

**Meeting of the Federal Open Market Committee on
June 29-30, 2005**

A meeting of the Federal Open Market Committee was held in the offices of the Board of Governors of the Federal Reserve System in Washington, D.C., starting at 2:00 p.m. on Tuesday, June 29, 2005, and continuing at 9:00 a.m. on Wednesday, June 30, 2005. Those present were the following:

Mr. Greenspan, Chairman
Mr. Geithner, Vice Chairman
Ms. Bies
Mr. Ferguson
Mr. Fisher
Mr. Gramlich
Mr. Kohn
Mr. Moskow
Mr. Olson
Mr. Santomero
Mr. Stern

Ms. Cumming, Messrs. Guynn and Lacker, Mses. Pianalto and Yellen, Alternate Members of the Federal Open Market Committee

Mr. Hoenig, Ms. Minehan, and Mr. Poole, Presidents of the Federal Reserve Banks of Kansas City, Boston, and St. Louis, respectively

Mr. Reinhart, Secretary and Economist
Ms. Danker, Deputy Secretary
Ms. Smith, Assistant Secretary
Mr. Alvarez, General Counsel
Mr. Baxter, Deputy General Counsel
Ms. Johnson, Economist
Mr. Stockton, Economist

Messrs. Evans, Freeman, and Madigan, Ms. Mester, Messrs. Oliner, Rolnick, Rosenblum, Tracy, and Wilcox, Associate Economists

Mr. Kos, Manager, System Open Market Account

Mr. Ettin, Deputy Director, Division of Research and Statistics, Board of Governors

Messrs. Kamin, Slifman, and Struckmeyer, Associate Directors, Divisions of International Finance, Research and Statistics, and Research and Statistics, respectively, Board of Governors

Messrs. Clouse, Wascher, and Whitesell, Deputy Associate Directors, Divisions of Monetary Affairs, Research and Statistics, and Monetary Affairs, respectively, Board of Governors

Messrs. English, Leahy, and Treacy¹, Assistant Directors, Divisions of Monetary Affairs, International Finance, and Banking Supervision and Regulation, respectively, Board of Governors

Mr. Simpson, Senior Adviser, Division of Research and Statistics, Board of Governors

Mr. Skidmore, Special Assistant to the Board, Office of Board Members, Board of Governors

Mr. Small, Project Manager, Division of Monetary Affairs, Board of Governors

Mr. Wright², Section Chief, Division of Monetary Affairs, Board of Governors

Messrs. Bowman², Gallin¹, and Lehnert¹, Senior Economists, Divisions of International Finance, Research and Statistics, and Research and Statistics, respectively, Board of Governors

Messrs. Doyle¹ and Martin¹, Economists, Division of International Finance, Board of Governors

Messrs. Kumasaka¹ and Luecke, Senior Financial Analysts, Division of Monetary Affairs, Board of Governors

Ms. Low, Open Market Secretariat Specialist, Division of Monetary Affairs, Board of Governors

Mr. Barron, First Vice President, Federal Reserve Bank of Atlanta

Messrs. Eisenbeis and Judd, Executive Vice Presidents, Federal Reserve Banks of Atlanta and San Francisco, respectively

Messrs. Fuhrer, Goodfriend, and Hakkio, Ms. Perelmuter, Messrs. Rasche, Rudebusch¹, Sniderman, and Williams¹, Senior Vice Presidents, Federal Reserve Banks of Boston, Richmond, Kansas City, New York, St. Louis, San Francisco, Cleveland, and San Francisco, respectively

Mr. Peach¹, Vice President, Federal Reserve Bank of New York

¹ Attended Wednesday's portion of the meeting.

² Attended Thursday's portion of the meeting.

