for some time into the future. Cost pressures also have risen. Probable revisions to labor compensation and unit labor costs will show acceleration, whereas the pre-revision data had shown some moderation. Energy prices remain subject to surges from geopolitical or weather events. Even though profit margins probably are sufficiently high for firms to absorb some cost pressures, downward revisions to profits increase uncertainty about the extent to which firms will be able to do so.

Measures of trend inflation arguably have risen above any meaningful comfort zone for the long-term inflation objective. For core inflation to reverse and move toward its implicit target in the absence of other shocks, the economy would have to grow below potential for some time. The resulting negative output gap then should ease cyclical pressures on prices.

Complicating matters is that the metrics of the output gap have changed recently because measures of potential growth have been revised downward along with actual GDP growth. Furthermore, recent NIPA revisions suggest that past inflation may have been higher, suggesting that the monetary stance in prior years may have been more accommodative than previously thought. While trend productivity growth remains above its level in 1973-95, it appears to be lower than we previously thought. Some of the forces that could have helped to subdue inflationary pressure thus may not be as strong going forward. Consequently, with a slower potential growth rate, demand growth must fall more than previously thought to reduce inflation pressures.

Although the monetary tightening to date apparently is beginning to reduce demand growth (as evidenced by the slowdown in the housing market), the issue is whether demand is cooling at a pace appropriate to begin to reduce core inflation toward the implicit target. In fact, the signs of weaknesses in real activity are tentative; even with housing slowing, manufacturing production indicators have remained strong. Therefore, far from pointing to a lasting slowdown, the overall evidence is mixed; the economy may turn out to be more resilient than commonly thought.

There are several possible sources for upside risks to real activity. For example, wage and salary growth has been robust compared to recent years, which could help support stronger-than-expected consumer spending. Unfilled orders for investment goods have been strong in the first half of the year, signaling a possible robust rebound in capital expenditures. The decline in federal government spending observed in 2006Q2 is unlikely to continue.

Finally, economic conditions in the world economy are strengthening, with welcome implications for the demand of U.S. exports and positive ramifications for capital goods production and investment.

If demand conditions remain relatively buoyant, price pressures will not be contained by cyclical forces. In this case, the implications for monetary policy are clear; further tightening, either now or in the future, will be required to achieve the desired macroeconomic outcomes for inflation and output. The international context reinforces the case for doing more now. Expectations of a narrowing of the differential between foreign and U.S. interest rates, with signals of continued tightening in the euro area and Japan among others, may reduce appetite for U.S. assets. This may ignite the smoldering embers of dollar depreciation against the combustible backdrop of persistent trade imbalances and saving gaps. If reliance on cyclical factors to reduce inflation pressures indeed turns out to be misplaced, the risk is that inflation will become so entrenched in market expectations that it will seriously threaten the credibility of the FOMC. Mitigating such a threat requires raising the policy rate earlier rather than later.

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## A. Forecast Details

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

This table summarizes the FRBNY forecast for the current FOMC cycle and the previous two cycles. It provides the forecasts of real GDP growth, the change in the GDP deflator, the 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 (Q4/Q4) over the forecast horizon.

*Source: MMS Function, FRBNY*

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

This table summarizes the baseline FRBNY and Board forecasts for the current FOMC cycle and the previous cycle. In addition to variables included in Exhibit A-1, there are forecasts for the growth contributions of some broad components of GDP, the growth of some measures of productivity and wages, labor force participation, payroll employment growth, and some financial market variables. Data frequencies are yearly (Q4/Q4 or Q4 level) over the forecast horizon.

*Source: MMS Function, FRBNY; and Federal Reserve Board staff*

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

This table gives history and current forecasts of the primary variables in the FRBNY forecast over the forecast horizon. This includes the detailed judgments—such as those for interest rates, profit growth, productivity, and real activity—that are behind the FRBNY forecasts for aggregates such as real GDP and inflation. Data frequencies are both quarterly and yearly (Q4/Q4 or Q4 level).

*Source: MMS Function, FRBNY*

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

This table provides history and current forecasts of the real GDP growth contributions for the broad components of expenditures. Growth contributions are in percentage points.

*Source: MMS Function, FRBNY*



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

This table compares the FRBNY forecast with real GDP growth and CPI inflation forecasts from other sources. In addition to the FRBNY forecast, the table includes the median forecasts from two surveys of forecasters (Blue Chip and Survey of Professional Forecasters [SPF]), the forecast from Macroeconomic Advisers, and the forecast from a small internal model (PSI model) that uses business activity and sentiment measures as the primary independent variables.

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

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

The three tables in this exhibit show the changes in the overall price indices and various components for the most recent month of released data, as measured by the PCE deflator, CPI, and PPI. Growth rates (at annual rate) are taken over 1, 3, 6, 12, and 24 months.

*Source: Bureau of Economic Analysis and Bureau of Labor Statistics*

**Exhibit A-7. Measures of Trend Inflation**

These charts display various measures of trend inflation. The alternative measures of CPI inflation are the core, the median, the trimmed mean (Cleveland Fed), a smoothed measure (from overall CPI inflation using a time series model estimated at FRBNY), and the Underlying Inflation Gauge (UIG) measure. (A non-technical description of the construction of this measure is in the Appendix to Exhibit A-7 and A-8 below.) The alternative measures of PCE inflation are the core, the trimmed mean (Dallas Fed), and a smoothed measure (calculated in a manner similar to the smoothed CPI measure). Also included are charts showing the annualized change in the core CPI and PCE over the 24-, 12-, 6-, and 3-month horizons. The horizontal lines show the implied target range used by Macroeconomic Advisers.

*Source: FRB Cleveland; FRB Dallas; MMS Function, FRBNY; and Swiss National Bank*

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**Exhibit A-8. Expected Inflation: Underlying Inflation Gauge (UIG) and TIPS Implied Inflation**

The chart displays compares inflation expectations over various horizons as measured by the UIG and TIPS (A non-technical description of the construction of the UIG is in the Appendix to Exhibit A-7 and A-8 below. A non-technical description of the construction of inflation expectations from TIPS is in the Appendix to Exhibit B-2).

*Source: MMS Function, FRBNY; and Swiss National Bank*

**Appendix to Exhibit A-7 and A-8. Construction of UIG (Underlying Inflation Gauge)**

The Underlying Inflation Gauge is a measure of underlying inflation that incorporates information from a broad set of nominal and real variables. It uses a dynamic factor model to extract a common component from the set of variables and then removes the high frequency movements (fluctuations with a frequency of up to one year) from this common component. This filtering reflects our view that monetary policy is primarily concerned with shocks that impact inflation in the medium-term. The level of the UIG is designed to map into the level of the CPI.

## 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 |       |       |       |      |      |      |
|                       | May06      | Jun06 | Aug06           | May06 | Jun06        | Aug06 | May06    | Jun06 | Aug06             | May06 | Jun06 | Aug06 |      |      |      |
| 2006 Q1               | 4.8        | 5.3   | 5.6             | 3.3   | 3.3          | 3.2   | 2.0      | 2.0   | 2.1               | 2.0   | 2.0   | 2.1   | 4.8  | 4.7  | 4.7  |
| 2006 Q2               | 3.1        | 2.8   | 2.5             | 1.9   | 3.6          | 3.3   | 3.8      | 4.3   | 4.1               | 2.4   | 3.1   | 2.9   | 4.7  | 4.7  | 4.6  |
| 2006 Q3               | 3.5        | 3.2   | 3.4             | 1.9   | 1.5          | 3.4   | 2.2      | 2.3   | 2.9               | 2.2   | 2.3   | 2.5   | 4.7  | 4.7  | 4.7  |
| 2006 Q4               | 3.0        | 2.8   | 2.2             | 2.1   | 1.8          | 1.7   | 2.2      | 2.3   | 2.3               | 2.1   | 2.2   | 2.2   | 4.7  | 4.7  | 4.7  |
| 2007 Q1               | 3.2        | 3.1   | 3.1             | 2.4   | 2.3          | 2.3   | 2.1      | 2.3   | 2.3               | 2.0   | 2.0   | 2.1   | 4.7  | 4.7  | 4.7  |
| 2007 Q2               | 3.2        | 3.5   | 2.9             | 2.1   | 2.5          | 2.4   | 1.9      | 2.2   | 2.2               | 2.0   | 2.0   | 2.0   | 4.7  | 4.7  | 4.7  |
| 2007 Q3               | 3.4        | 3.5   | 3.5             | 2.1   | 2.1          | 2.4   | 2.0      | 2.2   | 2.2               | 1.9   | 1.9   | 1.9   | 4.7  | 4.7  | 4.7  |
| 2007 Q4               | 3.4        | 3.2   | 2.4             | 2.1   | 2.1          | 2.0   | 1.9      | 2.2   | 2.2               | 1.8   | 1.9   | 1.9   | 4.7  | 4.7  | 4.7  |
| 2008 Q1               | NA         | NA    | 3.5             | NA    | NA           | 2.2   | NA       | NA    | 2.2               | NA    | NA    | 1.8   | NA   | NA   | 4.7  |
| 2008 Q2               | NA         | NA    | 3.2             | NA    | NA           | 2.5   | NA       | NA    | 2.2               | NA    | NA    | 1.8   | NA   | NA   | 4.7  |
| 2008 Q3               | NA         | NA    | 2.9             | NA    | NA           | 2.3   | NA       | NA    | 2.2               | NA    | NA    | 1.8   | NA   | NA   | 4.7  |
| 2008 Q4               | NA         | NA    | 2.6             | NA    | NA           | 1.9   | NA       | NA    | 2.2               | NA    | NA    | 1.8   | NA   | NA   | 4.7  |
| 2004 Q4 to<br>2005 Q4 | 3.2        | 3.2   | 3.1             | 3.1   | 3.1          | 3.1   | 3.0      | 3.0   | 3.1               | 2.0   | 2.0   | 2.1   | -0.5 | -0.4 | -0.5 |
| 2005 Q4 to<br>2006 Q4 | 3.6        | 3.5   | 3.4             | 2.3   | 2.5          | 2.9   | 2.5      | 2.7   | 2.8               | 2.2   | 2.4   | 2.4   | -0.2 | -0.3 | -0.3 |
| 2006 Q4 to<br>2007 Q4 | 3.3        | 3.3   | 3.0             | 2.2   | 2.3          | 2.3   | 2.0      | 2.2   | 2.2               | 1.9   | 2.0   | 2.0   | 0.0  | 0.0  | 0.0  |
| 2007 Q4 to<br>2008 Q4 | NA         | NA    | 3.0             | NA    | NA           | 2.2   | NA       | NA    | 2.2               | NA    | NA    | 1.8   | NA   | NA   | 0.0  |

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 |      |      |      |      |     |
|---|-------|------|------|------|------|------|-------|------|------|------|------|-----|
|   | 2006  |      | 2007 |      | 2008 |      | 2006  |      | 2007 |      | 2008 |     |
|   | JUN   | AUG  | JUN  | AUG  | JUN  | AUG  | JUN   | AUG  | JUN  | AUG  | JUN  | AUG |
| REAL GDP (Q4/Q4)                          | 3.5   | 3.4  | 3.3  | 3.0  | NA   | 3.0  | 3.3   | 3.2  | 2.7  | 2.3  | NA   | NA  |
| GROWTH CONTRIBUTIONS(Q4/Q4)               |       |      |      |      |      |      |       |      |      |      |      |     |
| FINAL SALES TO DOMESTIC PURCHASERS        | 3.8   | 3.4  | 3.8  | 3.2  | NA   | 3.0  | 3.2   | 3.1  | 2.8  | 2.5  | NA   | NA  |
| CONSUMPTION                               | 2.4   | 2.4  | 2.2  | 2.1  | NA   | 1.9  | 2.3   | 2.3  | 2.0  | 1.7  | NA   | NA  |
| BFI                                       | 1.1   | 0.8  | 1.1  | 0.7  | NA   | 0.6  | 0.8   | 0.9  | 0.6  | 0.6  | NA   | NA  |
| STRUCTURES                                | 0.2   | 0.2  | 0.2  | 0.2  | NA   | 0.1  | 0.3   | 0.4  | 0.2  | 0.2  | NA   | NA  |
| EQUIPMENT & SOFTWARE                      | 0.9   | 0.5  | 0.9  | 0.5  | NA   | 0.4  | 0.5   | 0.6  | 0.4  | 0.4  | NA   | NA  |
| RESIDENTIAL INVESTMENT                    | -0.3  | -0.4 | -0.1 | -0.2 | NA   | 0.0  | -0.3  | -0.6 | -0.1 | -0.2 | NA   | NA  |
| GOVERNMENT                                | 0.5   | 0.7  | 0.6  | 0.6  | NA   | 0.5  | 0.4   | 0.5  | 0.3  | 0.4  | NA   | NA  |
| FEDERAL                                   | 0.3   | 0.3  | 0.2  | 0.2  | NA   | 0.2  | 0.2   | 0.2  | 0.0  | 0.1  | NA   | NA  |
| STATE & LOCAL                             | 0.3   | 0.4  | 0.4  | 0.4  | NA   | 0.4  | 0.2   | 0.3  | 0.3  | 0.3  | NA   | NA  |
| INVENTORY INVESTMENT                      | 0.1   | 0.0  | 0.0  | 0.1  | NA   | 0.0  | 0.0   | 0.0  | 0.0  | -0.1 | NA   | NA  |
| NET EXPORTS                               | -0.4  | 0.0  | -0.4 | -0.3 | NA   | 0.0  | 0.0   | 0.1  | -0.2 | -0.1 | NA   | NA  |
| INFLATION/PRODUCTIVITY/WAGES (Q4/Q4)      |       |      |      |      |      |      |       |      |      |      |      |     |
| GDP DEFLATOR                              | 2.5   | 2.9  | 2.3  | 2.3  | NA   | 2.2  | 2.7   | 2.8  | 2.3  | 2.3  | NA   | NA  |
| PCE                                       | 2.7   | 2.8  | 2.2  | 2.2  | NA   | 2.2  | 2.5   | 2.9  | 2.2  | 2.1  | NA   | NA  |
| CORE PCE                                  | 2.4   | 2.4  | 2.0  | 2.0  | NA   | 1.8  | 2.4   | 2.5  | 2.2  | 2.3  | NA   | NA  |
| COMPENSATION PER HOUR                     | 4.4   | 5.4  | 4.3  | 5.2  | NA   | 5.0  | 5.1   | 5.5  | 5.2  | 5.3  | NA   | NA  |
| OUTPUT PER HOUR                           | 2.8   | 2.4  | 2.7  | 2.5  | NA   | 2.5  | 2.6   | 2.4  | 2.9  | 2.5  | NA   | NA  |
| UNIT LABOR COSTS                          | 1.6   | 3.0  | 1.6  | 2.7  | NA   | 2.5  | 2.4   | 3.0  | 2.3  | 2.8  | NA   | NA  |
| EMPLOYMENT VARIABLES                      |       |      |      |      |      |      |       |      |      |      |      |     |
| UNEMPLOYMENT RATE (Q4 LEVEL)              | 4.7   | 4.7  | 4.7  | 4.7  | NA   | 4.7  | 4.9   | 4.8  | 5.2  | 5.2  | NA   | NA  |
| PARTICIPATION RATE (Q4 LEVEL)             | 66.1  | 66.2 | 66.1 | 66.2 | NA   | 66.2 | 66.0  | 66.0 | 65.7 | 65.7 | NA   | NA  |
| NONFARM PAYROLL EMPLOYMENT (Q4/Q4 CHANGE) |       |      |      |      |      |      |       |      |      |      |      |     |
| TOTAL, IN THOUSANDS                       | 1910  | 1801 | 1615 | 1572 | NA   | 1675 | 1700  | 1500 | 700  | 700  | NA   | NA  |
| AVERAGE PER MONTH, IN THOUSANDS           | 159   | 150  | 135  | 131  | NA   | 140  | 142   | 125  | 58   | 58   | NA   | NA  |
| FINANCIAL MARKET VARIABLES                |       |      |      |      |      |      |       |      |      |      |      |     |
| FED FUNDS RATE (PERCENT)                  | 5.25  | 5.25 | 5.00 | 5.00 | NA   | NA   | 5.25  | 5.25 | 5.25 | 5.25 | NA   | NA  |
| BAA BOND YIELD (PERCENT)                  | 6.9   | 6.8  | 6.9  | 6.8  | NA   | NA   | 6.7   | 6.6  | 6.7  | 6.6  | NA   | NA  |
| EFFECTIVE EXCHANGE RATE (Q4/Q4 % CHANGE)  | -5.5  | -4.6 | -1.4 | -1.5 | NA   | NA   | -3.6  | -3.4 | -1.7 | -1.8 | NA   | NA  |

