

**FRBNY Blackbook**

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**RESEARCH AND STATISTICS GROUP**

**FOMC Background Material**

**December 2005**

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# FRBNY BLACKBOOK

December 2005

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## 1. Overview

Our forecast and risk assessment are consistent with a 25 basis point increase in the target at the December 13<sup>th</sup> meeting, accompanied by a signal that the target could move as high as 4.75% during 2006. The Greenbook (GB) has nudged up its path so that the target is set at 4.5% in early 2006 and held steady thereafter. This leaves the GB path slightly below our path and that implied by futures market data.

Our central forecasts for core PCE inflation and real GDP growth in '06 and '07 are unchanged from the previous Blackbook (BB). The GB has lowered its forecast for core PCE inflation in '06 and '07, and raised its forecast for overall inflation in '06. With these adjustments, the GB inflation forecast has moved closer to our outlook. Our view is still that real GDP will grow steadily near potential over the next two years, while the GB has growth above potential in '06 and below in '07.

Over the period since the previous BB, there appears to have been a retreat in the level of long-run inflation expectations derived from consumer surveys, and expectations measures calculated from financial market data continue to be well-contained. While the outlook for energy prices remains highly uncertain, there is little evidence that higher energy prices per se are significantly hampering growth in the U.S. or the rest of the world.

Despite generally favorable real growth and inflation conditions, there are still challenges to determining the appropriate stance of policy over the next few quarters. Perhaps chief among those challenges is interpreting the seemingly low yields on long-term assets relative to short rates, the narrowness of credit spreads and the low levels of implied volatilities. Without a clear understanding of the fundamental factors behind these phenomena, it is difficult to determine whether further policy firming is likely to precipitate a yield curve inversion or whether such an inversion would carry the recessionary signal with which it has been associated in the past.

Another challenge is the management of the communication strategy. There are two factors that have brought this issue to the forefront at the present time. The first is the

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process of transitioning to a new chairman. Perhaps more important, however, is the fact that the committee is moving out of a situation where effective communication of the direction and pace of its policy intentions was aided significantly by the distance of the target rate from any historical estimate of neutral, the lack of inflationary pressures and the general conformity of the actual data with the forecast.

## 2. Recent Developments

### U.S.

*Summary.* The data released since the last FOMC meeting indicate a reduced risk of inflation exceeding the 1½% implicit target and a greater upside risk to real activity. Core inflation measures moderated slightly in October, and headline measures retreated but stayed positive due to the lingering effects of the sharp rises in energy prices during the summer. GDP growth in Q3 was revised upward, as was productivity growth, reducing concern about a productivity slowdown and raising suggestions of stronger underlying real growth. Consumption data so far in Q4 indicate weak consumption growth in the quarter, but business spending indicators have been stronger. Production indicators also have shown some vigor. Payroll employment rebounded in November, although hours were flat. Wage growth has picked up, but revisions to unit labor costs now show declines in Q2 and Q3. Consumer confidence measures rebounded in November and early December, while business survey indicators continued to be robust.

*Inflation.* Core inflation measures moderated slightly, indicating that past rises in energy prices and their continued high levels have had little effect on these measures [see Exhibit A-6]. The core PCE deflator increased 0.1% in October, and its 12-month change was 1.8%. The 12-month change is about ½ percentage point below the corresponding change at the end of 2004. Nevertheless, it remains above the implicit target and near the upper end of the probable acceptable range of the FOMC. The core CPI increased 0.2% in October, as some volatile components such as lodging away from home contributed positively to the increase. The 12-month change was unchanged at 2%: this change has fallen slightly over recent months as core goods inflation has moderated slightly and core

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services inflation has been flat. The core PPI fell in October, and its 12-month change declined to 2%, continuing its recent moderation.

With energy prices moderating in October, overall inflation rates declined but remain elevated. The 12-month change of the overall PCE deflator was 3.3% in October and the corresponding change of the CPI was 4.3%. Both declined from their September levels, but only modestly. With overall inflation remaining rather high, measures of underlying inflation derived from time series models indicate inflation pressures remain high relative to the implicit target and the signals from core inflation measures. In contrast, our underlying inflation gauge (UIG) was little changed at longer (2-3 and 3-5 year) horizons [see Exhibit A-7]. Other alternative measures of “core” inflation (medians and trimmed means) also have been flat recently [see Exhibit A-8]. Moreover, longer-term inflation expectations from TIPS changed little and remain contained, and household survey expectations dropped in November and early December.

*Real activity.* Real GDP growth in Q3 was revised upward to 4.3% (annual rate), well above Q2’s rate of 3.3%. Productivity growth in the quarter was 4.7%, pushing the four-quarter change back above 3%. This has reduced concern about a productivity slowdown and has increased the likelihood that productivity growth will remain strong. Some consumption indicators were rather soft during the inter-meeting period, but business spending and production indicators were fairly robust.

Consumption looks to be rather soft in Q4, primarily because auto sales have been weak in a payback from the incentive-induced surge of the summer. Auto sales were under 15 million units (annual rate) in October and rebounded only modestly in November, putting sales in Q4 well under the pace of nearly 18 million in Q3. In contrast, retail sales excluding autos were strong in October and data from MasterCard suggest they remained so in November (taking into account the decline in gasoline prices). Growth in real services consumption was weak in October, partly reflecting weaker electricity consumption induced by higher prices and the weather. Overall, these indicators suggest

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that real PCE growth may be only about 1% (annual rate) in Q4, but that such a slowdown should be temporary.

There have been scattered signs of moderation in the housing market—declines in housing starts and existing home sales in October as well as some moderation in mortgage applications. Still, the levels of these data are quite high and new home sales rose to a new record. Also, home prices remain robust, with the four-quarter change in the OFHEO index still at a double-digit level. The overall impression of the data is that the housing market remains quite strong.

Business spending indicators generally were strong. Shipments of nondefense capital goods excluding aircraft rose in October to a level that was 2.2% above their Q3 average; orders for these goods indicate good near-term momentum. Manufacturing inventories rose in October more than they did in all of Q3, although the inventories-shipments ratio remained low. The wholesale inventories-sales ratio also remained low. This is consistent with a positive contribution from inventory investment in Q4, in contrast to the -0.44 percentage point contribution in Q3. Manufacturing production rose briskly in October, in part because of a rebound from the effects of the hurricanes and Boeing strike. Production growth in the IT sector was robust, consistent with the faster growth in our Tech Pulse index.

*Labor market.* Payroll employment rebounded in November, rising 215,000, after small changes in September and October following the hurricanes. The November gains were broad-based, with the employment diffusion index increasing to over 60. However, the aggregate hours index fell slightly, and the October-November average was only slightly above the Q3 average. The unemployment rate in November was 5.0%, the same as it was in October. The labor force participation rate also was unchanged in November at 66.1%, while the employment-population ratio fell slightly. Initial claims for unemployment insurance returned to their pre-Katrina levels, and continuing claims were only slightly above such levels.

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Wage and compensation data were mixed. Growth in average hourly earnings rose in the last couple of months, with the 12-month change at 3.2%, the highest it has been since early 2003. In contrast, compensation growth from the productivity and costs release was revised downward in Q2 and Q3, and the four-quarter change in Q3 was 5.0% compared to over 6% in Q1. With strong productivity growth, unit labor costs declined in Q2 and Q3, suggesting somewhat reduced labor cost pressures for firms.

*Surveys.* Consumer confidence indicators rebounded sharply in November and early December from their low levels in the previous two months. Lower energy prices probably were a significant factor. The rebound reduced worries that greater uncertainty and higher energy prices may lead to weaker consumer spending. Business survey indicators continued to hold up well. The ISM manufacturing and non-manufacturing indices, the Empire State Index, and the Philadelphia Fed Index were at levels in November consistent with vigorous growth. The prices paid index associated with each of these surveys generally declined some in November, but remain at elevated levels, indicating continued input cost pressures on firms.

## **Global**

Growth in Q3 was surprisingly strong in many major countries, with notable strength in the euro area, Korea, Taiwan, and Mexico. The Q3 GDP data increased our projection for growth in the major foreign economies to 2.9 percent (Q4/Q4) in 2005 from the previous forecast of 2.6 percent. Growth is expected to ease to 2.5 percent in 2006, with slowdowns in Japan, China, and Mexico.

*Industrial Countries.* The euro area economy grew 2.6 percent (saar) in Q3, with investment spending and exports both up significantly. Somewhat surprisingly, consumer spending was relatively strong after little growth in the first half of the year. The indicators point to a solid GDP performance in Q4. In particular, orders and exports in the euro area were both up in September, while the available October data for German

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orders and production were encouraging. Industrial confidence in November was unchanged from October, keeping it above its long-run average.

Real GDP in Japan grew 1.0 percent (saar) in Q3. This was a significant slowdown from the pace of the first half of 2005, which was accentuated by a large drag from inventories. The fourth quarter started well, with industrial production, exports, and consumption all increasing smartly in October. Food prices brought the consumer price index down 0.7 percent over the year in October. This decline makes up for a surge in food prices last year. The price index excluding food was unchanged from its year-ago level.

*Emerging Economies.* GDP growth in China was again quite strong in Q3 and October data for investment spending, retail sales and exports point to similar growth of near 9.0 percent in Q4. Only industrial production appears to have softened a bit over the past two months, albeit from a high level. Loan growth has been accelerating. The forecast is for growth to slow next year to 8.5 percent (Q4/Q4) from 9.2 percent in 2005. Growth in Q3 was very strong across the rest of emerging Asia, with both Korea and Taiwan growing near 7.0 percent (annual rate). The strong Q3 performances across the region were characterized by solid private consumption and robust export growth.

Mexico and Argentina had stronger-than-expected performances in Q3, leading to an upward revision of their growth forecasts. Moving in the opposite direction, output contracted sharply in Brazil, as tight monetary conditions and political uncertainty weakened investment spending.

### **Trade**

The U.S. trade deficit broke its string of fairly steady readings in 2005 as the deficit jumped to \$66.1 billion in September from \$59.3 billion in August. The increase was due to a \$3.0 billion fall in exports, a \$3.0 billion rise in non-oil imports, and a \$1.5 billion rise in oil imports caused by another upsurge in oil prices.



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The U.S. trade deficit had been remarkably flat for most of 2005, in large part because demand for non-oil imports was surprisingly soft relative to the overall strength of the U.S. economy. Imports finally picked up in September and are expected to be relatively strong going forward.

The net export component is expected to take 0.7 percentage point and 0.4 percentage point off GDP growth in 2005Q4 and 2006Q1 respectively. The large drag for Q4 is due to an expected rebound of non-oil imports suggested by the September surge.

Over the four quarters of 2006, the assumption of strong U.S. domestic demand growth leads to a forecast of net exports taking roughly 0.5 percentage point off GDP growth.

## **Financial**

### *Domestic markets*

TIPS implied inflation at the two-year horizon decreased from 2.97% on October 31<sup>st</sup> to 2.25%, while at the 5-year horizon it declined from 2.66% to 2.36% [Exhibit B-1]. Most of these declines can be attributed to the carry effect: the carry-adjusted decline was only from 2.86% to 2.78% for the two-year horizon and from 2.62% to 2.57% for the five-year horizon [Exhibit B-1].

Since the last FOMC meeting, the nominal yield curve has been flat on average in the 2- to 5-year range and the term spread between 3-month and 10-year Treasuries continued to decline [Exhibit B-3]. The flat 2- to 5-year yield curve reflects an upward sloping real yield curve combined with a downward sloping expected future inflation curve. A negative 3-month/10-year spread cannot be ruled out over next year, but such a development depends upon how longer rates will respond to a further tightening of monetary policy. The box, *Recent Yield Curve Developments*, discusses the sources and implications of changes in the yield curve in more detail.

The implied Eurodollar Fed Funds futures curve is inverted after June 2006, and the slope of this inversion has increased slightly since October 31<sup>st</sup> [Exhibit B-4]. This

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development is consistent with the primary dealer survey that reports an increase in their subjective probability of a cut in the Fed Funds target during the second half of 2006, as well as with the modest increase in implied volatility at the six month horizon [Exhibit B-6]. In contrast, the average implied Eurodollar skewness increased from -2.81% in the week before the last FOMC meeting to -2.58% [Exhibit B-5], indicating that the market slightly increased its assessment of the likelihood of a positive rate surprise relative to a negative rate surprise.

Implied volatilities in equities and Treasuries continue to be at historically low levels. The 10-year Treasury implied volatility is currently at 4.75%, down from 5.21% on October 31, while the S&P 500 implied volatility is currently at 11.52%, down from 12.14% on October 31. These low levels of implied volatilities suggest low risk premia. The persistently low levels of credit spreads and high equity valuation ratios corroborate this interpretation. The S&P 500 price-earnings ratio is currently at 18, which is above its long-run (since 1946) historical average of 16 (the average of the price-earnings ratio from 1946 – 1996 of 14 was even lower).

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# Special Topic

## Recent Yield Curve Developments

December 8<sup>th</sup>, 2005  
Tobias Adrian Redacted

Since the last FOMC meeting, the nominal yield curve has been flat in the 2-year to 5-year range [Exhibit B-3]. The source of changes in this slope can be divided into: (1) differences in inflation expectations at the 2- to 5-year horizon; (2) the evolution of expected future real short rates; and (3) differences in the term premium at the 2- and 5-year horizons.

Carry-adjusted implied inflation from TIPS provides a gauge of differences in the inflation expectations. It slopes down, implying that the real 2-year to 5-year yield curve is positively sloped. The 5-year minus the 2-year implied inflation spread averaged -1 basis point in 2004Q3-2005Q1, -12 basis points in 2005Q2, -18 basis points in 2005Q3, and -28 basis points in 2005Q4 thus far.

This decline in the 2-year / 5-year implied inflation spread reflects that 2-year implied inflation increased 35 basis points since June 2004, while that at the 5-year horizon only increased 6 basis points. In comparison, the nominal yield spread was 117 basis points in June 2004 versus -1 basis point today. The real 5-year minus 2-year spread was thus 118 basis points in June 2004 and is 27 basis points today. The flattening of the nominal 2-year / 5-year spread since the beginning of the tightening cycle thus can be attributed mainly to a flattening of the real yield curve (of 91 basis points) as the 2-year / 5-year slope of implied inflation decreased 27 basis points.

In terms of levels, the flatness of the 2-year / 5-year nominal spread masks an underlying real spread that is upward sloping and an expectation of a decline in inflation at the 2- to 5-year horizon of the order of about ¼% at an annual rate.

The ten-year / three-month Treasury spread is currently at 55 basis points, down from 72 basis points on October 31. The average yield spread was 57 basis points in November, down from an average of 96 basis points in June 2005 and 345 basis points in June 2004. The 12-month ahead recession probability (as of November 2005) implied by the methodology of Estrella and Mishkin is around 18%, up from around 10% in June 2004. The future evolution of the ten-year / three-month spread is difficult to predict, as shocks to the spread are very persistent. However, conventional forecasts tend to miss business cycle turning points (and thus turning points in the spread). Therefore, it is difficult to say whether the downward trend in the spread that has started at the beginning of the tightening cycle of the Federal Funds target rate in June 2004 will continue into next year. If we examine models of the yield spread and construct a 95% confidence interval of the forecasts over a 6-12 month horizon, then the interval would include values associating with an inversion of the ten-year / three-month spread.

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*Monetary Policy and Global Bond Markets*

Global financial developments were benign during the inter-meeting period, reflecting positive news on growth in the Americas, Europe and Asia, and more stable energy prices, after the previous turbulent period. Monetary tightening in North America and Europe was widely expected, resulting in stable long-term yields and buoyant stock markets.

In early December, the European Central Bank moved for the first time in 2½ years, hiking its key refinancing rate 25 basis points to 2.25 percent. The move was widely anticipated and another rate increase is seen as unlikely before March 2006. This thus caused the yield curve to flatten. The Bank of Canada also tightened on December 6 – its third consecutive 25 basis points rate hike – as the economy is running close to full capacity behind solid performance of markets for natural resources. Ten-year rates have increased 35 basis points since the Bank set off its tightening cycle in October.

In Japan, tensions were exposed between the central bank and the government during the inter-meeting period. While the Bank of Japan favors front-loaded abandonment of its quantitative easing stance, the government favors postponing changes in policy until deflation is firmly out of sight. In any event, market participants expect that the period of zero-interest-rates may last longer than previously anticipated. This has helped to contain the rise in longer-term yields and also has weighed upon the yen, despite growing evidence of economic strength.

Monetary aggregates continue to grow faster than officially projected in China. Exceptions to the global trend in rising policy rates are found in Mexico and Brazil, where easing continues. Appetite for emerging markets bonds remained strong, despite some adverse news from Brazil and Argentina, with stripped yields in the EMBI+ index hovering around multi-year lows.

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The market for inflation-indexed bonds continued to grow (estimates put it at US\$784 billion in September 2005, up from US\$682 billion in December 2004 and US\$268 billion in December 2000). Breakeven rates implied in 10-year inflation-indexed bonds have fallen since September-October, but are still 4 basis points higher than pre-Katrina levels for UK and euro area bonds, and 15 points higher for Japanese bonds.

### *Equity Markets*

Buoyed by stable long-term interest rates and favorable news on activity, global stock markets surged in the inter-meeting period. Gains were particularly robust in Japan (more than 10 percent) and solid elsewhere (European indices rose 3 to 6 percent), partly reflecting the likely contribution to regional growth of weaker local currencies. Indeed, shares of export-oriented Japanese companies posted especially strong gains.

