FRBNY Blackbook

RESEARCH AND STATISTICS GROUP

FOMC Background Material

June 2006

CONFIDENTIAL(FR) Class II FOMC

FRBNY BLACKBOOK

June 2006

CONTENTS

Exhibits

1. Overview

Our outlook is for real GDP growth near its potential rate through the end of 2007, and core inflation moderating to 2.0% by the end of 2007. The Greenbook shows a softer path for output growth over the forecast horizon, with output growing below potential through 2007. The Greenbook also has a higher path for core inflation, both relative to May and relative to our forecast, with core PCE at 2.2% in 2007.

Since the last Blackbook, we have raised the path of the Federal Funds rate (FFR) target to reflect the anticipated 25 basis point increase at the June meeting. The FFR remains at 5.25% until just before the end of 2007, at which time it falls to 5.0%. The Greenbook holds the funds rate at 5.25% through the end of 2007.

Maintenance of the FFR at 5.25% through the end of 2007Q3 is consistent with our central forecast scenario, and is similar to the path priced into futures markets. Further, this slightly tighter stance increases the confidence in our central forecast scenario relative to that in May. In terms of our alternative scenarios and the probabilities attached to them, we have introduced an "over-tightening" scenario that is designed to capture the risk that our forecast assumes too little structural inertia in the inflation process, and by doing so essentially encourages policymakers to over-react to observed inflation and needlessly dampen output growth. The confluence of continued high readings on inflation and continued low longer-term inflation expectations provides the rationale for introducing this scenario. We have also eliminated the "global deflation" scenario, and decreased the weight on the "overheating" scenario.

Despite the increase in the expected FFR path priced into markets over the course of this cycle, there has been little else in financial market data to cause us to significantly alter our view of the risks. To date the observed increase in implied volatility in equity markets and widening of certain credit spreads has not been mirrored by an increase on implied interest rate volatility at any horizon, a fact that seems somewhat hard to explain but that nonetheless suggests that uncertainty about monetary policy per se is not

introducing additional volatility into the markets. Also, while inflation expectations fluctuated over the inter-meeting period with key data releases and Fed commentary, there has been little change in these expectations on net. On balance, longer-term nominal forward rates have edged down, while real forward rates have edged up.

2. Recent Developments

U.S.

Summary. Measures of underlying inflation have continued their recent rise, indicating greater near-term upside risk to implicit targets. The monthly indicators suggest more moderation of real activity in 2006Q2 than we expected at the time of the May Blackbook. The labor market has shown some signs of softening with payroll growth slowing in the past three months, although the unemployment rate continued to fall. Consumer survey measures initially fell and then improved modestly during the inter-meeting period, possibly reflecting concerns about higher energy prices. Business survey measures generally remained fairly solid, but forward-looking components fell.

Inflation. Core inflation measures remain elevated compared to desired levels, with recent reports prompting greater concerns about the future inflation outlook [see Exhibit A-6]. The (annualized) monthly change in the core PCE deflator actually declined to 3.0% in April from 4.1% in March. However, longer horizon changes indicate some acceleration with an increase of 2.1% on a 12-month basis, 2.4% (annual rate) on a 6-month basis, and 3.0% (annual rate) on a 3-month basis. The message from the core CPI was worse with a monthly change in April and May of 3.6% (annual rate). Owners' equivalent rent has played a notable role in the recent pickup in core CPI inflation, and is discussed in more detail in the Special Topic "Some information on owners' equivalent rent." The pattern of the core CPI over various horizons was similar to that of the core PCE deflator, with 12-, 6-, and 3-month changes of 2.4%, 2.9%, and 3.8% (annual rates), respectively.

Overall inflation rates remain elevated, with energy prices continuing to be a key factor. The total PCE deflator rose 5.9% (annual rate) in April, while the CPI rose 7.5% and 5.5% (annual rates) in April and May, respectively. Our underlying inflation gauge (UIG), however, has shown almost no change at the 2-3 and 3-5 year horizons and only a slight rise at the short (2-year) horizon [see Exhibit A-7]. On the other hand, alternative measures of "core" inflation have continued their recent upturn [see Exhibit A-8], and are above the traditional core measure as well as the upper end of the acceptable range. Financial markets' inflation expectations at the two-year horizon rose during May and June. While longer-term expectations also rose during May, they declined in June, leaving them slightly lower over the inter-meeting period. Household survey expectations ended up showing little change from April, but short-term expectations displayed considerable volatility over the period. The median expected one-year-ahead inflation rate jumped from 3.3% to 3.9% in early May and then eventually dropped to 3.4% in early June, while the expected 5-year-ahead rate showed a slight decline from 3.1% to 3.0%. The movement in short-term inflation expectations likely reflects a reaction of consumers to the recent step-up in gasoline prices and then an ebbing of their concerns.

Real activity. Real GDP growth in 2006Q1 was revised upward to 5.3% (annual rate). The recent monthly indicators, however, suggest real GDP growth in 2006Q2 may be about 2½%, a more substantial slowdown than we expected at the time of the last Blackbook. Primary factors behind the slowdown appear to be slower consumption growth and a decline in residential investment.

The recent data indicate that real personal consumption expenditures (PCE) growth in 2006Q2 may be about 2% (annual rate), well below its 5.2% growth rate in 2006Q1. Real PCE growth was modest in April: growth in May and June would need to accelerate to raise the quarterly growth rate much beyond our forecast. May auto sales and retail sales excluding autos were rather weak, indicating that no such acceleration is evident. Income growth was fairly solid in April, but high energy prices may continue to be a factor leading to subdued consumption growth.

Housing indicators still point toward a moderate slowdown in the market. Housing starts fell in April and rose in May; over the past three months they seem to have stabilized at early 2004 levels. However, building permits fell in April and May, suggesting that building activity may slow further over the near term. Housing completions also fell; their level is comparable to that of early 2005. After declining earlier in the year, new and existing home sales appear to have steadied at levels below their peaks of last summer. Mortgage applications have stabilized, suggesting that sales may not fall much further at this time. The new home inventories-sales ratio fell in April, but it remains elevated compared to its level of the past several years. Home price indicators provided conflicting signals. The four-quarter change in the OFHEO index remained in double digits. The more current but less reliable median sales prices have displayed greater moderation in home price appreciation.

Business spending indicators have been solid so far in 2006Q2. Shipments and orders of nondefense capital goods excluding aircraft (a monthly proxy for equipment and software expenditures) were at levels consistent with continued vigorous growth of equipment spending. Nonresidential construction rose strongly in April, indicating that a substantial rebound in this sector is more firmly in place. Businesses appear to have inventories near their desired levels as inventories-sales ratios have been stable at low levels over the last few months. Manufacturing production had another robust gain in April, but paused in May. Even with the pause, the 12-month change in production remains near the upper end of its range over the past two years. The capacity utilization rate also exceeded 80% for the sixth consecutive month. The strength in production is most evident in the IT sector, consistent with the growth in our Tech Pulse index.

Labor market. The labor market has shown some signs of softness since the last Blackbook. Payroll growth has slowed significantly in the three months through May. Part of the slowdown has been in temporary help services, which typically suggests that payroll growth could be rather soft in the second half. The growth of aggregate hours so

far in 2006Q2 has been under 2% (annual rate), below the prevailing rate over the past year. Despite the softness in the establishment survey, the unemployment rate fell in May to 4.6%, a new low for the current cycle, while the labor force participation rate and employment-population ratio were unchanged. Also, unemployment claims do not suggest a further softening in the labor market. Measures of labor compensation continued to give somewhat conflicting signals. The four-quarter change for compensation per hour was revised downward to near that for the employment cost index, and the four-quarter change in unit labor cost growth was near zero through 2006Q1. The growth of average hourly earnings remains higher than these measures, even though its 12-month change fell slightly in May.

Surveys. Consumers' spirits took a noticeable downturn during early May, before stabilizing later in the month and then showing a slight improvement in early June. During the course of the period, there were declines in both the current and future expectations components. The recent fluctuations may reflect survey respondents' varying concerns about higher gasoline prices. Business surveys generally indicate that the manufacturing expansion remains on track, although there were indications of some deceleration in manufacturing activity. The ISM manufacturing and non-manufacturing indices as well as the Richmond survey of manufacturers weakened in May, but remained at fairly healthy levels. The Empire State Index and Philadelphia Fed Index in May and June were at levels typically associated with solid growth. More worrisome, however, may be the fact that most surveys showed a deterioration in future prospects as well as an intensification in price pressures.

Special Topic

Some Information on Owners' Equivalent Rent (OER)

June 22nd, 2006

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As core inflation measures have risen during the first half of 2006, so has inflation in the price of shelter consumed by homeowners or "owners' equivalent rent" (OER). This note discusses some basic issues concerning OER.

What is OER?

In measuring the price of current housing services consumed by homeowners, the US uses a rental equivalence approach; i.e., all households are treated as renters, even if the tenant and landlord are the same. Owners' equivalent rent attempts to measure the gross rent homeowners would receive from renting their home to a tenant (or equivalently, the rent a homeowner would have to pay to rent a home similar to the one he/she owns).

Why has it received attention lately?

As the 12-month change in core CPI has risen from 2.1% to 2.4% so far this year, the 12-month change in OER has risen from 2.5% to 3.3%. Many commentators thus have attributed much of the rise in core inflation to this category, especially because it receives a high weight in the CPI (see below).

Furthermore, the rise in OER inflation has occurred as the housing market has slowed. Because this situation seems somewhat paradoxical, many commentators believe that OER as measured in the US is misleading about the "true" state of inflation of housing services, and thereby is contributing to mismeasurement of underlying inflation.

What is OER's importance in consumer price indices?

OER comprises a large portion of the Consumer Price Index (CPI). It represents 23.4% of the total CPI and 30.3% of the core CPI. (These weights come from the Consumer Expenditure Survey, which specifically asks homeowners how much rent they could receive from their home; however, this information is not used to determine OER inflation.) It has a smaller weight in the Personal Consumption Expenditures (PCE) deflator because that index has a wider scope than the CPI: its weight is 10.8% in the total PCE deflator and 13.6% in the core PCE deflator.

How is OER measured in the US?

Both the CPI and the PCE deflator use the same elementary price indexes for tenant rent and OER, which are produced by the Bureau of Labor Statistics (BLS) based upon a survey of about 30,000 rental housing units.

Although the measurement of tenant rent is relatively straightforward, the measurement of OER is less so. Implicit rent is not observable and so must be estimated. The current method can be described as a reweighted sample of rental units. The OER index level is derived from the same sample of rental units referred to above, but the weighting scheme reflects aggregate expenditures on owner-occupied housing rather than rental housing. As a result, rental units in areas with a high percentage of homeownership receive greater weight than they do in the tenant rent index.

Do utilities cause OER to be mismeasured?

An issue that has received attention recently is the

the treatment of utilities in the estimation of OER. As mentioned above, OER is estimated from tenant rents, and in some cases the cost of utilities is included in the contract rent. In the estimation of OER, BLS computes an estimate of "pure rent" by stripping out the effect that changes in utility prices have on contract rents. If the contract rent were not adjusted in this manner, an increase in utility prices would likely be double counted in the CPI as it would appear in both OER and in the fuels and utilities component of the overall housing category.

Some analysts have argued that this adjustment is inappropriate. Since rents tend to be established by annual contracts, short-run fluctuations in utilities prices are more likely to be reflected in landlords' net income than in rents. As a result, OER inflation is understated when utilities price inflation increases and vice versa. Indeed, a graph showing year-over-year changes in OER as well as in electricity and natural gas prices does reveal what appears to be a strong negative correlation.

The BLS has noted that its methodology actually observes changes in rents over a six-month interval and converts them to monthly changes. This increases the likelihood that the observed rent change reflects, at least in part, changes in the utilities cost. Moreover, the BLS has noted that only about 10 percent of the rental units in their sample have the costs of natural gas and electricity included in the contract rent. Finally, statistical analysis has revealed that while the change in OER as well as in electricity and natural gas prices are negatively correlated, the economic significance of this correlation is modest.

What is causing OER and tenant rent to increase?

The economy has returned to full employment with reasonably strong growth of employment and income. The income elasticity of demand for housing is believed to exceed one. As a result, demand for housing has been increasing faster than supply, such that the rental vacancy rate has been declining for the past two years. The fact that OER inflation has increased more than tenant rent inflation most likely reflects the stronger demand for rental units in areas with higher homeownership rates.

Some analysts have argued recently that the decline of homeownership affordability has led to increased demand for rental housing relative to supply. They note that the substantial increase in the homeownership rate from 1995 to 2004 appears to have depressed the demand for rental housing, leading to rising vacancy rates and slower rent inflation. Such analysts regard this development as another distortion and conclude that the current increase in OER inflation should be "discounted" for monetary policy purposes.

We believe this argument is flawed because it ignores the real phenomenon of housing units switching from rental to owner status and vice versa. Indeed, the increase in the rental vacancy rate from 1995 to 2004 was due in large part to an absolute decline in the number of renter-occupied units (the denominator of the vacancy rate) as opposed to an increase in the number of vacant units for rent (the numerator).

How is OER measured in other countries?

In many cases, including the United Kingdom and the Euro area, the rental services consumed by homeowners are excluded from the official CPIs. In their view, increases in homeowners' implicit rent

increase the homeowner's implicit income by the same amount, leading to no change in the standard of living. The counterargument is that this confuses the price of a service with the income of the household consuming that service: increases in the price of any good or service will raise aggregate nominal income.

Canada, Sweden, and a few other countries employ a user cost approach: the housing services consumed by homeowners are approximated by the costs of ownership, including interest payments, depreciation, maintenance and repair, taxes, and insurance. The change in the price of housing services is a weighted average of the change in the price of these various inputs. In long-run equilibrium the two approaches are equivalent.[1]

Finally, a few countries, including Australia, Finland, and New Zealand, use the net acquisition approach in which changes in the price of housing services for homeowners are measured by the change in the price of new homes (excluding land prices) as well as changes in the price of related transactions prices.

Why not use home prices?

Some commentators have suggested that home prices would be a better measure of the costs of homeownership. We disagree with this view. Fundamentally, home prices reflect the discounted value of expected future rents from the property. As such, changes in home prices will reflect (at least partly) changes in expected future rents or the discount rate of those flows. Neither is appropriate in a measure of the cost of current consumption. Prior to 1983, home prices and mortgage interest rates were included in the CPI. This approach was dropped following severe and appropriate criticism from the academic and policy making communities.

[1] In implementing OER in the early 1980s, the BLS considered the user cost approach, but found it to lead to what it considered an "excessively" volatile price index.

Global

Foreign growth is projected to slow slightly to 3.1 percent (Q4/Q4) in 2006, down from 3.3 percent in 2005. The outlook is essentially unchanged since the last FOMC meeting with data confirming solid growth in all major regions. The forecast is for Japan and Emerging Asia to slow moderately in 2006 after strong growth in 2005, while Europe experiences some acceleration relative to last year.

Industrial Countries. Euro area growth came in near expectations in 2006Q1 at 2.4 percent (annual rate), and indicators point to a similar performance in Q2. Growth in 2006 is projected at 2.3 percent (Q4/Q4). It is then expected to moderate in 2007, partly in response to less expansionary monetary policy. Industrial production was up 2 percent over the year in April – a good number, but not quite as robust as recorded in previous months. Orders and exports grew at solid rates in March. The industrial confidence index continued to offer encouraging signals, rising in May to well above its most recent mid-2003 peak. Credit growth was 11 percent over the year in April, 3 percentage points higher than in April 2005. Employment was a healthy 1.5 percent above year-ago levels in 2006Q1. This bodes well for consumption spending, which has been lagging the overall economy. The data, though, also suggest that productivity growth remains quite weak. Consumer prices were up 2.5 percent over the year in May, while core inflation was only 1.5 percent, near the pace it has kept since early 2005.

The Japanese economy grew a robust 3.1 percent (annual rate) in 2006Q1, driven by domestic consumption and private investment. The stronger-than-expected Q1 data raised the 2006 forecast, although growth is still projected to slow to a more sustainable pace in coming quarters. Indicators for Q2 show the expansion continuing at near the Q1 rate. Industrial production and core machinery orders picked up in April. Business confidence remains steady at a high level. Consumer prices, excluding the volatile fresh food component, were up 0.5 percent over the year in April. Inflation is forecasted to remain near this modest level in 2006 and 2007.

Emerging Economies.

The 2006 GDP growth forecast for China was raised to 9.5 percent (Q4/Q4) from 9.0 percent to reflect strong data on exports, industrial production, retail sales, and investment spending; as well as robust M2 and loan growth (both running well ahead of official targets). This forecast now implies a more modest slowing from the 10.3 percent growth (annual rate) recorded in Q1. The trade surplus is now projected to rise to $145 billion in 2006 from $102 billion in 2005, which contrasts with the previous forecast of a slight decline. This change largely reflects a surprising rise of the surplus to $47 billion through May, compared to $30 billion last year. Inflation remained subdued at 1.4 percent over the year in May, although official figures probably understate actual inflation.

The 2006 forecast for the Asian NIEs is unchanged at 4.3 percent (Q4/Q4). Strong Q1 growth in Korea, Hong Kong and Singapore offset a sluggish performance in Taiwan. The latest data for production and exports have been generally strong, suggesting that growth in the region continues at a healthy rate. Looking ahead, domestic demand should continue on its recent firming trend, while export growth moderates from its recent elevated pace.

Solid growth in Latin America is expected to continue despite greater market volatility. Inflationary pressures remained modest except in Argentina. In Mexico, Q1 GDP data indicated that the economy bounced back from an unexpected slowing at the end of 2005. Driven by strong industrial activity and a recovery of the agricultural sector, GDP expanded 6.3 percent (annual rate). Data indicate moderating growth in Q2. Brazilian Q1 GDP growth of 5.7 percent (annual rate) was slightly faster than expected, with business investment up a sharp 15.8 percent. More recent data indicate that growth has moderated in Q2 to a more sustainable pace. In Argentina, data indicate that activity is moderating more gradually than originally anticipated. Industrial production rose sharply in April and the monthly estimator of economic activity in March showed a 7.7 percent

gain over the year. This surprising strength has led to a modest rise in the 2006 growth forecast to 7.5 percent.