## A. Forecast Details

## Exhibit A-3: Judgment Table

|  | 2006:01 | 2006:02 | 2006:03 | 2006:04 | 2007:01 | 2007:02 | 2007:03 | 2007:04 | 2008:01 | 2008:02 | 2008:03 | 2008:04 | 2005   | 2006   | 2007   | 2008   |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|--------|--------|--------|
| <b>REAL GDP AND COMPONENTS (% Change, AR)</b>              |         |         |         |         |         |         |         |         |         |         |         |         |        |        |        |        |
| GDP.....   | 5.6     | 2.5     | 3.4     | 2.2     | 3.1     | 2.9     | 3.5     | 2.4     | 3.5     | 3.2     | 2.9     | 2.6     | 3.1    | 3.4    | 3.0    | 3.0    |
| CHANGE IN INVENTORIES (GROWTH CONTRIBUTION) 1).....        | 0.0     | 0.4     | -0.1    | -0.4    | 0.4     | -0.1    | 0.3     | -0.2    | 0.2     | -0.1    | 0.0     | 0.0     | -0.1   | 0.0    | 0.1    | 0.0    |
| DOMESTIC PRIVATE PURCHASES.....                            | 5.3     | 2.0     | 3.1     | 2.3     | 3.2     | 2.7     | 3.4     | 2.9     | 3.2     | 2.7     | 2.8     | 2.8     | 3.1    | 3.2    | 3.1    | 2.9    |
| CONSUMPTION EXPENDITURES.....                              | 4.8     | 2.5     | 3.3     | 3.1     | 3.0     | 3.0     | 3.0     | 3.0     | 2.8     | 2.8     | 2.8     | 2.8     | 2.9    | 3.4    | 3.0    | 2.8    |
| BUSINESS FIXED INVESTMENT.....                             | 13.7    | 2.7     | 6.8     | 7.1     | 6.4     | 6.4     | 6.7     | 6.7     | 5.7     | 5.7     | 5.4     | 5.4     | 5.6    | 7.5    | 6.6    | 5.6    |
| RESIDENTIAL INVESTMENT.....                                | -0.3    | -6.3    | -7.0    | -12.0   | -9.0    | -5.0    | 0.3     | -0.8    | -0.8    | -0.8    | -0.8    | -0.8    | 9.0    | -6.5   | -3.7   | -0.8   |
| NET EXPORTS (GROWTH CONTRIBUTION) 1).....                  | 0.0     | 0.3     | 0.1     | -0.3    | -0.3    | 0.0     | -0.1    | -0.7    | 0.0     | 0.3     | 0.0     | -0.4    | -0.1   | 0.0    | -0.3   | 0.0    |
| EXPORTS.....   | 14.0    | 3.3     | 6.4     | 7.3     | 6.2     | 5.9     | 6.1     | 5.8     | 7.6     | 7.6     | 6.9     | 7.4     | 6.7    | 7.7    | 6.0    | 7.4    |
| IMPORTS.....   | 9.1     | 0.2     | 3.8     | 6.6     | 5.7     | 4.0     | 4.8     | 7.9     | 4.8     | 3.2     | 4.8     | 7.3     | 5.2    | 4.8    | 5.6    | 5.0    |
| FEDERAL GOVERNMENT.....                                    | 8.8     | -3.4    | 6.0     | 4.0     | 6.0     | 1.5     | 2.0     | 2.0     | 5.5     | 1.5     | 1.5     | 1.5     | 2.1    | 3.7    | 2.9    | 2.5    |
| STATE & LOCAL GOVERNMENTS.....                             | 2.7     | 3.0     | 3.3     | 4.0     | 3.5     | 3.5     | 3.5     | 3.5     | 3.0     | 3.0     | 3.0     | 3.0     | 0.8    | 3.2    | 3.5    | 3.0    |
| <b>INTEREST RATE ASSUMPTIONS (%)</b>                       |         |         |         |         |         |         |         |         |         |         |         |         |        |        |        |        |
| FEDERAL FUNDS RATE (TARGET).....                           | 4.43    | 4.90    | 5.25    | 5.25    | 5.25    | 5.00    | 5.00    | 5.00    | NA      | NA      | NA      | NA      | 3.97   | 5.25   | 5.00   | NA     |
| YIELD ON 10-YR GOVERNMENT.....                             | 4.6     | 5.1     | 5.0     | 5.0     | 5.0     | 5.0     | 5.0     | 5.0     | NA      | NA      | NA      | NA      | 4.5    | 5.0    | 5.0    | NA     |
| BAA BOND YIELD.....  | 6.3     | 6.7     | 6.8     | 6.8     | 6.8     | 6.8     | 6.8     | 6.8     | NA      | NA      | NA      | NA      | 6.3    | 6.8    | 6.8    | NA     |
| <b>INCOME (% Change, AR)</b>                               |         |         |         |         |         |         |         |         |         |         |         |         |        |        |        |        |
| PERSONAL INCOME.....                                       | 6.4     | 6.4     | 9.1     | 2.4     | 6.2     | 6.0     | 8.6     | 3.0     | 7.4     | 6.4     | 8.2     | 3.2     | 4.6    | 6.0    | 5.9    | 6.3    |
| REAL PERSONAL DISPOSABLE INCOME.....                       | 1.7     | 1.0     | 6.4     | 0.0     | 4.0     | 3.8     | 6.7     | 0.6     | 5.3     | 4.2     | 6.3     | 0.8     | 0.3    | 2.2    | 3.7    | 4.1    |
| PERSONAL SAVING RATE (% OF DPI).....                       | -1.0    | -1.5    | -0.7    | -1.5    | -1.3    | -1.2    | -0.3    | -0.9    | -0.3    | -0.1    | 0.7     | 0.1     | -0.4   | -1.2   | -0.9   | -0.7   |
| CORPORATE PROFITS BEFORE TAXES.....                        | 60.8    | -1.6    | 4.8     | -1.0    | 1.2     | 0.8     | 1.3     | -1.3    | -1.7    | -0.6    | -0.9    | -2.0    | 12.8   | 13.2   | 0.5    | -1.3   |
| <b>PRICES &amp; PRODUCTIVITY (% Change, AR)</b>            |         |         |         |         |         |         |         |         |         |         |         |         |        |        |        |        |
| GDP IMPLICIT DEFLATOR.....                                 | 3.2     | 3.3     | 3.4     | 1.7     | 2.3     | 2.4     | 2.4     | 2.0     | 2.2     | 2.5     | 2.3     | 1.9     | 3.1    | 2.9    | 2.3    | 2.2    |
| PERSONAL CONSUMPTION EXPENDITURES.....                     | 2.0     | 4.1     | 2.9     | 2.3     | 2.3     | 2.2     | 2.2     | 2.2     | 2.2     | 2.2     | 2.2     | 2.2     | 3.1    | 2.8    | 2.2    | 2.2    |
| CORE PERSONAL CONSUMPTION EXPENDITURES.....                | 2.1     | 2.9     | 2.5     | 2.2     | 2.1     | 2.0     | 1.9     | 1.9     | 1.8     | 1.8     | 1.8     | 1.8     | 2.1    | 2.4    | 2.0    | 1.8    |
| CONSUMER PRICE INDEX.....                                  | 2.2     | 5.0     | 2.7     | 2.8     | 2.7     | 2.6     | 2.5     | 2.5     | 2.4     | 2.4     | 2.4     | 2.4     | 3.7    | 3.2    | 2.6    | 2.4    |
| CORE CONSUMER PRICE INDEX.....                             | 2.4     | 3.5     | 2.9     | 2.8     | 2.7     | 2.6     | 2.5     | 2.4     | 2.3     | 2.3     | 2.3     | 2.3     | 2.1    | 2.9    | 2.5    | 2.3    |
| COMPENSATION PER HOUR (NONFARM BUSINESS).....              | 6.3     | 4.4     | 5.1     | 6.6     | 4.9     | 5.0     | 4.7     | 6.4     | 4.6     | 4.9     | 4.4     | 5.9     | 2.8    | 5.4    | 5.2    | 5.0    |
| OUTPUT PER HOUR (NONFARM BUSINESS).....                    | 4.0     | 0.7     | 2.5     | 2.5     | 2.5     | 2.5     | 2.5     | 2.5     | 2.5     | 2.5     | 2.5     | 2.5     | 2.5    | 2.4    | 2.5    | 2.5    |
| UNIT LABOR COST (NONFARM BUSINESS).....                    | 2.3     | 3.7     | 2.6     | 4.1     | 2.4     | 2.5     | 2.2     | 3.9     | 2.1     | 2.4     | 1.9     | 3.4     | 0.3    | 2.9    | 2.7    | 2.5    |
| <b>REAL ACTIVITY</b>                                       |         |         |         |         |         |         |         |         |         |         |         |         |        |        |        |        |
| CAPACITY UTILIZATION (MANUFACTURING, %).....               | 80.3    | 80.9    | 81.1    | 81.3    | 81.6    | 81.9    | 82.1    | 82.3    | NA      | NA      | NA      | NA      | 77.1   | 80.9   | 82.0   | NA     |
| CIVILIAN UNEMP RATE (%) 2).....                            | 4.7     | 4.6     | 4.7     | 4.7     | 4.7     | 4.7     | 4.7     | 4.7     | 4.7     | 4.7     | 4.7     | 4.7     | 5.0    | 4.7    | 4.7    | 4.7    |
| PRIVATE HOUSING STARTS (THOUS. AR).....                    | 2123    | 1878    | 1840    | 1800    | 1775    | 1775    | 1775    | 1775    | NA      | NA      | NA      | NA      | 2073   | 1910   | 1775   | NA     |
| LIGHT VEHICLE SALES (MIL UNITS, AR) 3).....                | 16.9    | 16.3    | 16.9    | 16.7    | 16.9    | 16.9    | 16.9    | 17.0    | NA      | NA      | NA      | NA      | 16.9   | 16.7   | 16.9   | NA     |
| FEDERAL SURPLUS/DEFICIT (Unified Basis, Bils, NSA) 4)..... | #/NA    | #/NA    | #/NA    | #/NA    | #/NA    | #/NA    | #/NA    | #/NA    | #/NA    | #/NA    | #/NA    | #/NA    | -317.7 | -357.2 | -298.6 | -297.6 |

NOTE: All series other than interest rates and the federal deficit are seasonally adjusted. Italics indicate a reported value. 1) Growth contribution to real GDP. 2) Annual values are end of Q4 levels. 3) Includes domestic and imported 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)

|   | 2006  |      |      |      | 2007 |      |      |      | 2008 |      |      |      | Q4/Q4 % CHANGE/Q4 LEVEL |      |      |      |
|---|---|------|------|------|------|------|------|------|------|------|------|------|-------------------------|------|------|------|
|   | Q1  | Q2   | Q3   | Q4   | Q1   | Q2   | Q3   | Q4   | Q1   | Q2   | Q3   | Q4   | 2005                    | 2006 | 2007 | 2008 |
|   | <b>REAL GDP (Growth, Annual Rate)</b> ..... | 5.6  | 2.5  | 3.4  | 2.2  | 3.1  | 2.9  | 3.5  | 2.4  | 3.5  | 3.2  | 2.9  | 2.6                     | 3.1  | 3.4  | 3.0  |
| <i>Contributions to GDP growth:</i>             |   |      |      |      |      |      |      |      |      |      |      |      |                         |      |      |      |
| <b>FINAL SALES TO DOMESTIC PURCHASERS</b> ..... | 5.7   | 1.7  | 3.3  | 2.9  | 3.0  | 3.0  | 3.3  | 3.3  | 3.2  | 2.9  | 2.9  | 2.9  | 3.4                     | 3.4  | 3.2  | 3.0  |
| CONSUMPTION EXPENDITURES.....                   | 3.4   | 1.7  | 2.3  | 2.2  | 2.1  | 2.1  | 2.1  | 2.1  | 1.9  | 1.9  | 1.9  | 1.9  | 2.0                     | 2.4  | 2.1  | 1.9  |
| BUSINESS FIXED INVESTMENT.....                  | 1.4   | 0.3  | 0.7  | 0.7  | 0.7  | 0.7  | 0.7  | 0.7  | 0.6  | 0.6  | 0.6  | 0.6  | 0.6                     | 0.8  | 0.7  | 0.6  |
| RESIDENTIAL INVESTMENT.....                     | 0.0   | -0.4 | -0.4 | -0.7 | -0.5 | -0.3 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.5                     | -0.4 | -0.2 | 0.0  |
| FEDERAL GOVERNMENT.....                         | 0.6   | -0.2 | 0.4  | 0.3  | 0.4  | 0.1  | 0.1  | 0.1  | 0.4  | 0.1  | 0.1  | 0.1  | 0.1                     | 0.3  | 0.2  | 0.2  |
| STATE & LOCAL GOVERNMENTS.....                  | 0.3   | 0.4  | 0.4  | 0.5  | 0.4  | 0.4  | 0.4  | 0.4  | 0.4  | 0.4  | 0.4  | 0.4  | 0.1                     | 0.4  | 0.4  | 0.4  |
| <b>NET EXPORTS</b> .....                        | 0.0   | 0.3  | 0.1  | -0.3 | -0.3 | 0.0  | -0.1 | -0.7 | 0.0  | 0.3  | 0.0  | -0.4 | -0.1                    | 0.0  | -0.3 | 0.0  |
| EXPORTS.....                                    | 1.4   | 0.4  | 0.7  | 0.8  | 0.7  | 0.7  | 0.7  | 0.6  | 0.8  | 0.9  | 0.8  | 0.8  | 0.7                     | 0.8  | 0.7  | 0.8  |
| IMPORTS.....                                    | -1.5  | 0.0  | -0.6 | -1.1 | -1.0 | -0.7 | -0.8 | -1.3 | -0.8 | -0.5 | -0.8 | -1.2 | -0.8                    | -0.8 | -0.9 | -0.9 |
| <b>CHANGE IN INVENTORIES</b> .....              | 0.0   | 0.4  | -0.1 | -0.4 | 0.4  | -0.1 | 0.3  | -0.2 | 0.2  | -0.1 | 0.0  | 0.0  | -0.1                    | 0.0  | 0.1  | 0.0  |