### *Exchange Rates and Capital Flows*

Capital continued to flow smoothly from virtually all regions to the United States, with a persistent key role for inflows from oil-producing countries, China, and other Asian economies. On major development of the inter-meeting period was the continued weakness of the yen, as the policy of quantitative easing – and expectations that the Bank of Japan will keep an accommodative stance for longer than previously expected – is biting on the value of the currency. Over the past year, the yen has lost 15 percent of its value against the dollar, and 3.5 percent since November 1 alone.

Other currencies were mixed relative to the dollar since the last FOMC meeting. The euro lost 2.0 percent, and now is 10 percent below its end-2004 peak. Euro weakness is likely to persist in the immediate future, reflecting widening interest rate spreads between the United States and the euro area. Latin American and Asian currencies were mixed: the Korean won and Singapore and Taiwan dollars appreciated versus the US dollar, and the Indian rupee depreciated 3 percent over the period. The Chinese RMB appreciated slightly against the dollar, as the People's Bank of China continued to take baby steps

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towards a market-oriented stance, including its first FX swap transaction – a \$6 billion 12-month deal – at end-November. Currencies of resource-oriented economies – such as Canada and Chile – continued to appreciate. The overall result was a modest appreciation (less than one percent) of the dollar in effective terms since November 1.

### *Oil Market Developments*

Oil prices stabilized around pre-Katrina levels of \$59-\$60/barrel, well below their August 30 peak of \$69.8/barrel, with futures prices following suit. In 2006, global oil demand is projected to rise marginally above its 2005 levels. Barring further disruptions in oil supply, U.S. production is projected to recover, and significant increases are expected from African producers. The current forecast is for oil prices to remain stable: the level projected for 2006Q4, based on current futures prices, is \$60.50.

### **Second District**

Our Indexes of Coincident Economic Indicators for October indicate steady and moderate economic growth in New York and New Jersey, but a pause in growth in New York City [Exhibit E-1]. Looking ahead to the next nine months, our leading indexes predict sluggish growth: economic activity is projected to grow roughly at a 2% annual rate in New Jersey and a less than 1% rate in both New York State and New York City [Exhibit E-2]. A moderate deceleration in energy prices led to a slight decline in local-area inflation in October—metropolitan New York City's Consumer Price Index (CPI) rose 4.5% from a year earlier, about the same as for the U.S. and down from 4.8% in September. However, the core CPI accelerated slightly: the 12-month change was 2.7% versus 2.1% nationally.

*Labor Markets.* The region's job market gave mixed signals in October. Based on the establishment survey, private-sector employment declined at a roughly 1% annual rate in both New York and New Jersey, and fell more sharply in New York City. However, this follows brisk back-to-back gains in August and September, and employment levels in the

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region remain 1-2% above those of a year ago [Exhibit E-3]. At the same time, based on the household survey, unemployment retreated by roughly ½ percentage point in all three areas following a spike in September. While the prior month's rise in unemployment reflected higher labor force participation [as opposed to underlying weakness in employment], October's improvement did not reflect a pullback in participation but rather underlying strength in employment. Thus, in October, employment-population ratios in both New York and New Jersey climbed to their highest levels in more than five years [Exhibit E-4].

*Real Estate.* Construction activity in New York and New Jersey retreated in October, hampered by unusually wet weather across much of the region. Compared to a year ago, multi-family housing permits were down almost 10%—though the current level is still quite high—while single-family permits were up marginally. Home prices continued to run well ahead of a year earlier in the third quarter, based on repeat-sales indexes: prices were up 13-15% in New Jersey, downstate New York and the Albany area but increased a more modest 5-8% across most of upstate New York.

*Surveys and Other Business Activity.* Recent surveys of consumers and businesses suggest a general improvement in economic conditions. Consumer confidence, which had fallen sharply in the wake of Katrina, rebounded in October and November, based on regional surveys by the Conference Board and Siena College; both surveys show confidence in this region rising to its highest level since July.

Similarly, preliminary returns from our December Empire State Manufacturing Survey suggest some further acceleration in manufacturing activity. The general business conditions diffusion index rose to a 12-month high, and expectations remained markedly positive and little changed from November. These manufacturers continue to report widespread increases in input prices and, to a lesser extent, selling prices. Further widespread increases are expected over the next six months.

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### 3. Outlook

#### FRBNY's Central Forecast

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

1. Inflation expectations are well-contained despite the recent higher level of overall inflation.
2. There is little if any slack remaining in resource utilization. Therefore, if there are no large shocks, future growth will be near its potential rate of approximately 3¼-3½% (2¼-2½% long-run productivity growth plus 1% labor force growth).
3. Long-term interest rates will remain relatively low.

*Inflation.* Although energy prices were lower during the inter-meeting period, the moderation in overall inflation has been modest so far. Therefore, our short-term forecast for overall PCE inflation is now just over 3%. We still expect this impetus to be temporary and for overall inflation to return to around 2% in 2006 and 2007. We also expect that in an environment of flexible labor and product markets as well as continued FOMC credibility the feed-through of energy prices into prices of other goods and services will be modest. However, some of the factors that held down Q3 core inflation (e.g., auto incentives) are likely to reverse in Q4. Consequently, we expect core PCE inflation to be around 2% in 2006, near where it was in the first half of 2005. In 2007, a slow moderation begins as FOMC credibility and monetary tightening effects begin to take hold, causing core PCE inflation to decline slowly as it returns gradually toward the implicit target.

*Real Activity.* Our forecast has changed little, as the aggregate economy has shown little effect so far from the hurricanes and higher energy prices. We continue to expect real growth over the near- to medium-term to be around our estimate for the potential growth rate (about 3¼-3½%). Rebuilding from the storms (including higher government outlays) may lead to slightly higher growth in the first half of 2006, which may be mitigated by the possible delayed effects from higher energy prices on consumer spending as well as



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some retrenchment in housing. The fading of the positive factors suggest somewhat slower growth in the second half of 2006. In 2007, with long-term rates remaining low, we expect growth to be near potential. With real growth around potential over the forecast horizon, we expect the unemployment rate to remain near 5%.

### **Comparison with Greenbook Forecasts**

*GDP and Inflation Forecast.* The Greenbook (GB) outlook has changed in a number of ways since October:

- The assessment of overall inflation is lower for '05, higher for '06 and unchanged for '07.
- The entire profile for the core PCE deflator has shifted down through the end of '07.
- The outlook for real GDP growth has shifted up over the forecast horizon, as has the profile for structural labor productivity and actual productivity.
- Potential GDP was increased for '06 and '07, but not for '05.
- Private payroll projections have been reduced markedly since the last GB, while the outlook for the unemployment rate and participation are essentially unchanged.

There are two (related) aspects of the changes in the GB outlook that bear further mention. The first is that higher structural labor productivity in '05, '06 and '07 only translates into increased potential output growth in '06 and '07. The second is that taken at face value, the assumption of slower employment growth with unchanged unemployment and participation rates would seem to violate the accounting identity that exists between these three variables. These features of the change in the GB outlook are related to the behavior of a “technical factor” used to adjust for the fact payroll survey measures of employment have been consistently weaker than household measures in recent years.<sup>1</sup> Past GBs effectively have resolved this discrepancy in favor of the household survey, essentially taking productivity and potential output as given and

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<sup>1</sup> Footnote 3 on pg I-10 reads: ...this technical factor reconciles the fact that the labor input is measured primarily from the household survey while productivity is measured primarily using hours information

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boosting the private payrolls projection. With the upward adjustment to structural productivity growth over the forecast horizon undertaken in this GB, there was a corresponding one-time *downward* adjustment to the size of this technical factor in '05--essentially allowing higher productivity to translate into lower "trend" payroll growth rather than higher potential output growth in that year. Also, the GB makes the additional assumption that the technical factor will remain small in the future because the discrepancy between the two surveys will diminish or disappear. The behavior of this technical factor, then, explains why potential doesn't rise in '05 in the GB, and how it is possible to project significantly lower employment growth without projecting higher unemployment or lower participation.

The Oct GB had higher core inflation and lower overall inflation in '06 relative to our outlook, with the differences being driven by the assumptions for the path of oil prices, the degree of pass-through from energy to core and the amount of other price pressures. The Oct GB had energy prices rising sharply through early '06 and then falling back to lower levels for the rest of '06 and '07, and also assumed more pass-through from high oil prices early on and greater non-oil cost pressures from factors such as unit labor costs. The adjustment to the GB inflation forecast has moved it closer to ours. Our views on real GDP growth—steady growth near potential—are unchanged from the last BB. The GB has raised its growth profile relative to the October outlook, but still sees relatively robust growth in '06 and relatively slow growth in '07. The factors slowing the economy by the end of the forecast horizon in the GB are the tighter stance of monetary policy, the waning fiscal stimulus and the waning stimulus to spending from household wealth.

Despite raising its assessment of output per hour, the GB view is still below ours for '06 and '07. Also, there is not a marked change in the GB view that growth in compensation per hour and unit labor costs will remain strong, and with our stronger productivity assessment and accompanying forecast that sees considerably less growth in unit labor

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derived from the payroll survey.

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costs in particular. The GB holds the unemployment rate at 5.0% throughout the forecast period, while our forecast is 4.9% in '06 and '07.

*Alternative Board Scenarios.* The scenarios in this GB focus on possibilities ranging from a considerable housing slump accompanied by a substantial increase in the personal saving rate, to the upside risk to real activity from productivity growth. The two housing scenarios (1 and 2) generate the weakest paths for real output growth and the unemployment rate. These scenarios seem the most compelling from the perspective of telling an economic story about what could go wrong in the outlook, but it is difficult to attach any probability to these scenarios or to feel confident in the estimates of parameters such as the wealth effect embedded in them. The only scenario that generates significant inflation is the one in which inflation expectations rise more than the baseline. Consistent with the fact that inflation moves slowly in the Board's model, the stronger aggregate demand scenario generates a remarkably similar profile for inflation to that generated by the stronger aggregate supply scenario.

*Scenario 1: Housing slump*

This scenario assumes that the cumulative decline in house prices over the forecast period is 20% larger than what is assumed in the baseline.

*Scenarios 2: Housing slump with greater fallout*

This scenario assumes the same decline in house prices as in *scenario 1*, but also assumes that these declines precipitate an increase in the saving rate that is twice as large as in the baseline model.

*Scenario 3: Stronger aggregate demand*

This scenario assumes a higher neutral level of the ff rate and a smaller increase in the saving rate than is assumed in the baseline.

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*Scenario 4: Faster productivity growth*

This scenario assumes that aggregate spending could be stronger than the baseline because underlying growth in potential is stronger.

*Scenario 5: Deteriorating inflation expectations*

In this scenario, long-run inflation expectations move up about 1 percentage point relative to the baseline over the course of 2006 (because of higher energy prices and other costs).

*Scenario 5: Less inflationary pressure*

This scenario assumes slower compensation growth than in the baseline, and no increase in long-run inflation expectations (the baseline assumption is for ½ percentage point increase in long-run inflation expectations since 2004).

*Foreign Outlook.* There are only modest differences between our forecast and the Board's. In Q4, both anticipate broad-based slowdowns in foreign growth, with the notable exception of China, which is expected to keep growing at a rapid pace. For 2006, the notable difference is that the Board sees more of deceleration in China's growth, while we take the recent data to indicate the economy will start next year with a fair amount of momentum. Another difference is that we are more concerned about the impact of political instability in Mexico on investment spending, and, as a consequence, are less optimistic about Mexican growth in 2006.

*U.S. Trade.* Our trade forecast is very similar to the Board's. We both see net exports taking 0.7 percentage point off GDP growth in Q4 and 0.4 percentage point off growth in 2006Q1. We both expect a resurgence in the demand for imported goods. For 2006, both forecasts expect roughly the same 0.5 percentage point drag on GDP growth (Q4/Q4) from net exports. The Board has a significantly more volatile quarterly pattern, in large part due to their efforts to capture the history of wild swings in oil imports. We are less confident in our ability to track the quarterly pattern of oil imports and, as a consequence, projected a smoother path.

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## Alternative Scenarios and Risks

*Alternative 1: Global Deflation.* The scenario is related to changes in the world economy, particularly the growth of the Chinese economy and the stagnation of the economies of Europe and Japan. The growth of the Chinese economy represents a shift in the aggregate supply curve, leading to higher growth and lower inflation in the US. On the other hand, the stagnation of the European and Japanese economies represent a shift in the aggregate demand curve, leading to lower inflation and lower growth in the US. The net effect of these shifts has been unambiguous in terms of lowering inflation and lowering long-term yields. These developments have been supportive of recent growth in the US. However, the downside risk in this scenario comes from an abrupt slowdown in Chinese growth without a compensating increase in Europe or Japan, thereby generating a bad deflationary shock to the world economy. While recent reported improvements in Chinese economic performance have slightly lowered the probability of this scenario, the inadequacies of national income accounts in China argue for the need to follow more indirect indicators such as core goods prices and world interest rates. The evidence from these two indicators is mixed with core goods prices weak but world interest rates increasing during the inter-meeting period.

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

### *2a. Productivity Boom*

The developments in the labor market and continued strength of labor productivity over the longer term—despite the recent short-term moderation—suggest that firms have become more efficient in using labor. As such, strong productivity growth could persist. This would imply that the potential growth rate is higher than our current estimates. Strong productivity growth would also limit labor cost pressures, and inflation thus would remain subdued. For most of the past year the incoming data had been less supportive of this scenario, but recent data have been much more supportive. Further

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support is evident from the continued strength in IT industrial production growth, the FRBNY Tech pulse index as well as the upside risk to equipment and software expenditure. In addition, the increase in real rates over the last year is supportive of this scenario.

### *2.b Productivity Slump*

It is possible that the source of the recent upswing in productivity is temporary. Further, the persistent increase in the level and volatility of energy prices and reallocation of resources produced by recent natural disasters in the US also could be associated with lower labor productivity growth. The high productivity growth rate in Q3 and high projection for 2005Q4 has lowered the probability of this scenario.

*Alternative 3: Overheating.* The extremely accommodative policy followed in the US and other countries since the global slowdown of 2000-2003 may produce a persistent move in inflation above implicit targets with an abrupt slowdown in real output growth starting in early 2006. There are two potential connected channels at work here. The first is a continued underestimate of the equilibrium real rate (i.e., an overestimate of slack in the economy) and the second is higher energy prices. Sustaining the real policy rate below the equilibrium rate for a long time will tend to switch the impact of monetary policy from increasing real output to raising inflation due to an increase in inflation expectations. The evidence from core inflation reports recently has not been supportive of this viewpoint, although total inflation has been very high because of energy price increases. TIPS implied inflation rates give no indication that markets are pricing in a large increase in underlying inflation, and the UIG also does not indicate a large increase. Further, household inflation expectations have come back down with the decrease in retail gasoline prices and there is some evidence of an ordered cooling off in the housing market. Thus, we have lowered the weight on this scenario. However, it is possible that some of the cooling off in total consumption expenditure will turn out to be more than just weather and auto incentive related. If so, then this scenario will receive more weight going forward.

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*Alternative 4: Hurricane.* This scenario has been eliminated.

*Additional Uncertainties*

*Foreign Outlook.* Worries that oil prices would depress global growth lessened considerably with the recent string of favorable Q3 GDP data for the major foreign economies. The risk, though, cannot be dismissed entirely. Of particular interest will be the impact of high heating bills on consumer spending during the holiday season. This may prove critical for the euro area outlook, which projects the relatively strong consumer spending in Q3 continuing in Q4 and into 2006. The downside risk is that the false starts in recent years may be repeated. The landslide victory of Prime Minister Koizumi in the September 11<sup>th</sup> election bodes well for future reforms of the Japanese economy. However, the possibility remains that a premature fiscal tightening could derail the expansion. In addition, economic prospects are not helped by the Bank of Japan recent comments suggesting it may end its policy of quantitative easing sooner than had been expected.

The market appears increasingly comfortable with China's new currency regime, and now expects only modest further appreciation over the next year. However, the Chinese authorities' marked preference for gradualism raises the risk that future currency moves will be too small to forestall trade tensions with major partners. As a result, the current quiet environment could give way to potentially destabilizing currency speculation.

The July 2006 election in Mexico will be closely contested and will likely be followed by a period of uncertainty until the new government takes office in December 2006. In Brazil, corruption allegations may continue to be a source of market concern in the lead-up to the 2006 presidential election, and disappointing output data may result in increased criticism of the economic team. In Argentina, inflation remains a key concern. President Kirchner's dismissal of Economy Minister Lavagna makes it clear the government will continue to use to price controls and other unorthodox measures to stem inflation rather than tighter monetary policy or a stronger peso.

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*U.S. Trade Forecast.* A key uncertainty is how the recent appreciation of the dollar will affect the trade balance. In particular, the rise against the yen and, to a lesser extent, the euro, can have a larger-than-expected effect by pricing out U.S. firms in foreign markets where they compete with Japanese and European firms. Another risk concerns uncertainty about oil imports. Oil-import volumes are projected to increase by 2 percent in 2006, lower than the 4 percent average increase since 2000. The forecast assumes that U.S. production picks up as repairs to damage caused by hurricanes are completed and that there is some modest demand response to the doubling of oil prices since the beginning of 2004.