Trade

The U.S. trade deficit widened to $63.4 billion in April from $61.9 billion in March, boosted by higher oil prices. The increase in oil prices more than offset a decline in oil import volumes, which have been trending down since the beginning of the year.

In real terms, the merchandise trade deficit in April was unchanged from its Q1 average, as non-petroleum imports were flat and the fall in the volume of oil imports was offset by a decline in real exports. The decline in exports was concentrated in capital goods (mostly aircraft) and consumer goods.

Revised data for 2005 and 2006 show a slightly smaller trade deficit for 2005 than previously reported. More significant was the downward revision to the 2006Q1 deficit: the revised data imply the drag on GDP growth from net exports may be 0.25 percentage points less than previously recorded.

The current account deficit was $835 billion (annual rate) in 2006Q1 and is projected to reach $1.0 trillion by the end of 2006, which is about 7.5 percent of nominal GDP. The net income balance improved by nearly $16 billion (annual rate) in 2006Q1 relative to 2005Q4 because of a large increase in the net surplus for foreign direct investment. Net income is, nevertheless, projected to worsen in 2006 and 2007 as higher interest rates, applied to an ever-increasing stock of U.S. interest-sensitive liabilities, offset the net surplus on foreign direct investment.

The net export contribution to GDP growth is projected to be -0.1 percentage point in Q2. For 2006 as a whole, the forecast is for net exports to take about 0.5 percentage points off

GDP growth. The key driver of this forecast is the assumption of strong U.S. domestic demand growth this year.

Financial

Domestic Markets

Federal Reserve commentary and economic releases dominated developments in domestic fixed income markets over the inter-meeting period. The Minutes from the May FOMC meeting as well as FOMC member speeches increased expectations of further policy tightening, helping to cause market-based measures of inflation expectations to decline despite stronger-than-expected CPI releases. Intermediate-term Treasury yields rose significantly since the last Blackbook, consistent with firmer policy expectations. Outside the Treasury market, risk perceptions increased, with wider credit spreads, lower equity prices, and higher equity implied volatility.

Over the inter-meeting period, Federal Reserve commentary and stronger-than-expected inflation data increased expectations of further policy tightening [Exhibit B-4]. The implied July Fed Funds rate rose by 17 basis points to 5.27% since the May Blackbook, with the market currently pricing in a 25 basis point increase at the June meeting with near certainty. The largest daily changes in the implied July rate came on the day of Chairman Bernanke's comments before the American Banker's Association (June 5, + 6 basis points), on the May employment report release date (June 2, -6 basis points), and on the May CPI release date (June 14, +4.5 basis points). Expectations beyond the June meeting firmed even more over the inter-meeting period, with the expected rate for October rising 27 basis points to 5.44%.

Perceptions of the Federal Reserve being more vigilant against inflation helped to cause inflation expectations derived from nominal and inflation-protected Treasury securities to decline modestly over the inter-meeting period, despite the stronger-than-expected inflation data [Exhibit B-2]. Ten-year breakeven inflation, which roughly gauges

expected inflation over the next 10 years, declined 13 basis points to 2.56%. Carry-adjusted implied inflation compensation declined 12 basis points for the 0-5 year horizon to 2.51%, and 12 basis points for the 0-10 year horizon to 2.57%.

Nominal Treasury yields rose over the inter-meeting period in a manner consistent with expectations of tighter policy over the next couple of years [Exhibit B-1]. The 2-year note yield, in particular, rose 24 basis points to 5.20%, with the largest daily yield changes coming with the May CPI release (June 14, +11 basis points), the May Employment Report (June 2, -9 basis points), Chairman Bernanke's ABA comments (June 5, +7 basis points), and the FOMC Minutes (May 31, +7 basis points). Longer-term yields rose more modestly, consistent with contained inflation expectations, with the 10-year note yield rising 3 basis points to 5.16%.

Despite the change in policy expectations, measures of policy uncertainty changed little over the inter-meeting period [Exhibits B-5 and B-6]. The range within which the 3-month Eurodollar rate is expected to remain over the next 3 months, for example, declined 3 basis points to 80 basis points, whereas the comparable figure for the next 6 months rose by 5 basis points to 129 basis points.

Consistent with perceptions of increased risk outside the Treasury market, corporate credit spreads widened over the inter-meeting period [Exhibit B-8]. The single A spread widened 7 basis points to 88 basis points and the BB spread widened 31 basis points to 269 basis points. Ten-year interest rate swap spreads widened by 7 basis points to 58 basis points.

Equity markets declined over the inter-meeting period and equity implied volatility increased [Exhibit B-7]. The NASDAQ Composite index declined by 8.4% and the S&P 500 declined by 5.5% since the last Blackbook, although both markets have come off of their recent lows. S&P 500 implied volatility for the next 3 months rose from 12.0% to 15.5% and NASDAQ Composite implied volatility rose from 14.6% to 20.0%, although

both measures have declined from their recent highs. Longer-term implied volatilities also increased, albeit more modestly.

Monetary Policy and Global Bond Markets

Global financial markets were unsettled during the inter-meeting period before stabilizing in recent days. Inflation concerns in mid-period in the United States and abroad, widespread monetary tightening, and unstable commodity prices, led investors to upgrade perceived risk in most markets – especially in markets that recently yielded the largest returns.

Short-term interest rates firmed globally, as policy was tightened in both industrial and emerging economies. During the inter-meeting period, policy rates were hiked in the euro area, Canada, Norway, Sweden, and Switzerland, as well as in India, Korea, South Africa, Thailand, and Turkey, with expectations of further tightening in most regions. The Bank of Japan held its policy rate at zero, but continued to drain bank reserves in preparation for a rate hike before end-summer – maybe as early as next month. Policy remains on a tightening path in Australia, China, and most other emerging economies, and a small upward bias is now priced also into UK rates.

These developments have led to flatter yield curves, with ten year rates near 4 percent in the euro area and 1.9 percent in Japan in recent days (Exhibit B-10). Central banks' firm response to inflation news contributed to keeping inflation fears in check. Breakeven rates from inflation-linked bonds, which had risen through mid-May, have since receded, in both Europe and North America. Lower yields on industrial countries' bonds may also owe, however, to a reallocation of funds from stocks and other risky instruments, such as emerging market assets.

Emerging market spreads widened – by 30-40 basis points – but remain low by historical standards (Exhibit B-9). This performance suggests that investors may have decided to reduce some of their risk exposure and realize some of their previous (perhaps excessive)

gains, but still view fundamental conditions in these countries as healthy. Indeed, spreads have risen relatively more where the largest asset gains had been previously recorded, such as in commodity-exporting Indonesia, Russia, South Africa, and Venezuela.

Foreign Equity Markets

Inflation fears and an upgrade in perceived global risk spurred a global equity sell-off in the inter-meeting period. Euro-area and Japanese equities lost about 10 percent since the last FOMC meeting – the steepest decline since 1998 – while emerging market indices fell even more sharply (Exhibit B-9). However, such declines follow spectacular gains in the first few months of 2006, leaving equity prices in many countries still above their levels at the beginning of this year and more than 30 percent higher than in early 2005. Equity prices have stabilized in recent days, suggesting that the current phase of global re-pricing may have been completed.

Exchange Rates and Capital Flows

Global currency markets have featured two distinct phases in recent months, with a clear break occurring during the inter-meeting period. Until mid-May, the dollar was on a weakening trend, having lost about 4 percent in nominal effective terms since January. During this phase, foreign central banks, mostly from Asia, continued to lean against appreciation of local currencies, and made sizable reserve purchases.

Since mid-May, rising anticipation of tighter Fed policy ahead has lifted the dollar. As a result, the dollar now stands 1 percent higher against the euro, 4 percent higher against the yen and 2 percent higher against a basket of Emerging Asia currencies (Exhibit B-9) than at the time of the last FOMC meeting. The dollar also gained 6-7 percent on the Brazilian real and Mexican peso, while the currencies of South Africa and Turkey were also hit hard. Currencies managed more tightly, including China's, Russia's and India's, have changed little against the dollar. As investors' appetite for emerging markets' currencies ebbed, reserve purchases by foreign central banks are estimated to have fallen

to modest levels since May. In any event, exchange rate volatility implied in currency options has risen, although it remains well below its peak levels in 2004 and before (Exhibit B-9).

Global capital flows are continuing along their recent trends. Most purchases of U.S. assets by net-saving countries are still being made by the official sector, with a growing share now originating (directly or indirectly) from oil-exporting countries. The saving surplus of oil-exporters (including Russia, Norway, and Venezuela) is projected to reach $545 billion in 2006 (up from $400 billion in 2005). Japan's and China's net saving surpluses for 2006 are projected at $170 billion and $200 billion, respectively. Most of these flows are destined for the United States, with Western Europe receiving small net inflows.

Commodity Market Developments

Commodity prices were volatile during the inter-meeting period, spiking in May and stabilizing in more recent weeks, as many investors have reportedly unwound speculative positions opened in previous months. The price of gold has fallen by almost $150 an ounce since mid-May. Oil prices, currently near $70 per barrel (WTI), have also fallen slightly off their May peaks, but remain elevated, supported by strong global growth and capacity constraints on production.

Oil demand is expected to remain strong in 2006, although estimates of demand growth have been trimmed since the last FOMC meeting. On the supply side, availability of new fields in Russia and Angola is expected to make up for continued shortages in Iraq and Nigeria. WTI prices are now assumed to reach $73.00 in Q4 2006 and remain stable through 2007. The previous assumptions were for prices of $65.50 and $74.25, for Q4 2006 and Q4 2007, respectively.

Second District

Our Indexes of Coincident Economic Indicators for May indicate brisk and accelerating economic growth in New York City, moderate growth in New York State, and a pause in growth in New Jersey [Exhibit E-1]. Looking ahead to the next nine months, our leading indexes continue to predict growth of nearly 2% (annual rate) for New York City, less than 1% for New York State, and close to zero for New Jersey [Exhibit E-2]. Local-area inflation accelerated substantially on a year-over-year basis: the 12-month change in metropolitan New York City's Consumer Price Index (CPI) was 4.8% in May, up from 3.6% in April and about ½ percentage point above the U.S. rate. Similarly, 12-month change in the core CPI rose to 3.9%, up from 2.8% in April and 1½ percentage points above the U.S. rate. This divergence was driven mainly by the housing component, which accelerated sharply locally.

Labor Markets. The district's labor markets have remained fairly robust since the last Blackbook. Private-sector employment in the New York-New Jersey region grew 1.7% (annual rate) in April and 1.3% in May, and is up roughly 1% from a year ago in both states [Exhibit E-3]. New York City has registered annualized job growth of roughly 2%—both in May and over the past 12 months. Labor force data have been mixed but on balance positive: New York State's unemployment rate fell 0.3 percentage points in May to a 5-year low of 4.6%, while New York City's rate fell to an 18-year low of 5.0%; in contrast, New Jersey's rate, which jumped to a 2-year high of 5.1% in April, retreated only marginally in May to 5.0% [Exhibit E-4]. Moreover, whereas New York's labor force expanded briskly in May, New Jersey's contracted.

Real Estate. New York City's commercial real estate market showed further signs of tightening in May: vacancy rates continued to decline in both Downtown and Midtown Manhattan, while asking rents continued to post double-digit percentage gains on a year-over-year basis. In contrast, housing has shown further signs of softening. The New Jersey Association of Realtors reported a sharp drop in unit sales and a deceleration in

sales prices for the first quarter. New York State Realtors also report some leveling of prices, along with a more moderate drop-off in sales activity.

Surveys and Other Business Activity. Recent surveys indicate that business sentiment has improved, while consumer sentiment has declined only moderately in the wake of surging energy prices. Results from the June Empire State Manufacturing Survey suggest an acceleration of manufacturing activity, as well as a modest pickup in price pressures. Similar signals were also evident in May surveys of purchasing managers in both the Buffalo and Rochester areas. Consumer confidence surveys were more mixed in May: the Conference Board's survey of Middle Atlantic (NY, NJ, Pa) residents indicates that confidence retreated moderately, while Siena College's survey of New York State residents shows confidence rebounding modestly following a dip in April. Finally, tourism has shown strength across the district: Broadway theaters and Manhattan hotels report strong revenue growth, and hotel occupancy rates are reported to be up from last year in Buffalo, Rochester and Niagara Falls.

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 expected to remain contained.
2. There is little if any slack remaining in resource utilization. Therefore, if there are no large shocks, and if fiscal and monetary policies maintain a near-neutral stance, then growth over the medium term will be near its potential rate of approximately 3¼-3½% (2¼-2½% long-run productivity growth [GDP basis] plus 1% labor force growth).
3. The term premium is expected to remain low.

These underlying assumptions for the central forecast have not changed from the last Blackbook. Moreover, recent developments have made us more confident about these assumptions than we were at the time of the May Blackbook. Longer-term inflation expectations in financial markets and household surveys have declined slightly since May, although they remain elevated compared to earlier in the year. The payback in 2006Q2 from the robust 2006Q1 growth appears to be reasonably moderate and consistent with future growth remaining near its potential rate. Conversely, recent declines in equity markets, higher volatility in those markets, and a flat yield curve may be signals of a more persistent slowdown. Nevertheless, the uncertainty around our forecast has diminished over the inter-meeting period.

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

Inflation. Monthly changes in overall and core price indices again were high in May, while oil prices remained at elevated levels. These developments have led us to once again raise our inflation forecast over the remainder of 2006, with the Q4/Q4 change in the core PCE deflator now expected to be almost 2½% (the overall deflator is expected to rise slightly more). We still see this increase as temporary because we anticipate little net change in oil prices over the forecast horizon and only modest pass-through of previous energy price increases to other goods and services due to an environment of flexible product and labor markets as well as continued FOMC credibility. Furthermore, previous monetary tightening should begin to have more impact on inflation over the next several quarters. Therefore, we expect inflation to decline in 2007, as core PCE inflation falls toward 2%. Further declines in 2008 will push the inflation rate toward the implicit target.

Real Activity. We expect that the economy will grow close to its potential rate (3¼%-3½%) over most of the forecast horizon. As stated earlier, we expect real GDP growth to be about 2¾% in the current quarter, a payback after the strong growth in 2006Q1. In particular, the monthly indicators of consumer expenditures, residential investment, and government spending point to slower growth. In the second half of 2006, strong business fixed investment should support growth, counteracting a continued moderation in the housing market. Beyond this, our forecast is unchanged with growth near its potential rate through 2007. Because average real growth remains close to its potential rate over the forecast horizon, we expect little change in the unemployment rate from its current level.

Comparison with Greenbook Forecasts

GDP and Inflation Forecast

The Greenbook baseline forecast is conditioned on a higher policy path than in May: the policy rate is expected to rise to 5.25% at the June meeting and to stay at that level through the end of 2007. The May Greenbook policy path assumed instead the policy rate would stay constant at 5% through the end of 2007. There are significant changes in the conditioning assumptions on energy prices, equity prices and the dollar. The equity price path has been adjusted downward to reflect the decline over the inter-meeting period (this decline contributes to dampening economic activity in their story) and the path of energy prices is revised downwards .The dollar is assumed to resume its depreciation, but on a slightly lower trajectory. There are only very minor changes in the conditioning assumptions for long-term interest rates and housing prices.

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

- Compared to the May Greenbook, core PCE inflation in 2006 has been revised up 0.2 percentage points to 2.4%, and 0.2 percentage points in 2007 to 2.2%.
- The real GDP growth forecast for 2006 is 3.3%, half a percentage point lower than the May forecast. Real GDP growth for 2007 is 2.7%, revised down 0.3 percentage points from May.
- Potential GDP growth is essentially unchanged at 3.2% over the forecasting period.

- Relative to the May projections, output per hour is revised down by 0.2 percentage points for both 2006 and 2007.
- Payroll employment growth is expected to decline further over the forecast horizon (slightly more than in the May Greenbook) as labor force participation continues a secular decline. The slowdown in real activity is expected to produce an increase in the unemployment rate to 0.2 percentage points above the NAIRU.

Our staff forecast of real GDP growth and inflation differs significantly from the Greenbook forecast [see Exhibit A-2]. In particular, our outlook appears to consider the output slowdown and the inflation pick up of 2006Q2 as more transitory, and projects both higher growth and lower core inflation for 2007.

Our projection for GDP growth for 2006 is 0.2 percentage point above the Greenbook forecast (3.5% vs. 3.3%) and 0.6 percentage point above the 2007 Greenbook projection (3.3% vs. 2.7%).

The slow growth projected by the Greenbook derives from a downward revision in both consumption and investment spending. The slowdown in 2006 appears to be primarily due to lower consumption growth, as a result of lower equity prices and deterioration in labor income. In 2007, the larger contribution to slower output growth appears to be a decline in housing that was not incorporated in the May Greenbook forecast, and a decline in overall business investment.

For inflation, our staff forecast is in line with the Greenbook's for 2006, but 0.2% lower for 2007: this reflects our assumption of less inertia in the average inflation process and a lower path of labor costs.

As it has been the case for the last few FOMC cycles, our outlook for unit labor costs is quite different from the Greenbook's. For both 2006 and 2007 our forecast is about half a percentage point below the Board's forecast: the difference is as usual driven by the Greenbook's higher projected hourly compensation, while productivity is assumed to evolve on a path roughly similar to ours.

We also believe that some of the upward pressure on inflation in the Greenbook's forecast for 2007 derives from their projection of lower investment, which has a negative impact on productivity.

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

The June Greenbook describes several alternative scenarios. Three of them imply an impact on the economy which is significantly different from the baseline scenario. The first scenario describes a change in the demand-side baseline: a further decline in housing activity ("housing slump"). Presumably, the decision to present this scenario is linked to concerns about a downturn in the housing markets and the fact that housing activity slowed down more substantially than was forecast in the May Greenbook. Under this scenario real activity decreases substantially more than in the baseline, while inflation stays unchanged and the policy instrument consistent with this outlook is substantially lower in 2007 (down to 4.4% versus 5.25%).