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June 29—Afternoon Session

CHAIRMAN GREENSPAN. Good afternoon, everyone. I think you all are aware that this is the last meeting Governor Gramlich plans to attend. There will be a luncheon in his honor after the meeting ends tomorrow. It's also the last meeting for Ed Ettin, who will retire at the end of July, and for Marvin Goodfriend from the Richmond Bank, who will move to Carnegie Mellon at the end of the summer. We'll miss all of them. Ed, as some of us know, has been attending FOMC meetings since the late 1970s, and Marvin has been attending since 1993. As for Ned, there are certain special things that I'm going to say about him tomorrow, which I won't repeat here. We'll let him be a little nervous. [Laughter]

MR. GRAMLICH. I've got a few things to say, too.

CHAIRMAN GREENSPAN. Ah, but I will have the gavel! The first item on the agenda is the selection of Richard T. Freeman as an Associate Economist of the FOMC to serve until the election of a successor at the first regularly scheduled meeting of the Committee in 2006. Would somebody like to move that nomination?

MR. FERGUSON. I'll move that nomination.

CHAIRMAN GREENSPAN. Without objection, that is approved. We will be discussing a special topic today at your request, housing valuations and monetary policy. You've obviously received the documents the staff has distributed. Mine are buried in this stack here; I have them. Let's turn now to Dave Stockton.

MR. STOCKTON. Thank you, Mr. Chairman. We have five briefings this afternoon and the issues covered in those briefings are so intertwined that we thought it would be best if we just

presented all five and then opened the floor for discussion and questions afterward. We recognize that a long presentation, coming right after lunch and while a number of you are still probably a bit jet-lagged, could test your powers of concentration, but I think you'll find the presenters to be both well informed and entertaining. [Laughter] So with that we'll begin.

MR. GALLIN.³ Thank you. My presentation begins on the third page of the handout you received.

It seems that everybody is talking about house prices, and the upper panel of your first exhibit shows why: House prices, adjusted for general inflation, have risen at a rapid pace in recent years and did not even pause during the last recession. Indeed, the real rate of appreciation has increased, and the most recent readings have been at annual rates greater than 7 percent. By comparison, the average annual increase in real house prices during the past 30 years is only about 1¾ percent.

The next two panels illustrate some of the eye-popping gains that have been recorded in selected metropolitan areas. For example, as shown in the middle left panel, real house prices increased about 16 percent in San Francisco and 30 percent in Las Vegas during the four-quarter period ending in the first quarter; as shown to the right, the most recent gain was 13 percent in New York and 20 percent in Miami.

Rapid price appreciation has sparked debate about whether housing has become overvalued, and the popular press is filled with stories suggesting that it has. As summarized in the lower left panel, anecdotes suggesting that the housing market is overheated include those about increased speculation, purchase decisions that are perhaps too dependent on rosy assessments of future appreciation, and increased reliance on novel forms of financing without full recognition of the associated risks.

Although these anecdotes are suggestive, they do not provide a benchmark for valuing housing. Two approaches that do provide a benchmark are listed to the right. One is to ask if housing is affordable for a typical family. Some analysts have argued that prices are too high relative to incomes, while others say low interest rates have kept required monthly mortgage payments affordable. Another approach is to ask if house prices are properly aligned with rents. I have pursued both approaches in my research, and have concluded that rents provide a preferable benchmark for valuing housing. I will therefore focus my prepared remarks on this approach.

As summarized in the upper left panel of your next exhibit, a strength of this approach is that it employs a standard asset pricing framework, such as that often used in studies of stock market valuation. In this framework, rental payments in the housing market are analogous to dividends in the stock market. Seen this way, the

³ The materials used by Messrs. Gallin, Lehnert, Peach, Rudebusch, and Williams are appended to this transcript (appendix 1).

price of a house should reflect the appropriately discounted stream of expected rents; high prices could be justified by high rents or by low carrying costs, which include interest payments, net taxes, and depreciation. But if prices appear unusually high relative to rents and carrying costs, one might conclude that housing is overvalued.