*Quantifying the Risks.* The incoming data continue to be consistent with our central scenario. Therefore, we are raising the current probability assessment of the central scenario to 68% (it was 67% for the November FOMC). We are changing the balance of risks by placing less weight on the productivity slump, overheating scenario and more weight on the productivity boom. **The combination of these changes produces less downside risk to the output forecast in 2006 and 2007, less upside risk to inflation and a lower probability of exceeding implicit target ranges. [see Exhibit C-4].**

We assume that the most likely alternative scenario is the productivity surge at 12% (8% in November), followed by the productivity slowdown at 8% (10% in November), then overheating at 6% (8% in November), and finally global deflation at 3% (4% in November). The remaining 3% (3%) 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 these risk assessments are shown in Exhibits C-4 and C-5. The Bank forecast has been extended through the end of 2008 under the assumption that output grows at the potential rate of 3.3% and inflation converges back to the implicit inflation target of 1.5%. The increased weight on the productivity boom scenario and recent benign readings on core inflation lower the probability of core PCE inflation exceeding 2.5% by the end of 2008 to 50% (63% in November) (this probability is produced by considering the share of inflation



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paths that exceed 2.5% and cannot be obtained directly from the forecast distribution presented in Exhibit C-4). The probability that the expansion continues through the end of 2008 is unchanged at 95%. The FRBNY “confidence intervals” are very similar to those presented in the Greenbook for 2005. There are differences in 2006 and 2007. In general we have a similar level of confidence in our output forecast but less confidence in the inflation forecast. For example, in 2007 the Greenbook has a 70% probability interval of 0.9% to 2.7% for core PCE inflation and our interval is 0.3% to 3.5%.

#### 4. Policy Alternatives

There is no substantive argument against increasing the funds rate another 25 basic points at the upcoming meeting. The crucial issue is deciding upon the appropriate stopping point, and the appropriate signal to convey about the Committee’s thinking about the subject. The February succession further complicates this issue, given uncertainty about potential differences between the Greenspan- and Bernanke-led Feds.

As indicated in the November minutes, at this juncture and in light of the extent of the previous increases in the FFR as well as the nearness of current short-term rates to long-term interest rates, it is appropriate that policy decisions become increasingly driven by the underlying flow of the data and its affect on the forecast. The recent numbers have altered our assessment of the underlying risks. Spending and production indicators remain firm despite the disruption caused by the hurricanes; further, price data excluding food and energy have tended to be below expectations. The source of this encouraging set of data appears to be strong productivity growth. Taken together, the evidence suggests that potential growth and possibly the degree of slack in the economy may be a bit higher than had been assumed.

Higher trend growth increases the neutral real policy rate. The implications for current policy rates and the neutral nominal policy rate are less clear. Financial markets are providing strong indications that the level of nominal FFR in the late 1990s is not appropriate in the current situation. Moreover, a FFR at or above 4.75% would produce a

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yield curve inversion at the current moment. On balance, it looks desirable that the policy signal now becomes a bit softer, not only in the direction of continuing to be more data-dependent, but also more cognizant of the dual mandate.

1. *Dove (Previously called Raise and Wait, modestly below market expectations)*. Increase 25 bp in December with a data dependent signal noting moderation of inflationary pressures and strength of productivity growth.
2. *Dual (Previously called Continued Measured Firming, at to above market expectations)*. Increase 25 bp in December with a clear signal that January will see another increase and a high likelihood of an increase in March.
3. *Inflation Hawk (modestly above market expectations)*. Increase 25 bp with a signal of less sensitivity to the activity data and emphasis on reducing core inflation to (implicit or, perhaps, explicit) targets on a sustained basis (for instance, in that regard the two-year growth rate in the core PCE has been at or near 2% all this year, despite the recent low monthly numbers).

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

Exhibit D-1 contains the results of averaging the prescription of these three rules over the Bank forecast. It shows the implied (quarterly average path) of FFR through the end of 2006 compared to that currently priced into markets.

Both the *inflation hawk* and *dual* rules produce a higher level for the FFR at the end of 2006 than presently is priced into financial markets. Further, the gap between the market expectation and the expected values prescribed by these two rules is larger than in November using the metrics introduced in the September Blackbook as shown in Exhibit D-6.

Exhibit D-5 shows there is a high probability that 4.75% represents a ceiling for the FFR under the *Dual* rule, and that the *Dove* rule puts some weight on rate cuts in 2006H1.

There continues to be some positive skewness in the distribution of FFR implied by our rules (that is, the expected value is above the median as can be seen in the Exhibits D-5 and D-6). There is no evidence that such positive skewness is priced into markets [see

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Exhibit B-5], but the positive skewness is consistent with Fed commentary concerning risks to price stability.

If we focus on the signal that appears to be most consistent with market expectations for the next two meetings, *dual*, then the alternative scenario of global deflation continues to have very different implications for policy in 2006 and 2007. Exhibit D-2 contains the path of the nominal FFR and Exhibit D-3 contains the path of the real FFR for our four main alternative scenarios.

As seen in Exhibit D-2, the projected path of the FFR is much higher under the overheating scenario in 2006 than in either our central projection or the market-implied path. The path of the FFR under the global deflation scenario is very different, even in the short-run, from the other paths as the Fed reacts quickly to signs of deflationary pressures. It should be noted that the simulation assumes the Fed recognizes immediately that the global deflation scenario is occurring. It is also worth noting that the output implications of the productivity boom are very similar in the short-run to overheating, but that the policy responses in late 2006 and in 2007 are very different. These scenarios are distinguished by differential effects on inflation and also by examining the composition of output growth. [see Exhibits C-2 and C-3].

Exhibit D-4 shows the result of running our standard policy rule (setting the initial FFR at its value in 2004Q4) with a 1.5% inflation target and with a 1.75% inflation target. The path derived from the 1.5% target closely follows the actual FFR increases in 2005 albeit with less steepness to its slope. The expected endpoint is lower than that from our three policy rules discussed above.

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## A. Forecast Details

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

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

*Source: MMS Function, FRBNY*

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

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

*Source: MMS Function, FRBNY; Board staff*

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

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

*Source: MMS Function, FRBNY*

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

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

*Source: MMS Function, FRBNY*

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

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

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

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

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

The three tables in this exhibit are included as reference: they show the actual changes in inflation over 1, 3, 6, 12, and 24 months.

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

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

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

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

#### **Exhibit A-8. Comparison of Alternative Measures of Trend Inflation**

These charts display widely used measures of trend inflation. The measures of CPI inflation include the core, the median, the trimmed mean (Cleveland Fed) and the UIG measure. The measures of PCE inflation are core and the trimmed mean (Dallas Fed).

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

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

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

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

## A. Forecast Details

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

	Chain Type															
	Real GDP			GDP Price Index			PCE Deflator			Core PCE			Unemployment Rate			
	Sep05	Oct05	Dec05	Sep05	Oct05	Dec05	Sep05	Oct05	Dec05	Sep05	Oct05	Dec05	Sep05	Oct05	Dec05	
2005 Q1	3.8	3.8	3.8	3.1	3.1	3.1	2.3	2.3	2.3	2.4	2.4	2.4	5.3	5.3	5.3	
2005 Q2	3.3	3.3	3.3	2.4	2.6	2.6	3.2	3.3	3.3	1.6	1.7	1.7	5.1	5.1	5.1	
2005 Q3	3.5	3.8	4.3	2.6	3.1	3.0	3.6	3.7	3.6	1.4	1.3	1.2	4.9	5.0	5.0	
2005 Q4	3.3	3.8	3.3	1.4	2.8	3.5	1.7	3.3	3.1	1.8	1.8	1.8	4.9	4.9	5.0	
2006 Q1	3.4	3.6	3.8	2.5	2.7	2.8	2.2	2.2	1.8	1.9	1.9	1.9	4.8	4.9	4.9	
2006 Q2	3.3	3.4	3.4	2.2	2.3	2.1	2.2	2.2	2.2	2.0	2.0	2.0	4.8	4.9	4.9	
2006 Q3	3.2	3.1	3.1	2.2	2.0	2.2	2.3	2.0	2.1	2.1	2.1	2.1	4.8	4.9	4.9	
2006 Q4	3.2	3.1	3.0	2.2	2.2	2.2	2.3	2.1	2.1	2.1	2.1	2.1	4.8	4.9	4.9	
2007 Q1	3.3	3.3	3.3	2.2	2.3	2.3	2.2	2.1	2.1	2.0	2.0	2.0	4.8	4.9	4.9	
2007 Q2	3.4	3.4	3.4	2.1	2.0	2.0	2.1	1.9	1.9	1.9	1.8	1.9	4.8	4.9	4.9	
2007 Q3	3.3	3.3	3.3	2.0	2.0	2.0	2.0	2.0	2.0	1.8	1.8	1.8	4.8	4.9	4.9	
2007 Q4	3.3	3.3	3.3	2.0	1.9	2.0	1.9	1.9	1.9	1.7	1.7	1.8	4.8	4.9	4.9	
2003 Q4 to 2004 Q4	3.8	3.8	3.8	2.9	2.9	2.9	3.1	3.1	3.1	2.2	2.2	2.2	-0.4	-0.4	-0.4	*
2004 Q4 to 2005 Q4	3.5	3.7	3.7	2.4	2.9	3.0	2.7	3.1	3.1	1.8	1.8	1.8	-0.5	-0.5	-0.4	*
2005 Q4 to 2006 Q4	3.3	3.3	3.3	2.3	2.3	2.3	2.2	2.1	2.1	2.0	2.0	2.0	-0.1	0.0	-0.1	*
2006 Q4 to 2007 Q4	3.3	3.3	3.3	2.1	2.0	2.1	2.0	2.0	2.0	1.8	1.8	1.9	0.0	0.0	0.0	

\* Q4 to Q4 absolute change

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

## A. Forecast Details

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

	FRBNY						Board					
	2005		2006		2007		2005		2006		2007	
	OCT	DEC	OCT	DEC	OCT	DEC	OCT	DEC	OCT	DEC	OCT	DEC
REAL GDP (Q4/Q4)	3.7	3.7	3.3	3.3	3.3	3.3	3.5	3.7	3.3	3.5	2.8	3.0
GROWTH CONTRIBUTIONS(Q4/Q4)												
FINAL SALES TO DOMESTIC PURCHASERS	3.9	3.8	3.6	3.7	3.6	3.6	3.5	3.7	3.7	3.8	3.0	3.3
CONSUMPTION	2.4	2.1	2.3	2.4	2.2	2.2	1.9	2.1	2.3	2.5	2.2	2.4
BFI	0.7	0.8	0.9	0.9	1.0	1.0	0.6	0.7	1.0	0.9	0.5	0.6
STRUCTURES	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.0	0.1
EQUIPMENT & SOFTWARE	0.7	0.8	0.8	0.8	0.8	0.8	0.5	0.6	0.7	0.6	0.5	0.5
RESIDENTIAL INVESTMENT	0.3	0.4	-0.1	-0.1	-0.1	-0.1	0.5	0.5	0.0	0.0	0.0	0.0
GOVERNMENT	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3
FEDERAL	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.0	0.0
STATE & LOCAL	0.2	0.2	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.3	0.3	0.3
INVENTORY INVESTMENT	-0.2	-0.1	0.2	0.2	0.1	0.1	-0.2	0.0	-0.1	-0.1	0.3	0.2
NET EXPORTS	0.0	-0.1	-0.5	-0.6	-0.4	-0.4	0.2	-0.1	-0.3	-0.3	-0.4	-0.5
INFLATION/PRODUCTIVITY/WAGES (Q4/Q4)												
GDP DEFLATOR	2.9	3.0	2.3	2.3	2.0	2.1	2.8	2.7	2.1	2.3	1.9	1.9
PCE	3.1	3.1	2.1	2.1	2.0	2.0	3.2	2.8	1.9	2.1	1.7	1.7
CORE PCE	1.8	1.8	2.0	2.0	1.8	1.9	1.9	1.8	2.3	2.1	1.9	1.8
COMPENSATION PER HOUR	4.8	4.1	4.6	4.6	4.5	4.5	4.4	3.6	5.3	5.3	5.0	5.1
OUTPUT PER HOUR	2.8	3.4	3.0	3.0	3.0	3.0	2.8	3.2	2.2	2.7	2.5	2.8
UNIT LABOR COSTS	2.0	0.7	1.6	1.6	1.5	1.5	1.5	0.4	2.9	2.5	2.4	2.3
EMPLOYMENT VARIABLES												
UNEMPLOYMENT RATE (Q4 LEVEL)	4.9	5.0	4.9	4.9	4.9	4.9	5.0	5.0	5.0	5.0	5.1	5.0
PARTICIPATION RATE (Q4 LEVEL)	66.2	66.1	66.2	66.2	66.2	66.2	66.2	66.1	66.0	66.0	65.8	65.8
NONFARM PAYROLL EMPLOYMENT (Q4/Q4 CHANGE)												
TOTAL, IN THOUSANDS	2074	1896	1431	1293	1340	1318	2100	2000	1900	1900	1100	1000
AVERAGE PER MONTH, IN THOUSANDS	173	158	119	108	112	110	175	167	158	158	92	83
FINANCIAL MARKET VARIABLES												
FED FUNDS RATE (PERCENT)	3.96	3.96	4.50	4.75	4.50	4.70	4.25	4.25	4.25	4.50	4.25	4.50
BAA BOND YIELD (PERCENT)	6.2	6.4	6.6	6.8	6.6	6.8	6.0	6.0	6.0	6.0	5.9	5.9
EFFECTIVE EXCHANGE RATE (Q4/Q4 % CHANGE)	-1.3	-0.6	-1.5	-1.6	N/A	N/A	-2.0	2.7	-2.1	-1.5	N/A	N/A



# A. Forecast Details

## Exhibit A-3: Judgment Table

													Q4/Q4 % CHANGE/Q4 LEVEL			
	2005:01	2005:02	2005:03	2005:04	2006:01	2006:02	2006:03	2006:04	2007:01	2007:02	2007:03	2007:04	2004	2005	2006	2007
<b>REAL GDP AND COMPONENTS (% Change, AR)</b>																
GDP.....	3.8	3.3	4.3	3.3	3.8	3.4	3.1	3.0	3.3	3.4	3.3	3.3	3.8	3.7	3.3	3.3
CHANGE IN INVENTORIES (GROWTH CONTRIBUTION) 1\.....	0.3	-2.1	-0.4	1.9	0.2	0.4	0.0	0.1	-0.1	0.2	0.2	0.1	0.2	-0.1	0.2	0.1
DOMESTIC PRIVATE PURCHASES.....	4.0	2.1	4.3	3.8	3.9	3.7	3.5	3.5	3.5	3.5	3.5	3.5	4.5	3.5	3.6	3.5
CONSUMPTION EXPENDITURES.....	3.5	3.4	4.3	1.1	3.5	3.4	3.4	3.3	3.2	3.2	3.2	3.2	3.8	3.0	3.4	3.2
BUSINESS FIXED INVESTMENT.....	5.7	8.8	8.7	8.3	8.5	8.5	8.5	8.5	8.7	8.8	8.8	8.8	10.9	7.9	8.5	8.8
RESIDENTIAL INVESTMENT.....	9.5	10.8	8.4	-1.5	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	6.6	6.7	-2.0	-2.0
NET EXPORTS (GROWTH CONTRIBUTION) 1\.....	-0.4	1.1	-0.3	-0.7	-0.4	-0.5	-0.6	-0.7	-0.4	-0.4	-0.4	-0.4	-0.9	-0.1	-0.6	-0.4
EXPORTS .....	7.5	10.7	0.8	13.4	7.8	5.0	6.2	5.6	6.6	6.6	6.6	6.6	6.1	8.0	6.2	6.6
IMPORTS .....	7.4	-0.2	2.1	13.3	7.6	6.4	7.7	8.1	6.5	6.5	6.5	6.5	10.6	5.5	7.4	6.5
FEDERAL GOVERNMENT.....	2.3	2.4	8.1	3.3	6.0	1.0	2.2	1.8	5.5	1.7	1.7	1.7	4.2	4.0	2.7	2.6
STATE & LOCAL GOVERNMENTS.....	1.6	2.6	0.4	2.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.9	1.7	3.0	3.0
<b>INTEREST RATE ASSUMPTIONS (%)</b>																
FEDERAL FUNDS RATE (TARGET).....	2.44	2.92	3.43	3.96	4.46	4.75	4.75	4.75	4.70	4.65	4.60	4.55	1.94	3.96	4.75	4.6
YIELD ON 10-YR GOVERNMENT.....	4.3	4.2	4.2	4.5	4.7	4.9	5.0	5.0	5.0	5.0	5.0	5.0	4.2	4.5	5.0	5.0
BAA BOND YIELD.....	6.0	6.0	6.0	6.4	6.5	6.7	6.7	6.8	6.8	6.8	6.8	6.8	6.2	6.4	6.8	6.8
<b>INCOME (% Change, AR)</b>																
PERSONAL INCOME.....	2.0	4.5	2.9	8.8	7.3	6.4	6.9	4.8	7.1	6.2	7.0	5.0	7.5	4.5	6.3	6.3
REAL PERSONAL DISPOSABLE INCOME.....	-3.4	0.2	-0.7	5.5	5.4	4.2	4.8	2.5	5.2	4.3	5.2	2.9	4.1	0.3	4.2	4.4
PERSONAL SAVING RATE (% OF DPI).....	0.5	-0.2	-1.5	-0.5	-0.1	0.1	0.4	0.1	0.4	0.6	1.0	0.8	1.7	-0.4	0.1	0.7
CORPORATE PROFITS BEFORE TAXES.....	24.5	19.7	-12.8	72.9	-3.6	2.2	1.6	0.6	-2.1	1.7	1.7	1.6	9.6	22.4	0.2	0.7
<b>PRICES &amp; PRODUCTIVITY (% Change, AR)</b>																
GDP IMPLICIT DEFLATOR.....	3.1	2.6	3.0	3.5	2.8	2.1	2.2	2.2	2.3	2.0	2.0	2.0	2.9	3.0	2.3	2.1
PERSONAL CONSUMPTION EXPENDITURES.....	2.3	3.3	3.6	3.1	1.8	2.2	2.1	2.1	2.1	1.9	2.0	1.9	3.1	3.1	2.1	2.0
CORE PERSONAL CONSUMPTION EXPENDITURES.....	2.4	1.7	1.2	1.8	1.9	2.0	2.1	2.1	2.0	1.9	1.8	1.8	2.2	1.8	2.0	1.9
CONSUMER PRICE INDEX.....	2.4	4.2	5.1	4.1	2.3	2.3	2.4	2.4	2.2	2.1	2.1	2.0	3.4	3.9	2.3	2.1
CORE CONSUMER PRICE INDEX.....	2.6	2.0	1.5	2.1	2.1	2.2	2.3	2.3	2.1	2.0	1.9	1.9	2.1	2.0	2.2	2.0
COMPENSATION PER HOUR (NONFARM BUSINESS).....	5.5	0.9	3.7	6.5	4.8	4.7	4.4	4.5	4.5	4.4	4.5	4.5	5.8	4.1	4.6	4.5
OUTPUT PER HOUR (NONFARM BUSINESS).....	3.2	2.1	4.7	3.6	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.6	3.4	3.0	3.0
UNIT LABOR COST (NONFARM BUSINESS).....	2.2	-1.3	-1.0	2.9	1.8	1.7	1.4	1.5	1.5	1.4	1.5	1.5	3.2	0.7	1.6	1.5
<b>REAL ACTIVITY</b>																
CAPACITY UTILIZATION (MANUFACTURING, %).....	78.7	78.6	78.5	78.9	79.5	80.1	80.3	80.5	80.7	80.8	81.0	81.1	77.1	78.7	80.1	80.9
CIVILIAN UNEMP RATE (%) 2\.....	5.3	5.1	5.0	5.0	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	5.4	5.0	4.9	4.9
PRIVATE HOUSING STARTS (THOUS, AR).....	2083	2044	2092	2020	1985	1940	1925	1910	1905	1900	1895	1880	1950	2060	1940	1895
LIGHT VEHICLE SALES (MILS, AR) 3\.....	16.5	17.2	17.9	15.7	16.9	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.8	17.0	17.0
FEDERAL SURPLUS/DEFICIT (Unified Basis, Bil\$, NSA) 4\.....	-176.6	45.2	-69.2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	-412.1	-318.6	-348.3	-281.4