The other two scenarios describe a change in the supply-side of the Greenbook baseline. In the "skittish investors" scenario, term premiums in long-term treasury bonds increase because of higher inflation risks. While this has a strong negative effect on economic activity, it nevertheless pushes up inflation slightly. This pattern generates a decrease in the path of the federal funds rate from 5.3% baseline down to 5.0% in 2007.

In the "greater pricing power" scenario, firms increase their mark-ups compared to the baseline. This results in a strong increase in inflation and a milder decline in economic activity. In this case the policy rule implies a steep increase in the policy rate, which rises to 6.1% in 2007.

Finally, there is an additional "Robust Investment" scenario worth noting. In this scenario, investment continues to grow strongly in 2006 and 2007 instead of decelerating as in the baseline scenario. Because of the higher investment, economic activity is higher than in the baseline, but inflation in 2007 is slightly lower due to resulting higher productivity. This scenario is interesting because it implies a forecast for output growth and inflation similar to our central forecast. However the Greenbook's implied path for the policy rate increases to 5.8% in 2007, while our staff's forecast predicts a downward adjustment to 5% at the end of that year. The two different policy implications can be reconciled by the different evolution of unit labor costs and differences in the persistence of inflation previously discussed.

Foreign Outlook. There are only minor differences between our foreign outlook and the Board's. Both forecasts expect foreign growth in 2006 to be roughly similar to that in 2005, with faster growth in Europe offsetting somewhat slower growth in Asia. Both forecasts have a similar slowdown in foreign growth next year, although there are notable divergences in the outlook across regions. The Board has slower growth in the euro area, China, Korea and Mexico, while projecting faster growth in Japan and the U.K.

U.S. Trade. The Board assumes lower domestic demand which translates into lower import growth and a smaller drag from net exports on GDP. For 2006 as a whole, they assume no drag from net exports, while we assume a 0.4 percentage point drag. Their assumption of lower domestic demand in 2007 also leads to divergent net exports forecasts. They expect a 0.2 percentage point drag from trade over the year, while we forecast a 0.4 percentage point drag.

Comparison with Private Forecasters

Our staff forecast for real GDP growth is roughly in line with those from the private sector. We see GDP growth somewhat above the Macro Advisers forecast and slightly below the Blue Chip forecast for Q2. For Q3 we assume, as in the Macro Advisers forecast, a rebound slightly stronger than the Blue Chip consensus forecast. For CPI inflation, the FRBNY forecast is higher than private sector forecasts. However, this difference may reflect the timing of the most recent CPI release relative to the recording date of the private sector forecasts. For 2006Q2, we project CPI inflation above the Macro Advisers forecast both for the headline and the core measures. For 2006Q3, we project the same core CPI inflation, but a lower headline number than the Macro Advisers forecast.

FRBNY Alternative Scenarios and Risks

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

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

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

FRBNY Alternative 1: Overheating.

There are two potentially connected forms of this alternative. The first is a more standard scenario in which the extremely accommodative policy stance adopted in the US and other countries in response to the global slowdown of 2000-2003 produces a persistent move in inflation above implicit targets with an abrupt slowdown in real output growth starting in mid-2006. If central banks have consistently underestimated the equilibrium real rate (i.e., overestimated the slack in the global economy), then this will lead to excess aggregate demand growth and, ultimately, to an increase in inflation and inflation expectations. The continued upside surprises to energy prices in particular and commodity prices in general are supportive of this sort of global overheating scenario. Also, core and most other measures of underlying inflation have been above the "comfort zones" of U.S. policymakers, and TIPS implied inflation rates had shown signs of an increase in U.S. long- and medium-term expectations (though the movements have been reversed more recently). However, the orderly slowing of the U.S. economy to date as well as the downward revision to compensation growth have reduced the likelihood of this version of the scenario. Consequently, this first form of the overheating scenario seems incomplete in that it is difficult to reconcile with the fact that these seemingly accommodative policies have been in place for an extended period of time without precipitating a significant rise in inflation by historical standards.

The second form of this scenario (described in the special topic *The Free Lunch* in the May Blackbook) highlights the possibility that the U.S. economy could be overheating but that the overheating might not manifest itself immediately in uncomfortably high domestic consumer inflation rates (i.e., where uncomfortably high is defined as a rate well in excess of the FOMC's implicit target). The argument is that if the dollar is not

freely floating, and moreover if the dollar is being boosted by capital inflows designed to strengthen it relative to other currencies, then it is possible that market interest rates could be held below what might be reasonably viewed as the equilibrium rate for a significant period of time.

To see why inflation per se may not have provided a reliable signal of this scenario recently, consider the extreme case of an overvalued currency in a fixed exchange rate regime. In the absence of a nominal devaluation, the country with the overvalued currency would need to experience a decline in its price level (relative to other countries) to restore equilibrium. If instead that country experiences positive, albeit low, inflation, then it is possible for the country's real interest rate to remain at an artificially low level relative to the equilibrium level. Because avoiding significant deviations of actual real interest rates from their equilibrium value (in order to avoid distorting inter-temporal consumption and saving decisions) is a fundamental objective of monetary policy, the monetary policy in that country is in effect overly expansionary.

A crucial element of this version of the scenario is that the direct costs of supporting the (over-valued) dollar are being borne by economies seeking to keep their currencies weak relative to the dollar. If these intervention efforts are large enough to affect world capital markets and interest rates, then the U.S. is effectively importing the expansionary monetary policies of these other countries. If the FOMC does not actively offset this policy, but instead passively accepts these lower world interest rates, then it is effectively allowing monetary policy to have real effects (the free lunch). While this situation is not sustainable, the adoption of this type of policy can certainly cause damage to the long-run growth trajectory of both the U.S. and the rest of the world during its tenure.

There is now less evidence suggesting that the U.S. is over-consuming today at the expense of future consumption. The most direct evidence in favor of this view was the apparent non-sustainability of the U.S. current account deficit in general, its fiscal imbalances and the large increases in house prices. The recent stabilization of the U.S. real trade deficit, the short-run improvement in the fiscal position, and the orderly

slowing of the U.S. housing market all point to less weight being placed on this version of the scenario.

FRBNY Alternative 2: Productivity Shifts. In the post-war era, the United States has experienced three productivity epochs (pre-1973, High I; 1973 to mid-1990s, Low I; and mid-1990s onward, High II). 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 the continued strength of labor productivity over the longer term suggest that firms have become more efficient in using labor. As such, strong productivity growth could persist, which would imply that the potential growth rate is higher than our current estimate. Strong productivity growth would also limit labor cost pressures, and thereby help to keep inflation subdued. Solid productivity growth in 2006Q1 and a projection for continuation in 2006Q2 suggests the recent slowdown in productivity was temporary. Moreover, this scenario is supported by the continued strength in IT industrial production growth, the FRBNY Tech pulse index, and hi-tech equipment and software expenditure indicators.

2b. Productivity Slowdown

It is possible that the recent upswing in productivity may not be sustained. Further, the persistent increase in the level and volatility of energy and commodity prices also could result in lower labor productivity growth. The recent slowing in real compensation growth has raised the probability of this scenario according to the Kahn-Rich productivity model. However, the forecasts from this model are not yet showing a sharp slowing of

productivity growth. Therefore, we have reduced modestly the probability of the productivity boom scenario while keeping the probability of a slowdown the same. This effectively raises slightly the relative weight on the return of a slump.

FRBNY Alternative 3: Overtightening.

Our outlook is based on the assumption that the neutral policy rate is between 4% and 4.5% with an implicit target for the core PCE of 1.5%. Recent inflation data have core PCE running above 2%. If sustained, this development is consistent with a Fed Funds rate above 5%. However, there is a risk that the recent increase in inflation is a lagging indicator of demand pressures and the economy will slow below potential. This view is supported by the fact that inflation expectations remain contained despite a long period of headline inflation running at 3% or more. Furthermore, the Fed has been increasing the FFR for two years, with a cumulative increase of 400bp. While there has been the risk of a yield curve inversion for most of the last six months, its implications had been discounted because of the low level of long forward rates. Long forward rates have subsequently increased and the situation now seems more reminiscent of prior periods when the Fed induced a yield curve inversion. Finally, the recent jump in stock market volatility suggests increased fears of a policy-induced decline in real activity.

Additional Uncertainties

Foreign Outlook.

The euro area forecast does not envision growth exceeding 2.5 percent, unlike the region's experience in the late 1990s. This cautious outlook is supported by various output indicators and by the projection of a gradual tightening of monetary conditions in the region and abroad. Yet, business optimism continues to improve rather than stabilize, suggesting an upside risk to the forecast. Labor market data are admittedly a mixed bag. Strong employment data in Q1 and a steady fall in the unemployment rate may lead to a greater-than-expected increase in consumer spending. On the downside, the economy is

growing by hiring workers without notable improvements in productivity, lessening potential real wage and profit gains.

A major uncertainty in Japan is the future conduct of monetary policy. Recent statements by Governor Fukui raised the possibility of a rise in the overnight interest rate on July 14. There are concerns that this move could be premature, although the economy appears strong enough to weather an early policy tightening.

Growth in Emerging Asia outside China remains geared to the global cycle. Recoveries in the region would be at risk were a significant slowdown in global growth to occur. Offsetting such risk, solid fundamentals make Emerging Asia less vulnerable than other emerging economies to changes in global risk appetites (Indonesia and the Philippines are exceptions). Values of Emerging Asia assets also appear to have risen less than those of comparable assets in other emerging markets, limiting the scope for sudden corrections.

Investment as a share of GDP in China remains unsustainably high and is rising. The acceleration in loan growth in China serves as a reminder that the country remains vulnerable to overheating and to an eventual abrupt slowdown, with likely spillover effects for the rest of Asia.

In Latin America, the points that bear monitoring include financial market reactions to upcoming elections in Mexico and Brazil. Mexico's July presidential election has tightened, while President Lula has consolidated his polling lead over his main rival in Brazil's October elections. In Argentina, inflation and the government's heterodox policy response remain key concerns.

U.S. Trade Forecast.

Consistent with 2005 data, the forecast assumes import volumes will grow somewhat slowly relative to domestic demand growth. If import demand recovers, however, the drag from net exports on GDP will be greater than anticipated.

An additional risk is that the forecast attributes the Q1 decline in oil import volumes to seasonal factors, rather than to a softening in oil demand. Should the decline instead reflect the response of demand to higher energy prices, then oil import volumes may be lower than expected.

Quantifying the Risks.

The inflation data over the inter-meeting period have been less consistent with our central scenario, while the real activity data have been more consistent with a soft landing to a more sustainable pace of expansion. Therefore, we are raising the current likelihood of the central scenario to 71% (it was 66% for the May FOMC). The increase in the likelihood placed on the central scenario is the result of a sharp reduction on the weight placed on the overheating scenario and a decline on the weight placed on the productivity boom. We assume that the most likely scenarios are the productivity boom at 8% (10% in May) and productivity slowdown at 8% (8% in May), followed by overheating at 5% (12% in May) and over-tightening at 5% (new scenario not considered in May). The remaining 3% (3% in May) is split evenly between upside and downside risks. The implied dynamic balance of risks is shown in Exhibit C-1.

The forecast distributions for core PCE inflation and GDP growth produced by the standard risk assessments are shown in Exhibits C-4 and C-5. The Bank forecast has been extended through the end of 2009 under the assumptions that output grows at the potential rate of 3.3% and core PCE inflation is converging back to the implicit inflation target of 1.5%. We discuss the assumption behind this extension in the Special Topic "Forecast errors and implications for policy."

The probability of core PCE inflation exceeding 2.5% by the end of 2008 is now 70% (65% in May)--this probability is produced by considering the share of inflation paths that exceed 2.5% and cannot be obtained directly from the forecast distribution presented in Exhibit C-4. The probability that the expansion continues through the end of 2008 is

93% (95% in May). This increase in downside risk is produced by the weight placed on the over-tightening scenario.

The FRBNY “confidence intervals” can be compared to those presented in the Greenbook. In general we have a similar level of confidence for 2006 as the Board, but less confidence in 2007 on inflation. For example, the Greenbook has a 70% probability interval of 1.4% to 3.0% for core PCE inflation in 2007, while our interval ranges from 1% to 3.5%. The source of the wider interval is the weight we place on our alternative scenarios. These scenarios do not receive the same weight in the historical data since 1986, from which the Greenbook derives its forecast errors.

Special Topic

Forecast Errors and Implications for Policy

June 22nd, 2006

Dick Peach Redacted *and Simon Potter* Redacted

The confidence in our point forecast for real growth has increased over the inter-meeting period. At the same time, the confidence in our point forecast for inflation has declined, with our perceptions of the risks clearly skewed to the upside. Some of us are becoming more uneasy with a point forecast for core PCE deflator inflation of 2% (Q4/Q4) in 2007, roughly where we have been for quite some time, along with near-term projections of core inflation that have moved up dramatically. For 2006Q2 we now expect the core PCE deflator to increase at a 3.1% annual rate. Even that elevated number assumes a fairly benign June number.

This discomfort stems in large part from the vast amount of empirical research that suggests inflation has had a high degree of persistence during the post-war period. For example, estimated Phillips curve models typically find that lagged actual inflation is the most important determinant of future inflation. Indeed, feeding a 3.1% core inflation rate for 2006Q2 into our Phillips curve models keeps core inflation significantly higher than our point forecast over the forecast horizon. The relatively benign point forecast is the result of adjusting the predictions of the models through judgmental "add factoring." The need to use an "add factor" to lower the forecast of standard Phillips curve models is also a practice applied by the Board staff to a variety of inflation forecasting models.

The confidence to override the forecasts comes from the strong belief that the high persistence of inflation observed in these models primarily reflects the unanchored inflation expectations of the 1970s and early 1980s. Thus, the view is that inflation forecasting models that are estimated over long sample periods, including the 1970s and 1980s, will result in an over-estimate of the current level of persistence. Moreover, we have evidence that current inflation expectations are relatively well anchored, and so we would expect actual inflation to converge to those expectations in the not too distant future. In the meantime, we can continue to monitor those expectations and adjust policy accordingly.

It is reasonable to think, however, that expectations are not the only determinant of persistence. Rather, it is likely that the structural features of an economy also play a role in the degree of persistence. These structural features relate to arrangements such as explicit or informal cost of living adjustments to prices and wages. The greater the extent to which these structural features are the source of persistence, the greater the likelihood that core inflation over the forecast horizon will turn out to be higher than our point forecast.

What are the policy implications of this second scenario? The first line of defense would be to communicate that it may take somewhat longer to achieve our inflation objective than previously thought, but we are firmly committed to meeting our objective. However, if the upside surprises on actual inflation feed through to expectations, some additional tightening may be needed to bring them back down.

4. Policy Alternatives

Under our main forecast and risk assessment, the target FFR should be raised by 25 basis points to 5.25% at the upcoming meeting. This rate is higher than the peak FFR level that has been implied by our forecasts and risk assessments for most of the current tightening cycle, but our projected peak rate has been increasing for some time. The primary reason we are now recommending a tighter path for the policy rate relative to the May Blackbook is the recent increase in core inflation readings. The readings themselves did not exceed our forecast sufficiently to cause us to alter our baseline outlook, but they are consistent with adopting a slightly tighter stance to ensure against an increase in inflation expectations and potential erosion of FOMC credibility.

Maintaining the FFR at 5.25% through the end of 2007Q3 is consistent with our central forecast scenario and is similar to the path priced into futures markets. Further, this slightly tighter stance increases the confidence in our central forecast scenario relative to that in May. In terms of the probabilities we assign to our alternative scenarios, most of the increased likelihood we place on the central scenario is attained through a reduction in the likelihood of the *overheating* scenario. In this Blackbook, we also have lowered the weight on the global deflation scenario to zero, and replaced it with an over-tightening scenario.

The appropriate path of policy seems increasingly dependent on two factors. The first is the public's perception regarding the credibility of the FOMC's commitment to its implicit inflation target. The more compromised this commitment is viewed to be, the more one might prefer to err on the side of insuring that core inflation returns to a level well below the upper bound of its implicit range sooner rather than later. This prescription should be followed even if it comes at the expense of some loss to real activity. Alternatively, if the FOMC's credibility is not at stake, then one might prefer to tolerate temporary upward movements in core inflation due to energy price shocks or to other factors. Implicitly, this translates into not "rushing" to return core inflation into its

preferred range, but rather taking seriously the possibility that our central forecast significantly underestimates the degree of "structural" persistence in inflation (that is, persistence attributable to factors in the economy beyond the erosion in the public's confidence in the FOMC's commitment to low inflation). This possibility is explored in Special Topic "Forecast errors and implications for policy" in the Alternatives Scenarios and Risks section. Naturally, if inflation expectations at medium- to long-term horizons were to begin to rise significantly, then restoring these expectations to comfortable levels might require more tightening in the future on the concern that the observed increase implies a slippage in credibility.

Generally, policymaker preferences and their assessment of the current situation determines the trade-off between adopting a policy of an immediate move to maintain credibility versus a policy that pauses but signals the willingness to move later if necessary (so as to avoid an inadvertent over-tightening). Our analysis of the policy alternatives is couched in terms of the assessment of the current situation, but it is possible to re-frame the discussion in terms of two policymakers who possess the same current situation assessment but hold different views of the trade-off between inflation and real activity.

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

1. *Baseline Policy Rule (slightly below near-term market expectations).* Increase by 25 basis points in June, and send a mild positive signal regarding future actions.

2. *Opportunistic Disinflation (slightly above near-term market expectation) Rule.* Increase by 25 basis points in June, and signal tighter policy until four-quarter core PCE inflation drops below 2%.

3. *Inflation Hawk (above near-term market expectations) Rule.* Increase by 25 basis points in June, and strongly signal increase in August unless monthly core inflation readings are lower than in the last 3 months.

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

Both the *Inflation Hawk* and *Opportunistic Disinflation* rules are designed to provide information on the FFR path profile if policymakers wanted to signal a more aggressive stance on core inflation. They differ in that the Inflation Hawk responds aggressively to monthly inflation above the target zone, whereas the Opportunistic Disinflation policymaker lowers the FFR more slowly than the baseline rule prescription, which leads to the real rate staying higher for longer.