As highlighted to the right, I have implemented the framework using repeat-transactions price indexes from the Office of Federal Housing Enterprise Oversight [OFHEO] and Freddie Mac and the tenants' rent index from the consumer price index. I made several adjustments to these series to address some of the shortcomings of the published data. As you will see in Dick Peach's presentation, he and I disagree about the best way to measure house prices. I would be happy to discuss the issue during the question period.

That said, the red line in the middle panel shows the estimated price-rent ratio for the stock of housing, and the black line shows the estimated real carrying cost of housing. The first point to note is that the measured price-rent ratio is currently higher than at any earlier time for which we have data. Moreover, the run-up in prices appears to be far greater than can be explained by carrying costs, at least if we use the historical relationship between the two series as our guide. Although theory suggests a tight link between carrying costs and the price-rent ratio, the data suggest that the actual link is more tenuous. At the simplest level, while the price-rent ratio is at a historical high, the carrying cost is not at a historical low. More formally, regression analysis suggests that prices are about 20 percent too high given rents and carrying costs.

One might reasonably ask what this potential 20 percent overvaluation portends for house prices. The lower panel summarizes the historical experience on this question. The panel shows a scatter plot of the price-rent ratio (on the horizontal axis) and changes in real house prices over the subsequent three years (on the vertical axis); the panel also includes a fitted regression line. As I mentioned a moment ago, carrying costs are only slightly correlated with the price-rent ratio. Thus, their effects can be excluded from the chart without materially affecting the results.

The downward slope of the regression line summarizes a key finding: When house prices have been high relative to rents, subsequent price changes have typically been smaller than usual. For example, on the right side of the panel we can see that in the second quarter of 1979, the price-rent ratio stood above 24, and real prices decreased 7 percent during the subsequent three years. Near the other end of the scale, in the third quarter of 1970 the price-rent ratio stood just above 19, and real prices increased more than 5 percent during the subsequent three years. However, as is readily apparent from the chart, the relationship is loose. Most notably, in the first quarter of 2002, the last observation for which we have a reading for the subsequent three-year change in house prices, the price-rent ratio stood at 22. Although the regression suggests that real prices should have been about flat since

then, real prices actually increased more than 20 percent, and the price-rent ratio rose to about 27—literally off the chart.

To give an impression of what has happened in local markets, the upper panel of your next chart summarizes housing-market conditions for four metropolitan areas: San Francisco, New York, Chicago, and Miami. The panel displays the deviation of each city's price-rent ratio from its long-run level in the second quarter of 1979 (the red bars), the fourth quarter of 1989 (the black bars), and the first quarter of 2005 (the green bars). The numbers above the bars indicate their height. The first two episodes represent previous peaks of the price-rent ratio at the national level. The third episode is where we are now.

The numbers below the red and black bars show the performance of real house prices in each city in the three years following each episode. For instance, as shown by the red bar, the price-rent ratio in San Francisco was 7 percent above its long-run level in the middle of 1979. During the subsequent three years, real house prices there fell 5 percent. At the end of 1989 (the black bar) the price-rent ratio in San Francisco was 15 percent above its long-run level, and real prices there fell 12 percent during the subsequent three years. The most recent reading for San Francisco indicates that the price-rent ratio is now further above its long-run level than in either 1979 or 1989.

The price-rent ratios suggest that housing is overvalued in the other three cities as well, but to differing degrees. Although the price-rent ratio in New York is elevated, housing does not look much more overvalued there than it did in the late 1980s. House prices appear elevated relative to rents in Chicago as well, but it is Miami that stands out as the most overheated of the four markets shown here.

The evidence that I have shown you so far suggests that rents provide a loose tether for house prices; prices deviate from their long-run relationship with rents for extended periods, but not indefinitely. However, to provide a forecast of house prices, we must consider both the long-run relationship between prices and rents and the short-run dynamics among prices and other economic factors. The middle left panel of your exhibit lists several factors that affect real house-price dynamics in the short run. In particular, the Board's staff has found that a basic model should include lagged changes in house prices, as well as changes in real income, real carrying costs, and the unemployment rate. This basic model does not take a stand on whether housing is overvalued. Alternatively, our error-correction model adds to the basic model the lagged level of the price-rent ratio and the lagged level of carrying costs. It therefore provides a formal way to model short-run dynamics around a long-run equilibrium level. The estimated coefficient on the lagged price-rent ratio is negative, capturing the idea that there is a long-run relationship between house prices and rents and that price changes are restrained when prices are high relative to rents.