NOTE: All series other than interest rates and the federal deficit are seasonally adjusted. Italics indicates a reported value. 1\ Growth contribution to real GDP 2\ Annual values are end of Q4 levels 3\ Includes domestic and foreign auto and light truck sales 4\ Yearly numbers are based on the fiscal year

## A. Forecast Details

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

	2005				2006				2007				Q4/Q4 % CHANGE/Q4 LEVEL			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2004	2005	2006	2007
<b>REAL GDP (Growth, Annual Rate).....</b>	<b>3.8</b>	<b>3.3</b>	<b>4.3</b>	<b>3.3</b>	<b>3.8</b>	<b>3.4</b>	<b>3.1</b>	<b>3.0</b>	<b>3.3</b>	<b>3.4</b>	<b>3.3</b>	<b>3.3</b>	<b>3.8</b>	<b>3.7</b>	<b>3.3</b>	<b>3.3</b>
<u>Contributions to GDP growth:</u>																
<b>FINAL SALES TO DOMESTIC PURCHASERS.....</b>	<b>3.9</b>	<b>4.4</b>	<b>5.0</b>	<b>2.0</b>	<b>3.9</b>	<b>3.5</b>	<b>3.6</b>	<b>3.5</b>	<b>3.7</b>	<b>3.5</b>	<b>3.5</b>	<b>3.5</b>	<b>4.5</b>	<b>3.8</b>	<b>3.7</b>	<b>3.6</b>
CONSUMPTION EXPENDITURES.....	2.4	2.4	3.0	0.8	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.7	2.1	2.4	2.2
BUSINESS FIXED INVESTMENT.....	0.6	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.1	0.8	0.9	1.0
RESIDENTIAL INVESTMENT.....	0.5	0.6	0.5	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.4	0.4	-0.1	-0.1
FEDERAL GOVERNMENT.....	0.2	0.2	0.6	0.2	0.4	0.1	0.2	0.1	0.4	0.1	0.1	0.1	0.3	0.3	0.2	0.2
STATE & LOCAL GOVERNMENTS.....	0.2	0.3	0.0	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.1	0.2	0.4	0.4
<b>NET EXPORTS.....</b>	<b>-0.4</b>	<b>1.1</b>	<b>-0.3</b>	<b>-0.7</b>	<b>-0.4</b>	<b>-0.5</b>	<b>-0.6</b>	<b>-0.7</b>	<b>-0.4</b>	<b>-0.4</b>	<b>-0.4</b>	<b>-0.4</b>	<b>-0.9</b>	<b>-0.1</b>	<b>-0.6</b>	<b>-0.4</b>
EXPORTS.....	0.7	1.1	0.1	1.3	0.8	0.5	0.7	0.6	0.7	0.7	0.7	0.7	0.6	0.8	0.7	0.7
IMPORTS.....	-1.1	0.0	-0.3	-2.1	-1.2	-1.0	-1.2	-1.3	-1.1	-1.1	-1.1	-1.1	-1.5	-0.9	-1.2	-1.1
<b>CHANGE IN INVENTORIES.....</b>	<b>0.3</b>	<b>-2.1</b>	<b>-0.4</b>	<b>1.9</b>	<b>0.2</b>	<b>0.4</b>	<b>0.0</b>	<b>0.1</b>	<b>-0.1</b>	<b>0.2</b>	<b>0.2</b>	<b>0.1</b>	<b>0.2</b>	<b>-0.1</b>	<b>0.2</b>	<b>0.1</b>

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

## A. Forecast Details

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

#### GDP

	Release Date	2005-Q4		2006-Q1		2006-Q2	
		Prev*	Dec	Prev*	Dec	Prev*	Dec
FRBNY	12/8/2005	3.8	3.3	3.6	3.8	3.4	3.4
PSI Model	12/8/2005	3.6	4.3	3.6	4.2	--	--
Blue Chip	12/9/2005	3.0	3.2	3.5	3.5	3.4	3.4
Median SPF	11/14/2005	3.6	3.2	3.3	3.7	3.4	3.3
Macro Advisers	12/6/2005	3.5	3.7	4.2	4.2	3.5	3.6

#### CPI

	Release Date	2005-Q4		2006-Q1		2006-Q2	
		Prev*	Dec	Prev*	Dec	Prev*	Dec
FRBNY	12/8/2005	3.6	4.1	2.2	2.3	2.3	2.3
Blue Chip	12/9/2005	4	3.9	2.5	2.2	2.3	2.4
Median SPF	11/14/2005	2.4	3.9	2.4	2.4	2.5	2.3
Macro Advisers	12/6/2005	4.3	4.0	1.3	2.0	2.3	1.9

#### Core CPI

	Release Date	2005-Q4		2006-Q1		2006-Q2	
		Prev*	Dec	Prev*	Dec	Prev*	Dec
FRBNY	12/8/2005	1.9	2.1	2.1	2.1	2.2	2.2
Macro Advisers	12/6/2005	1.6	2.0	2.0	2.0	2.3	2.1

Notes: Previous release of SPF is August, of Macro Advisers & Blue Chips is November, and of all others is October.

## A. Forecast Details

**Exhibit A-6: Reference Table 1 - CONSUMER PRICE INDEX DATA AS OF OCTOBER 2005**

	Annualized Percent Change Over Indicated Interval					Weights (December 2003)	
	24 Month	12 Month	6 Month	3 Month	1 Month	Total	Core
<b>Consumer Price Index</b>	3.7	4.3	4.9	8.0	2.4	100.00	
<b>Energy</b>	22.1	29.6	40.8	89.3	-2.9	7.08	
<b>All Items Ex Energy</b>	2.1	2.0	1.7	2.0	3.1		
Food	2.8	2.2	1.9	2.3	3.8	14.38	
Food Away From Home	3.2	3.1	3.3	3.3	3.8	6.13	
<b>All Items Ex Food and Energy</b>	2.0	2.0	1.7	1.8	3.0	78.54	100.00
Core Chain-Weight CPI (NSA)	1.7	1.7	0.9	2.9	4.4		
<b>Core Goods</b>	0.2	0.4	0.0	1.1	0.0	22.25	28.34
Apparel	-0.9	-1.1	-2.3	2.0	-4.9	3.98	5.06
Medical Care Commodities	4.3	4.1	3.6	3.4	6.5	1.50	1.91
Durable Goods	-0.1	0.2	-0.2	0.3	1.0	11.28	14.36
New Vehicles	0.2	0.9	-1.0	1.8	6.3	4.82	6.13
Used Vehicles	2.0	2.8	3.7	-1.1	-7.4	2.01	2.56
<b>Core Services</b>	2.7	2.7	2.3	2.2	4.1	56.28	71.66
Rent of Primary Residence	3.0	3.1	3.3	3.3	5.1	6.16	7.84
Owners' Equivalent Rent	2.3	2.3	2.2	1.7	1.6	23.38	29.77
Lodging Away from Home	3.6	1.2	-3.9	-2.7	51.1	2.95	3.76
Medical Care Services	4.8	4.6	3.5	3.1	6.6	4.58	5.83
Transportation Services	1.9	2.8	3.6	3.2	0.5	6.32	8.05

## A. Forecast Details

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

	Annualized Percent Change Over Indicated Interval				
	24 Month	12 Month	6 Month	3 Month	1 Month
<b>PCE Deflator</b>	3.1	3.3	3.6	5.9	1.2
<b>Market Based PCE Deflator</b>	3.0	3.4	3.8	6.3	1.1
<b>Durable Goods</b>	-0.7	-0.7	-1.6	-0.9	-0.2
Motor Vehicles and Parts	1.3	1.9	-0.2	1.5	6.1
<b>Nondurable Goods</b>	4.7	5.1	6.2	12.6	-4.7
Clothing and Shoes	-1.1	-1.5	-2.9	1.1	-3.1
<b>Services</b>	3.2	3.2	3.4	4.1	4.6
Housing	2.5	2.4	2.1	1.9	3.9
Transportation	2.6	3.9	4.0	1.5	0.5
Medical Care	3.0	2.7	2.8	2.9	1.9
<b>PCE Deflator Ex Food and Energy</b>	2.0	1.8	1.6	1.9	1.7
<b>Market Based Core PCE Deflator</b>	1.6	1.6	1.4	1.6	1.5
Personal Business Services-Market Based	3.0	2.1	1.6	0.6	0.5
Personal Business Services-Not Market Based	2.9	1.5	1.6	0.7	0.0

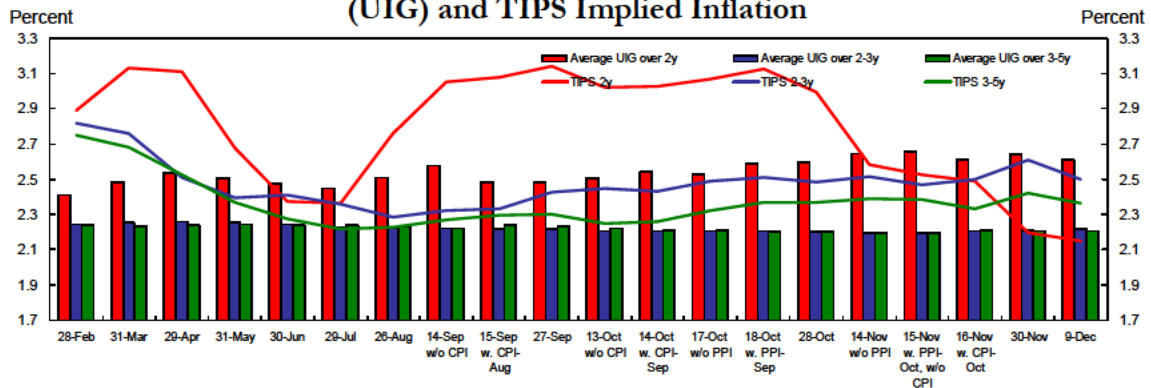
## A. Forecast Details

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

	Annualized Percent Change Over Indicated Interval				
	24 Month	12 Month	6 Month	3 Month	1 Month
<b>Finished Goods</b>	5.1	5.9	7.4	13.2	8.6
<b>Finished Consumer Goods</b>	6.3	7.3	9.5	17.6	12.3
Finished Consumer Goods Ex Food	8.1	10.0	13.9	23.4	17.8
Nondurables Ex Food	11.1	14.0	20.0	34.7	30.2
Durables	0.9	0.2	-1.0	-2.6	-10.0
Capital Equipment	1.8	1.8	0.8	0.3	-2.4
Electronic Computers (NSA)	-17.4	-23.0	-21.9	-16.6	-16.4
Communication and Related Equipment (NSA)	-1.3	-0.4	-1.2	-0.8	1.2
<b>Finished Goods Ex Food and Energy</b>	1.8	2.0	0.8	0.0	-3.0
<b>Finished Consumer Goods Ex Food and Energy</b>	1.8	2.0	0.7	-0.2	-2.9
<b>Intermediate Materials</b>	9.8	10.5	14.2	27.7	42.4
Intermediate Materials Ex Food and Energy	6.1	4.3	3.8	9.7	15.8
<b>Crude Materials</b>	23.8	31.5	46.4	109.1	116.8
Crude Materials Ex Food and Energy	13.6	0.9	6.0	40.1	-13.9

# A. Forecast Details

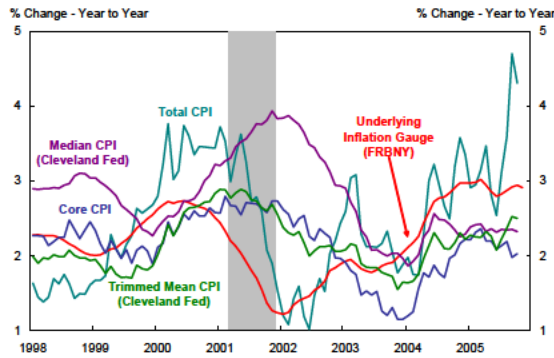
## Exhibit A-7: Underlying Inflation Gauge (UIG) and TIPS Implied Inflation



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

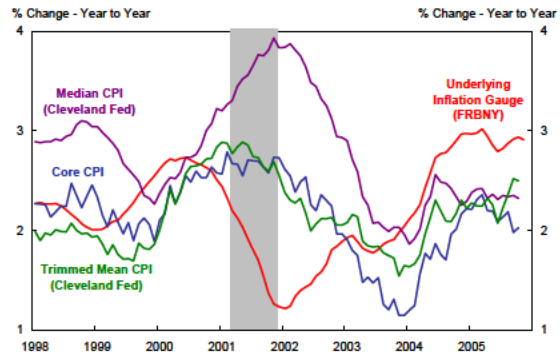
## Exhibit A-8: Underlying Measures of Trend Inflation

### Measures of CPI Inflation



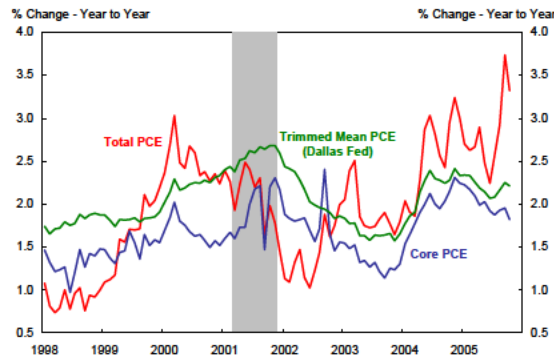
Source: Bureau of Labor Statistics, Cleveland Fed, and FRBNY

### Measures of CPI Inflation



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

### Measures of PCE Inflation



Source: Bureau of Economic Analysis and Dallas Fed

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## B. Financial Markets

### Exhibit B-1. TIPS Implied Inflation at Various Horizons

The first chart in this exhibit gives the time series of implied expected CPI inflation from the TIPS market. (a non-technical description of the construction of this measure is in Appendix to Exhibit B-1 below). The second chart shows the computed change in carry-adjusted measures from November 1<sup>st</sup> to December 7<sup>th</sup>, 2005.

*Source: Capital Markets Function FRBNY*

### Exhibit B-2. Breakeven Inflation Table

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

*Source: Capital Markets Function FRBNY*

### Exhibit B-3. Smoothed Treasury Yield Curve and Implied Forward Rate Curve

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

*Source: Monetary Affairs BofG*

### Exhibit B-4. Expected Path of Fed Funds Target Rate Derived from Futures

The chart in this exhibit shows the changes in expected path of the Fed Funds target rate since the last FOMC meeting, derived from Fed Funds and Eurodollar futures. A constant term premium risk adjustment is made in these calculations but there is no allowance for time-varying risk.