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

## A. Forecast Details

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

|                       | Release Date | GDP      |     |         |     |         |     |         |     |
|-----------------------|--------------|----------|-----|---------|-----|---------|-----|---------|-----|
|                       |              | 2006-Q2  |     | 2006-Q3 |     | 2006-Q4 |     | 2006-Q4 |     |
|                       |              | Prev*    | Aug | Prev*   | Aug | Prev*   | Aug | Prev*   | Aug |
| <b>FRBNY</b>          | 8/3/2006     | 2.8      | --  | 3.2     | 3.4 | 2.8     | 2.2 | 2.8     | 2.2 |
| <b>PSI Model</b>      | 8/3/2006     | 2.4      | --  | 2.1     | 2.1 | --      | 1.6 | --      | 1.6 |
| <b>Blue Chip</b>      | 7/10/2006    | 2.9      | 2.8 | 2.9     | 2.9 | 2.8     | 2.8 | 2.8     | 2.8 |
| <b>Median SPF</b>     | 5/15/2006    | 3.4      | 3.4 | 3.0     | 3.1 | 3.2     | 3.0 | 3.2     | 3.0 |
| <b>Macro Advisers</b> | 7/14/2006    | 2.4      | 2.7 | 3.3     | 3.0 | 3.0     | 3.1 | 3.0     | 3.1 |
|                       |              | CPI      |     |         |     |         |     |         |     |
|                       |              | 2006-Q2  |     | 2006-Q3 |     | 2006-Q4 |     | 2006-Q4 |     |
|                       |              | Prev*    | Aug | Prev*   | Aug | Prev*   | Aug | Prev*   | Aug |
| <b>FRBNY</b>          | 8/3/2006     | 5.2      | --  | 2.6     | 2.7 | 2.5     | 2.8 | 2.5     | 2.8 |
| <b>Blue Chip</b>      | 7/10/2006    | 4.2      | 4.5 | 2.6     | 2.8 | 2.3     | 2.4 | 2.3     | 2.4 |
| <b>Median SPF</b>     | 5/15/2006    | 2.5      | 3.4 | 2.5     | 2.6 | 2.4     | 2.4 | 2.4     | 2.4 |
| <b>Macro Advisers</b> | 7/14/2006    | 5.0      | 4.9 | 3.3     | 2.8 | 2.4     | 2.8 | 2.4     | 2.8 |
|                       |              | CORE CPI |     |         |     |         |     |         |     |
|                       |              | 2006-Q2  |     | 2006-Q3 |     | 2006-Q4 |     | 2006-Q4 |     |
|                       |              | Prev*    | Aug | Prev*   | Aug | Prev*   | Aug | Prev*   | Aug |
| <b>FRBNY</b>          | 8/3/2006     | 3.4      | --  | 2.5     | 2.9 | 2.4     | 2.8 | 2.4     | 2.8 |
| <b>Macro Advisers</b> | 7/14/2006    | 3.1      | 3.4 | 2.5     | 2.6 | 2.3     | 2.6 | 2.3     | 2.6 |

Notes: Previous release of SPF is February and all others is June.



## A. Forecast Details

Exhibit A-6: Reference Table 1 - CONSUMER PRICE INDEX DATA AS OF JUNE 2006

|                                     | Annualized Percent Change Over Indicated Interval |          |         |         |         | Weights<br>(December 2005) |
|-------------------------------------|---|----------|---------|---------|---------|----------------------------|
|                                     | 24 Month  | 12 Month | 6 Month | 3 Month | 1 Month |                            |
| <b>Consumer Price Index</b>         |   |          |         |         |         | <b>Total</b>               |
| Energy                              | 3.4   | 4.3      | 4.7     | 5.1     | 2.4     | 100.00                     |
|                                     | 14.9  | 23.2     | 22.8    | 23.8    | -10.5   | 8.69                       |
| <b>All Items Ex Energy</b>          |   |          |         |         |         |                            |
| Food                                | 2.4   | 2.6      | 3.0     | 3.4     | 3.6     | 13.94                      |
| Food Away From Home                 | 2.2   | 2.2      | 2.1     | 1.7     | 3.8     | 5.95                       |
|                                     | 3.2   | 3.1      | 3.3     | 3.3     | 3.1     |                            |
| <b>All Items Ex Food and Energy</b> | 2.4   | 2.7      | 3.2     | 3.6     | 3.6     | 77.37                      |
| Core Chain-Weight CPI (NSA)         | 2.2   | 2.4      | 3.6     | 1.8     | 1.1     | 100.00                     |
| <b>Core Goods</b>                   |   |          |         |         |         |                            |
| Apparel                             | 0.5   | 0.5      | 1.1     | 0.9     | 0.9     | 22.32                      |
| Medical Care Commodities            | -0.5  | 0.6      | 2.2     | 3.1     | 0.0     | 3.79                       |
| Durable Goods                       | 4.1   | 4.2      | 4.0     | 3.9     | 3.3     | 1.46                       |
| New Vehicles                        | 0.0   | -0.7     | -0.3    | -0.7    | -1.0    | 11.58                      |
| Used Vehicles                       | 0.0   | -0.6     | 0.3     | -1.7    | -0.9    | 5.16                       |
|                                     | 4.1   | 1.1      | 3.3     | 4.4     | 5.2     | 1.80                       |
| <b>Core Services</b>                |   |          |         |         |         |                            |
| Rent of Primary Residence           | 3.1   | 3.5      | 4.0     | 4.5     | 4.5     | 55.06                      |
| Owners' Equivalent Rent             | 3.2   | 3.5      | 3.8     | 4.2     | 5.5     | 5.83                       |
| Lodging Away from Home              | 2.9   | 3.6      | 4.7     | 5.6     | 5.2     | 23.44                      |
| Medical Care Services               | 3.9   | 4.7      | 4.6     | 1.5     | 3.6     | 2.61                       |
| Transportation Services             | 4.5   | 4.2      | 4.2     | 4.3     | 4.6     | 4.76                       |
|                                     | 2.5   | 2.5      | 2.4     | 3.9     | 4.3     | 5.71                       |

## A. Forecast Details

Exhibit A-6: Reference Table 2 - PCE DEFLATOR DATA AS OF JUNE 2006

| PCE Deflator                                | Annualized Percent Change Over Indicated Interval |          |         |         |         |
|---|---|----------|---------|---------|---------|
|   | 24 Month  | 12 Month | 6 Month | 3 Month | 1 Month |
| <b>Market Based PCE Deflator</b>            | 2.9   | 3.5      | 3.9     | 4.1     | 2.1     |
|   | 2.7   | 3.4      | 3.8     | 4.1     | 1.5     |
| <b>Durable Goods</b>                        | -1.1  | -1.5     | -0.8    | -0.9    | -3.0    |
| Motor Vehicles and Parts                    | 1.1   | 0.1      | 1.2     | -0.3    | -0.3    |
| <b>Nondurable Goods</b>                     | 3.6   | 5.3      | 6.9     | 7.7     | 0.7     |
| Clothing and Shoes                          | -0.8  | -0.1     | 1.4     | 1.2     | -0.6    |
| <b>Services</b>                             | 3.4   | 3.7      | 3.4     | 3.3     | 3.9     |
| Housing                                     | 3.1   | 3.6      | 4.5     | 5.1     | 4.9     |
| Transportation                              | 4.2   | 4.3      | 3.6     | 6.0     | 7.5     |
| Medical Care                                | 3.0   | 2.9      | 2.4     | 2.7     | 3.3     |
| <b>PCE Deflator Ex Food and Energy</b>      | 2.2   | 2.4      | 2.7     | 2.8     | 2.9     |
| <b>Market Based Core PCE Deflator</b>       | 1.8   | 2.0      | 2.3     | 2.6     | 2.3     |
| Personal Business Services-Market Based     | 2.8   | 2.5      | 2.7     | 3.5     | 1.2     |
| Personal Business Services-Not Market Based | 2.7   | 3.5      | 3.4     | 3.9     | 3.9     |

## A. Forecast Details

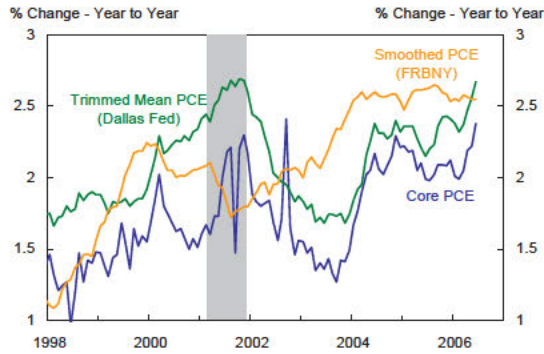
Exhibit A-6: Reference Table 3 - PRODUCER PRICE DATA AS OF JUNE 2006

|   | Annualized Percent Change Over Indicated Interval |          |         |         |         |
|---|---|----------|---------|---------|---------|
|   | 24 Month  | 12 Month | 6 Month | 3 Month | 1 Month |
| <b>Finished Goods</b>                             |   |          |         |         |         |
| <b>Finished Consumer Goods</b>                    |   |          |         |         |         |
| Finished Consumer Goods Ex Food                   | 4.3   | 4.8      | 2.1     | 6.7     | 6.1     |
| Nondurables Ex Food                               | 5.1   | 5.8      | 1.9     | 8.0     | 7.4     |
| Durables  | 6.9   | 7.8      | 3.5     | 9.4     | 4.3     |
| Capital Equipment                                 | 9.4   | 10.5     | 3.6     | 12.0    | 4.6     |
| Electronic Computers (NSA)                        | 0.8   | 1.0      | 2.8     | 1.5     | 2.6     |
| Communication and Related Equipment (NSA)         | 2.0   | 1.8      | 3.1     | 3.0     | 3.3     |
| <b>Finished Goods Ex Food and Energy</b>          | -21.9   | -22.7    | -26.1   | -26.2   | -32.5   |
| <b>Finished Consumer Goods Ex Food and Energy</b> | -0.2  | 0.1      | 0.8     | 2.0     | -1.2    |
| <b>Intermediate Materials</b>                     |   |          |         |         |         |
| Intermediate Materials Ex Food and Energy         | 2.1   | 1.9      | 3.1     | 2.3     | 2.3     |
| <b>Crude Materials</b>                            |   |          |         |         |         |
| Crude Materials Ex Food and Energy                | 2.2   | 1.9      | 3.2     | 1.9     | 2.2     |
| <b>Intermediate Materials</b>                     |   |          |         |         |         |
| Intermediate Materials Ex Food and Energy         | 7.8   | 9.3      | 6.6     | 11.1    | 8.3     |
| <b>Crude Materials</b>                            |   |          |         |         |         |
| Crude Materials Ex Food and Energy                | 6.1   | 7.2      | 7.7     | 9.8     | 10.0    |
| <b>Crude Materials</b>                            |   |          |         |         |         |
| Crude Materials Ex Food and Energy                | 5.5   | 8.7      | -19.1   | 5.7     | -19.0   |
| <b>Crude Materials</b>                            |   |          |         |         |         |
| Crude Materials Ex Food and Energy                | 19.6  | 33.7     | 37.1    | 63.1    | 22.2    |

## A. Forecast Details

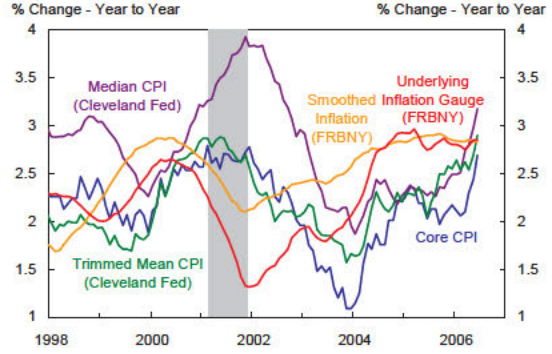
### Exhibit A-7: Measures of Trend Inflation

#### Alternative Measures of PCE Inflation



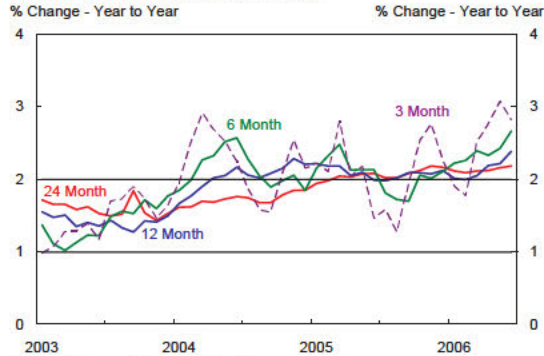
Source: Bureau of Economic Analysis, Dallas Fed, and FRBNY