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

Exhibit D-2 and Exhibit D-3 show the nominal and real FF rates, respectively, implied by our alternative scenarios under the *baseline* policy rule. The scenarios that imply significantly different paths from what is currently priced into markets are the over-tightening and overheating scenarios. The increased weight we have attached to the central scenario—in addition to the combination of a lower weight on the overheating scenario and a greater weight on the over-tightening scenario—explains in part why the

baseline policy rule shown in Exhibit D-1 moves down relative to the *market* path in the latter years of the forecast horizon.

Exhibit D-4 shows the result of running our *baseline* policy rule—setting the initial FFR at its average value of 1.9% in 2004Q4—with a 1.5% inflation target and a 2.0% inflation target (see the preamble to the Exhibit D for more information on the standard policy rules as well as this exercise). The path derived from the 1.5% target and 2.0% target both follow the actual FFR path closely until the middle of 2005. After this, the slope of actual policy has been considerably steeper than that implied by the baseline policy rule under either target. While the policy rule with the 1.5% inflation target is closer to the implied market path at the end of 2009 than is the rule with the 2.0% target, neither target implies policy as tight (or a terminal rate as high) as that which is currently priced into markets. In fact, at the end of 2006 and into 2007, the market path is around 100 basis points higher than either path. The exhibit also includes the implications of averaging our three policy rules, where the average was chosen to match the market-implied expected path as closely as possible.

Exhibit D-5 contains the probabilistic metric for comparing the market implied paths of the FFR with those of our policy rules at the end of 2007Q2. As was the case in May, it appears the market is pricing in behavior fairly close to that represented by our *Baseline* rule. But there has also been a substantial rise in the degree to which the market is pricing in the *Inflation Hawk* rule relative to May, and a comparable probability of the *Opportunistic Disinflation* rule. If we average across the three rules to capture possible beliefs priced into the market, we can match the market path almost exactly by placing 50% of the weight on the baseline rule and splitting the remaining weight equally between the two more aggressive rules. This suggests the market path will be very sensitive to any re-evaluation of the FOMC's aggressiveness towards inflation. Exhibit D-6 compares the implied distributions of FFR from the three rules and the average across rules with the distribution currently priced into markets. Again our forecast distribution and policy rules appear to accord closely with market views.

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 and 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 (Q4/Q4) 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 and 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 current predictions 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 current 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 number of sources. Besides the FRBNY forecast, the table includes the median forecasts from two surveys of forecasters (Blue Chip and Survey of Professional Forecasters [SPF]), the forecasts from

Macroeconomic 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 show the actual changes in inflation as measured by the PCE deflator, CPI, and PPI over 1, 3, 6, 12, and 24 months.
Source: Bureau of Economic Analysis and Bureau of Labor Statistics

Exhibit A-7. Measures of Trend Inflation

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

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

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 the UIG is in Appendix to Exhibit A-8 below. A non–technical description of the construction of inflation expectations from the TIPS is in Appendix to Exhibit B-2).
Source: MMS Function, FRBNY and Swiss National Bank.

Appendix to Exhibit A-8. 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 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.

A. Forecast Details

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

	Real GDP			Chain Type GDP Price Index			PCE Deflator			Core PCE			Unemployment Rate			
	Mar06	May06	Jun06	Mar06	May06	Jun06	Mar06	May06	Jun06	Mar06	May06	Jun06	Mar06	May06	Jun06	
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*	*5.2*	*5.2*	*5.2*	
2005 Q2	*3.3*	*3.3*	*3.3*	*2.6*	*2.6*	*2.6*	*3.3*	*3.3*	*3.3*	*1.7*	*1.7*	*1.7*	*5.1*	*5.1*	*5.1*	
2005 Q3	*4.1*	*4.1*	*4.1*	*3.3*	*3.3*	*3.3*	*3.7*	*3.7*	*3.7*	*1.3*	*1.3*	*1.3*	*5.0*	*5.0*	*5.0*	
2005 Q4	1.6	*1.7*	*1.7*	3.3	*3.5*	*3.5*	2.7	*2.9*	*2.9*	2.1	*2.4*	*2.4*	*5.0*	*5.0*	*5.0*	
2006 Q1	4.7	*4.8*	*5.3*	2.1	*3.3*	*3.3*	2.0	*2.0*	*2.0*	2.0	*2.0*	*2.0*	4.8	*4.8*	*4.7*	
2006 Q2	3.4	3.1	2.8	2.3	1.9	3.6	2.4	3.8	4.3	2.1	2.4	3.1	4.7	4.7	4.7	
2006 Q3	3.5	3.5	3.2	1.8	1.9	1.5	2.2	2.2	2.3	2.1	2.2	2.3	4.7	4.7	4.7	
2006 Q4	2.9	3.0	2.8	2.1	2.1	1.8	2.2	2.2	2.3	2.0	2.1	2.2	4.7	4.7	4.7	
2007 Q1	3.4	3.2	3.1	2.3	2.4	2.3	2.1	2.1	2.3	1.9	2.0	2.0	4.7	4.7	4.7	
2007 Q2	3.5	3.2	3.5	2.0	2.1	2.5	1.9	1.9	2.2	1.9	2.0	2.0	4.7	4.7	4.7	
2007 Q3	3.2	3.4	3.5	2.3	2.1	2.1	2.0	2.0	2.2	1.8	1.9	1.9	4.7	4.7	4.7	
2007 Q4	2.9	3.4	3.2	1.9	2.1	2.1	1.9	1.9	2.2	1.8	1.8	1.9	4.7	4.7	4.7	
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	3.2	*3.2*	*3.2*	3.1	*3.1*	*3.1*	3.0	*3.0*	*3.0*	1.9	*2.0*	*2.0*	*-0.4*	*-0.4*	*-0.4*	*
2005 Q4 to 2006 Q4	3.6	3.6	3.5	2.1	2.3	2.5	2.2	2.5	2.7	2.1	2.2	2.4	-0.3	-0.3	-0.3	*
2006 Q4 to 2007 Q4	3.2	3.3	3.3	2.1	2.2	2.3	2.0	2.0	2.2	1.8	1.9	2.0	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	
	MAY	JUNE	MAY	JUNE	MAY	JUNE	MAY	JUNE	MAY	JUNE	MAY	JUNE
REAL GDP (Q4/Q4)	3.2	3.2	3.6	3.5	3.3	3.3	3.2	3.2	3.8	3.3	3.0	2.7
GROWTH CONTRIBUTIONS(Q4/Q4)												
FINAL SALES TO DOMESTIC PURCHASERS	3.5	3.5	4.0	3.8	3.8	3.8	3.5	3.5	4.2	3.2	3.2	2.8
CONSUMPTION	2.1	2.1	2.7	2.4	2.2	2.2	2.1	2.1	2.8	2.3	2.2	2.0
BFI	0.7	0.7	1.1	1.1	1.1	1.1	0.7	0.7	1.0	0.8	0.7	0.6
STRUCTURES	0.0	0.0	0.1	0.2	0.1	0.2	0.0	0.0	0.3	0.3	0.2	0.2
EQUIPMENT & SOFTWARE	0.7	0.7	1.0	0.9	0.9	0.9	0.7	0.7	0.7	0.5	0.5	0.4
RESIDENTIAL INVESTMENT	0.4	0.4	-0.3	-0.3	-0.1	-0.1	0.4	0.4	0.0	-0.3	0.0	-0.1
GOVERNMENT	0.3	0.3	0.6	0.5	0.6	0.6	0.3	0.3	0.4	0.4	0.3	0.3
FEDERAL	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0
STATE & LOCAL	0.1	0.1	0.2	0.3	0.4	0.4	0.1	0.1	0.2	0.2	0.3	0.3
INVENTORY INVESTMENT	-0.1	-0.1	0.1	0.1	0.0	0.0	-0.1	-0.1	0.0	0.0	0.1	0.1
NET EXPORTS	-0.2	-0.2	-0.6	-0.4	-0.5	-0.4	-0.2	-0.2	-0.3	0.0	-0.3	-0.2
INFLATION/PRODUCTIVITY/WAGES (Q4/Q4)												
GDP DEFLATOR	3.1	3.1	2.3	2.5	2.2	2.3	3.1	3.1	2.6	2.7	2.3	2.3
PCE	3.0	3.0	2.5	2.7	2.0	2.2	3.0	3.0	2.5	2.5	2.0	2.2
CORE PCE	2.0	2.0	2.2	2.4	1.9	2.0	2.0	2.0	2.2	2.4	2.0	2.2
COMPENSATION PER HOUR	3.8	2.8	4.7	4.4	4.6	4.3	3.7	2.8	5.2	5.1	5.4	5.2
OUTPUT PER HOUR	2.5	2.5	2.9	2.8	2.8	2.7	2.5	2.5	2.8	2.6	3.1	2.9
UNIT LABOR COSTS	1.3	0.3	1.8	1.6	1.8	1.6	1.2	0.3	2.2	2.4	2.3	2.3
EMPLOYMENT VARIABLES												
UNEMPLOYMENT RATE (Q4 LEVEL)	5.0	5.0	4.7	4.7	4.7	4.7	5.0	5.0	4.8	4.9	5.0	5.2
PARTICIPATION RATE (Q4 LEVEL)	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.0	66.0	65.8	65.7
NONFARM PAYROLL EMPLOYMENT (Q4/Q4 CHANGE)												
TOTAL, IN THOUSANDS	1917	1917	1867	1910	1514	1615	1900	1900	1900	1700	900	700
AVERAGE PER MONTH, IN THOUSANDS	160	160	156	159	126	135	158	158	158	142	75	58
FINANCIAL MARKET VARIABLES												
FED FUNDS RATE (PERCENT)	3.97	3.97	5.00	5.25	5.00	5.00	4.25	4.25	5.00	5.25	5.00	5.25
BAA BOND YIELD (PERCENT)	6.3	6.3	7.0	6.9	7.0	6.9	6.3	6.3	6.7	6.7	6.7	6.7
EFFECTIVE EXCHANGE RATE (Q4/Q4 % CHANGE)	-1.4	-1.4	-4.0	-5.5	-1.5	-1.4	2.6	3.0	-4.4	-3.6	-1.9	-1.7

A. Forecast Details

Exhibit A-3: Judgment Table

	2005:01	2005:02	2005:03	2005:04	2006:01	2006:02	2006:03	2006:04	2007:01	2007:02	2007:03	2007:04	Q4/Q4 % CHANGE/Q4 LEVEL/ANNUAL AVERAGE 2004	2005	2006	2007
REAL GDP AND COMPONENTS (% Change, AR)																
GDP	*3.8*	*3.3*	*4.1*	*1.7*	*5.3*	2.8	3.2	2.8	3.1	3.5	3.5	3.2	*3.8*	*3.2*	3.5	3.3
CHANGE IN INVENTORIES (GROWTH CONTRIBUTION) 1\	*0.3*	*-2.1*	*-0.4*	*1.9*	*-0.1*	0.8	-0.1	0.0	-0.1	-0.1	0.0	0.0	*0.2*	*-0.1*	0.1	0.0
DOMESTIC PRIVATE PURCHASES	*4.0*	*2.1*	*4.0*	*2.9*	*5.5*	2.8	3.5	3.1	3.4	3.4	3.7	3.6	*4.5*	*3.2*	3.7	3.5
CONSUMPTION EXPENDITURES	*3.5*	*3.4*	*4.1*	*0.9*	*5.2*	2.0	3.5	3.3	3.2	3.2	3.2	3.2	*3.8*	*2.9*	3.5	3.2
BUSINESS FIXED INVESTMENT	*5.7*	*8.8*	*8.4*	*4.5*	*13.1*	9.5	9.5	9.8	10.1	10.1	9.4	8.7	*10.9*	*6.8*	10.5	9.6
RESIDENTIAL INVESTMENT	*9.5*	*10.8*	*7.3*	*2.8*	*3.0*	-5.0	-5.0	-10.0	-6.0	-3.0	0.0	2.0	*6.6*	*7.6*	-4.4	-1.8
NET EXPORTS (GROWTH CONTRIBUTION) 1\	*-0.4*	*1.1*	*-0.1*	*-1.4*	*-0.6*	-0.2	-0.5	-0.5	-0.5	-0.1	-0.5	-0.6	*-0.9*	*-0.2*	-0.4	-0.4
EXPORTS	*7.5*	*10.7*	*2.5*	*5.0*	*14.7*	6.6	6.1	8.7	7.3	7.1	7.5	6.9	*6.1*	*6.4*	9.0	7.2
IMPORTS	*7.4*	*-0.2*	*2.4*	*12.1*	*12.8*	5.1	7.0	8.3	7.6	4.8	*7.4*	7.9	*10.6*	*5.3*	8.3	6.9
FEDERAL GOVERNMENT	*2.3*	*2.4*	*7.5*	*-2.6*	*10.5*	-1.7	4.0	2.0	6.0	2.0	4.0	2.0	*4.2*	*2.3*	3.6	3.5
STATE & LOCAL GOVERNMENTS	*1.6*	*2.6*	*0.2*	*0.3*	*0.8*	1.8	3.0	3.0	3.0	3.0	3.0	3.0	*0.9*	*1.2*	2.1	3.0
INTEREST RATE ASSUMPTIONS (%)																
FEDERAL FUNDS RATE (TARGET)	*2.44*	*2.92*	*3.43*	*3.97*	*4.43*	4.89	5.25	5.25	5.25	5.25	5.00	5.00	*1.94*	*3.97*	5.25	5.00
YIELD ON 10-YR GOVERNMENT	*4.3*	*4.2*	*4.2*	*4.5*	*4.6*	5.1	5.3	5.3	5.3	5.3	5.3	5.3	*4.2*	*4.5*	5.3	5.3
BAA BOND YIELD	*6.0*	*6.0*	*6.0*	*6.3*	*6.3*	6.7	6.9	6.9	6.9	6.9	6.9	6.9	*6.2*	*6.3*	6.9	6.9
INCOME (% Change, AR)																
PERSONAL INCOME	*2.0*	*4.5*	*2.6*	*7.6*	*6.0*	6.5	6.5	3.7	6.3	7.3	7.5	4.6	*7.5*	*4.2*	5.7	6.4
REAL PERSONAL DISPOSABLE INCOME	*-3.4*	*0.2*	*-1.4*	*5.1*	*2.1*	2.2	4.3	1.3	4.0	5.1	5.3	2.1	*4.1*	*0.1*	2.5	4.1
PERSONAL SAVING RATE (% OF DPI)	*0.5*	*-0.2*	-1.6	*-0.5*	*-1.3*	-1.2	-1.0	-1.5	-1.4	-0.9	-0.4	-0.7	*1.7*	*-0.5*	-1.3	-0.8
CORPORATE PROFITS BEFORE TAXES	*24.5*	*19.7*	*-15.2*	*71.1*	*35.4*	-2.2	3.0	-0.1	0.7	0.8	0.7	-0.5	*9.6*	*21.3*	8.1	0.4
PRICES & PRODUCTIVITY (% Change, AR)																
GDP IMPLICIT DEFLATOR	*3.1*	*2.6*	*3.3*	*3.5*	*3.3*	3.6	1.5	1.8	2.3	2.5	2.1	2.1	*2.9*	*3.1*	2.5	2.3
PERSONAL CONSUMPTION EXPENDITURES	*2.3*	*3.3*	*3.7*	*2.9*	*2.0*	4.3	2.3	2.3	2.3	2.2	2.2	2.2	*3.1*	*3.0*	2.7	2.2
CORE PERSONAL CONSUMPTION EXPENDITURES	*2.4*	*1.7*	*1.3*	*2.4*	*2.0*	3.1	2.3	2.2	2.0	2.0	1.9	1.9	*2.2*	*2.0*	2.4	2.0
CONSUMER PRICE INDEX	*2.5*	*3.7*	*5.5*	*3.2*	*2.2*	5.2	2.6	2.5	2.4	2.3	2.3	2.2	*3.3*	*3.7*	3.1	2.3
CORE CONSUMER PRICE INDEX	*2.5*	*2.0*	*1.6*	*2.4*	*2.4*	3.4	2.5	2.4	2.3	2.2	2.1	2.1	*2.1*	*2.1*	2.7	2.2
COMPENSATION PER HOUR (NONFARM BUSINESS)	*5.6*	*1.3*	*5.5*	*-0.9*	*5.3*	3.8	4.5	4.1	4.4	4.2	4.3	4.3	*5.9*	*2.8*	4.4	4.3
OUTPUT PER HOUR (NONFARM BUSINESS)	*3.8*	*2.4*	*4.2*	*-0.3*	*3.7*	2.1	2.8	2.8	2.8	2.8	2.8	2.8	*2.6*	*2.5*	2.8	2.7
UNIT LABOR COST (NONFARM BUSINESS)	*1.8*	*-1.0*	*1.2*	*-0.6*	*1.6*	1.7	1.8	1.4	1.7	1.5	1.5	1.6	*3.3*	*0.3*	1.6	1.6
REAL ACTIVITY																
CAPACITY UTILIZATION (MANUFACTURING, %)	*78.7*	*78.6*	*78.5*	*79.8*	*80.4*	80.9	81.2	81.4	81.7	82.0	82.1	82.3	*77.1*	*78.9*	81.0	82.0
CIVILIAN UNEMP RATE (%) 2\	*5.2*	*5.1*	*5.0*	*5.0*	*4.7*	4.7	4.7	4.7	4.7	4.7	4.7	4.7	*5.4*	*5.0*	4.7	4.7
PRIVATE HOUSING STARTS (THOUS, AR)	*2069*	*2064*	*2101*	*2060*	*2123*	1920	1850	1790	1765	1765	1765	1765	*1950*	*2073*	1921	1765
LIGHT VEHICLE SALES (MIL UNITS, AR) 3\	*16.5*	*17.2*	*17.9*	*15.9*	*16.9*	16.4	17.0	16.7	16.9	16.9	16.9	17.0	*16.9*	*16.9*	16.7	16.9
FEDERAL SURPLUS/DEFICIT (Unified Basis, Bil$, NSA) 4	*-176.6*	*45.2*	*-69.2*	*-119.3*	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	*-412.3*	*-317.7*	-357.2	-298.6