*Source: MMS Function, FRBNY chart; Monetary Affairs, BofG data*

### Exhibit B-5. Implied Skewness and Implied volatility (percentages)

The chart in this exhibit shows the recent behavior of a measure of implied skewness derived from Eurodollar options. Positive (negative) implied skewness means that a tightening (easing) surprise around expected rate is expected to be larger than an easing



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(tightening) surprise. In addition implied volatility in percentages is plotted. Both measures are averages of 3-, 6- and 9-month values. No risk adjustment is made.

*Source: Capital Markets, FRBNY*

#### **Exhibit B-6. Implied Volatility on Eurodollar Options (Basis Points)**

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

*Source: Monetary Affairs, BofG*

#### **Exhibit B-7. Dollar Exchange rates**

This exhibit contains 4 charts showing the behavior of the dollar in the last 5 years. All series are defined so that a decline in the index represents a depreciation of the dollar. Effective rates are computed by the Board of Governors using a “narrow” set of weights, for 16 major exchange rates.

*Source: BofG, BIS, International Research Function FRBNY*

#### **Exhibit B-8. Implied volatility on Yen/Dollar and Euro/Dollar Exchange Rates**

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

*Source: Markets Group, FRBNY, Reuters*

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

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

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Katrina. The next date represents the post-Katrina peak in energy markets. October 27 represents current data.

*Source: Bloomberg.*

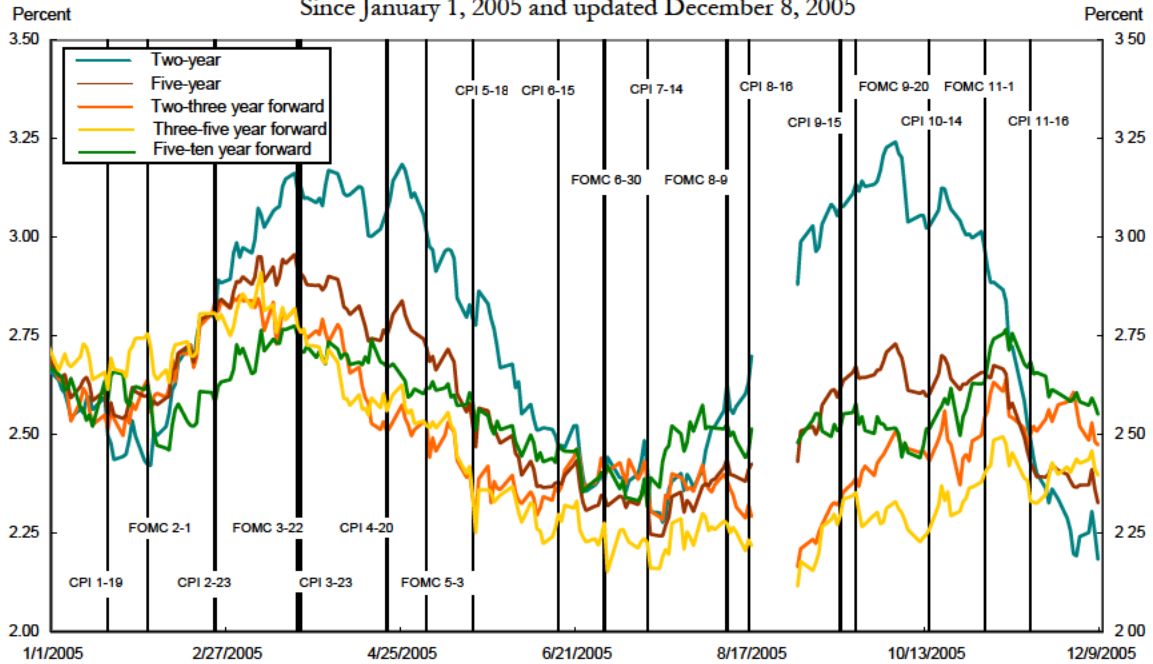
### **Appendix to Exhibit B-1. Construction of Implied Inflation from TIPS**

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

The carry-adjusted implied inflation series are measures of inflation expectations that remove the impact of forecast inflation accrual in NSA CPI over the 2.5 month indexation lag period in TIPS. Since inflation over that 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 NSA CPI implicit in same day CME CPI futures contracts.

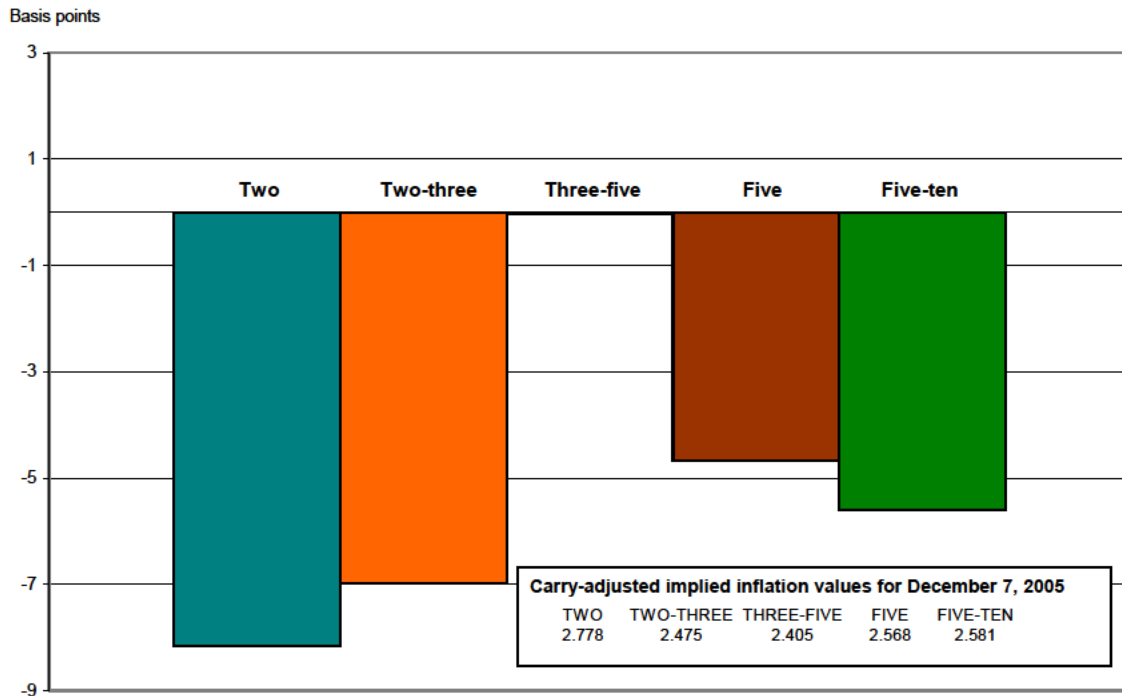
## B. Financial Markets

**Exhibit B-1:  
TIPS Implied Inflation at Various Horizons**  
Since January 1, 2005 and updated December 8, 2005



Implied inflation values between 8-18 and 8-31 are not reported because of data reliability problems.  
Data based on FRBNY calculations using 8:40am quotes. Tony Rodrigues [redacted].

**Change in Carry-adjusted TIPS Implied Inflation Since Last FOMC Meeting**  
Change in implied inflation measure from November 1, 2005 to December 7, 2005



Source: FRBNY

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## B. Financial Markets

### Exhibit B-2: Breakeven Inflation Table

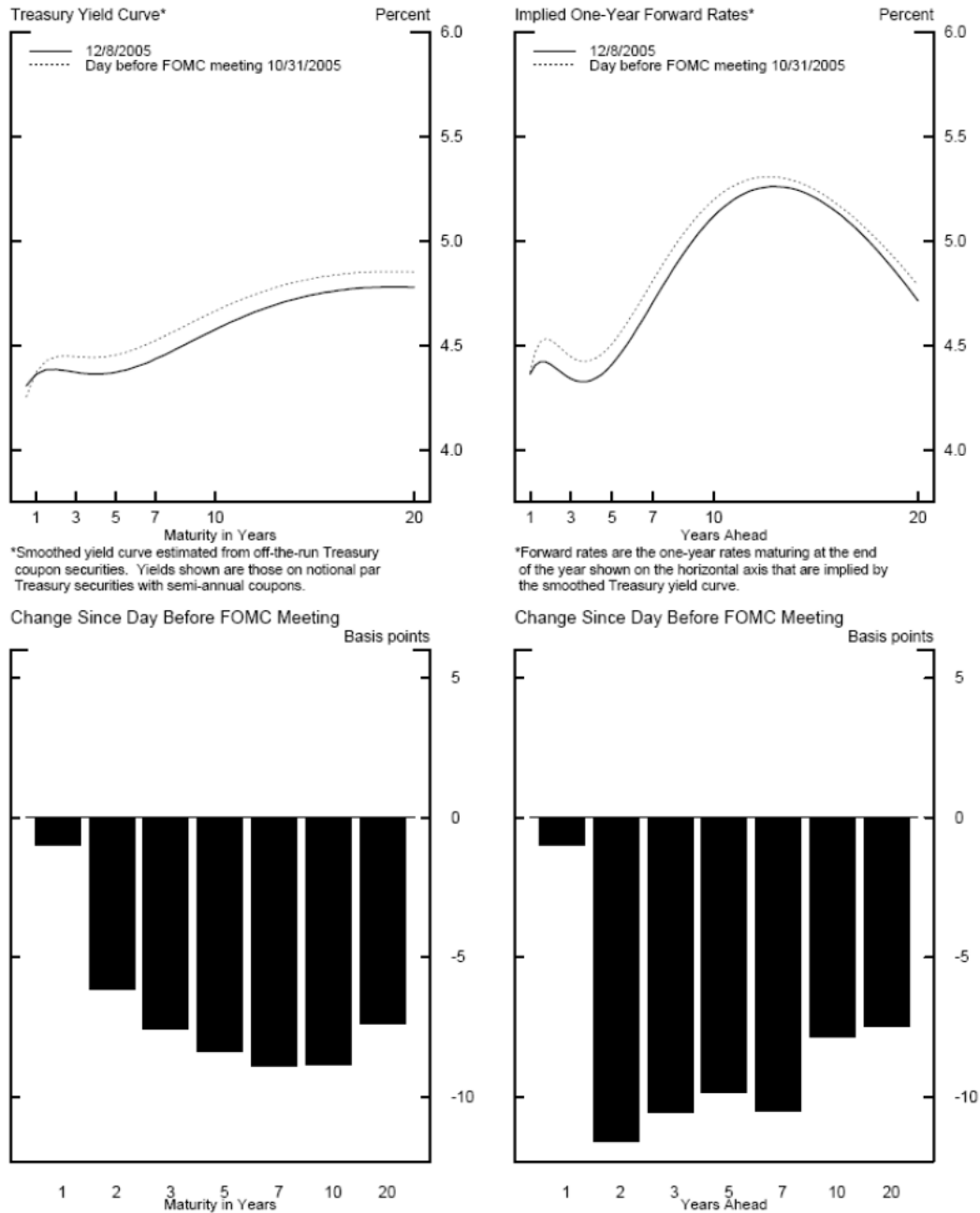
Real and Nominal Yield Spreads

	31-Jan-05	30-Jun-05	29-Jul-05	31-Aug-05	30-Sep-05	31-Oct-05	30-Nov-05	8-Dec-05
Five-year Spread (%)	2.55	2.35	2.32	2.47	2.72	2.65	2.37	2.30
Ten-year Spread	2.48	2.31	2.33	2.38	2.55	2.57	2.37	2.34
Five-year Real Yield (%)	1.17	1.38	1.74	1.47	1.43	1.81	2.01	2.12
Ten-year Real Yield	1.67	1.66	1.88	1.69	1.74	2.01	2.09	2.16
Five-year Nominal Yield	3.72	3.73	4.06	3.94	4.15	4.46	4.38	4.42
Ten-year Nominal Yield	4.15	3.97	4.21	4.07	4.29	4.58	4.46	4.50

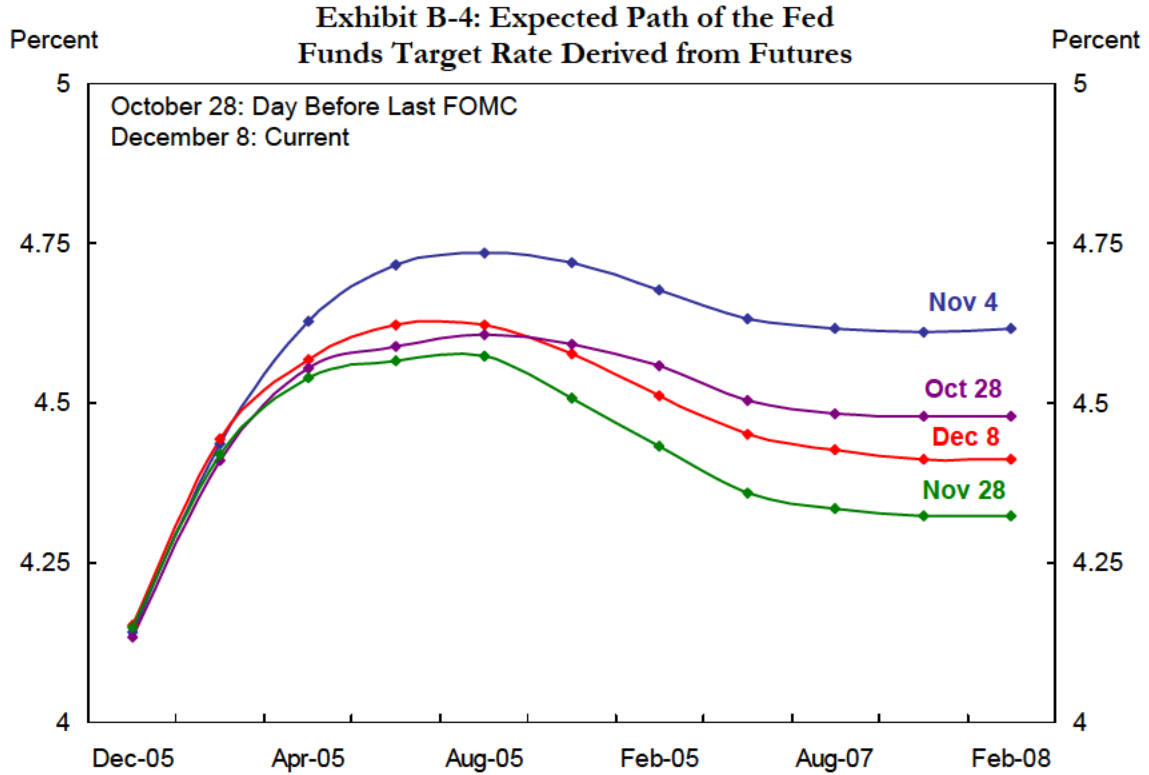
Source: FRBNY. 8:40am quotes.