#### Alternative Measures of CPI Inflation



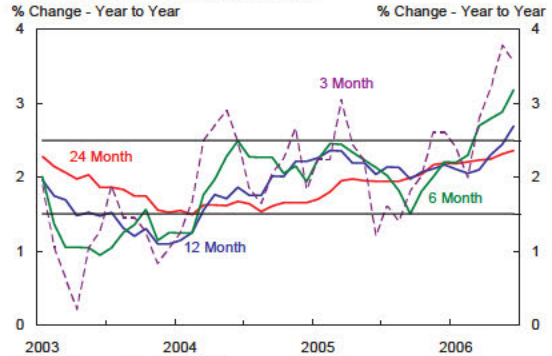
Source: Bureau of Labor Statistics, Cleveland Fed, and FRBNY

#### Core PCE over Various Horizons



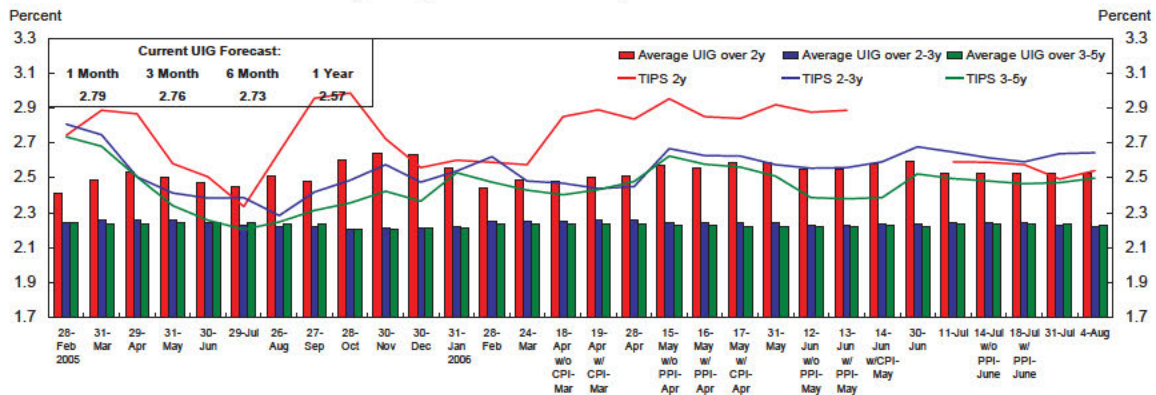
Source: Bureau of Economic Analysis

#### Core CPI over Various Horizons



Source: Bureau of Labor Statistics

### Exhibit A-8: Underlying Inflation Gauge (UIG) and TIPS Implied Inflation



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

Note: Shading represents NBER recessions, unless otherwise noted.

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## B. Financial Markets

### Exhibit B-1. Treasury Yields

The top two charts in this exhibit plot the yields of the on-the-run 3-month and 10-year Treasury securities daily over the past three years and intraday over the inter-meeting period. The middle two charts plot the Treasury yield curve and implied one-year forward rates, as estimated using off-the-run securities. The bottom two charts plot real and nominal forward rates over the past three years for the 4-5 and 5-10 year horizons.

*Source: Bloomberg and CM Function, FRBNY*

### Exhibit B-2. Inflation Expectations

The top two charts in this exhibit plot the time series of carry-adjusted expected CPI inflation over the past three years, as estimated from nominal and inflation-protected Treasury securities (see the Appendix to Exhibit B-2 below for a description of the construction of the FRBNY version of this measure). The left chart displays data over the 0-5 year horizon; the right chart displays data over the 4-5 and 5-10 year horizons. The third chart plots the 10-year breakeven inflation rate (not carry adjusted) over the inter-meeting period using intraday data.

*Source: Bloomberg; Federal Reserve Board; and CM Function, FRBNY*

### Exhibit B-3. Economic Releases

This exhibit shows the response of the implied fed funds futures rate, the 10-year Treasury yield, and the 10-year breakeven inflation rate to macroeconomic announcements. Market expectations for the releases are derived from the forward price for the economic derivatives auction, which concludes 30-60 minutes before the release. The surprise, measured in standard deviations, is calculated using the at-the-money implied volatility from the auctions. Yield changes are measured from 5 minutes before to 30 minutes after the release.

*Source: Bloomberg and CM Function, FRBNY*

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#### **Exhibit B-4. Policy Expectations**

The charts in this exhibit show market expectations of policy as derived from fed funds and Eurodollar futures, as well as from options on fed funds futures. The top left chart plots the expected path of the fed funds target rate allowing for a time-invariant term premium risk adjustment. The top right chart plots the implied August fed funds rate over the inter-meeting period using intraday data (without an adjustment for any term premia). The middle left chart plots the implied probability of no change in the funds rate versus the probability of a 25 basis point increase at the next meeting (allowing for a time-invariant term premium risk adjustment). The last two charts plot the implied probabilities of various policy rates following the next two meetings.

*Source: Bloomberg; FRB Cleveland; Federal Reserve Board; and CM Function, FRBNY*

#### **Exhibit B-5. Policy Uncertainty I**

The top left chart in this exhibit plots the width of the ranges within which the 3-month Eurodollar rate is expected to remain (with 90% confidence) over the next 3 and 6 months, as estimated from Eurodollar futures options. The top right chart plots the width of the ranges within which the 1-year swap rate is expected to remain (with 90% confidence) over the 1-2 and 4-5 year horizons, as estimated from swaptions. The last chart plots implied skewness and implied volatility in percentages, as derived from Eurodollar futures options. Both measures are averages of 3-, 6- and 9-month values. Positive (negative) implied skewness means that a tightening (easing) surprise around the expected target rate is expected to be larger than an easing (tightening) surprise.

*Source: CME; Datastream; and CM Function, FRBNY*

#### **Exhibit B-6. Policy Uncertainty II**

The top left chart in this exhibit plots the width of the range within which the 3-month Eurodollar rate is expected to remain (with 90% confidence) in the future relative to today. The top right chart shows the changes in the width of these ranges since the day before the last FOMC meeting. The middle chart shows the 50% and 90% confidence intervals around the expected policy path. The last two charts plot time series of the

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width of the ranges within which the 3-month Eurodollar rate is expected to remain (with 90% confidence) over the next 6 and 12 months.

*Source: Federal Reserve Board*

#### **Exhibit B-7. Equity Markets**

The top left chart in this exhibit plots the daily closes of the S&P 500 and NASDAQ Composite indices over the past three years. The top right chart plots the S&P 500 over the inter-meeting period using intraday data. The bottom two charts plot implied annualized volatilities for the S&P 500 and NASDAQ Composite indices over the next month and 12 months.

*Source: Bloomberg, CBOE, and OptionMetrics*

#### **Exhibit B-8. Corporate Credit Risk**

The left chart in this exhibit plots corporate credit spreads over the past three years for A- and BB-rated securities. The right chart plots corporate bond default rates over time, measured over the preceding 12-month interval and distinguishing between all and speculative-grade issues.

*Source: Merrill Lynch and Moody's*

#### **Exhibit B-9. Exchange Rates, Foreign Equity, and Bond Spreads**

The top two charts in this exhibit display the exchange rate of the dollar against the euro (in the left panel, with higher values of the index indicating dollar depreciation) and against the yen (in the right panel, with lower values of the index indicating dollar depreciation). The middle-left panel displays the nominal effective exchange rate of the dollar, computed by the Federal Reserve Board using a “narrow” set of weights for 16 major foreign currencies (lower values of the index indicate dollar depreciation). The middle-right chart displays a measure of volatility implied by options on Yen/Dollar and Euro/Dollar rates; each line shows the width of the range (in percentage points) around the current exchange rate within which the exchange rate is expected to fall in one month (with 90 percent confidence). The bottom-left chart displays normalized equity indices for the euro area and Japan. The bottom-right chart displays J.P. Morgan's EMBI+ index of 16 emerging markets' bond spreads over U.S. Treasury yields. (The index includes



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below-investment-grade bonds issued in dollars by a selected group of sovereign and quasi-sovereign issuers.)

*Source: Federal Reserve Board; BIS; International Function, FRBNY; Reuters; and J.P. Morgan*

#### **Exhibit B-10. Foreign Interest Rates**

The top two charts in this exhibit display short- and long-term interest rates for the euro area and Japan. The middle two charts display the three-month interest rate futures curves for the euro area and Japan, including the most recent curve. The bottom two charts display “real” yields on specific inflation-linked bonds for the euro area (OAT bonds from France) and Japan; the charts also display inflation expectations implied in these securities, computed as the spread of the yield on inflation-linked bonds over sovereign bonds of comparable maturity.

*Source: BIS; Federal Reserve Board; International Function, FRBNY; and Barclays*

#### **Exhibit B-11. Energy Futures Curves**

This exhibit displays futures curves for gasoline, heating oil, natural gas, and crude oil. The August 26 curve gives the state of the futures markets just before Hurricane Katrina. Also included are curves for the dates prior to the last two FOMC meetings and a curve for the most recent date.

*Source: Bloomberg*

#### **Appendix to Exhibit B-2. Estimation of Implied Inflation from TIPS**

The implied inflation series are estimates of inflation expectations derived from nominal Treasury securities and Treasury inflation-protected securities (TIPS). These differ from the simpler breakeven inflation rates that merely subtract real TIPS yields from on-the-run nominal yields of 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 securities. We then calculate 2-, 4-, and 5-year inflation rates corresponding to TIPS with those durations. Lastly, we compute approximate forward rates from the rates at the shorter- and longer-dated durations. For example, the 4-5 year forward rate is computed from the 4- and 5-year

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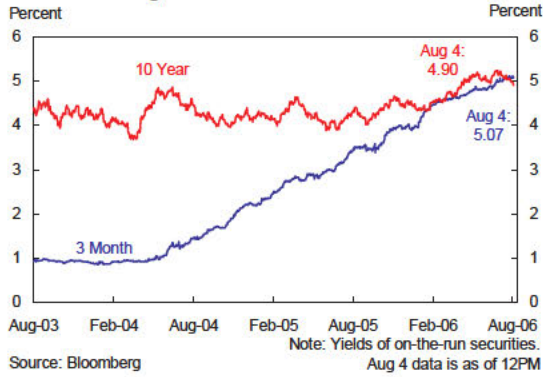
implied inflation values. The 5-10 year forward rate uses the 5-year implied inflation value and the implied inflation rate on the most recently issued 10-year TIPS.

The implied inflation series are also carry adjusted to remove the effect of expected inflation accrual in not seasonally adjusted CPI over the 2½-month indexation lag period in TIPS. Since inflation over this period is either known or largely predictable, it induces predictable variation in the unadjusted implied inflation series that is not necessarily related to future expected inflation. Our adjustment is derived from the forecast of not seasonally adjusted CPI implicit in the same day CPI futures contract traded on the CME. No adjustments are made to the implied inflation measures to account for risk premia or other technical factors.

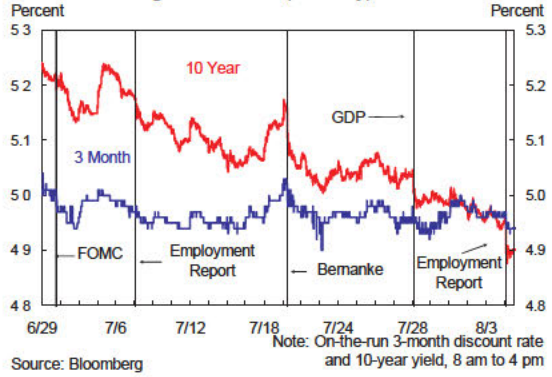
## B. Financial Markets

### Exhibit B-1: Treasury Yields

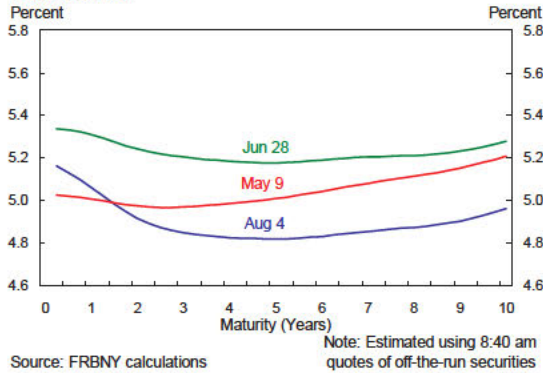
Short- and Long-Term Rates



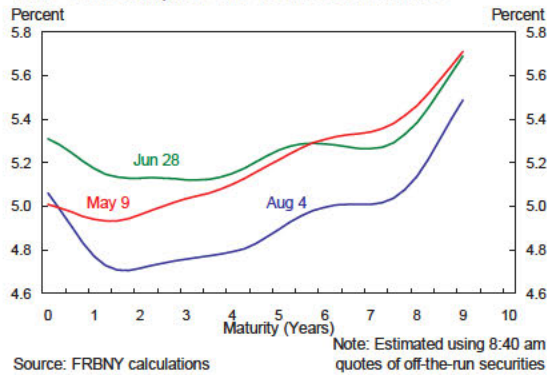
Short- and Long-Term Rates (Intraday)



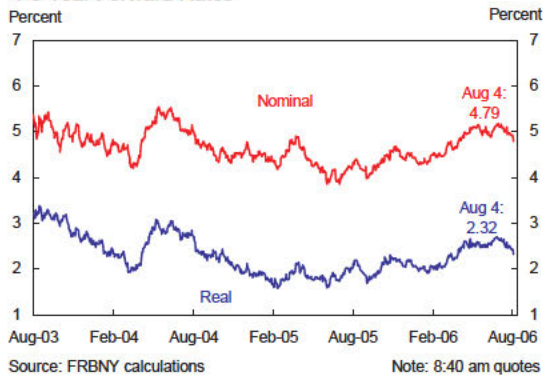
Yield Curves



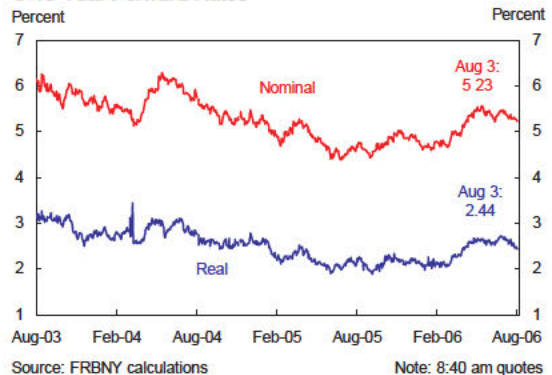
Yield Curves: Implied One-Year Forward Rates