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

A. Forecast Details

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

	2005				2006				2007				Q4/Q4 % CHANGE/Q4 LEVEL			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2004	2005	2006	2007
REAL GDP (Growth, Annual Rate)	*3.8*	*3.3*	*4.1*	*1.7*	*5.3*	2.8	3.2	2.8	3.1	3.5	3.5	3.2	*3.8*	*3.2*	3.5	3.3
Contributions to GDP growth:																
FINAL SALES TO DOMESTIC PURCHASERS	*3.9*	*4.4*	*4.7*	*1.1*	*6.0*	2.2	3.7	3.3	3.7	3.6	3.9	3.8	*4.5*	*3.5*	3.8	3.8
CONSUMPTION EXPENDITURES	*2.4*	*2.4*	*2.9*	*0.6*	*3.6*	1.4	2.4	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*	*0.5*	*1.4*	1 0	1 0	1.1	1.1	1.1	1.1	1.0	*1.1*	*0.7*	1.1	1.1
RESIDENTIAL INVESTMENT	*0 5*	*0.6*	*0.4*	*0.2*	*0.2*	-0.3	-0.3	-0.6	-0.4	-0 2	0.0	0.1	*0.4*	*0.4*	-0.3	-0.1
FEDERAL GOVERNMENT	*0 2*	*0.2*	*0.5*	*-0.2*	*0.7*	-0.1	0 3	0.1	0.4	0.1	0.3	0.1	*0.3*	*0.2*	0.3	0 2
STATE & LOCAL GOVERNMENTS	*0 2*	*0.3*	*0.0*	*0.0*	*0.1*	0 2	0.4	0.4	0.4	0.4	0.4	0.4	*0.1*	*0.1*	0.3	0.4
NET EXPORTS	*-0.4*	*1.1*	*-0.1*	*-1.4*	*-0.6*	-0.2	-0.5	-0.5	-0.5	-0.1	-0.5	-0.6	*-0.9*	*-0.2*	-0.4	-0.4
EXPORTS	*0.7*	*1.1*	*0.3*	*0.5*	*1.5*	0.7	0.6	0.9	0.8	0.8	0.8	0.8	*0.6*	*0.6*	0.9	0 8
IMPORTS	*-1.1*	*0.0*	*-0.4*	*-1.9*	*-2.0*	-0.8	-1.2	-1.4	-1 3	-0 8	-1.3	-1.4	*-1.5*	*-0.9*	-1.4	-1.2
CHANGE IN INVENTORIES	*0.3*	*-2.1*	*-0.4*	*1.9*	*-0.1*	0.8	-0.1	0.0	-0.1	-0.1	0.0	0.0	*0.2*	*-0.1*	0.1	0.0

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

A. Forecast Details

Exhibit A-5: Alternative GDP and Inflation Forecasts

GDP

		2006-Q1		2006-Q2		2006-Q3	
	Release Date	Prev*	June	Prev*	June	Prev*	June
FRBNY	6/22/2006	4.8	5.3	3.1	2.8	3.5	3.2
PSI Model	6/22/2006	--	--	3.8	2.4	3.8	2.1
Blue Chip	6/10/2006	4.8	5.3	3.4	2.9	3.0	2.9
Median SPF	5/15/2006	4.4	--	3.4	3.4	3.0	3.1
Macro Advisers	6/9/2006	4.8	5.3	3.3	2.4	3.2	3.3

CPI

		2006-Q1		2006-Q2		2006-Q3	
	Release Date	Prev*	June	Prev*	June	Prev*	June
FRBNY	6/22/2006	2.2	2.2	4.8	5.2	2.5	2.6
Blue Chip	6/10/2006	2.2	2.2	3.2	4.2	2.4	2.6
Median SPF	5/15/2006	2.0	--	2.5	3.4	2.5	2.6
Macro Advisers	6/9/2006	2.2	2.2	4.3	5.0	3.1	3.3

Core CPI

		2006-Q1		2006-Q2		2006-Q3	
	Release Date	Prev*	June	Prev*	June	Prev*	June
FRBNY	6/22/2006	2.4	2.4	2.7	3.4	2.4	2.5
Macro Advisers	6/9/2006	2.4	2.4	2.5	3.1	2.3	2.5

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

A. Forecast Details

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

	Annualized Percent Change Over Indicated Interval					Weights (December 2005)	
	24 Month	12 Month	6 Month	3 Month	1 Month	Total	Core
Consumer Price Index	3.5	4.1	4.2	5.7	5.5	100.00	
Energy	16.4	23.3	19.8	35.0	33.5	8.69	
All Items Ex Energy	2.3	2.4	2.8	3.2	3.6		
Food	2.2	1.8	1.7	0.6	1.2	13.94	
Food Away From Home	3.2	3.2	3.2	3.1	4.3	5.95	
All Items Ex Food and Energy	2.3	2.4	2.9	3.8	3.6	77.37	100.00
Core Chain-Weight CPI (NSA)	2.1	2.2	3.3	4.0	1.1		
Core Goods	0.5	0.3	1.0	1.7	0.9	22.32	28.85
Apparel	-0.4	0.0	1.7	7.3	2.0	3.79	4.89
Medical Care Commodities	4.2	4.1	3.9	4.5	4.0	1.46	1.88
Durable Goods	0.0	-0.7	-0.3	-0.3	0.0	11.58	14.96
New Vehicles	0.1	-0.6	0.1	-1.7	-3.4	5.16	6.66
Used Vehicles	3.4	1.5	2.2	4.1	4.4	1.80	2.33
Core Services	3.0	3.3	3.7	4.4	5.1	55.06	71.16
Rent of Primary Residence	3.1	3.3	3.4	4.0	3.8	5.83	7.54
Owners' Equivalent Rent	2.8	3.3	4.4	5.6	6.8	23.44	30.30
Lodging Away from Home	3.7	4.6	5.5	3.6	0.9	2.61	3.37
Medical Care Services	4.5	4.1	3.8	4.6	4.2	4.76	6.16
Transportation Services	2.4	2.4	1.7	2.1	4.8	5.71	7.38

A. Forecast Details

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

	Annualized Percent Change Over Indicated Interval				
	24 Month	12 Month	6 Month	3 Month	1 Month
PCE Deflator	2.9	2.9	1.9	3.7	5.9
Market Based PCE Deflator	2.8	2.8	1.6	3.6	6.0
Durable Goods	-0.8	-1.2	-0.9	-1.0	0.3
Motor Vehicles and Parts	1.6	0.8	1.9	0.7	-0.5
Nondurable Goods	3.9	3.6	0.9	6.9	14.4
Clothing and Shoes	-0.7	-0.7	1.4	2.7	5.1
Services	3.2	3.4	3.0	3.1	3.0
Housing	2.8	3.0	3.8	4.6	4.5
Transportation	3.6	4.3	4.4	6.0	8.4
Medical Care	2.8	2.8	2.1	3.8	2.8
PCE Deflator Ex Food and Energy	2.1	2.1	2.3	3.0	3.0
Market Based Core PCE Deflator	1.7	1.8	2.0	2.6	2.6
Personal Business Services-Market Based	2.6	2.5	2.6	0.4	4.4
Personal Business Services-Not Market Based	2.6	3.1	3.1	2.5	4.6

A. Forecast Details

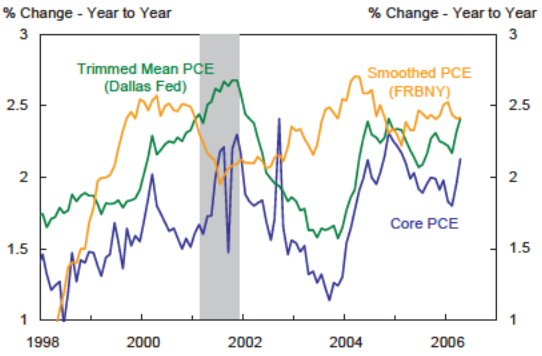
Exhibit A-6: Reference Table 3 - PRODUCER PRICE DATA AS OF MAY 2006

	Annualized Percent Change Over Indicated Interval				
	24 Month	**12 Month**	**6 Month**	**3 Month**	**1 Month**
Finished Goods	4.0	4.3	2.5	6.7	2.3
Finished Consumer Goods	4.7	5.4	2.4	8.3	2.2
Finished Consumer Goods Ex Food	6.6	7.9	4.7	11.0	4.3
Nondurables Ex Food	8.9	11.0	5.6	14.9	5.3
Durables	1.0	0.4	2.1	1.2	1.8
Capital Equipment	2.1	1.4	2.5	2.5	3.3
Electronic Computers (NSA)	-21.2	-21.4	-24.7	-24.2	-6.8
Communication and Related Equipment (NSA)	-0.3	0.1	1.0	1.6	4.8
Finished Goods Ex Food and Energy	2.1	1.6	2.7	2.0	3.1
Finished Consumer Goods Ex Food and Energy	2.2	1.7	2.9	1.9	2.9
Intermediate Materials	7.6	8.8	5.7	7.6	14.1
Intermediate Materials Ex Food and Energy	5.8	6.3	6.8	6.9	14.2
Crude Materials	7.1	8.7	-22.1	1.5	26.7
Crude Materials Ex Food and Energy	18.5	26.8	37.6	57.3	105.2

A. Forecast Details

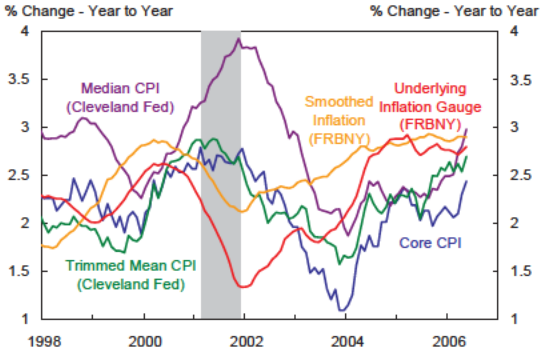
Exhibit A-7: Underlying Measures of Trend Inflation

Alternative Measures of PCE Inflation



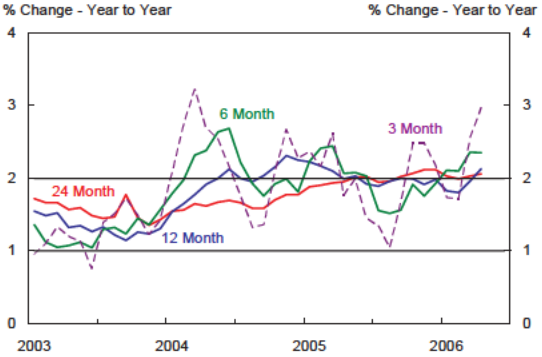
Source: Bureau of Economic Analysis, Dallas Fed, and FRBNY

Alternative Measures of CPI Inflation



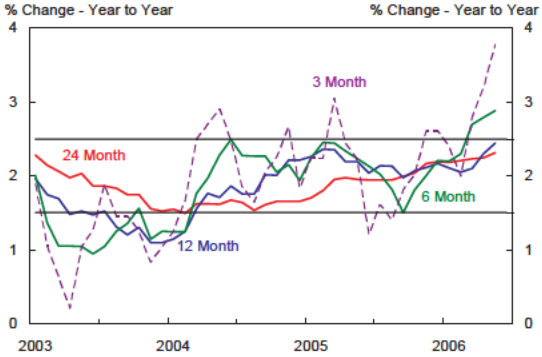
Source: Bureau of Labor Statistics, Cleveland Fed, and FRBNY

Core PCE over Various Horizons



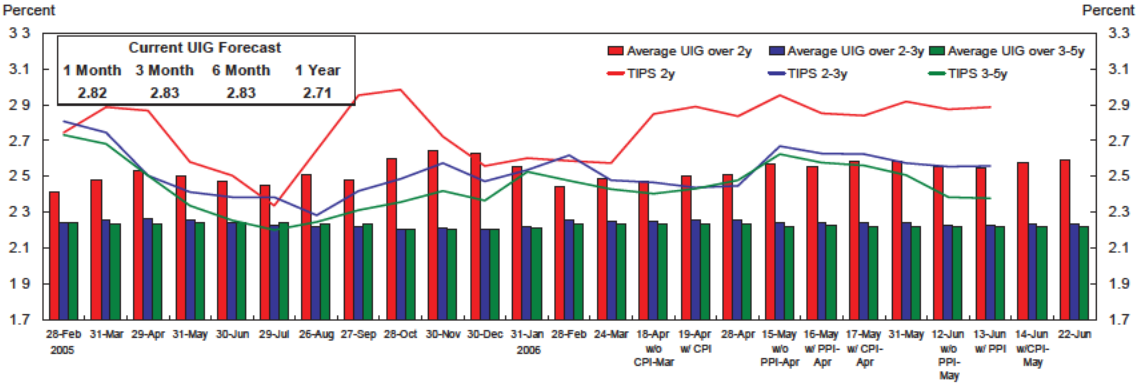
Source: Bureau of Economic Analysis

Core CPI over Various Horizons



Source: Bureau of Labor Statistics

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



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

Note: Shading represents NBER recessions, unless otherwise noted.

B. Financial Markets

Exhibit B-1. Treasury Yields

The first two charts in this exhibit plot the yields of the on-the-run 3-month and 10-year Treasury securities over time. The middle two charts plot the Treasury yield curve and implied one-year forward rates as estimated with off-the-run securities. The bottom two charts plot real and nominal forward rates over time for the 4-5 and 5-10 year horizons.
Source: Bloomberg and FRBNY calculations.

Exhibit B-2. Inflation Expectations

The first two charts in this exhibit plot the time series of implied carry-adjusted CPI inflation as estimated from nominal and inflation-protected Treasury securities (see the Appendix to Exhibit B-2 below for a description of the construction of this measure). The third chart plots the 10-year breakeven inflation rate (not carry adjusted) over time using intraday data.
Source: Bloomberg and FRBNY calculations.

Exhibit B-3. Economic Releases

This exhibit shows the response of the implied fed funds futures rate and the 10-year Treasury yield to macroeconomic announcements. Market expectations for the releases are from the forward price for the most recent economic derivatives auction, which concludes 30-60 minutes before the release. The surprise in standard deviations is calculated using the at-the-money implied volatility from the auctions. Yield changes are measured from 5 minutes before to 15 minutes after the release.
Source: Bloomberg and FRBNY calculations.

Exhibit B-4. Market Policy Expectations

The charts in this exhibit show market expectations of Fed policy over time as derived from Fed Funds and Eurodollar futures as well as options on Fed Funds futures. The first chart plots the expected path of the Fed Funds target rate allowing for a time-invariant term premium risk adjustment. The top right chart plots the implied July Fed Funds rate over time using intraday data (not allowing for a term premium risk adjustment). The

middle left chart plots the implied probability of the target rate remaining at 5 percent at the June FOMC meeting versus being raised to 5.25% (allowing for a time-invariant term premium risk adjustment). The last two charts plot the implied probabilities of the policy rate being at various levels after the June and August FOMC meetings.
Source: Bloomberg, Cleveland FRB, Federal Reserve Board, and FRBNY calculations.

Exhibit B-5. Policy Uncertainty I

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

Exhibit B-6. Policy Uncertainty II

The first chart in this exhibit plots the range within which the 3-month Eurodollar rate is expected to remain (with 90% confidence) in the future relative to today. The top right chart shows the changes in these ranges since the day before the last FOMC meeting. The middle chart shows the 50% and 90% confidence intervals around the expected policy path. The last two charts plot time series of the ranges within which the 3-month Eurodollar rate is expected to remain (with 90% confidence) over the next 6 and 12 months.
Source: Federal Reserve Board.

Exhibit B-7. Equity Market Performance and Volatility

The first chart in this exhibit plots the performance of the S&P 500 and NASDAQ Composite indices over time. The top right chart plots the S&P 500 over time using

intraday data. The middle two charts plot implied annualized volatilities for the S&P 500 and NASDAQ Composite indices over the next 3 and 18 months.
Source: Bloomberg, CBOE, and OptionMetrics.

Exhibit B-8. Corporate Credit Risk

The first chart in this exhibit plots corporate credit spreads over time for A- and BB-rated securities. The second chart plots corporate bond default rates over time, measured over the preceding 12-month interval and distinguishing between all and speculative-grade issues.
Source: Merrill Lynch and Moody's.

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

The top two charts in this exhibit display the exchange rate of the dollar against the euro (in the left panel, with higher values of the index indicating dollar depreciation) and against the yen (in the right panel, with lower values of the index indicating dollar depreciation). The middle-left panel in this exhibit displays the nominal effective exchange rate of the dollar, computed by the Board of Governors using a "narrow" set of weights for 16 major foreign currencies (lower values of the index indicate dollar depreciation). The middle-right chart displays information on volatility implied by options on Yen/Dollar and Euro/Dollar rates: a point on each of the two lines measures the width of the interval (in percentage points) around the current exchange rate that is expected to contain the exchange rate one month later, with 90 percent probability. The bottom-left chart displays normalized equity indices for the euro area and Japan. The bottom-right chart displays J.P. Morgan's EMBI+ index of 16 emerging markets' bond spreads over U.S. Treasury yields. (The index includes below-investment-grade bonds issued in dollars by a selected group of sovereign and quasi-sovereign issuers.)
Source: BofG, BIS, International Research Function FRBNY, Reuters, J.P. Morgan

Exhibit B-10. Foreign Interest Rates

The top two charts in this exhibit display short- and long-term interest rates for the euro area and Japan. The middle two charts display the three-month interest rate futures curves for the euro area and Japan, including the most recent curve. The bottom two

charts display “real” yields on specific inflation-linked bonds for the euro area (OAT bonds from France) and Japan; the charts also display inflation expectations implied in these securities, computed as the spread of the yield on inflation-linked bonds over sovereign bonds of comparable maturity.
Source: BIS, BofG, International Research Function FRBNY, Barclays

Exhibit B-11. 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 Katrina. March 27 represents the state prior to the March FOMC meeting, May 9 represents the state prior to the May FOMC meeting, and June 21 represents current data.
Source: Bloomberg.