## B. Financial Markets

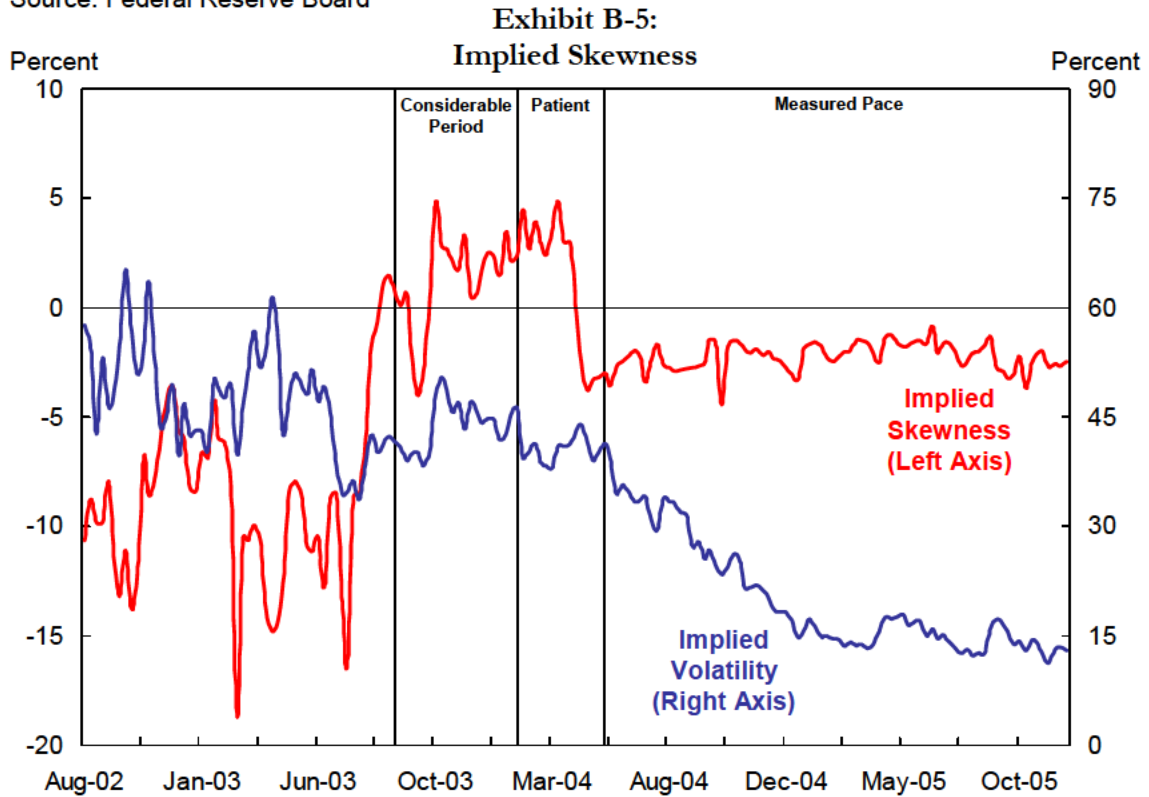
**Exhibit B-3:  
Treasury Yield Curve**



## B. Financial Markets



Source: Federal Reserve Board

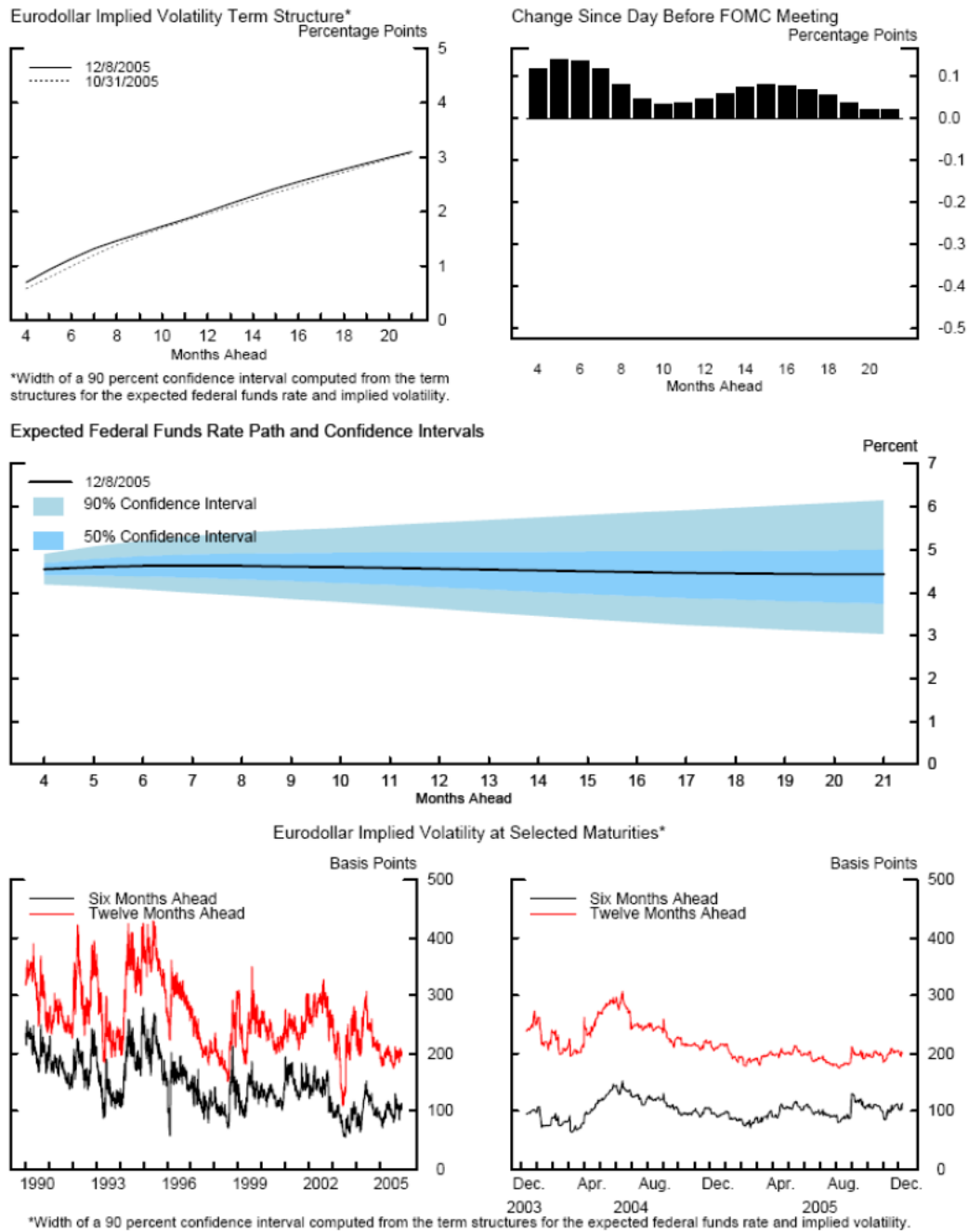


Source: CME and Author's Calculations

Joshua Rosenberg Redacted

## B. Financial Markets

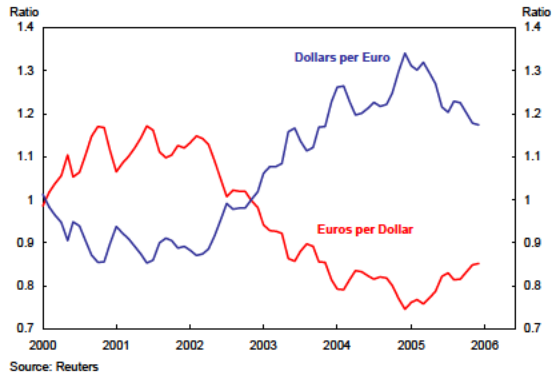
**Exhibit B-6:  
Implied Volatility on Fed Funds Options**



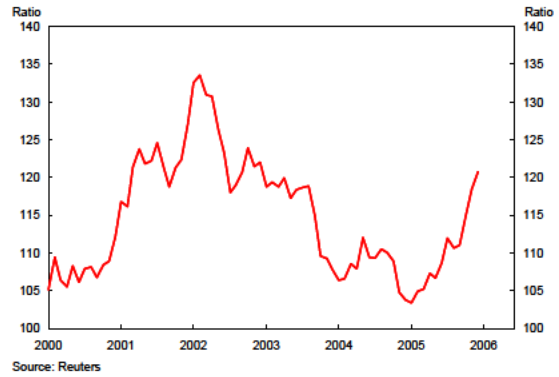
## B. Financial Markets

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

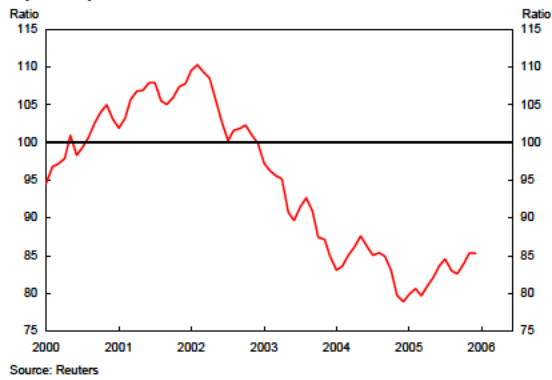
Dollar-Euro Exchange Rates



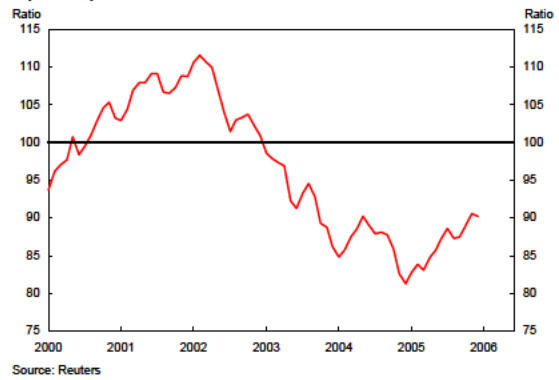
Yen per Dollar



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



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

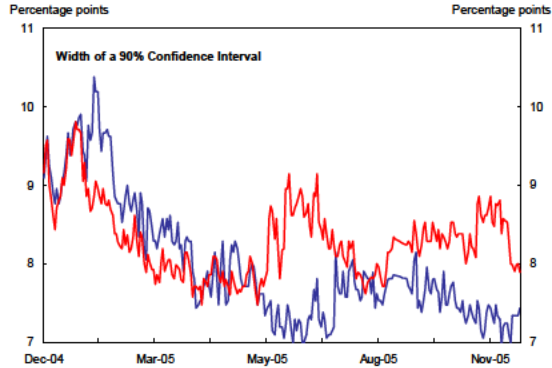




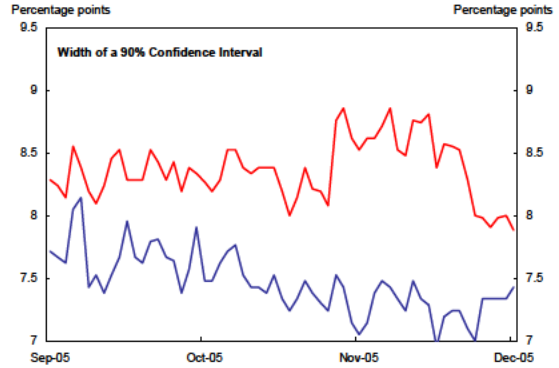
## B. Financial Markets

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

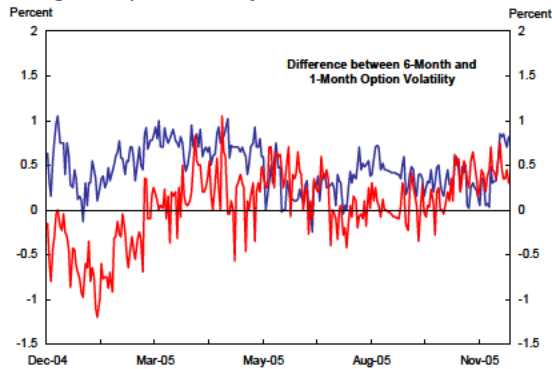
One-Month Volatility – Past Year



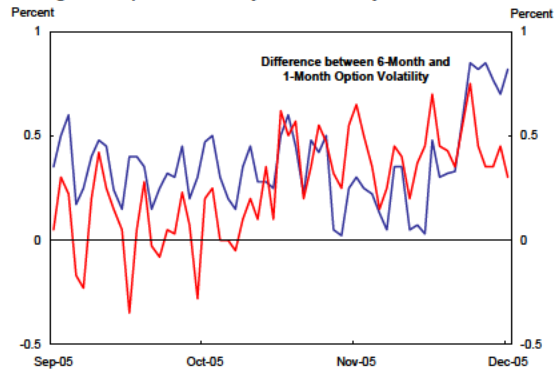
One-Month Volatility – Past 60 Days



Changes in Expected Volatility – Past Year



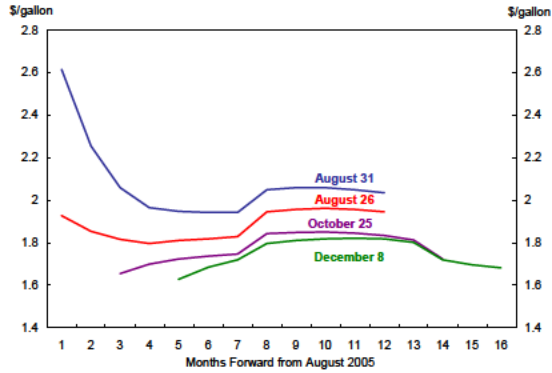
Changes in Expected Volatility – Past 60 Days



## B. Financial Markets

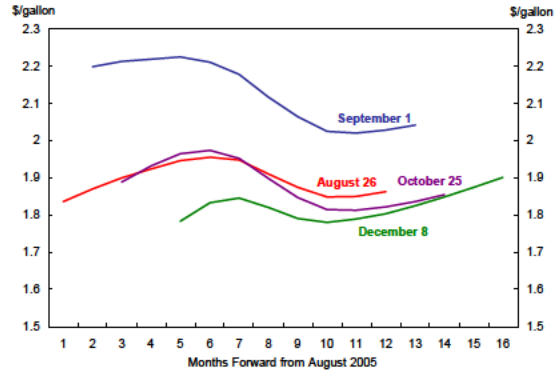
Exhibit B-9:  
Energy Futures Curves

Gasoline Futures



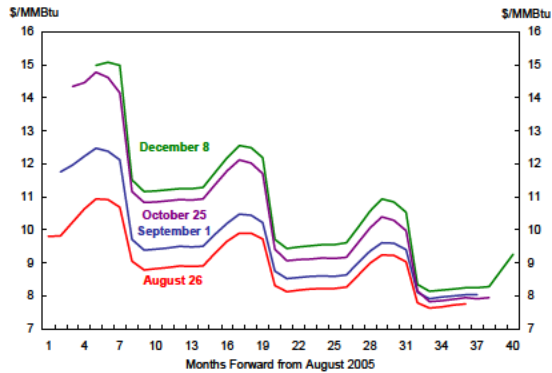
Source: Bloomberg

Heating Oil Futures



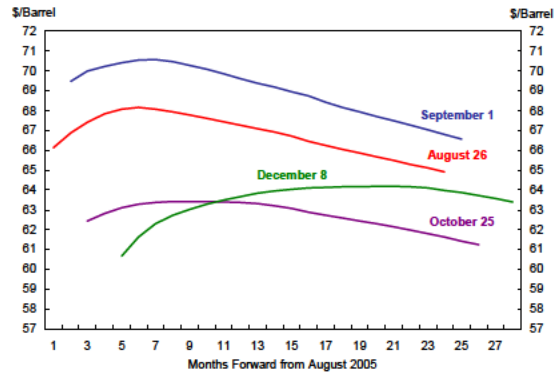
Source: Bloomberg

Natural Gas Futures



Source: Bloomberg

Crude Oil Futures



Source: Bloomberg

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## C. FRBNY Forecast Distributions

### Background

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

### Exhibit C-1: Risks

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

A second type calculates the probability of ever being in a particular scenario through 2008, with the exception of the central scenario where the probability shown is for not deviating from this scenario through 2008. Hence, one minus this probability is the risk of deviating from the central scenario at some point over the forecast horizon and this is equal to the sum of the probabilities of the other scenarios occurring.