4-5 Year Forward Rates



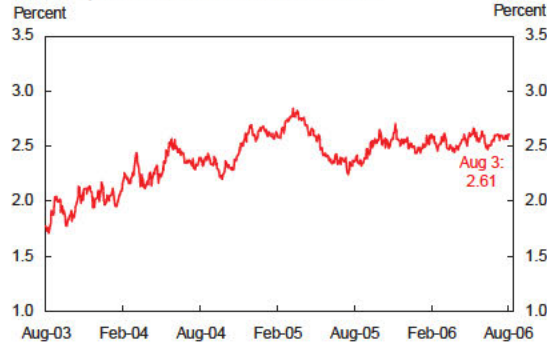
5-10 Year Forward Rates



## B. Financial Markets

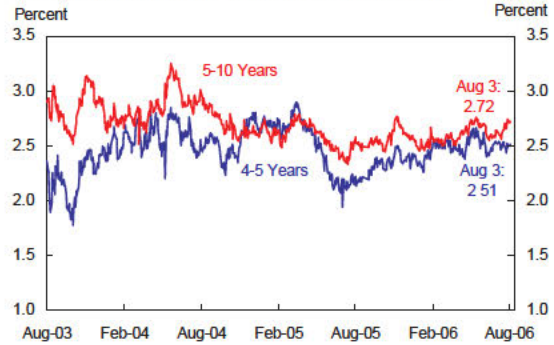
### Exhibit B-2: Inflation Expectations

TIPS Implied Inflation: 0-5 Year Horizon



Source: Federal Reserve Board

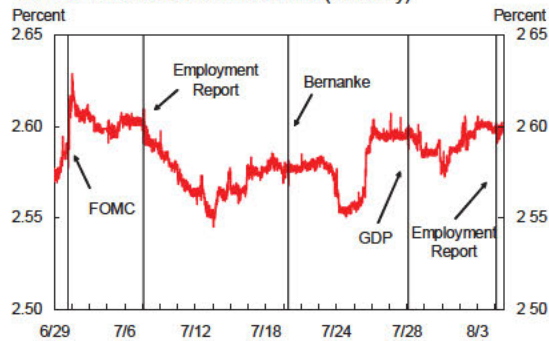
TIPS Implied Inflation: 4-5, 5-10 Year Horizons



Source: FRBNY calculations

Note: 8:40 am quotes

10-Year Breakeven Inflation Rate (Intraday)



Source: Bloomberg

Note: Calculated as difference between on-the-run 10-year Treasury and 10-year TIPS yield. 8 am to 4 pm.

### Exhibit B-3: Economic Releases

Market reaction to macro releases, market expectations using economic derivatives

| Release Type                        | Release Date | Actual Release | Market Expectation | Surprise | Surprise ( $\sigma$ 's) | Yield Change (bps) |          |                    |
|-------------------------------------|--------------|----------------|--------------------|----------|-------------------------|--------------------|----------|--------------------|
|                                     |              |                |                    |          |                         | August             | Ten Year | Ten Year Breakeven |
| Change in Nonfarm Payrolls, 1,000's | 8/4          | 113            | 148                | -35      | -0.4                    | -4                 | -7       | 0                  |
| Initial Jobless Claims, 1,000's     | 8/3          | 315            | 307                | 8        | 0.6                     | 1                  | 1        | 0                  |
| ISM Manufacturing, index level      | 8/1          | 54.7           | 53.8               | 0.9      | 0.5                     | 1                  | 0        | 0                  |
| GDP, %                              | 7/28         | 2.5            | 3.1                | -0.6     | -0.7                    | -3                 | -4       | 0                  |
| Initial Jobless Claims, 1,000's     | 7/27         | 298            | 308                | -10      | -0.7                    | 1                  | 1        | 0                  |
| Initial Jobless Claims, 1,000's     | 7/20         | 304            | 319                | -15      | -0.9                    | 0                  | 0        | 0                  |
| Core CPI, %                         | 7/19         | 0.29           | 0.27               | 0.02     | 0.3                     | 3                  | 3        | 0                  |
| Retail Sales Less Autos, %          | 7/14         | 0.26           | 0.36               | -0.10    | -0.3                    | 1                  | 2        | 0                  |
| Initial Jobless Claims, 1,000's     | 7/13         | 332            | 326                | 6        | 0.3                     | 0                  | 1        | 0                  |
| Trade Balance, \$billions           | 7/12         | -63.8          | -65.0              | 1.2      | 0.4                     | 0                  | 1        | 0                  |
| Change in Nonfarm Payrolls, 1,000's | 7/7          | 121            | 206                | -85      | -0.9                    | -1                 | -1       | 0                  |
| ISM Manufacturing, index level      | 7/3          | 53.8           | 54.6               | -0.8     | -0.5                    | 1                  | 0        | 0                  |

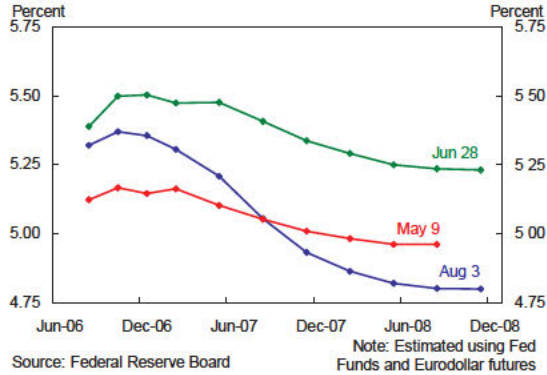
Source: Bloomberg and FRBNY calculations

Note: Market expectations are from the forward price from the most recent economic derivatives auction, which concludes 30-60 minutes before the release. Surprise in standard deviations is calculated using the at-the-money implied volatility from the auction. Yield changes are for the interval from 5 minutes before to 30 minutes after the release.

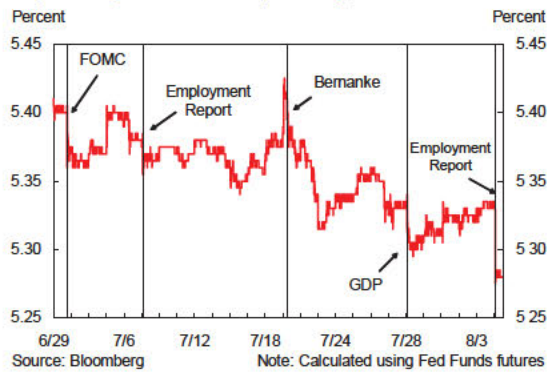
## B. Financial Markets

### Exhibit B-4: Policy Expectations

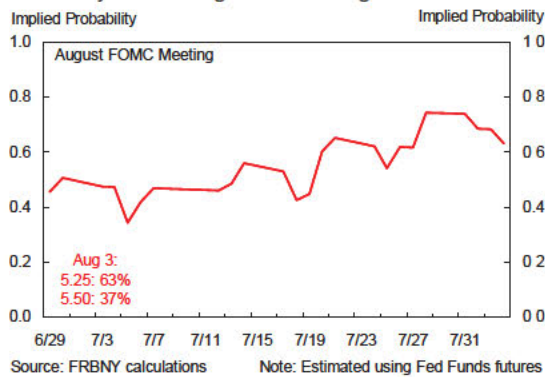
Expected Fed Funds



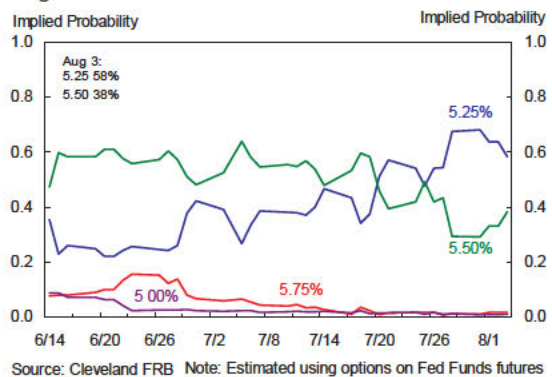
Implied August Fed Funds (Intraday)



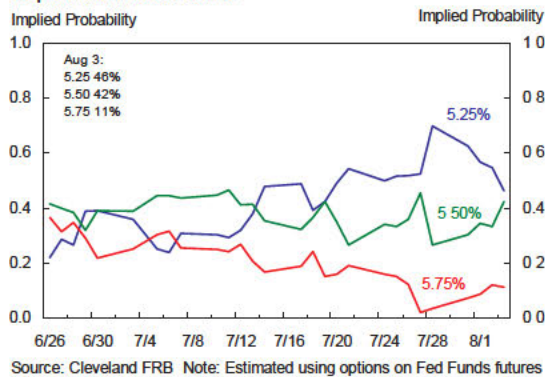
Probability of 5.25 Target vs. 5.50 Target



August 2006 FOMC



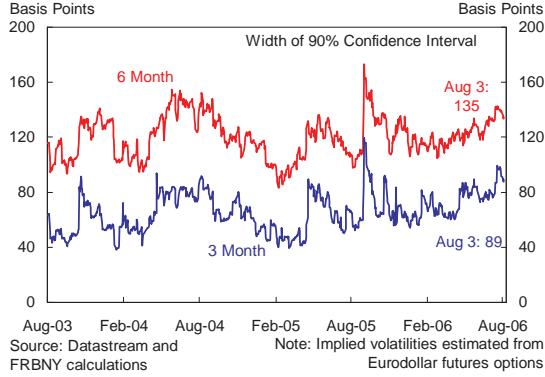
September 2006 FOMC



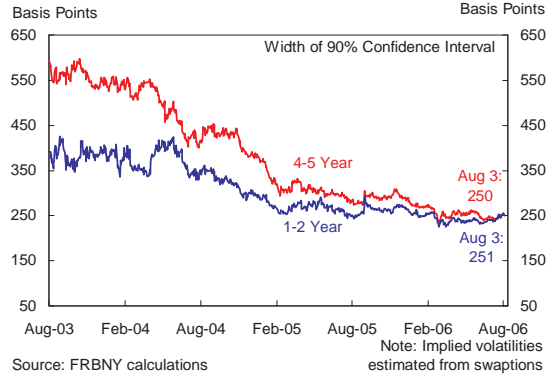
## B. Financial Markets

### Exhibit B-5: Policy Uncertainty I

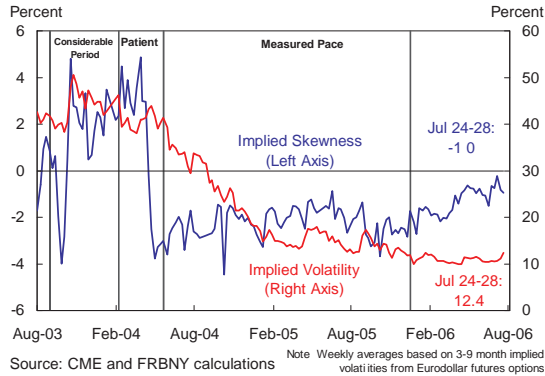
Interest Rate Volatility: Short-Term



Interest-Rate Volatility: Long-Term



Implied Skewness and Volatility

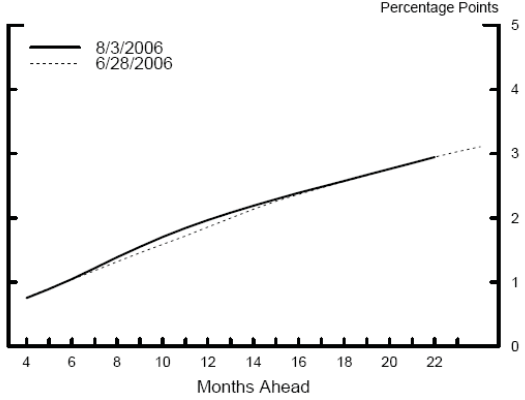




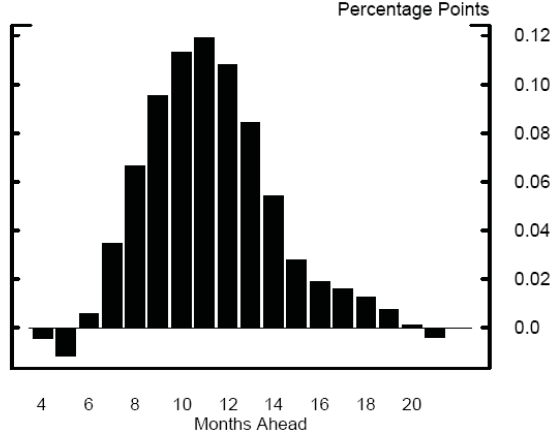
# Financial Markets

## Exhibit B-6: Policy Uncertainty II

Eurodollar Implied Volatility Term Structure\*

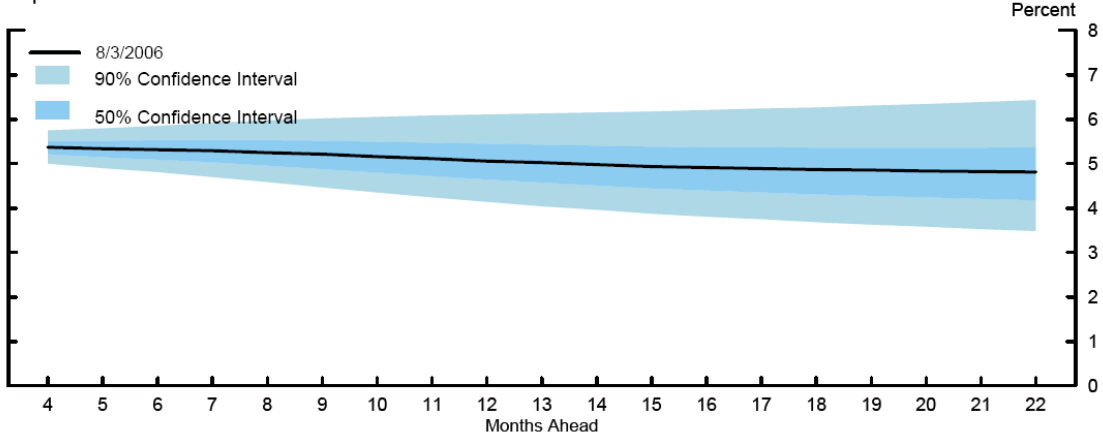


Change Since Day Before FOMC Meeting

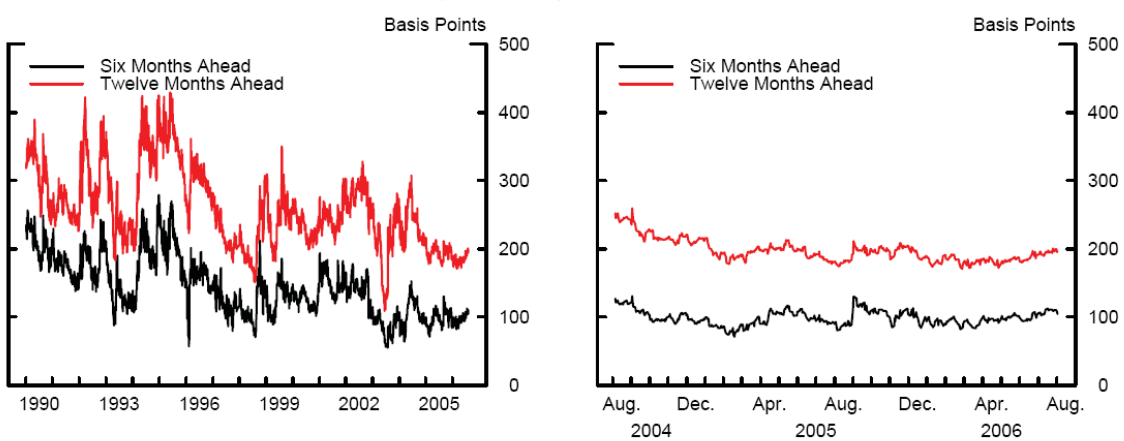


\*Width of a 90 percent confidence interval computed from the term structures for the expected federal funds rate and implied volatility.