The middle right panel shows the implications of these two models for the four-quarter percent change in real house prices at the national level during the Greenbook forecast period. The basic model—in green—suggests that house prices will decelerate in the coming two years, but that they will still rise faster than their long-run average of about $1\frac{3}{4}$ percent per year. Thus, even a model that ignores the long-run relationship between the levels of prices and rents predicts a slowdown in house-price appreciation. Still, housing would become slightly more overvalued relative to rents at the end of the forecast period.

The error-correction model—in red—calls for prices to decelerate more in the coming two years, with real prices actually edging down a bit in 2006. In this scenario, housing would be about 15 percent overvalued at the end of the forecast period. Note that the June Greenbook forecast—the black line—lies between the two model simulations.

To sum up, the statistical evidence that I have presented today provides support for the view that the price-rent ratio can be a useful tool for summarizing housing valuations. The price-rent ratio is currently very high by historical standards, suggesting that housing might be overvalued by as much as 20 percent. Historical experience suggests that the change in real house prices going forward will be slower than in recent years. Unfortunately, the evidence cannot rule out either further rapid gains in house prices for a time or a more rapid correction back to fundamentals. Just as the price-dividend ratio is an imperfect tool for forecasting stock prices, the price-rent ratio should be considered only a rough guide to valuations in the housing market. Thank you.

MR. LEHNERT. As Josh noted, everyone's talking about house prices; but they also seem to be talking a great deal about mortgages. The popular consensus appears to be that homebuyers, especially in hot housing markets, now make token down payments and can just scrape into their homes by resorting to interest-only mortgages; in this view, borrowers and lenders alike are vulnerable to any fall in house prices. In my prepared remarks I will address each of these issues.

An obvious measure of the vulnerability of a borrower to a decline in his house price is the ratio of the current mortgage balance to the current value of his home; this ratio is known as the current loan-to-value, or LTV, ratio. The top panel of your first exhibit compares the distribution of the estimated current LTV as of September 2003 (the black bars) with the distribution as of March 2005 (the red bars).

As shown by the leftmost red bar, 64 percent of borrowers currently have LTVs below 70 percent. Moving to the right, a further 18 percent currently have LTVs between 70 and 79 percent; 14 percent have LTVs between 80 and 89 percent; and only 4 percent have LTVs of 90 percent and above. Moreover, the recent rapid appreciation in house prices has actually outstripped mortgage debt growth, so that the average LTV has fallen over the past 18 months.

The middle left panel uses the same data to concentrate on the most leveraged borrowers. For a given drop in nominal house prices (the horizontal axis), the vertical axis gives the percent of borrowers who would have negative equity. As before, the black line reflects data from September 2003 while the red line reflects the most recent data. As shown by the red line, following a house-price drop of 10 percent, an estimated 4 percent of borrowers would have negative equity, while a drop of 20 percent would leave about 18 percent of borrowers in negative territory.

The middle right panel summarizes average LTVs at origination for homes purchased in 2004, by state, relative to price appreciation in that state over the previous four years. States with lower-than-average appreciation, such as Utah, Texas, and Oklahoma, are at the left, while states with faster-than-average appreciation, such as California, Massachusetts, and New York are at the right. As shown, LTV at origination in 2004 was actually lower in states with more appreciation. Thus, homebuyers in California and other high-appreciation states made larger down payments relative to the price of their house than homebuyers in low-appreciation states such as Oklahoma.

Increasing home equity, mainly driven by rising house prices, has supported mortgage credit quality in recent quarters. The bottom left panel plots delinquency rates for loans held on banks' books (the black line) as well as for the broader MBA [Mortgage Bankers Association] measure (the red line). Both have fallen significantly in recent years.