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

The implied inflation series are estimates of inflation expectations derived from nominal Treasury securities and Treasury inflation-protected securities (TIPS). These differ from the simpler breakeven inflation rates which just subtract real TIPS yields from on-the-run nominal yields of the same maturity. For each individual TIPS, we solve for the inflation rate that equates the discounted payments of the TIPS to its price, where the discount rates are derived from off-the-run nominal securities. We then calculate 2-, 4-, and 5-year inflation rates corresponding to TIPS with those durations. Lastly, we compute approximate forward rates from the rates at the shorter- and longer-dated durations. For example, the 4-5 year forward rate is computed from the 4- and 5-year implied inflation values. The 5-10 year forward rate uses the 5-year implied inflation value and the implied inflation rate on the most recently issued 10-year TIPS.
The implied inflation series are also carry adjusted to remove the effect of expected inflation accrual in not seasonally adjusted CPI over the 2½-month indexation lag period in TIPS. Since inflation over this period is either known or largely predictable, it induces predictable variation in the unadjusted implied inflation series that is not necessarily related to future expected inflation. Our adjustment is derived from the forecast of not seasonally adjusted CPI implicit in the same day CPI futures contract traded on the CME.

No adjustments are made to the implied inflation measures to account for risk premia or other technical factors.

B. Financial Markets

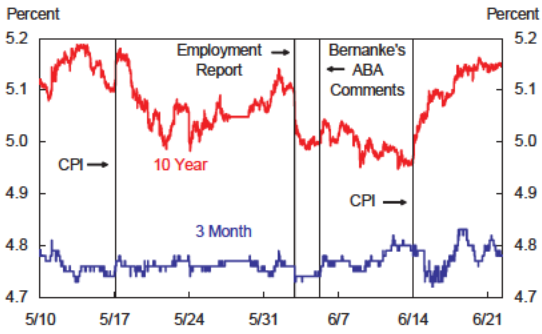
Exhibit B-1:
Treasury Yields

Short- and Long-Term Rates

Source: Bloomberg

Note: Yields of on-the-run securities

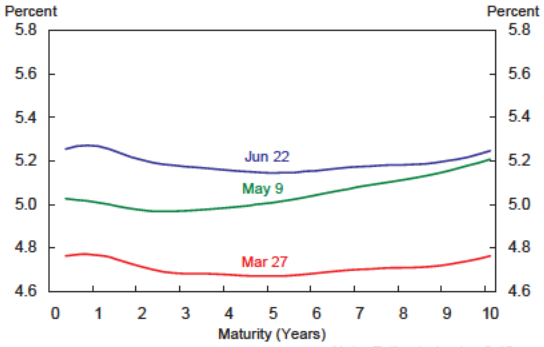
Intraday Short- and Long-Term Rates



Source: Bloomberg

Note: Yields of on-the-run securities between 8 am and 4 pm

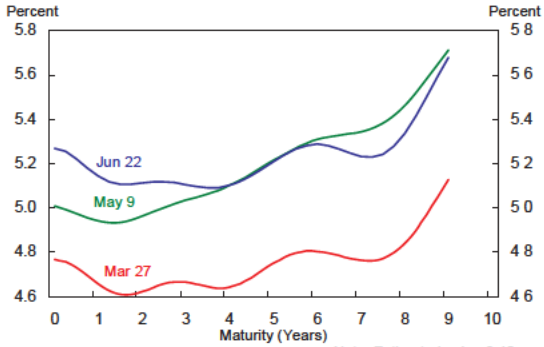
Yield Curves



Source: FRBNY calculations

Note: Estimated using 8:40 am quotes of off-the-run securities

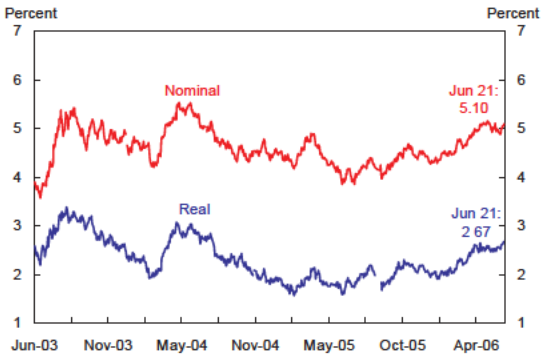
Yield Curves: Implied One-Year Forward Rates



Source: FRBNY calculations

Note: Estimated using 8:40 am quotes of off-the-run securities

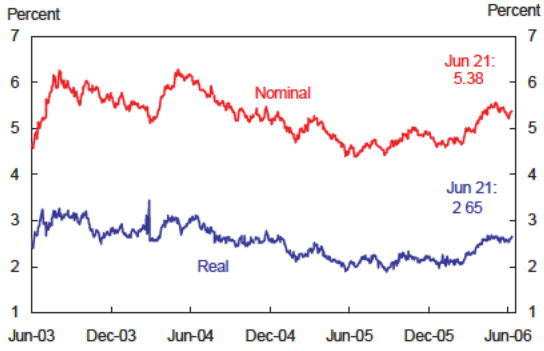
4-5 Year Forward Rates



Source: FRBNY calculations

Note: 8:40 am quotes

5-10 Year Forward Rates



Source: FRBNY calculations

Note: 8:40 am quotes

B. Financial Markets

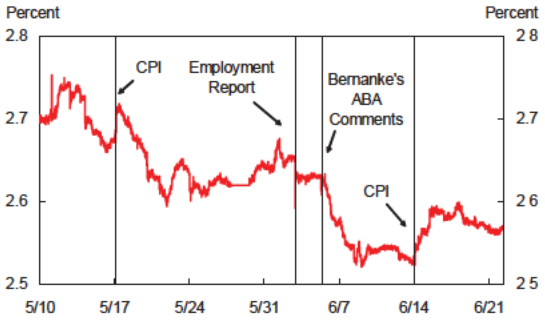
Exhibit B-2:
Inflation Expectations

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

Source: FRBNY calculations

Note: 8:40 am quotes

10-Year Breakeven Inflation Rate (Intraday)



Source: Bloomberg

Note Calculated as difference between on-the-run 0-year Treasury and 10-year TIPS yield. 8 am to 4 pm.

Exhibit B-3:
Economic Releases

Market reaction to macro releases, market expectations using economic derivatives

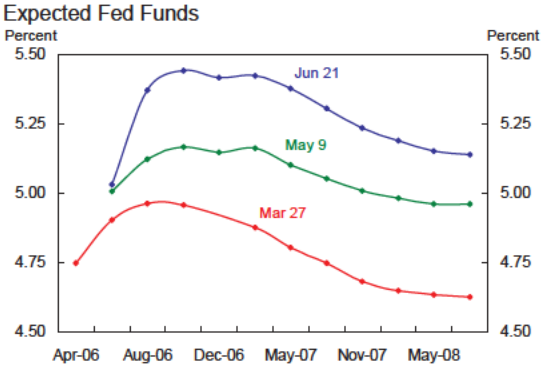
						Yield Change (bps)	
Release Type	Release Date	Actual Release	Market Expectation	Surprise	Surprise (σ's)	July FF Futures	Ten-Year
Initial Jobless Claims, 1,000's	6/22	308	306	2	0.1	0	1
Initial Jobless Claims, 1,000's	6/15	295	319	-24	-1 8	1	2
Core CPI, %	6/14	0.29	0 23	0.07	0.8	3	3
Retail Sales Less Autos, %	6/13	0.5	0.4	0.1	0 2	1	2
Trade Balance, $billions	6/9	-63.4	-64.7	1 3	0.4	1	1
Initial Jobless Claims, 1,000's	6/8	302	330	-28	-2 0	1	2
Change in Nonfarm Payrolls, 1,000's	6/2	75	163	-88	-1.1	-5	-6
ISM Manufacturing, index level	6/1	54.4	55.6	-1 2	-0.6	-1	-2
Initial Jobless Claims, 1,000's	6/1	336	321	15	1.1	-1	-1
Initial Jobless Claims, 1,000's	5/25	329	314	15	1 0	-1	0
Trade Balance, $billions	5/12	-62.0	-67.1	5.1	1.6	0	2
Retail Sales Less Autos, %	5/11	0.7	0.9	-0 2	-0.4	-1	-1

Source: Bloomberg and FRBNY calculations
Note: Market expectations are from the forward price from the most recent economic derivatives auction which concludes 30-60 minutes before the release. Surprise in standard deviations is calculated using the at-the-money implied volatility from economic derivatives auctions. Yield changes are for the interval from 5 minutes before to 15 minutes after the release.

B. Financial Markets

Exhibit B-4:
Market Policy Expectations

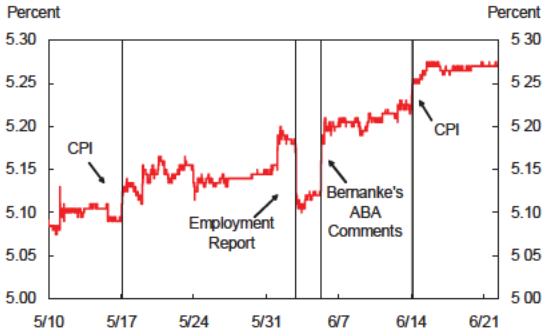
Expected Fed Funds



Source: Federal Reserve Board

Note: Estimated using Fed Funds and Eurodollar futures

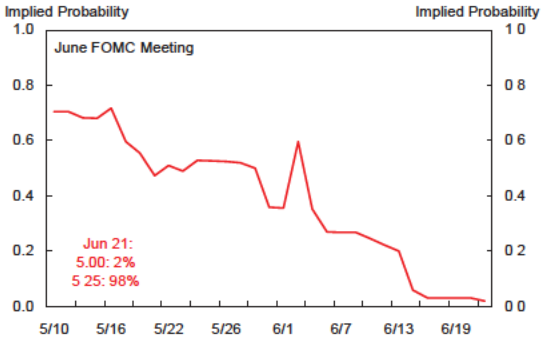
Implied July Fed Funds (Intraday)



Source: Bloomberg

Note: Calculated using Fed Funds futures

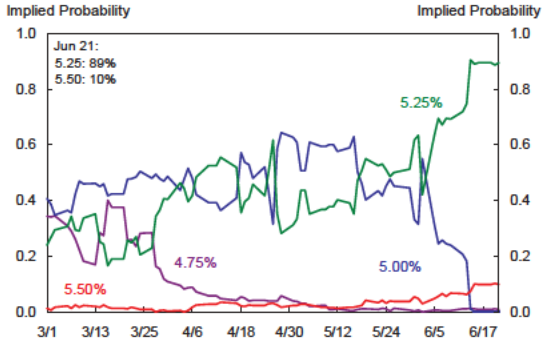
Probability of 5.00 Target vs. 5.25 Target



Source: Bloomberg and FRBNY calculations

Note: Estimated using Fed Funds futures

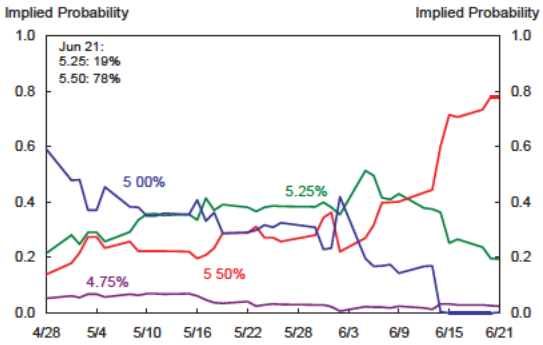
June 2006 FOMC



Source: Cleveland FRB

Note: Estimated using options on Fed Funds futures

August 2006 FOMC



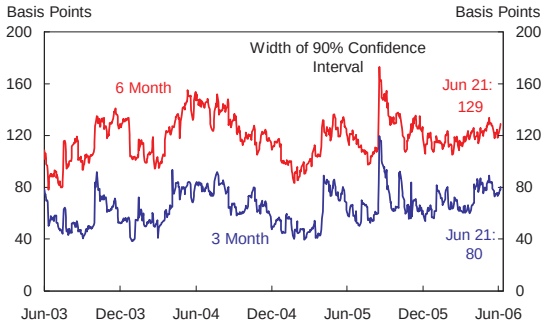
Source: Cleveland FRB

Note: Estimated using options on Fed Funds futures

B. Financial Markets

Exhibit B-5:
Policy Uncertainty I

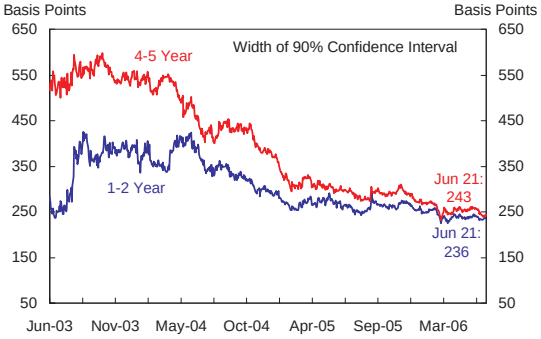
Interest Rate Volatility: Short-Term



Source: Datastream and FRBNY calculations

Note: Implied volatilities estimated from Eurodollar futures options

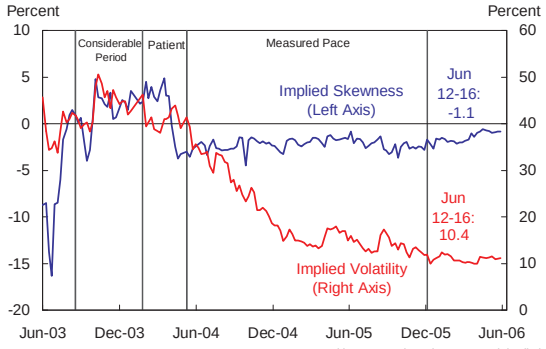
Interest Rate Volatility: Long-Term



Source: Datastream and FRBNY calculations

Note: Implied volatilities estimated from swaptions

Implied Skewness and Volatility



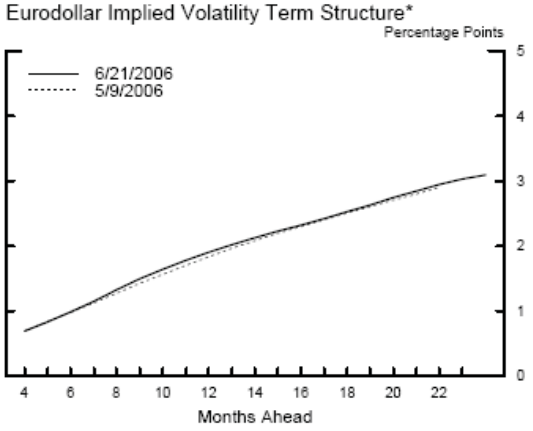
Source: CME and FRBNY calculations

Note: Weekly averages based on 3-9 month implied volatilities from Eurodollar futures options

Financial Markets

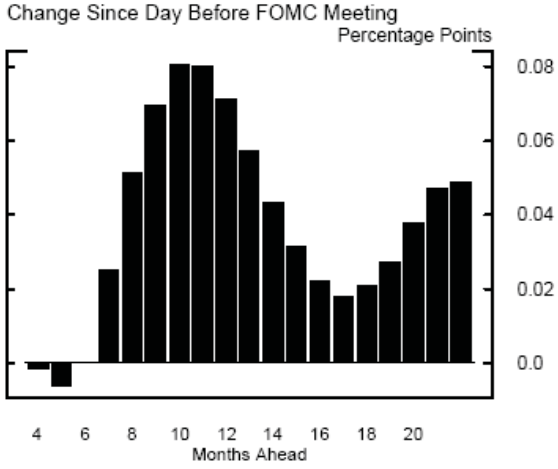
Exhibit B-6:
Policy Uncertainty II

Eurodollar Implied Volatility Term Structure*

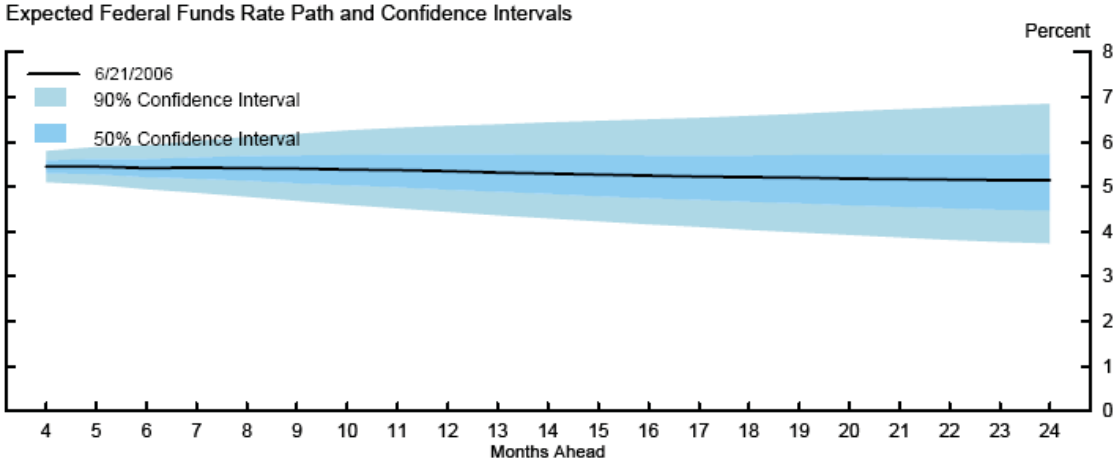


*Width of a 90 percent confidence interval computed from the term structures for the expected federal funds rate and implied volatility.