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

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

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

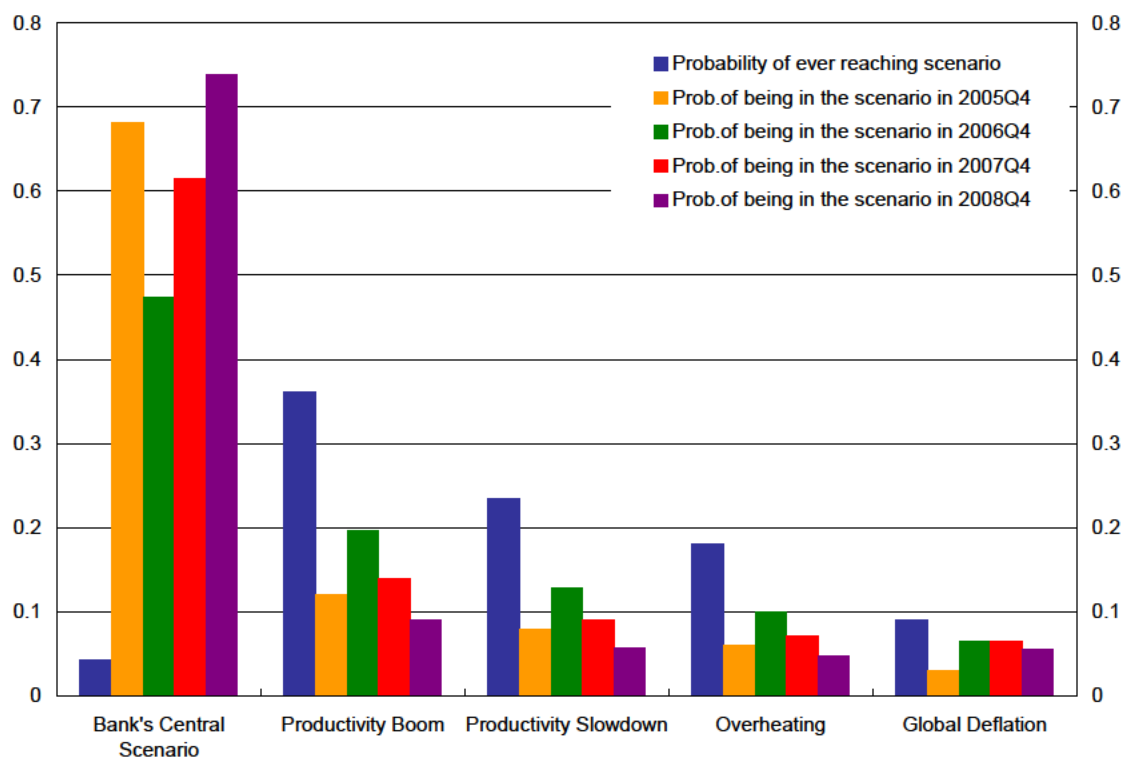
### **Exhibit C-4 & C-5: Fan Charts**

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

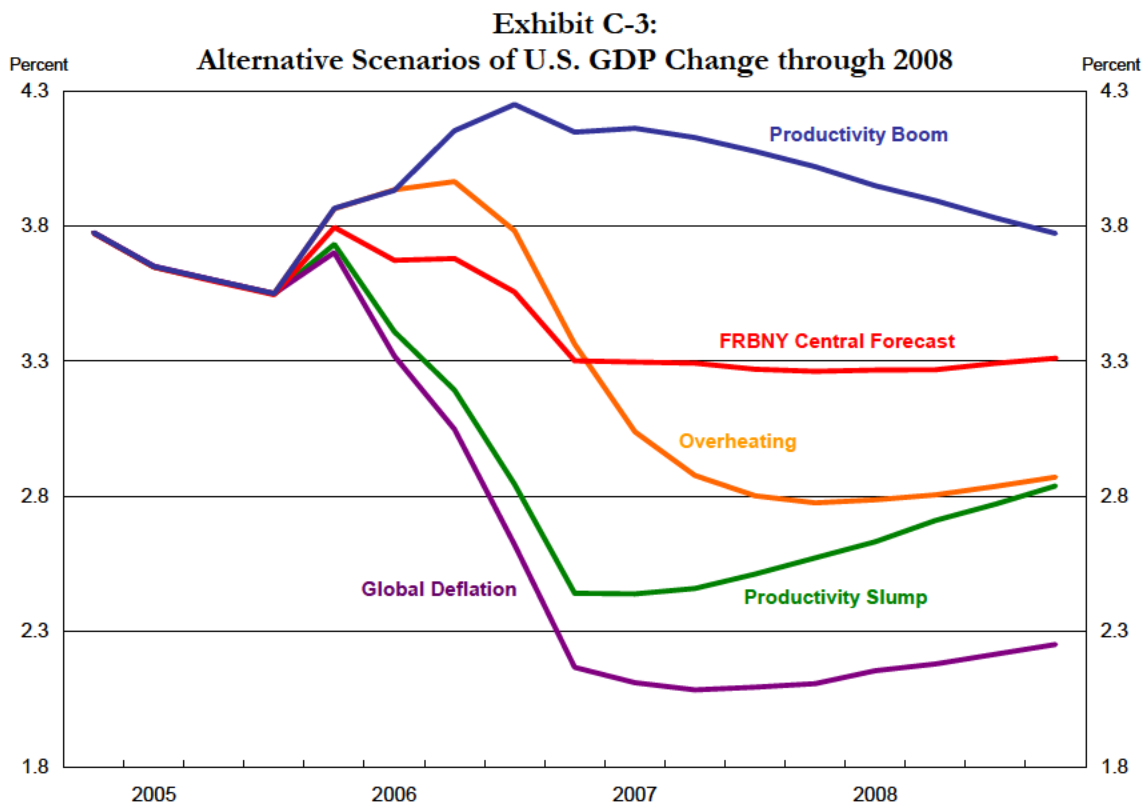
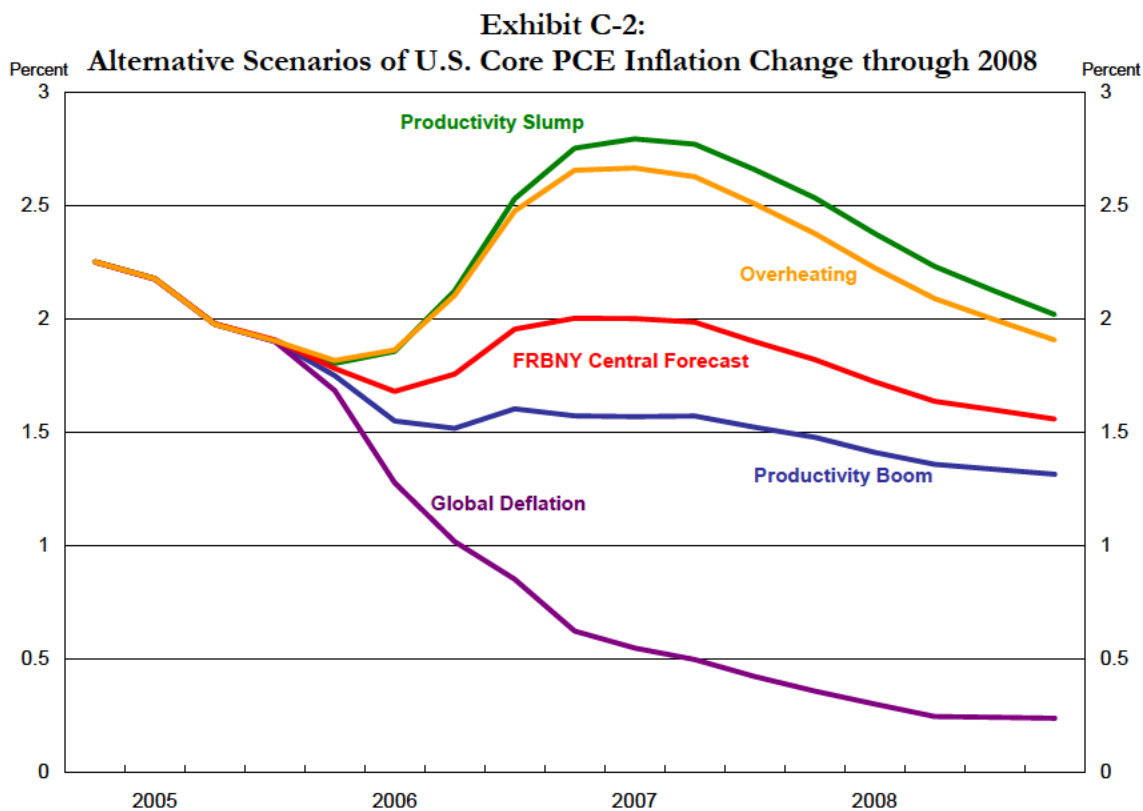
*Source: MMS Function, FRBNY*

## C. FRBNY Forecast Distributions

Exhibit C-1:  
Risks



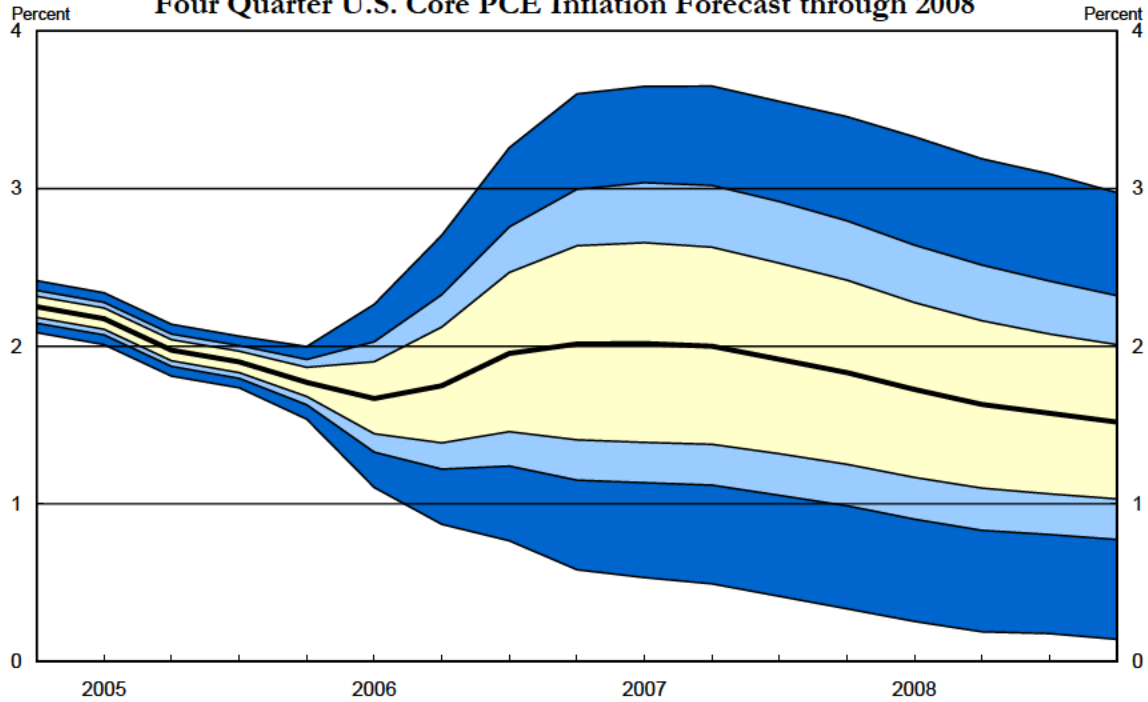
## C. FRBNY Forecast Distributions



## C. FRBNY Forecast Distributions

Exhibit C-4:

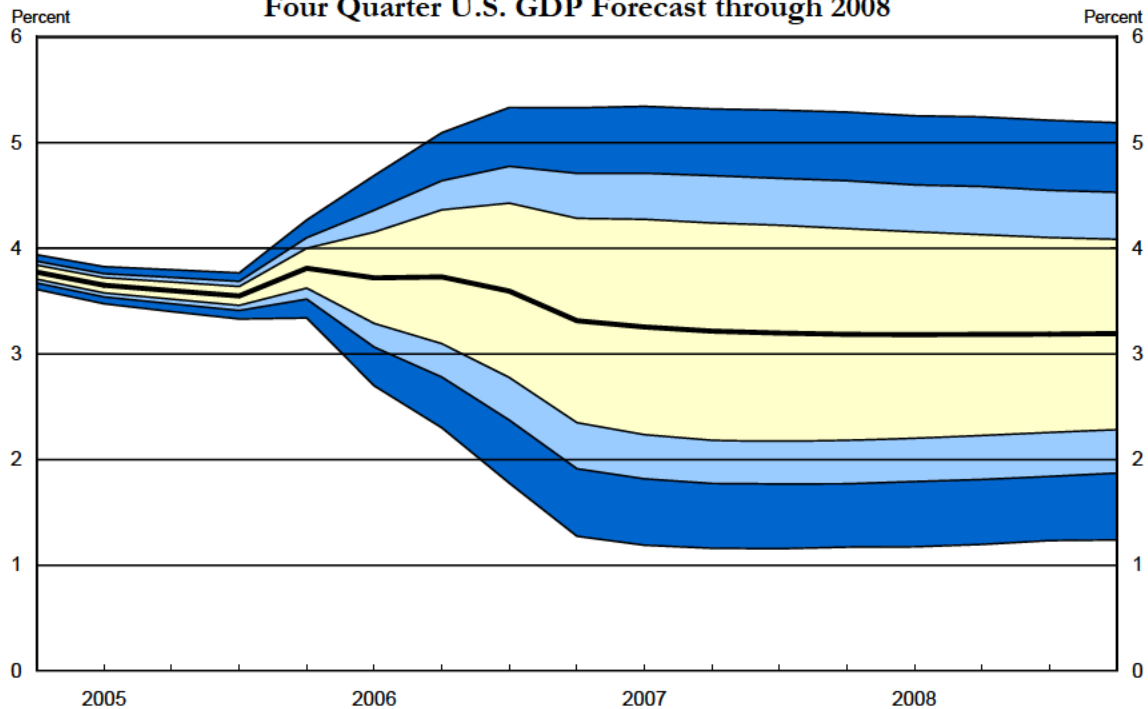
Four Quarter U.S. Core PCE Inflation Forecast through 2008



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

Exhibit C-5:

Four Quarter U.S. GDP Forecast through 2008



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

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## D. FRBNY Fed Funds Rate Projections

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

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

1. *Dove (Raise and Wait)*
2. *Dual (Continued Measured Firming)*
3. *Inflation Hawk*

The short-run restriction is enforced in the rules by calculating the FFR without restriction from our standard policy rule described below. Then this value is compared to the prescription of the different short-run rules. If the results are “similar” then the prescription of the short-run rule is followed. For example, under “dual” the FFR is increased by increments of 25 bp for the next 3 meetings unless the standard rule produces a prescription for the FFR outside of the interval 1% around the measured firming rate. The inflation hawk rule follows the prescription of the continued measured firming unless the inflation rate increases above a 2% rate.

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

Exhibit D-1 evaluates the three different policy rules at each of the draws from the forecast distribution of output and inflation and then averages them to produce an expected path if the rule is followed. The results are compared to the most recent implied market path from Exhibit B-5.

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

In these exhibits, we focus on the policy rule “dual” and evaluate it at the Bank’s central projection, productivity slowdown and boom, overheating and global deflation scenarios.



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Exhibit D-3 presents the average of FFR over paths containing these scenarios. Exhibit D-4 presents the average ex post real rate obtained by subtracting the 4-quarter lagged change of core PCE inflation from the paths of the nominal rate.

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

This exhibit shows the effect of different inflation targets and gives a measure of how the recent actual path of the FFR has differed from the prescription of our policy rule. The policy rule paths are calculated using the actual FFR at the end of 2004. It also plots an average over the three rules evaluated this cycle, with weights of 0.1, 0.8 and 0.15 respectively.

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

In this exhibit we examine the distribution of the FFR under the 3 different policy rules through the end of 2006. We also include the market distribution by assuming it has a normal distribution centered at the market path from Exhibit B-5 with a standard deviation derived from Exhibit B-6. The distribution is represented by a boxplot to this allow more direct comparison of the implications of different policy rules. The box represents the 50% probability interval, the line in the box the median and the tails the 90% probability interval.

*Source: MMS Function, FRBNY*

#### **Exhibit D-6: Comparing Market Beliefs to FRBNY**

In this exhibit, two metrics of measuring the distance between the market implied path and the FRBNY implied path are shown:

:

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

There are many other sources of differences between the two paths. One important consideration is the adjustment for risk in constructing the market path. We use an

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adjustment from the Board that is constant over time but there is some evidence that the adjustment may be time varying. Furthermore, the market faces uncertainty over the policies and targets used by the FOMC. We can attempt to capture this uncertainty but again it might vary over time.

*Source: MMS Function, FRBNY*

*Policy Rule: Baseline Specification*

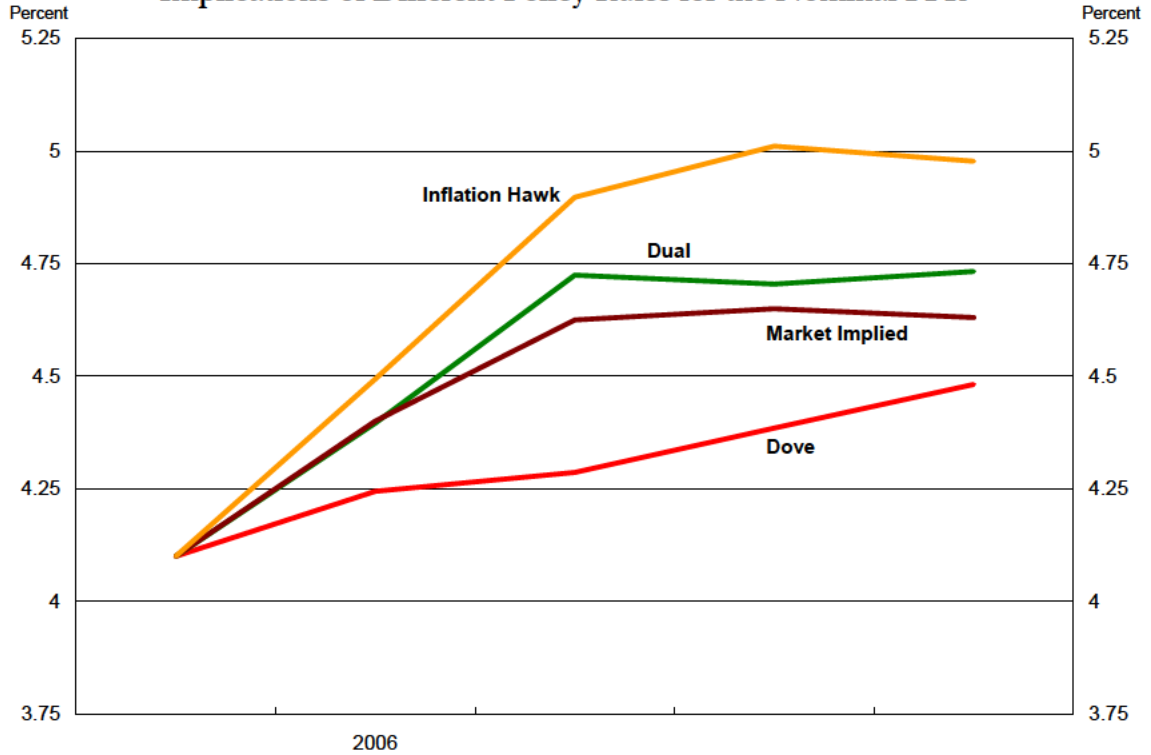
$$i_t = \rho i_{t-1} + (1 - \rho) [i^* + \varphi_\pi (\pi_t - \pi^*) + \varphi_x x_t]$$
$$\rho = 0.8$$
$$i_{2005Q2} = 2.91$$
$$i^* = 4.0$$
$$\pi = 1.5 \text{ (Core PCE y/y)}$$
$$\pi^* = 1.5$$
$$\varphi_\pi = 1.5$$
$$\varphi_x = 0.5$$