Expected Federal Funds Rate Path and Confidence Intervals



Eurodollar Implied Volatility at Selected Maturities\*



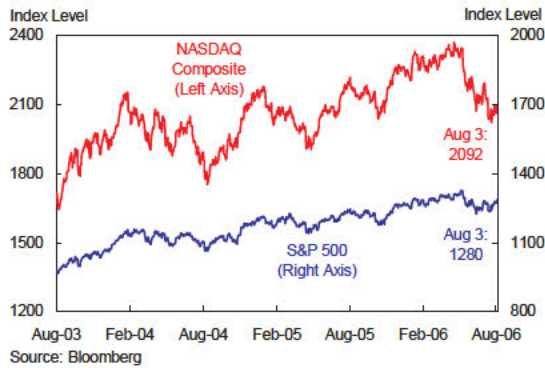
\*Width of a 90 percent confidence interval computed from the term structures for the expected federal funds rate and implied volatility.



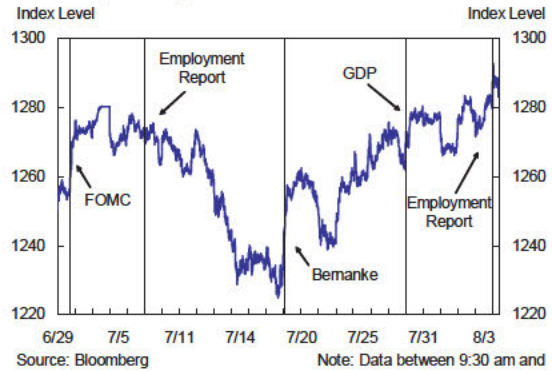
## B. Financial Markets

### Exhibit B-7: Equity Markets

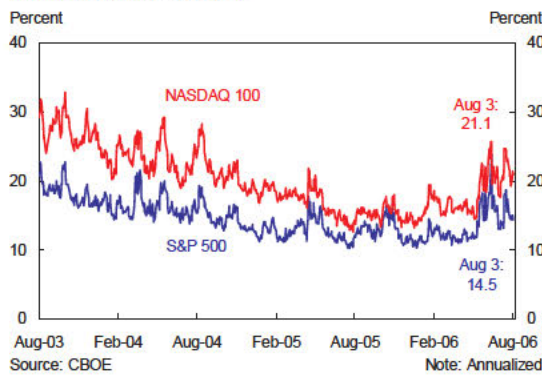
Performance



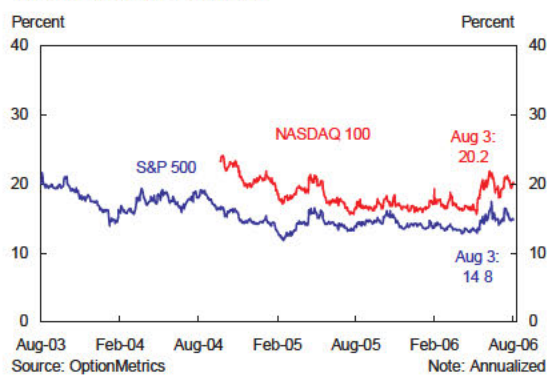
S&P 500 (Intraday)



Implied Volatility: 1 Month

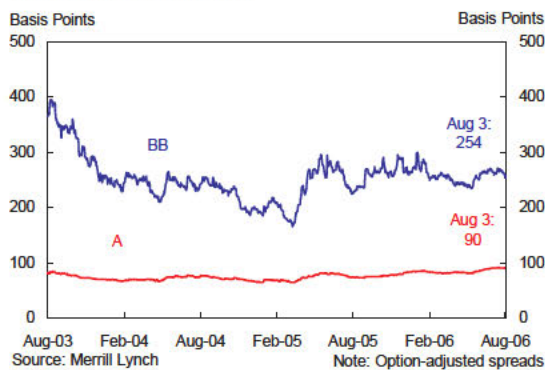


Implied Volatility: 12 Months

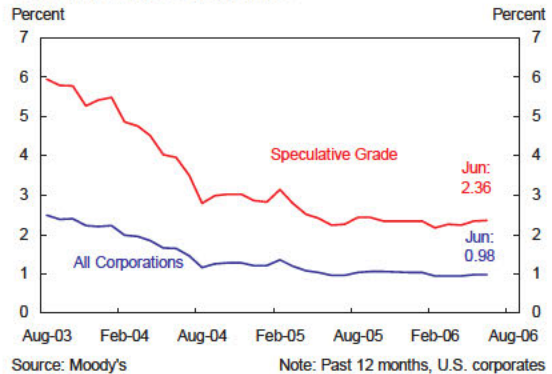


### Exhibit B-8: Corporate Credit Risk

Corporate Credit Spreads



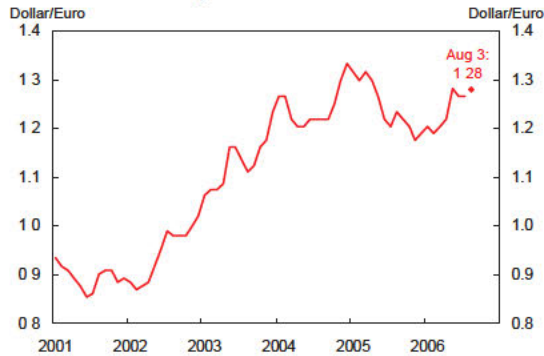
Corporate Bond Default Rates



## B. Financial Markets

### Exhibit B-9: Exchange Rates, Foreign Equity, and Bond Spreads

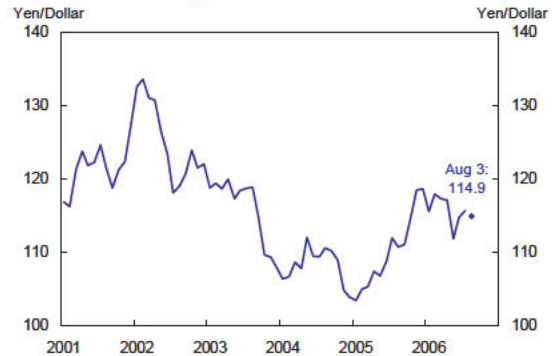
**Euro-Dollar Exchange Rates**



Source: BIS

Note: Data are monthly averages.

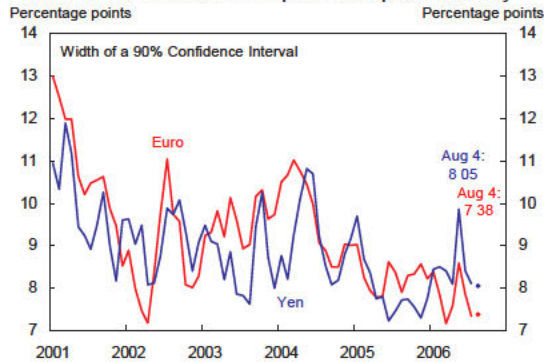
**Yen-Dollar Exchange Rates**



Source: BIS

Note: Data are monthly averages.

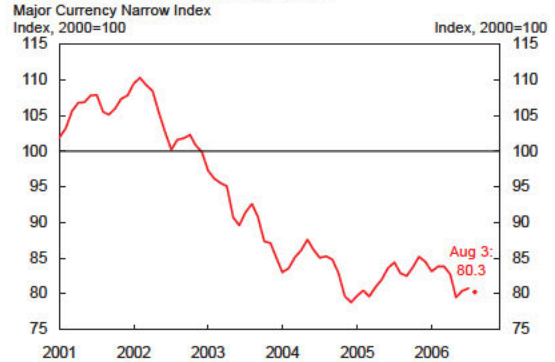
**Euro and Yen One-Month Implied FX Option Volatility**



Source: Reuters

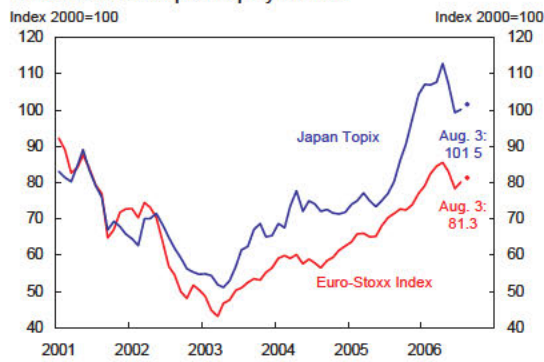
Note: Data are monthly averages.

**Nominal Effective Exchange Rate**



Source: Federal Reserve Board

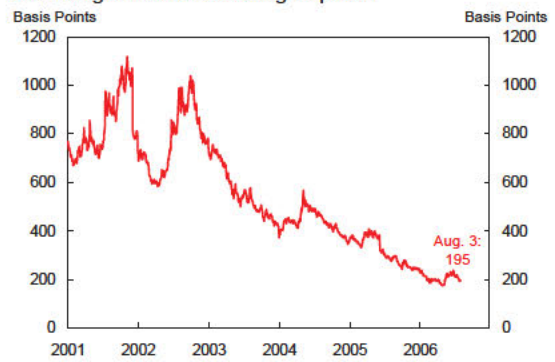
**Euro Area and Japan Equity Indices**



Source: BIS and Bloomberg

Note: Data are monthly averages.

**J.P. Morgan EMBI+ Sovereign Spread**



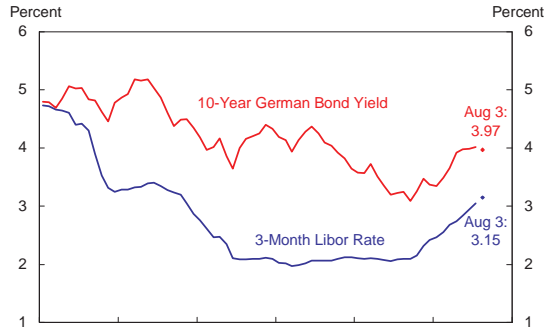
Source: Bloomberg

Note: Data are daily observations.

## B. Financial Markets

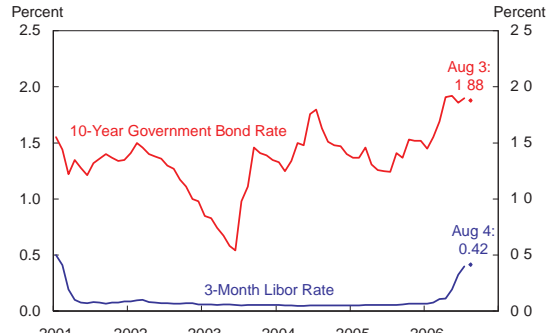
### Exhibit B-10: Foreign Interest Rates

Euro Area Short-Term and Long-Term Interest Rates



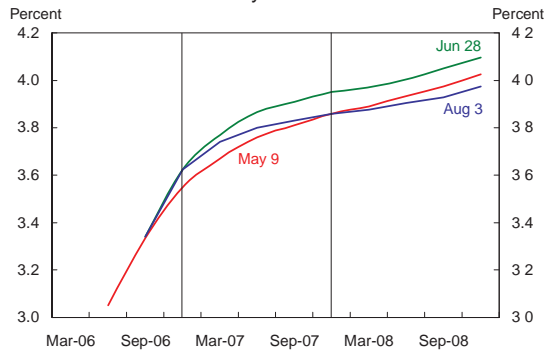
Source: BIS and Federal Reserve Board Note: Data are monthly averages.

Japan Short-Term and Long-Term Interest Rates



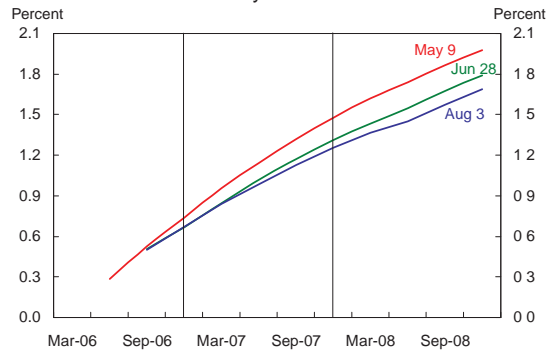
Source: Bloomberg and Federal Reserve Board Note: Data are monthly averages.