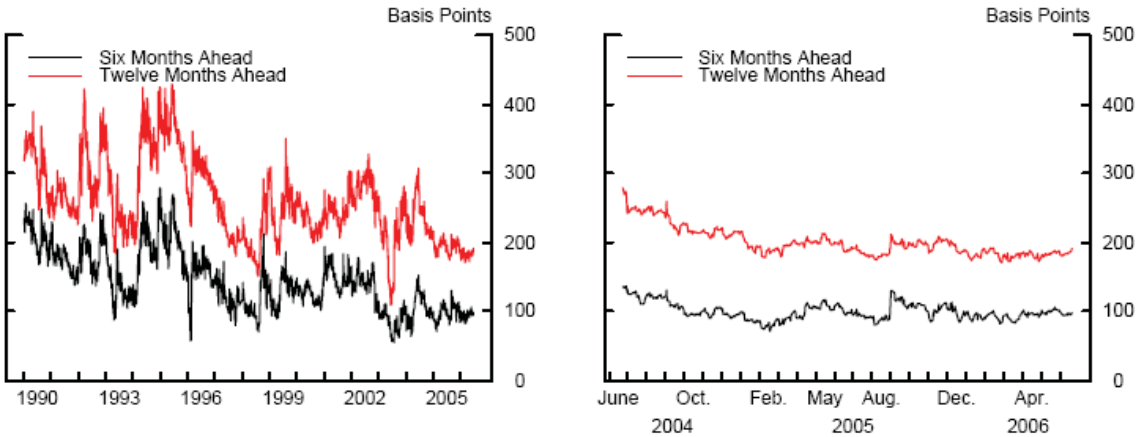
Change Since Day Before FOMC Meeting



Expected Federal Funds Rate Path and Confidence Intervals



Eurodollar Implied Volatility at Selected Maturities*

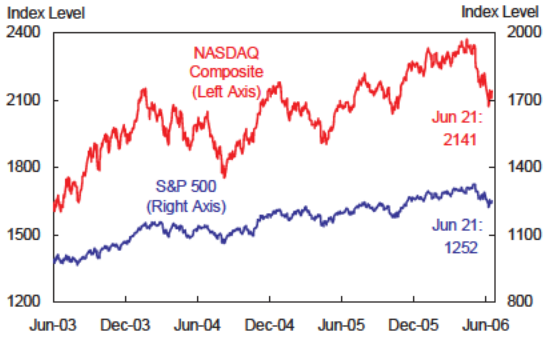


*Width of a 90 percent confidence interval computed from the term structures for the expected federal funds rate and implied volatility.

B. Financial Markets

Exhibit B-7:
Equity Market Performance and Volatility

Equity Market Performance



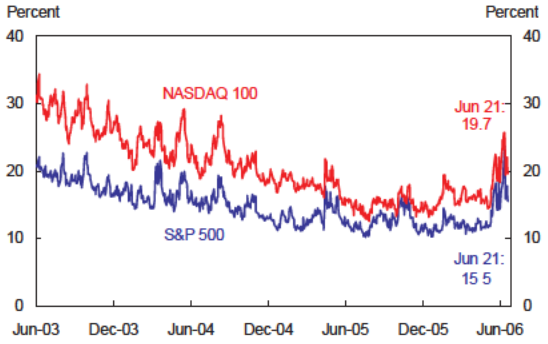
Source: Bloomberg

S&P 500 (Intraday)

Source: Bloomberg

Note: Data between 9 30 am and 4 00 pm

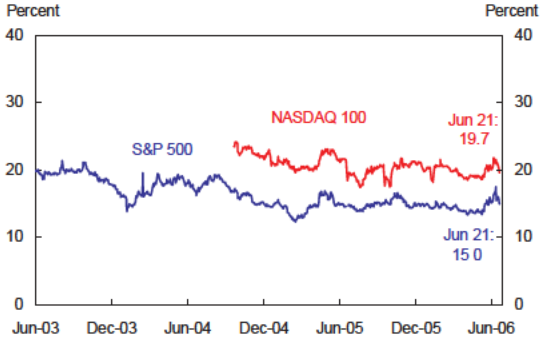
Equity Market Implied Volatility: 3 Months



Source: CBOE

Note: Annualized

Equity Market Implied Volatility: 18 Months

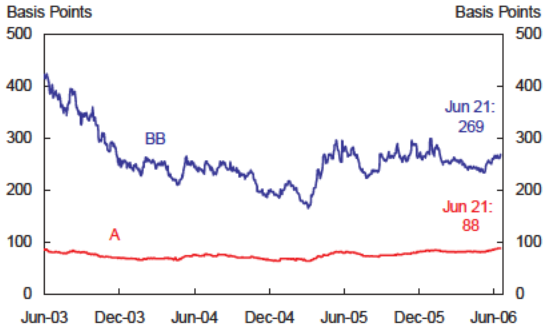


Source: OptionMetrics

Note: Annualized

Exhibit B-8:
Corporate Credit Risk

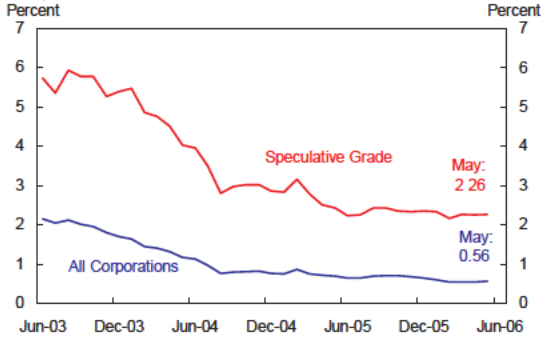
Corporate Credit Spreads



Source: Merrill Lynch

Note: Option-adjusted spreads

Corporate Bond Default Rates



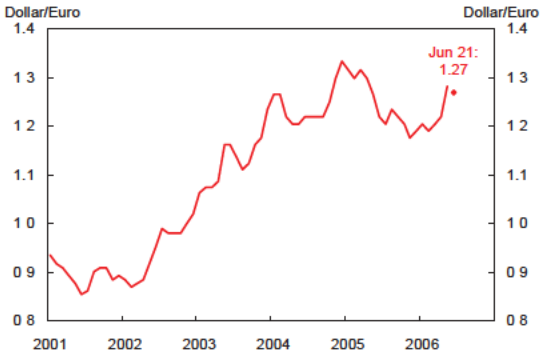
Source: Moody's

Note: Past 12 months, U.S. corporates

B. Financial Markets

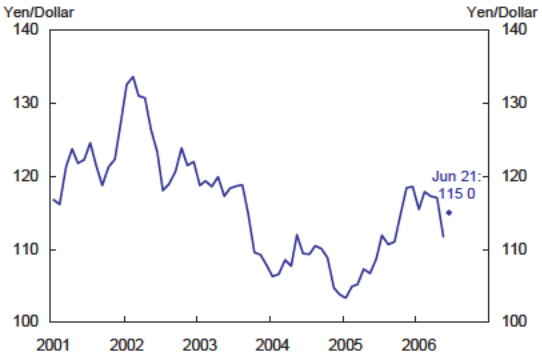
Exhibit B-9:
Exchange Rates, Foreign Equity, and Bond Spreads

Euro-Dollar Exchange Rates



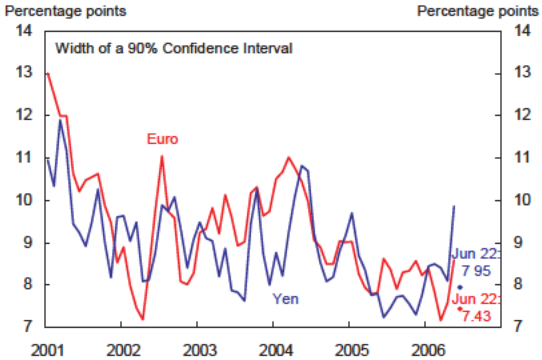
Source: BIS
Note: Data are monthly averages.

Yen-Dollar Exchange Rates



Source: BIS
Note: Data are monthly averages.

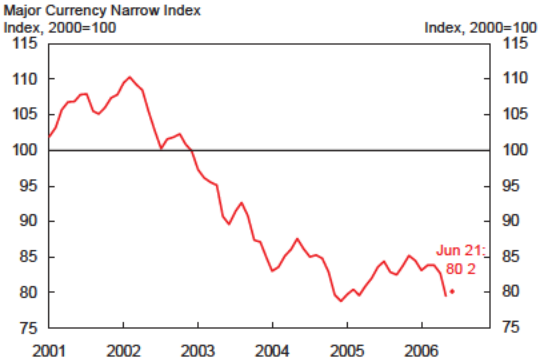
Euro and Yen One-Month Implied FX Option Volatility



Source: Reuters
Note: Data are monthly averages.

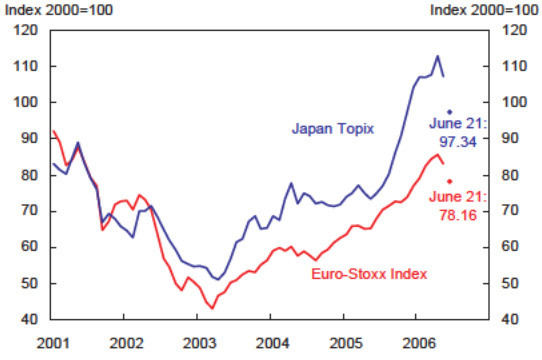
Nominal Effective Exchange Rate

Major Currency Narrow Index



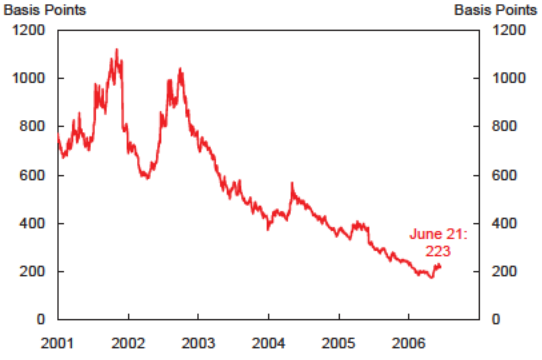
Source: Federal Reserve Board

Euro Area and Japan Equity Indices



Source: BIS and Bloomberg
Note: Data are monthly averages.

J.P. Morgan EMBI+ Sovereign Spread

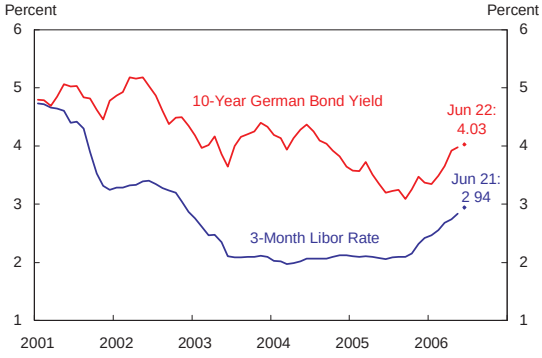


Source: Bloomberg
Note: Data are daily observations.

B. Financial Markets

Exhibit B-10:
Foreign Interest Rates

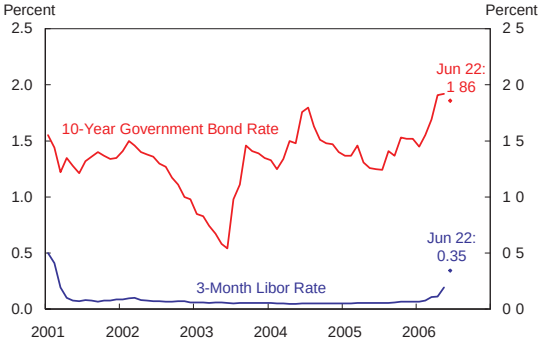
Euro Area Short-Term and Long-Term Interest Rates



Source: BIS and Federal Reserve Board

Note: Data are monthly averages.

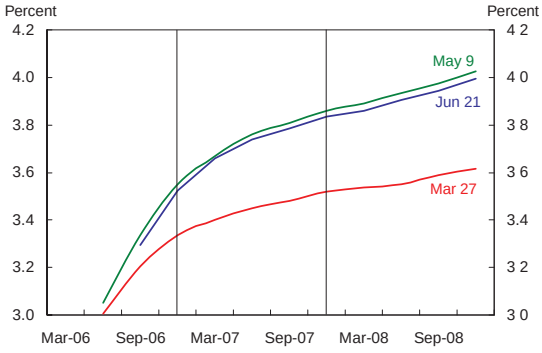
Japan Short-Term and Long-Term Interest Rates



Source: Bloomberg and Federal Reserve Board

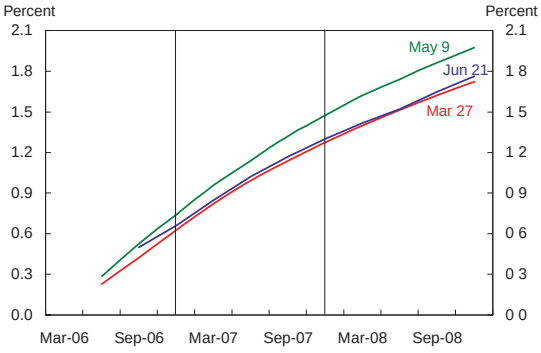
Note: Data are monthly averages.

Three-Month Eurocurrency Futures Rates: Euro



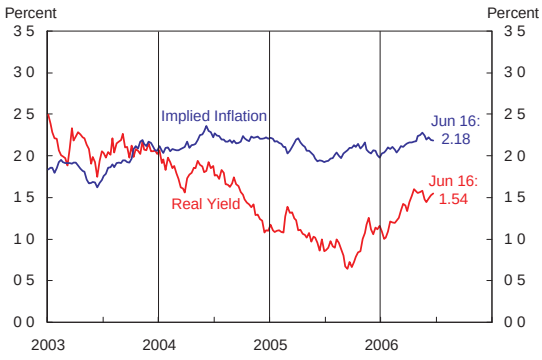
Source: Datastream

Three-Month Eurocurrency Futures Rates: Yen



Source: Datastream

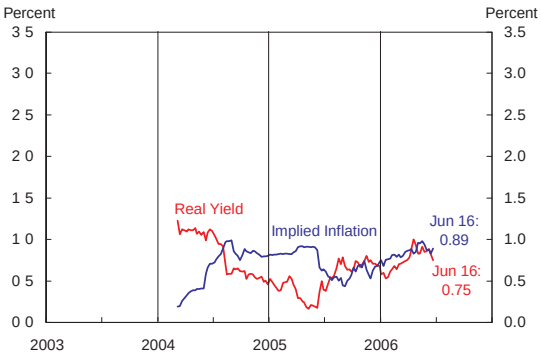
Euro Area Inflation-Linked Bonds



Source: Barclays

Note: OAT July 2012

Japanese Inflation-Linked Bonds



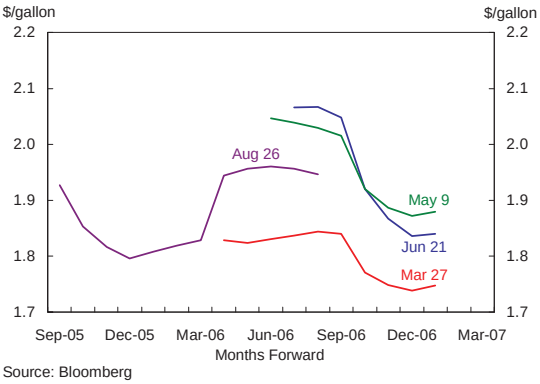
Source: Barclays

Note: JGB March 2014

B. Financial Markets

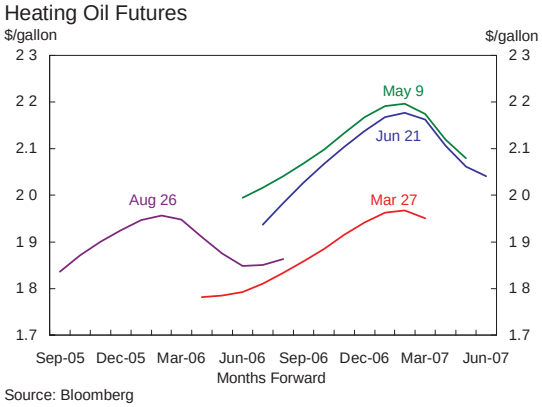
Exhibit B-11:
Energy Futures

Gasoline Futures



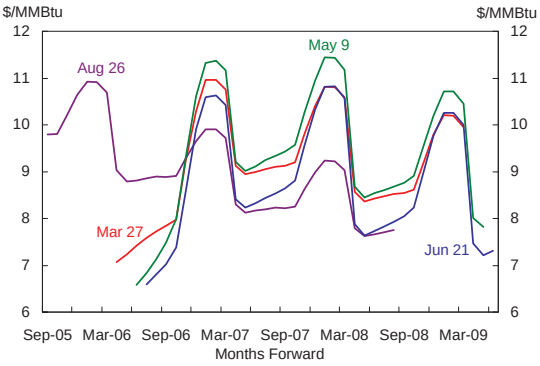
Source: Bloomberg

Heating Oil Futures



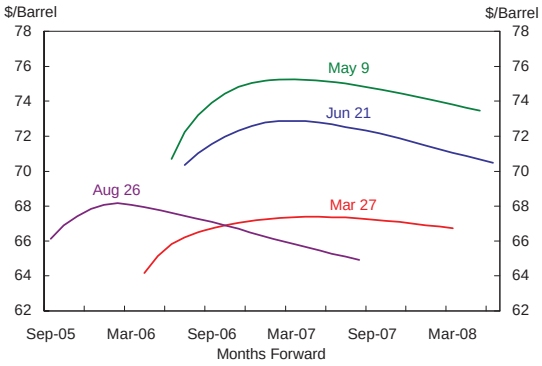
Source: Bloomberg

Natural Gas Futures



Source: Bloomberg

Crude Oil Futures



Source: Bloomberg

C. FRBNY Forecast Distributions

Background

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

Exhibit C-1: Risks

This exhibit shows the "balance of risks" for the individual alternative scenarios listed in Section 3 ("FRBNY Alternative Scenarios and Risks") and the central scenario contained in the Bank's forecast. Two measures of the balance of risks are shown. One is the probability of being in a particular scenario at a specific date. These scenarios are mutually exclusive, so they add up to one at any specific date.

For most scenarios, the second measure is the probability of being in a particular scenario at any time through 2009. For the central scenario, however, we show the probability of not deviating from this scenario at any time through 2009. Hence, one minus this latter probability is the risk of deviating from the central scenario at some point over the forecast horizon, which is equal to the sum of the probabilities of the other scenarios.