$\pi_t$  : Core PCE y/y  
 $x_t$  : Output Gap

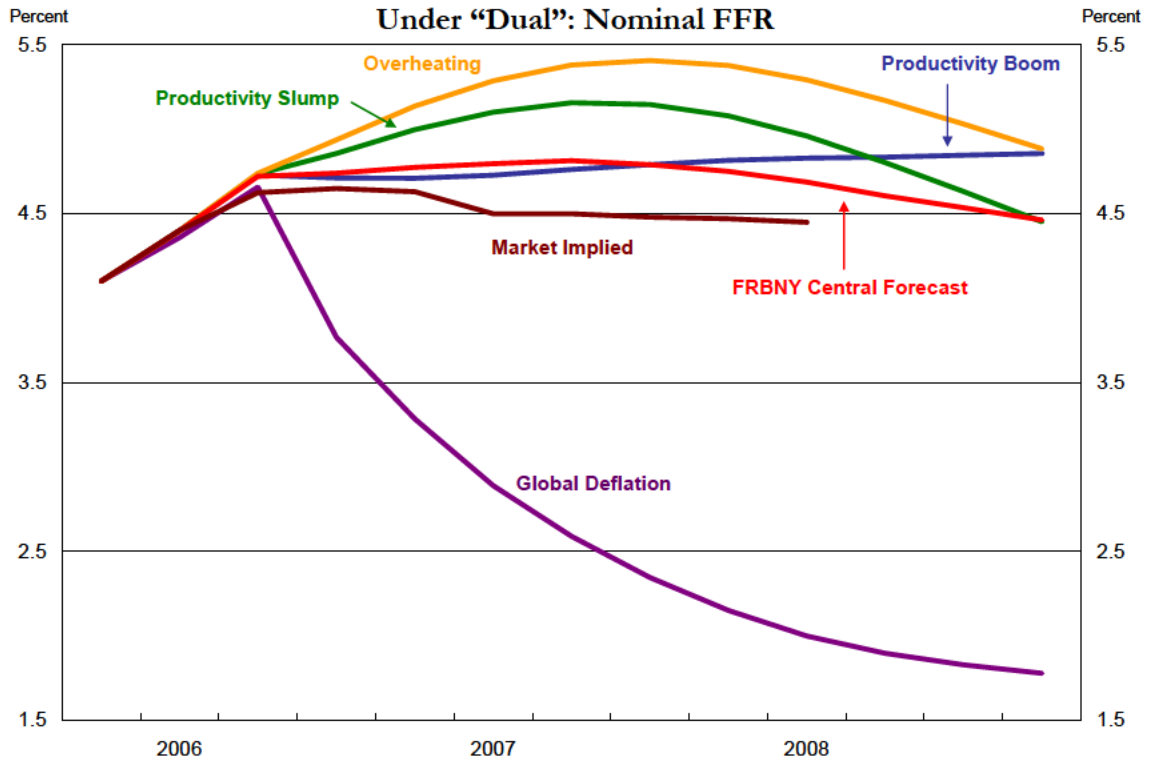
*Source: MMS function, FRBNY*

## D. FRBNY Fed Funds Rate Projections

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

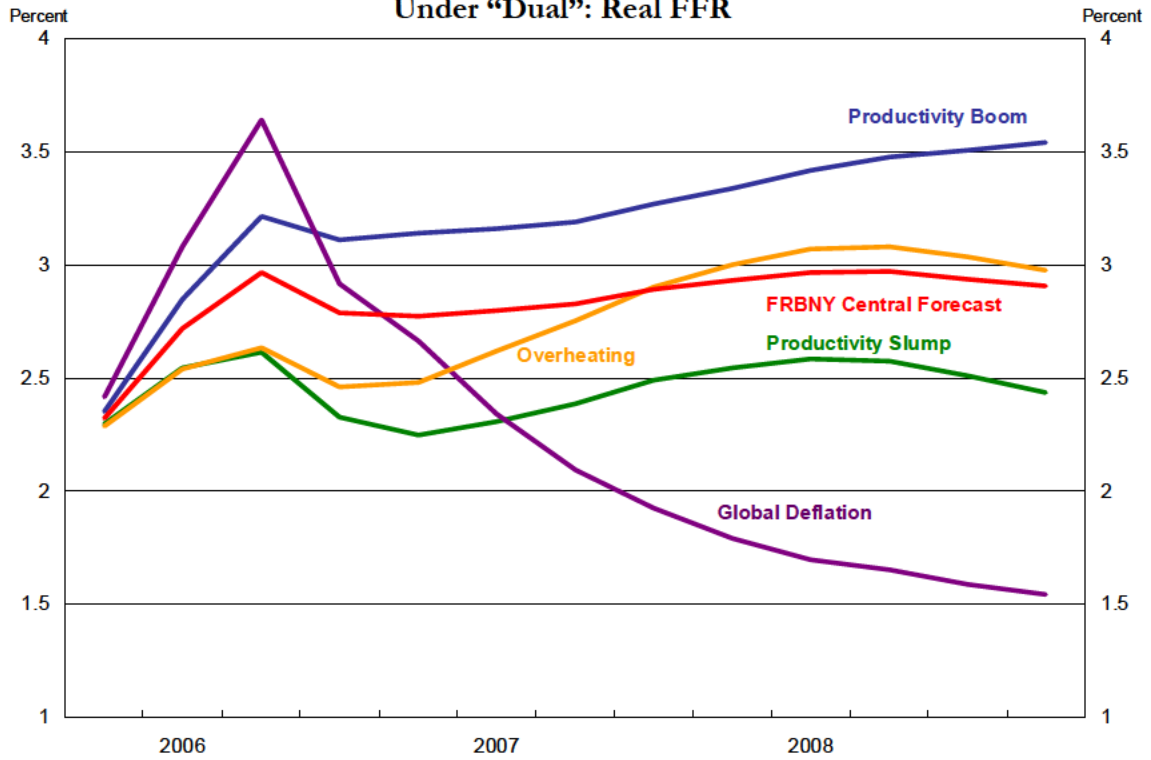


**Exhibit D-2:  
Alternative Forecast Scenarios  
Under "Dual": Nominal FFR**

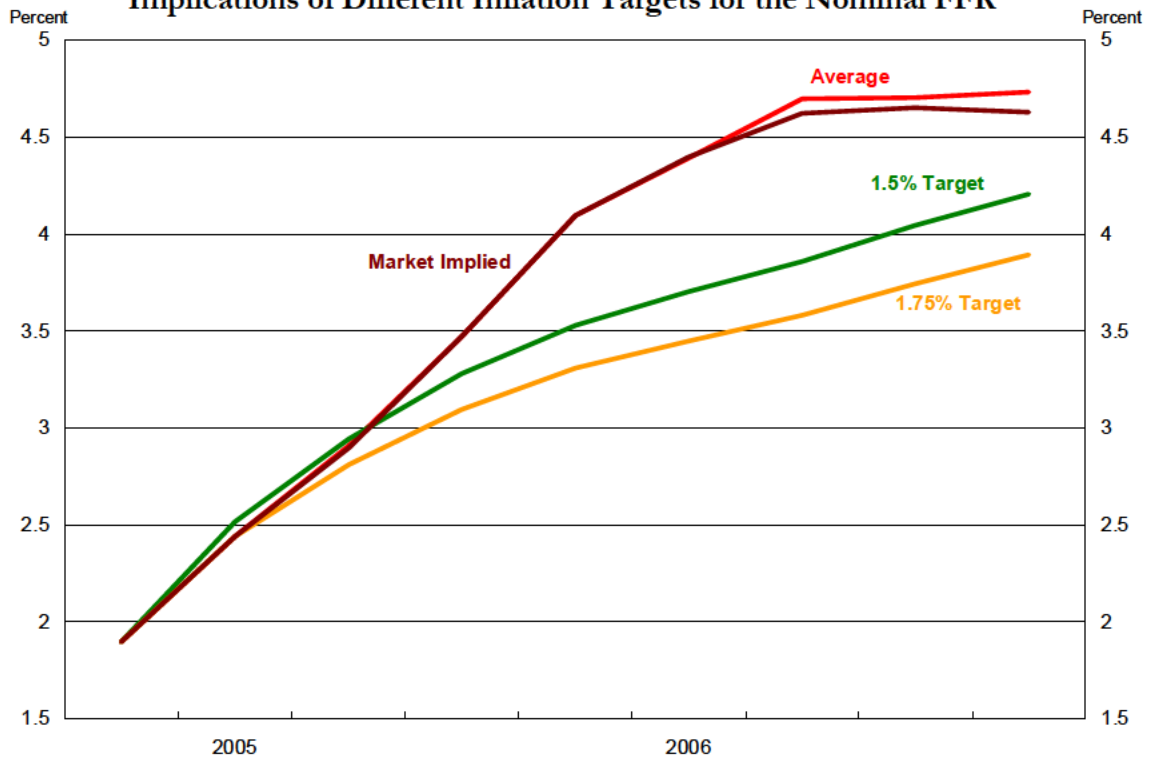


## D. FRBNY Fed Funds Rate Projections

**Exhibit D-3:  
Alternative Forecast Scenarios  
Under "Dual": Real FFR**

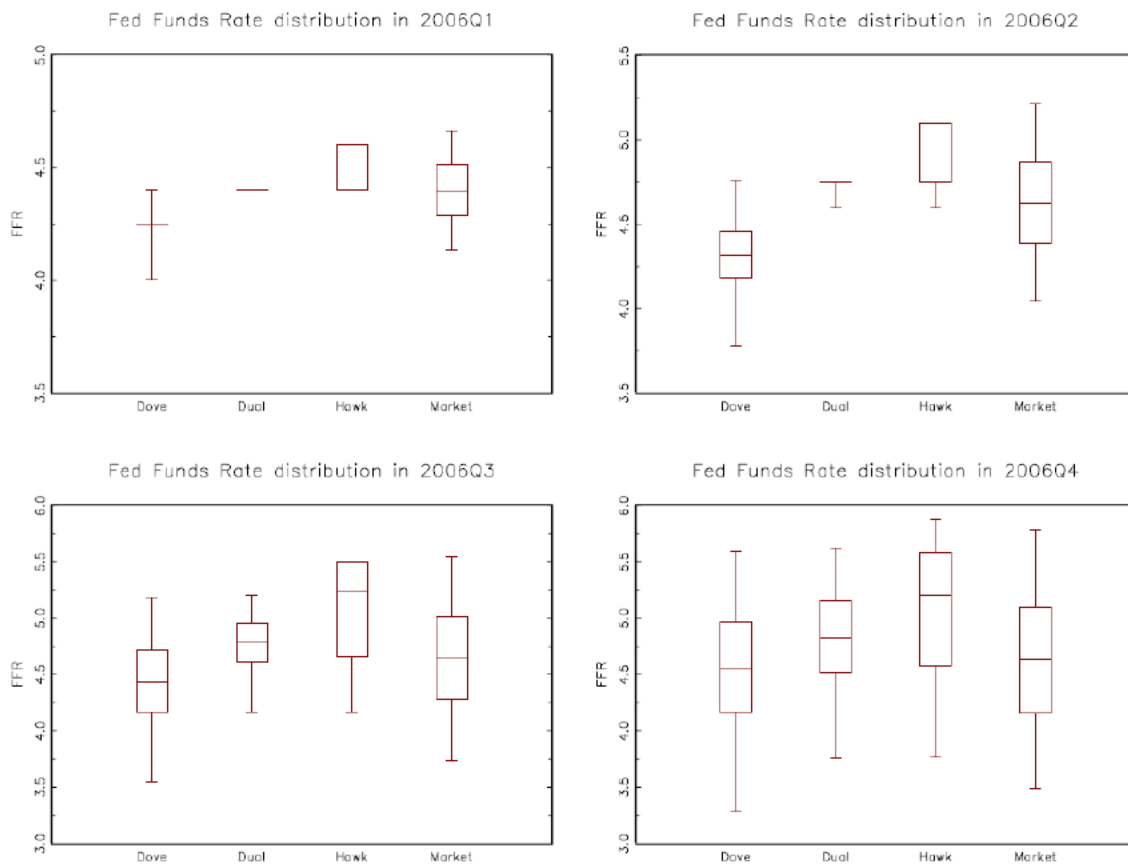


**Exhibit D-4:  
Implications of Different Inflation Targets for the Nominal FFR**



## D. FRBNY Fed Funds Rate Projections

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



### Exhibit D-6: Market Expectations of Future FFR and FRBNY Outlook for FFR

	Percentile of FRBNY Expectation in Market Distribution	Percentile of Market Expectation in FRBNY Distribution
<i>Dove</i>	42	55
<i>Dual</i>	56	33
<i>Inflation Hawk</i>	69	28

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## E. Regional Charts

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

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

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

*Source: MaRS Function, FRBNY*

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

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

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

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

*Source: MaRS Function, FRBNY*

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

This chart shows the 12-month growth rate of private-sector employment for New York-New Jersey (combined), New York City, and the U.S. (bars) from 1995 to present.

Underlying data can be found at:

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

*Source: U.S. Bureau of Labor Statistics*

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#### **Exhibit E-4. Employment-Population Ratios**

This chart shows the monthly employment-population ratios for New York State, New Jersey, New York City, and the U.S. from 1995 to present.

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

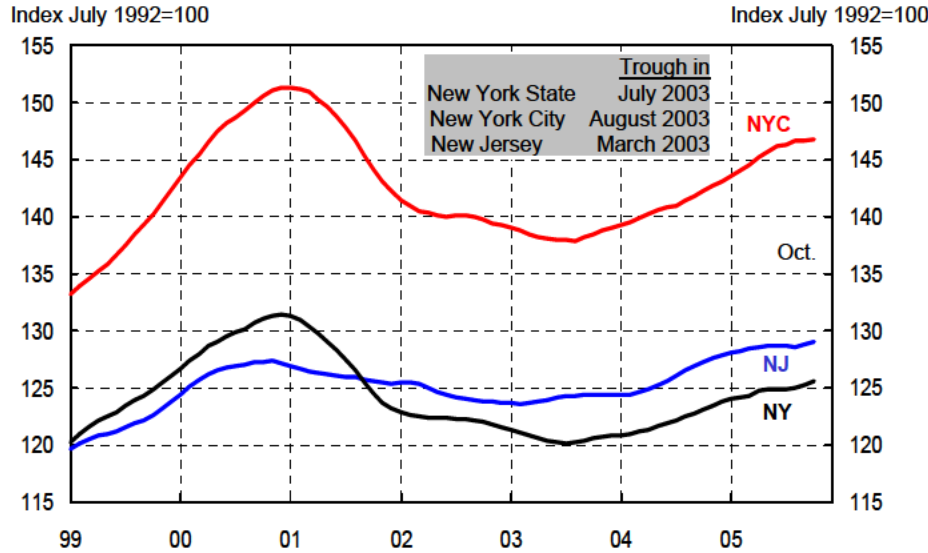
Data can be found at:

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

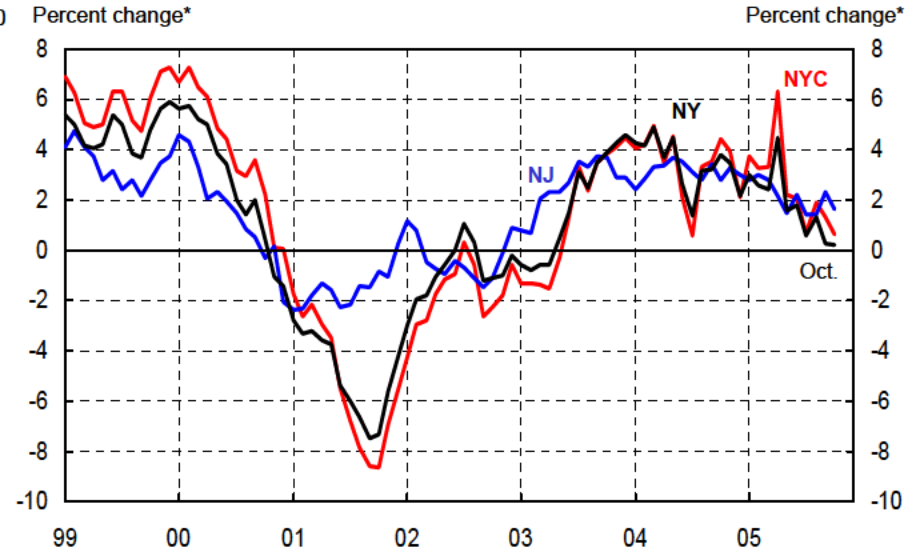
<http://www.wnjp.in.net/OneStopCareerCenter/LaborMarketInformation/lmi16/release1.htm>

## E. Regional Charts

### E1: INDEX OF COINCIDENT ECONOMIC INDICATORS

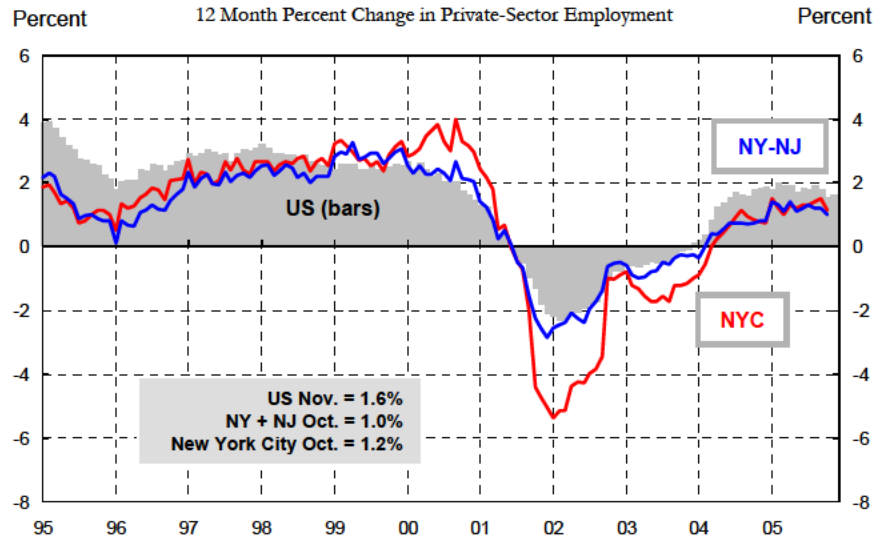


### E2: INDEX OF LEADING ECONOMIC INDICATORS



\* The percent change in this index represents the forecasted growth in the Coincident Index over the next 9 months.

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



### E4: EMPLOYMENT-POPULATION RATIOS