Three-Month Eurocurrency Futures Rates: Euro



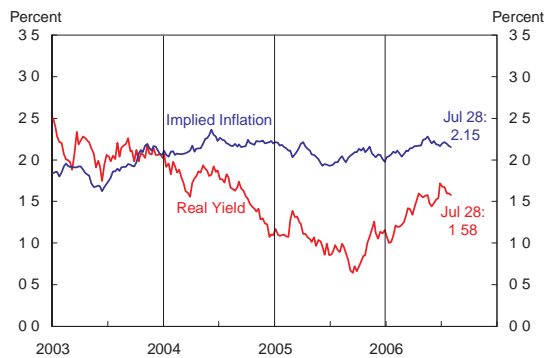
Source: Datastream

Three-Month Eurocurrency Futures Rates: Yen



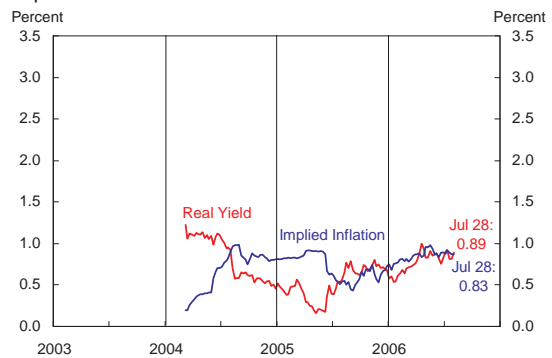
Source: Datastream

Euro Area Inflation-Linked Bonds



Source: Barclays Note: OAT July 2012

Japanese Inflation-Linked Bonds

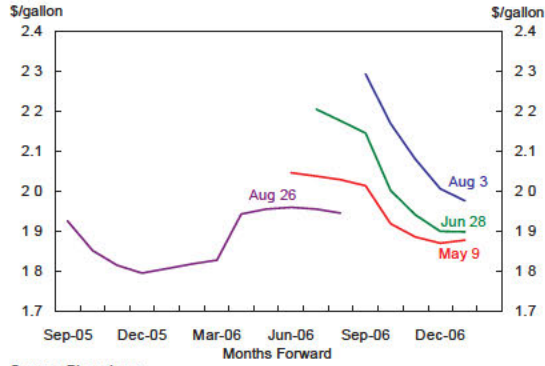


Source: Barclays Note: JGB March 2014

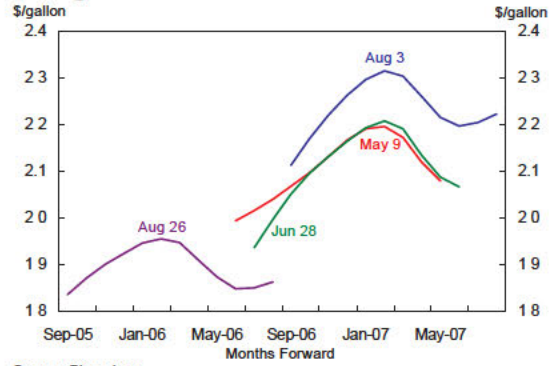
## B. Financial Markets

Exhibit B-11:  
Energy Futures

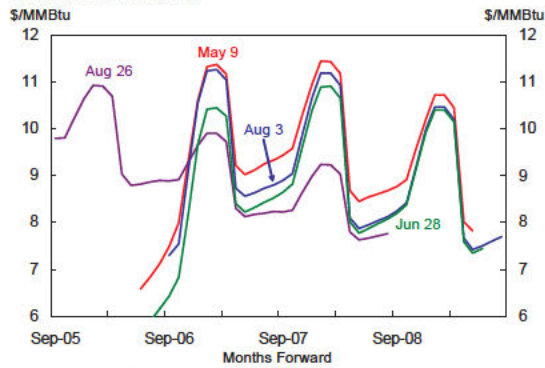
Gasoline Futures



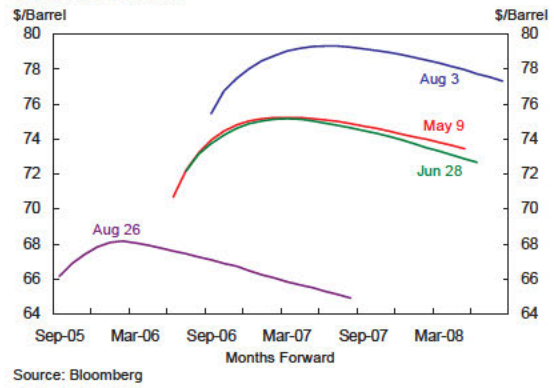
Heating Oil Futures



Natural Gas Futures



Crude Oil Futures



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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. We use a dynamic assessment of the risks that allows the probability of a deviation to build over time. We center long-run behavior at the implicit inflation target and potential growth rate and assume that, after a deviation into an alternative scenario, the economy eventually returns to this average long-run behavior. 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 alternative scenarios listed in Section 3 (“FRBNY Alternative Scenarios and Risks”) and the central scenario contained in the Bank’s forecast. Two measures of the balance of risks are shown. One is the probability of being in a particular scenario at a specific date. These scenarios are mutually exclusive, so the probabilities add up to one at any specific date. However, please note that two nonspecific scenarios representing general upside and downside risks to the FRBNY forecast are not pictured; thus, the values included the exhibit do not add up to exactly one.

For most scenarios, the second measure is the probability of being in a particular scenario at any time through 2009. For the central scenario, however, we show the probability of not deviating from this scenario at any time through 2009. Hence, one minus this latter probability is the likelihood of deviating from the central scenario at some point over the

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forecast horizon, which is equal to the sum of the probabilities of the other scenarios, including the general upside and downside scenarios not pictured.

### **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 of four-quarter changes in the core PCE deflator [Exhibit C-2] and real GDP [Exhibit C-3] under the central scenario and the alternative scenarios. A path is defined as falling under an alternative scenario if it has at least one quarter in that scenario.

The over-tightening scenario assumes that output growth is substantially slower than the central forecast and inflation is sometimes lower. The overheating scenario assumes that for two quarters the economy grows more quickly than in the central forecast, with both inflation and output higher than in the central forecast. Then, the real economy slows dramatically, but inflation continues to be above the central forecast. For this cycle we have increased the probability that overheating was occurring before 2006Q2.

The productivity boom scenario assumes that inflation is below the forecast, while output growth is above. The productivity slump takes the reverse; inflation is above the forecast, while output growth is below.

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

Fan charts are shown for the core PCE deflator [Exhibit C-4] and real GDP growth [Exhibit C-5]. These charts are constructed to represent the overall uncertainty contained in our main scenario and 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 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

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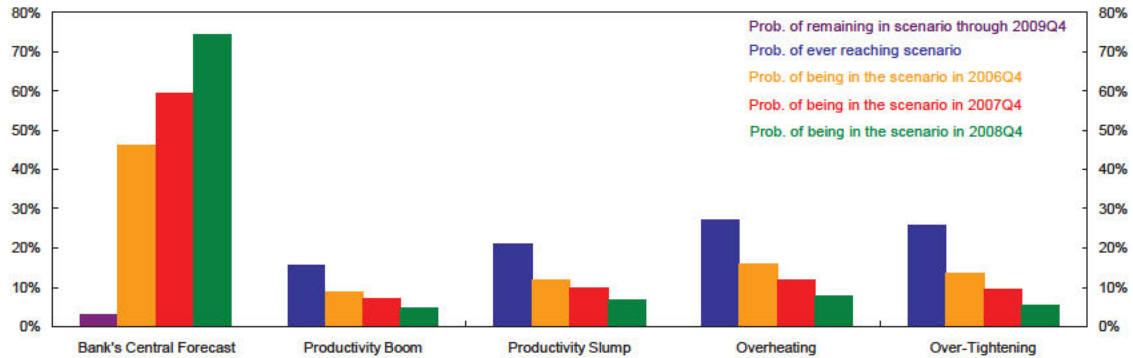
across all possible scenarios considered in Exhibit C-1. The difference between this profile and the central bank scenario is another measure of the balance of risks. If they are equal, the risks are balanced; if the expected value is above the central bank scenario, there is upside risk; if it is below, there is downside risk.

*Source: MMS Function, FRBNY*



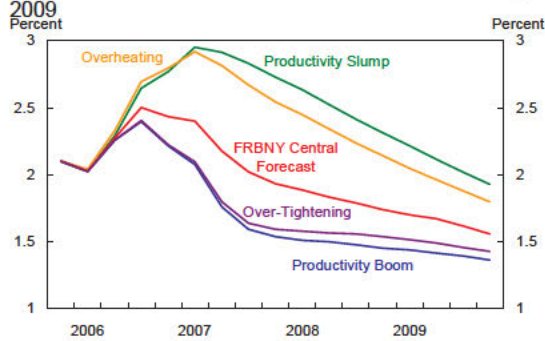
## C. FRBNY Forecast Distributions

C-1: Risks



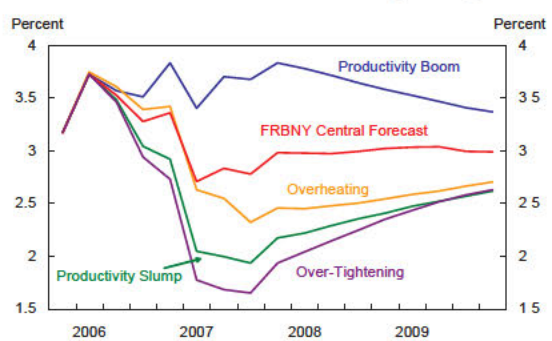
Source: MMS Function (FRBNY)

C-2: Alternative Scenarios of Core PCE Inflation through 2009



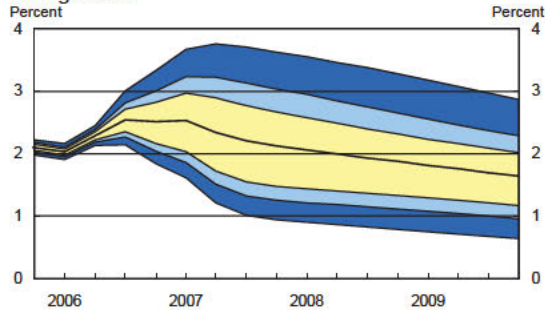
Source: MMS Function (FRBNY)

C-3: Alternative Scenarios of GDP Change through 2009



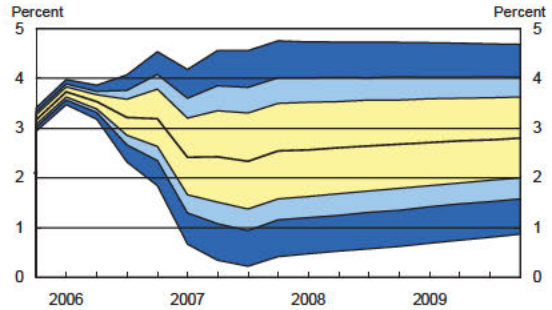
Source: MMS Function (FRBNY)

C-4: Four-Quarter Core PCE Inflation Forecast through 2009



Note: 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.  
Source: MMS Function (FRBNY)

C-5: Four-Quarter GDP Growth Forecast through 2009



Note: 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.  
Source: MMS Function (FRBNY)

## D. FRBNY Fed Funds Rate Projections

The exhibits in this section are constructed using the baseline specification of the policy rule detailed below, two modifications of the baseline policy rule, 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 level of uncertainty.

In all specifications the policy rate responds to deviation of inflation from target and output from potential GDP and incorporates some degree of inertia. We draw the future paths of these deviations from the forecast distribution of inflation and output. (We specify an implicit inflation target of 1.5% and assume potential output growth is 3%.)

*Policy Rule – Baseline Specification:*

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

$$\rho = 0.8$$

$$i_{2006Q2} = 4.9$$

$$i^* = 4.125$$

$$\pi^* = 1.5$$

$$\varphi_\pi = 1.5$$

$$\varphi_x = 0.5$$

$\pi_t$  : Core PCE 4 Q average

$x_t$  : Output Gap using 3% potential growth rate

*Source: MMS function, FRBNY*

For the next two quarters we amend the prescription of the baseline policy rule to capture some of the discreteness in the movement of the FFR. We translate the prescription of the baseline rule using the following table:

| Baseline Policy Rule Prescription | Average FFR in 2006Q3 | Average FFR in 2006Q4 |
|-----------------------------------|-----------------------|-----------------------|
| $r^* < 3.00$                      | 4.0                   | $r^*$                 |
| $3.00 < r^* < 3.75$               | 4.0                   | 4.0                   |
| $3.75 < r^* < 4.00$               | 4.5                   | 4.5                   |
| $4.00 < r^* < 4.25$               | 5.0                   | 4.75                  |
| $4.25 < r^* < 4.5$                | 5.0                   | 4.75                  |
| $4.5 < r^* < 4.75$                | 5.25                  | 4.75                  |
| $4.75 < r^* < 5.00$               | 5.25                  | 5.0                   |
| $5.0 < r^* < 5.25$                | 5.25                  | 5.25                  |
| $5.25 < r^* < 5.5$                | 5.25                  | 5.25                  |
| $5.5 < r^* < 5.75$                | 5.25                  | 5.5                   |
| $5.75 < r^* < 6$                  | 5.35                  | 5.5                   |
| $r^* > 6$                         | 5.35                  | $r^*$                 |

The two modifications of this amended baseline rule that we use this cycle are labeled *Opportunistic Disinflation* and *Inflation Hawk*. Both rules react more strongly to inflation data above the upper bound of the implicit target range (taken to be 2%) than the baseline policy rule. They differ in their reaction. The *Inflation Hawk* rule increases the policy rate by more than the baseline prescription if monthly core inflation readings continue to be above the target range. The *Opportunistic Disinflation* rule lowers the policy rate more slowly than the baseline prescription if inflation is slowing but still above the target range.

The *Inflation Hawk* policy rule follows the baseline rule (as amended in the table above) if two-quarter core PCE annualized inflation remains below 2.5%; if it rises above 2.5%, then the *Inflation Hawk* rule increases the FFR by 25 basis points in August. In 2006Q4 it follows the prescription of the baseline policy rule unless two-quarter core PCE annualized inflation remains above 2.1%. If it remains above this level, then it takes as a value the maximum of either 5.75% or the prescription of the baseline policy rule. In 2007, the *Inflation Hawk* returns to the prescription of the baseline rule.

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For the *Opportunistic Disinflation* rule, we follow the prescription of the baseline policy rule if the four-quarter average of core PCE inflation in the last quarter is below 2%. If the four-quarter average through the last quarter is above 2%, then we compare this value to the four-quarter average through the current quarter. If the value for this quarter is higher than the value for the last quarter, then the prescription of the baseline rule is followed. However, if the four-quarter average declines when compared to its value in the previous quarter, then last quarter's value is substituted for the current quarter value in the baseline policy rule. This rule is followed for the horizon of the forecast.

#### **Exhibit D-1: Nominal Fed Funds Rate Under Different Policy Rules**

Exhibit D-1 shows the expected path of the FFR under the three rules described, together with the most recent implied market path from Exhibit B-4. The paths under each rule are constructed by first evaluating the policy rule at each of the draws from the forecast distribution of output and inflation, and then averaging them to produce an expected path under that particular rule.

#### **Exhibit D-2 & D-3: Nominal and Real Fed Funds Rate Under Baseline in Alternative Scenarios**

In these exhibits, we focus on the baseline policy rule and evaluate it under the Bank's central projection, as well as under the alternative scenarios of a productivity slowdown, a productivity boom, overheating and over-tightening. Each path is obtained by evaluating the baseline policy rule at each of the draws from a forecast distribution of output and inflation under that particular scenario and averaging them to produce an expected path. The baseline rule is also evaluated using the Bank's central forecast. Exhibit D-2 presents the implications for the nominal FFR. Exhibit D-3 presents the implications for the average ex-post real rate. This real rate is calculated by subtracting the four-quarter lagged change of core PCE inflation from the path of the nominal rate.