Exhibit C-2 & C-3: Alternative Scenarios

These exhibits take the balance of risks for each scenario and show their implications for GDP growth and core PCE inflation. They plot the expected path of four-quarter changes in the core PCE deflator and real GDP under the central scenario and the alternative scenarios. A path is defined as falling under an alternative scenario if it has at least one quarter in that scenario.

The over-tightening scenario assumes that output growth is substantially slower than the central scenario and inflation is sometimes lower. The overheating scenario assumes that for two quarters the economy grows more quickly 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. For this cycle we have increased the probability that overheating was occurring before 2006Q2.

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

Exhibit C-4 & C-5: Fan Charts

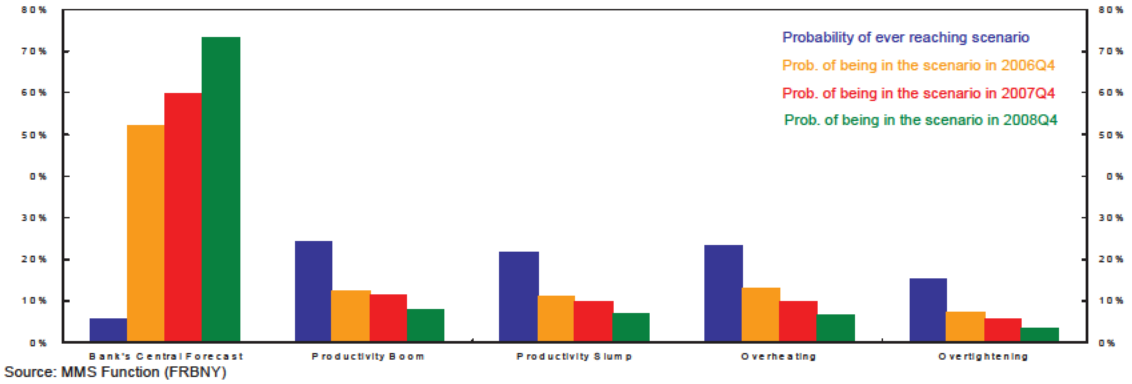
Fan charts are shown for the core PCE deflator [Exhibit C-4] and real GDP growth [Exhibit C-5]. These charts are constructed to represent the overall uncertainty contained in our main scenario and alternative scenarios. They combine the information contained in the previous exhibits with the additional uncertainty that we cannot predict perfectly the path of the economy, even if we knew which scenario were true. The amount of total uncertainty in the forecast distributions is 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

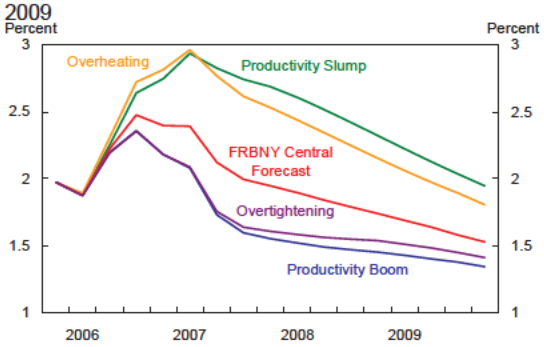
C. FRBNY Forecast Distributions

C-1: Risks



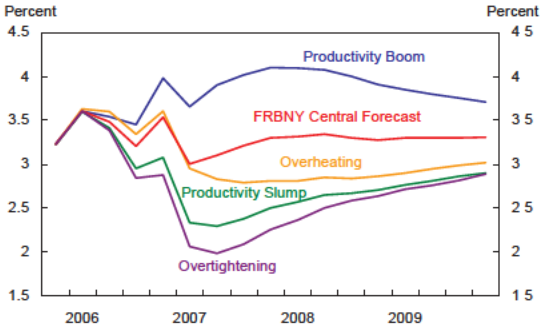
Source: MMS Function (FRBNY)

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



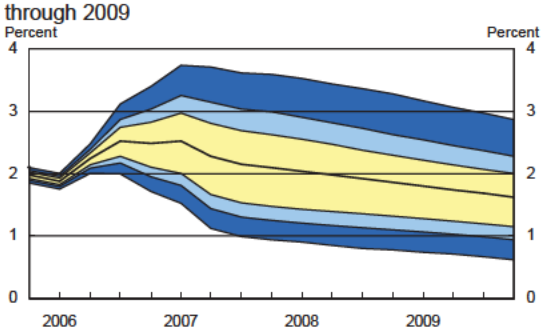
Source: MMS Function (FRBNY)

C-3: Alternative Scenarios of GDP Change through 2009



Source: MMS Function (FRBNY)

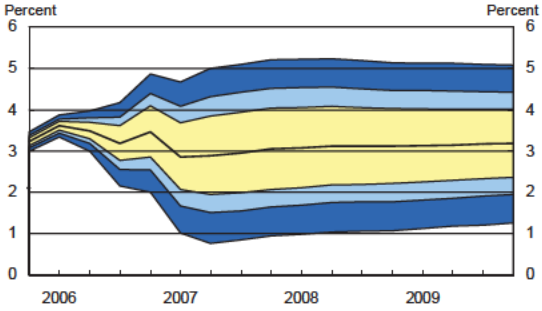
C-4: Four-Quarter Core PCE Inflation Forecast through 2009



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

Source: MMS Function (FRBNY)

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



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

Source: MMS Function (FRBNY)

D. FRBNY Fed Funds Rate Projections

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

In all specifications the policy rate responds to deviation of inflation from target and output from potential GDP and incorporates some degree of inertia. We draw the future paths of these deviations from the forecast distribution of inflation and output. (We specify an implicit inflation target of 1.5% and assume potential output growth is 3.3%.)

Policy Rule – Baseline Specification:

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

$$\rho = 0.8$$

$$i_{2006Q2} = 4.9$$

$$i^* = 4.25$$

$$\pi^* = 1.5$$

$$\varphi_\pi = 1.5$$

$$\varphi_x = 0.5$$

π_t : Core PCE 4 Q average

x_t : Output Gap using 3.3% potential growth rate

Source: MMS function, FRBNY

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

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

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

The *Inflation Hawk* policy rule follows the baseline rule (as amended in the table above) if two-quarter core PCE annualized inflation remains below 2.5%; if it rises above 2.5%, then the *Inflation Hawk* rule increases the FFR by 25 basis points in August. In 2006Q4 it

follows the prescription of the baseline policy rule unless two-quarter core PCE annualized inflation remains above 2.1%. If it remains above this level, then it takes as a value the maximum of either 5.75% or the prescription of the baseline policy rule. In 2007, the *Inflation Hawk* returns to the prescription of the baseline rule.

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

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

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

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

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

for average ex-post real rate. This real rate is calculated by subtracting the four-quarter lagged change of core PCE inflation from the path of the nominal rate.

Exhibit D-4: Effect of different inflation targets and recent actual FFR target decisions.

This exhibit shows the effect of different inflation targets and gives a measure of how the recent actual path of the FFR has differed from the prescription of our policy rule. This is implemented by running the baseline policy rule with two different inflation targets of 1.5% and 2.0% (in this case the neutral rate is increased by 50bp). Neither simulation uses the information about the 11 most recent increases in the FFR. Thus, these two policy rule paths are conditioned on the average FFR in 2004Q4 of 1.9%. The market implied path and the average, however, use the actual value of the FFR to date. The implied market path then uses the current FF futures values, while the average takes the mean over the three rules evaluated during this cycle, using weights of 0.5 (*Baseline*), 0.25 *(Inflation Hawk*) and 0.25 (*Opportunistic Disinflation*).

Exhibit D-5: Comparing Market Beliefs to FRBNY

In this exhibit, we report two metrics for measuring the distance between the market-implied path and the FRBNY implied path in 2007Q3.

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

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

Source: MMS Function, FRBNY

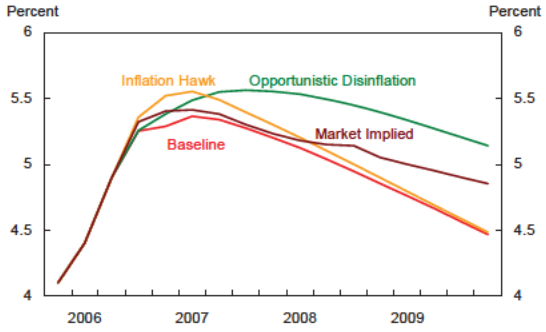
Exhibit D-6: FFR Distributions

In this exhibit we examine the distribution of the FFR under the three different policy rules through the third quarter of 2007. We also include the market distribution by assuming it has a normal distribution centered at the market path from Exhibit B-5 with a standard deviation derived from 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

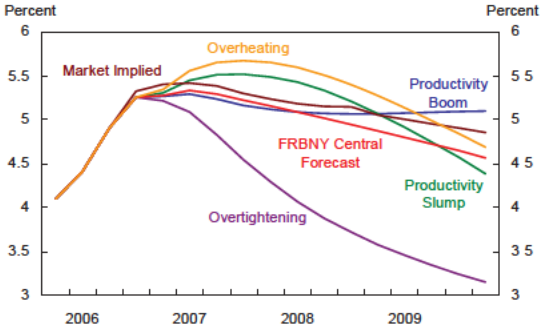
D. FRBNY Fed Funds Rate Projections

D-1: Nominal FFR under Different Policy Rules



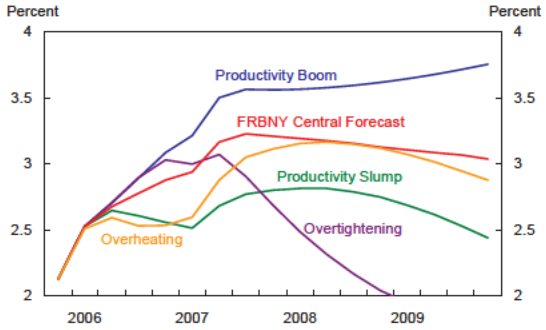
Source: MMS Function (FRBNY)

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



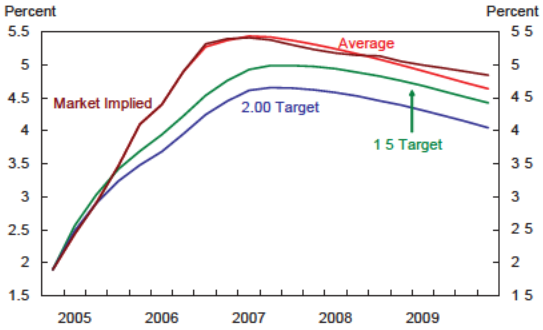
Source: MMS Function (FRBNY)

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



Source: MMS Function (FRBNY)

D-4: Baseline Policy Rule with Different Inflation Targets



Source: MMS Function (FRBNY)

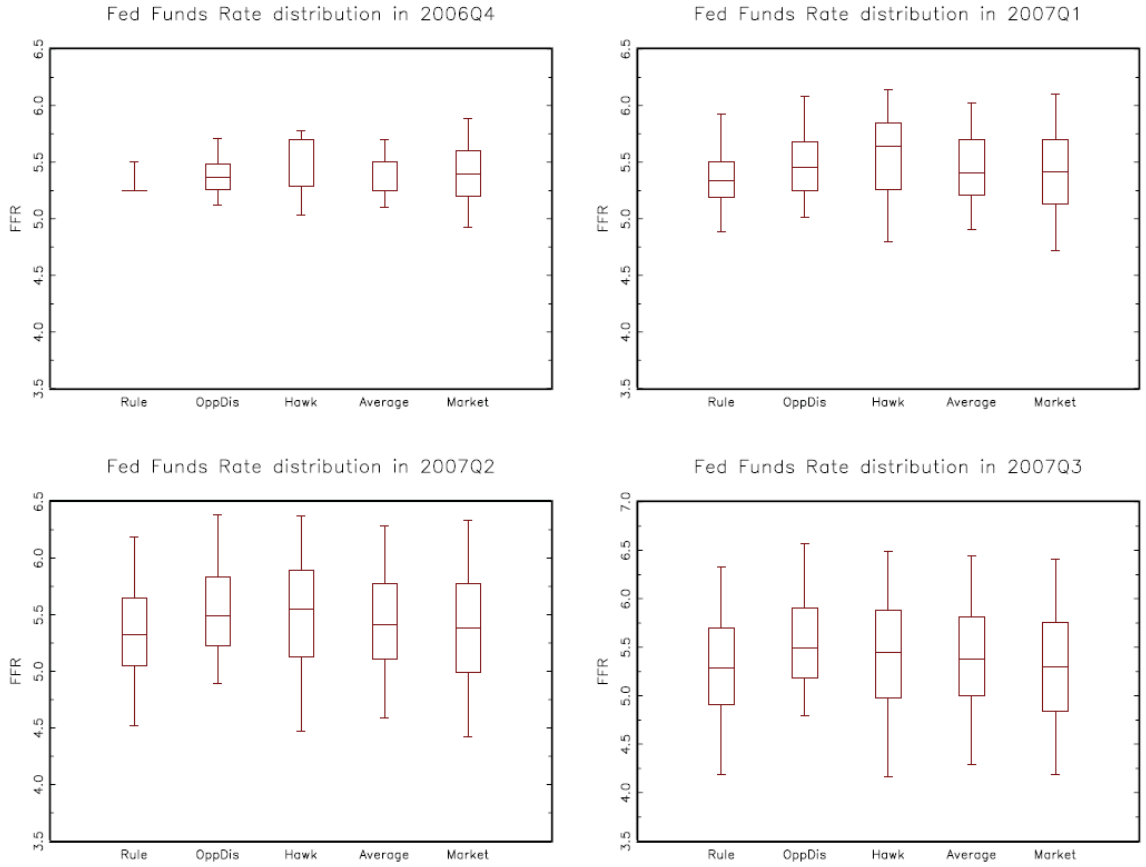
D. FRBNY Fed Funds Rate Projections

Exhibit D-5:
Market Expectations of Future FFR and FRBNY Outlook for FFR

	Percentile of FRBNY Expectation in Market Distribution	Percentile of Market Expectation in FRBNY Distribution
Baseline	47	55
Inflation Hawk	57	39
Opportunistic Disinflation	61	40
Average	53	47

Note: "Average" weights baseline at .5, inflation hawk rule at .25, and opportunistic disinflation at .25.

Exhibit D-6: Fed Funds Rate Distributions



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 through May 2006. The indexes are a composite of four economic indicators: payroll employment, unemployment rate, average weekly hours in manufacturing, and real wage & salary earnings.

More details on the methodology and construction of these indexes can be found at

http://www.ny.frb.org/research/regional_economy/coincident_summary.html

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 April 2006. The growth in the index for a given month represents a forecast of the growth in the coincident index nine months ahead. The components used in these three 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

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 1996 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

Exhibit E-4. Unemployment Rates

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

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

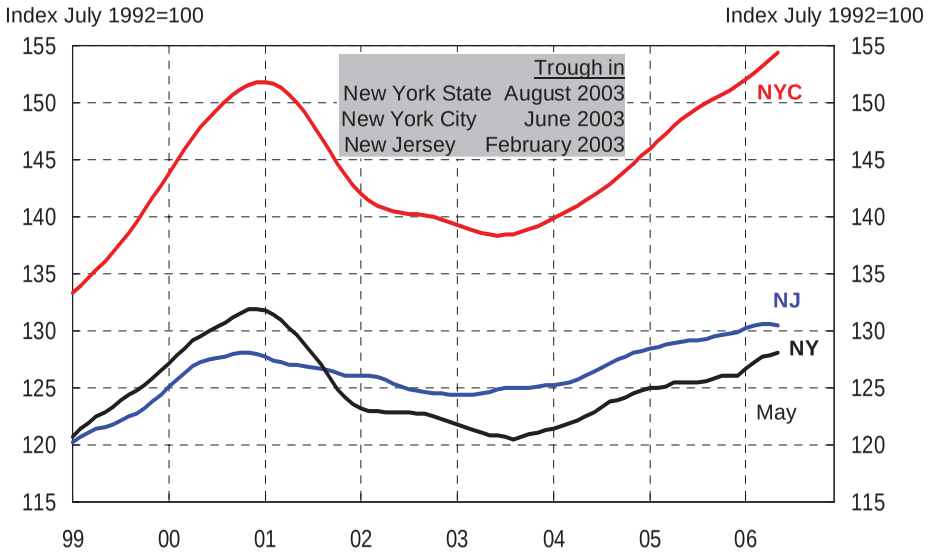
Data can be found at:

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

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

E. Regional Charts

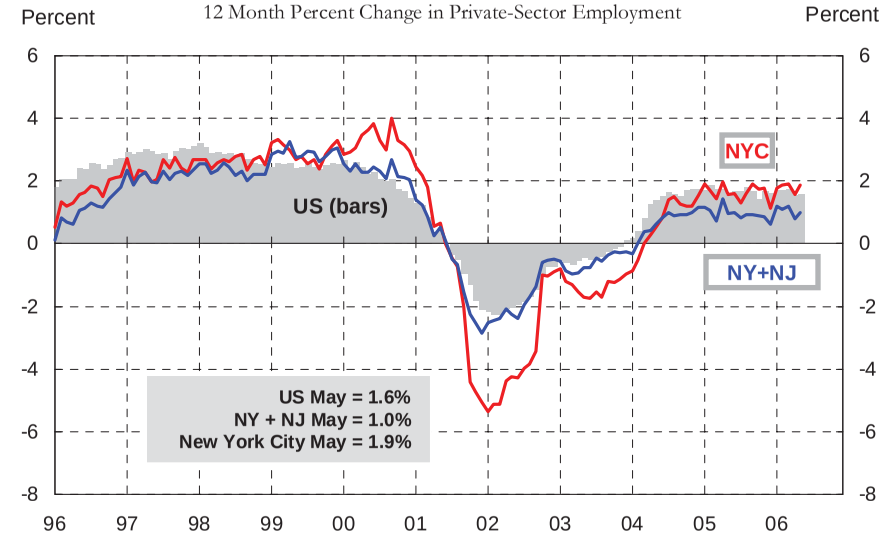
E1: INDEX OF COINCIDENT ECONOMIC INDICATORS



E2: INDEX OF LEADING ECONOMIC INDICATORS

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

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



E4: UNEMPLOYMENT RATES