#### **Exhibit D-4: Baseline Policy Rule with 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. This is implemented by running the baseline policy rule with two different inflation targets.

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First, we use the 1.5% target typically used by the baseline policy rule; then, we calculate the expected nominal rate using a 2.0% target, while also increasing the neutral rate by 50bp. Neither simulation uses the information about the 13 most recent increases in the FFR. Thus, these two policy rule paths are conditioned on the average FFR in 2004Q4 of 1.9%. The market implied path and the average, however, use the actual value of the FFR to date. The implied market path then uses the current FF futures values, while the average takes the mean over the three rules evaluated during this cycle, using weights of 0.75 (*Baseline*), 0.20 (*Inflation Hawk*) and 0.05 (*Opportunistic Disinflation*).

#### **Exhibit D-5: Comparison between Market Expectations and FRBNY Expectations of the Federal Funds Rate**

In this exhibit, we report two metrics for measuring the distance between the market-implied path and the FRBNY implied path in 2007Q2.

1. We take the expected value of each of our policy rules and calculate its corresponding percentile in the market's implied distribution.
2. We take the expected value of the market implied path and calculate its percentile in the distribution for each of our policy rules.

There are many other sources for 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; there is some evidence, however, that the adjustment varies over time. Furthermore, the market faces uncertainty over the policies and targets used by the FOMC. We can attempt to capture this uncertainty, but again, it may vary over time.

#### **Exhibit D-6: Federal Funds Rate Distributions**

In this exhibit we examine the distribution of the FFR under the three different policy rules through the third quarter of 2007. 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 the data in Exhibit B-6. The distribution is represented by a boxplot to allow for a more direct comparison of the implications of different policy

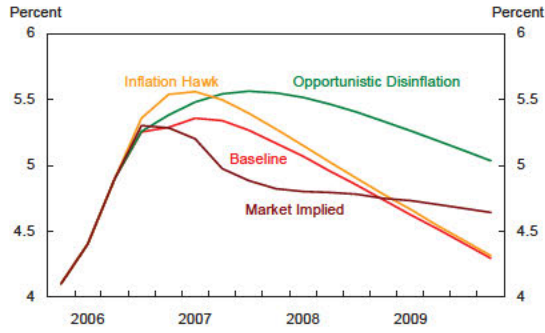
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rules. The box represents the 50% probability interval (25<sup>th</sup> to 75<sup>th</sup> percentile), the line in the box the median, and the tails the 90% probability interval (5<sup>th</sup> to 95<sup>th</sup> percentile).

*Source: MMS Function, FRBNY*

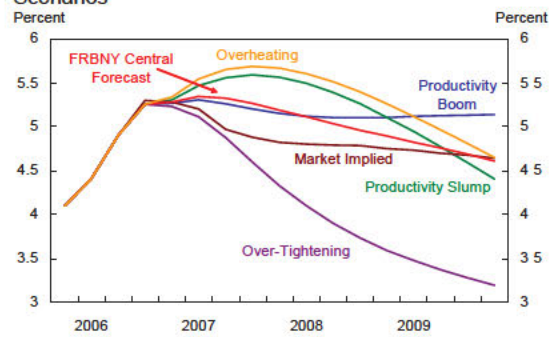
## D. FRBNY Fed Funds Rate Projections

D-1: Nominal FFR under Different Policy Rules



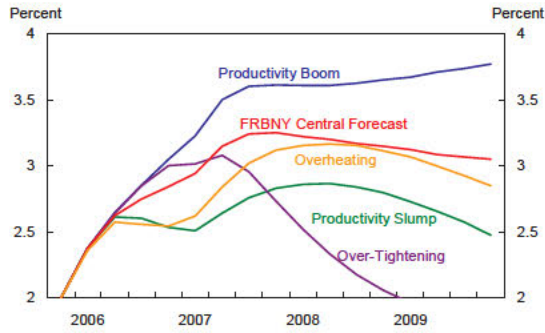
Source: MMS Function (FRBNY)

D-2: Nominal FFR under "Baseline" in Alternative Scenarios



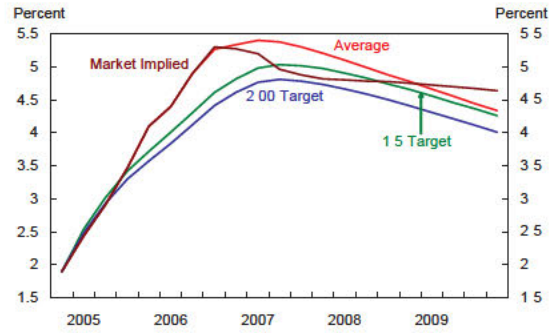
Source: MMS Function (FRBNY)

D-3: Real FFR under "Baseline" in Alternative Scenarios



Source: MMS Function (FRBNY)

D-4: Baseline Policy Rule with Different Inflation Targets



Source: MMS Function (FRBNY)



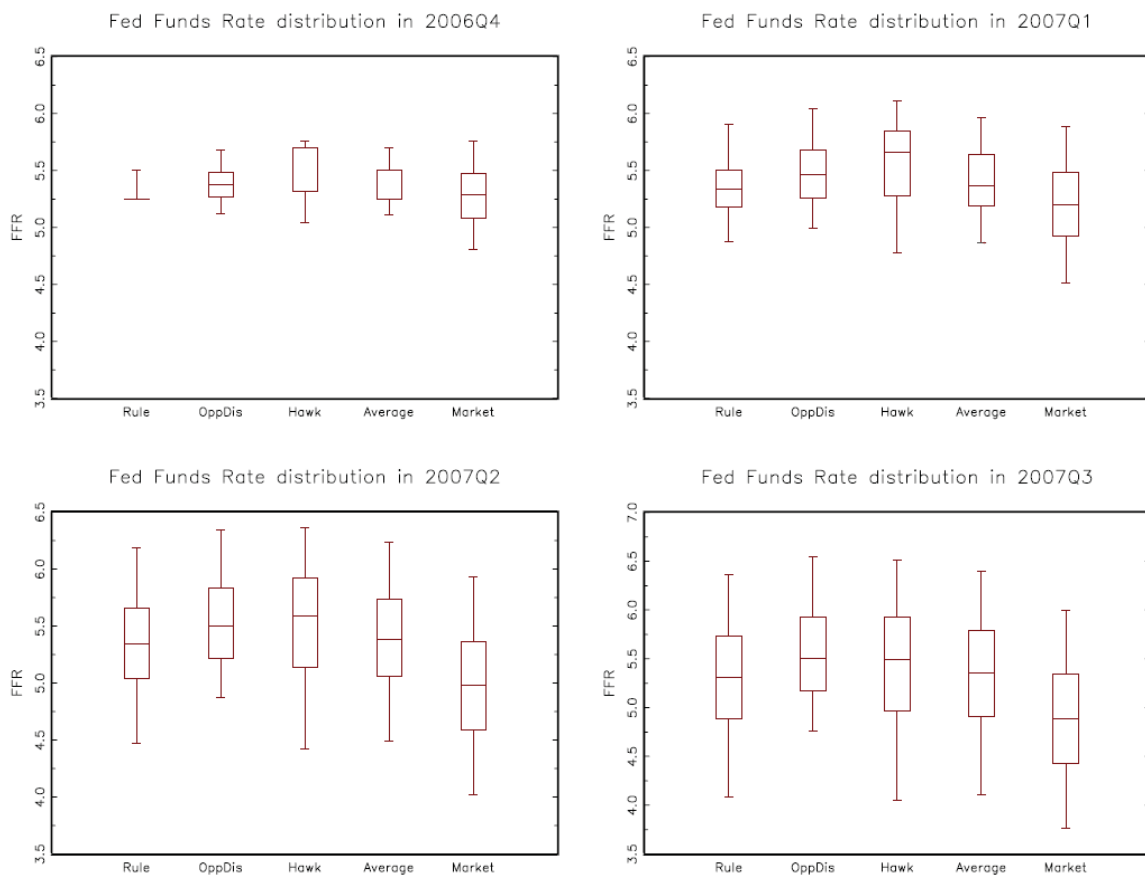
## D. FRBNY Fed Funds Rate Projections

**Exhibit D-5:**  
**Comparison between Market Expectations and FRBNY**  
**Expectations of the Federal Funds Rate**

|                                   | Percentile of FRBNY Expectation in Market Distribution | Percentile of Market Expectation in FRBNY Distribution |
|-----------------------------------|--|--|
| <i>Baseline</i>                   | 73   | 21   |
| <i>Inflation Hawk</i>             | 84   | 9  |
| <i>Opportunistic Disinflation</i> | 82   | 18   |
| <i>Average</i>                    | 76   | 20   |

Note: "Average" weights baseline at .75, inflation hawk rule at .20, and opportunistic disinflation at .05.

**Exhibit D-6: Fed Funds Rate Distributions**



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## E. Regional Charts

### Exhibit E-1. FRBNY's Index of Coincident Economic Indicators

The chart in this exhibit shows our monthly coincident indices for New York, New Jersey, and New York City since 1999. The indices are a composite of four 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. FRBNY's Index of Leading Economic Indicators

This chart shows the growth in our monthly leading indices for New York, New Jersey, and New York City since 1999. The growth in the index for a given month represents a forecast of the growth in the coincident index nine months ahead. The components used in these three indices differ slightly from index to index but include: housing permits, stock prices, the national leading index, and 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: 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) from 1996 to present.

*Source: Bureau of Labor Statistics*

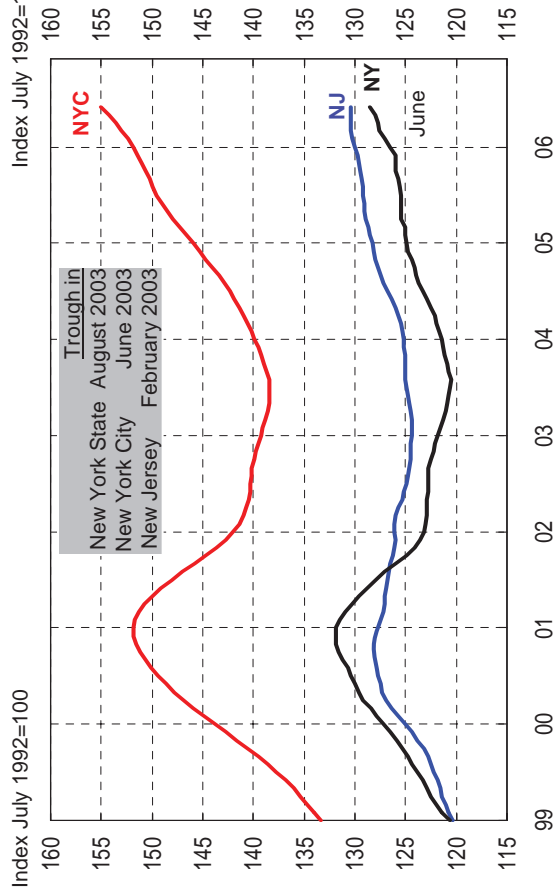
### Exhibit E-4. Unemployment Rates: U.S. and the Region

This chart shows the monthly unemployment rate for New York, New Jersey, New York City, and the U.S. from 1996 to present.

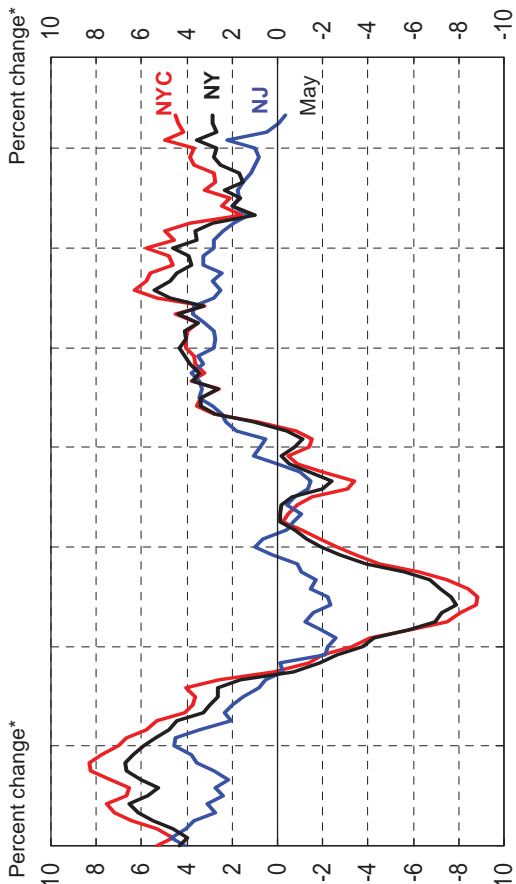
*Source: Bureau of Labor Statistics, New York State Department of Labor, and the New Jersey Department of Labor*

## E. Regional Charts

E1: INDEX OF COINCIDENT ECONOMIC INDICATORS

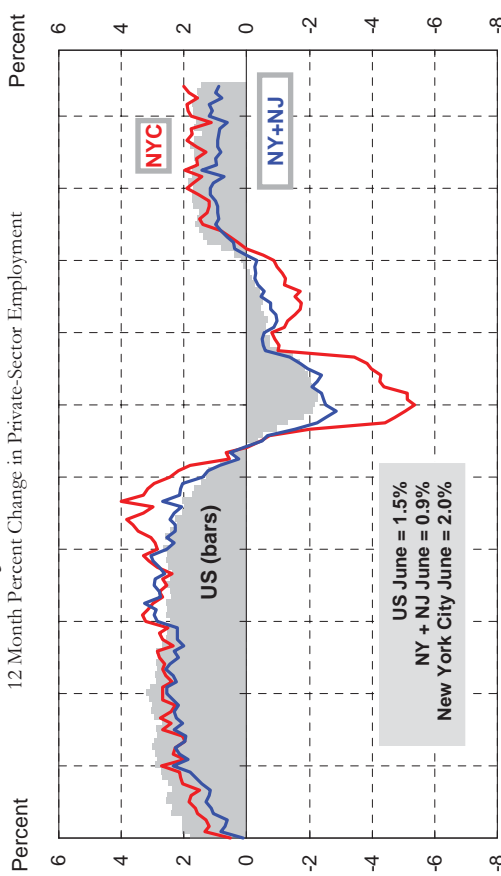


E2: INDEX OF LEADING ECONOMIC INDICATORS



\* Percent change represents the forecasted growth in the Coincident Index, over the next 9 months, at an annual rate.

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



E4: UNEMPLOYMENT RATES: U.S. AND THE REGION