The bottom right panel summarizes the vulnerability of borrowers to house-price shocks. The average LTV on mortgages has declined over the past 18 months, and most households currently have substantial equity in their homes. In the past few years, borrowers have benefited from rapidly rising house prices, which have kept mortgage delinquencies at extremely low levels. However, an estimated 4 percent of borrowers are highly leveraged and could lose all of their home equity if house prices were to fall 10 percent.

As I noted earlier, recent anecdotal reports have highlighted a second potential risk lurking within mortgage markets—the sudden popularity of interest-only mortgages. These are the subject of your next exhibit.

The statistics presented in exhibit 2 are taken exclusively from data on private-label—that is, non-GSE [government-sponsored enterprise]—residential mortgage-backed securities, or RMBS, pools. The overwhelming advantages of these pools for my purposes are that they are very transparent; that is, a great deal of information is available on the underlying mortgages and that they contain many heterodox mortgages, including interest-only mortgages. Many of the recent press articles citing the growth of novel mortgages are based on RMBS pool data and thus, because such mortgages are overrepresented in RMBS pools, have exaggerated, in my view, the role of heterodox mortgages.

Turning to the data, line 1 of the top left panel shows that the dollar value of RMBS pools has nearly doubled over the past two years. Moreover, as shown in line 2, RMBS pools backed by interest-only, or IO, mortgages have increased almost sixfold, and now amount to nearly \$300 billion. However, total home mortgage debt, line 3, has also increased over the past two years. As shown in the memo line, interest-only RMBS pools now account for 3.6 percent of all home mortgage debt, up from less than 1 percent two years ago, but still a small share of all mortgages.

As their name implies, interest-only mortgages do not require the borrower to make principal payments, at least during an initial period. Borrowers willing to use IO mortgages could qualify for a larger mortgage and thus be able to buy a more expensive house. The top right panel gives some idea of the relationship between price appreciation and the popularity of IO mortgages. The vertical axis shows the fraction of IO mortgages used to purchase houses, by state, in 2004. Again, I should emphasize that the IO shares are calculated within the RMBS world, and so are probably overstated. The horizontal axis gives state-level house-price appreciation from 1999 through 2003. As you can see, IO mortgages are somewhat more popular in states that saw more appreciation, although, as seen in the inset box, the correlation is not particularly strong.

While the principal value of an IO loan doesn't decline, if the initial down payment is large enough, the borrower may have a substantial equity cushion against price shocks. The middle panel reports the LTV at origination for IO loans made over the past three years. As shown, most IO mortgages had LTVs below 80 percent, although the trend over time has been away from the very lowest LTVs. That said, lenders have continued to make relatively few IO loans with LTVs above 80 percent. Those higher LTV loans now account for about 15 percent of all outstanding IOs.

Finally, anecdotes often emphasize that IO loans are extended to borrowers with lower credit quality. The bottom panel shows the distribution of credit quality, measured by FICO scores, among IO borrowers. As a rough approximation, most lenders define prime quality borrowers as those with FICO scores of 660 or above. The leftmost set of bars thus represents subprime borrowers. As shown, between 8 and 10 percent of IO loans have been extended to these borrowers. Moving to the right, the next two sets of bars show that the great majority of IO borrowers had solid credit scores between 660 and 779. As shown by the rightmost set of bars, about 10 percent of IO borrowers had credit scores above 780. On the whole, therefore, the credit quality of borrowers using interest-only loans does not appear particularly risky.

One might wonder if financial institutions and investors have, in the face of the continuing housing boom, dropped their defenses against the mortgage losses that would accompany a house-price bust. The top left panel of your next exhibit lists the main institutions exposed to residential mortgage credit risk and the main types of mortgages held by these institutions. The housing GSEs, line 1, almost

exclusively hold or guarantee conforming mortgages with fixed rates. Private mortgage insurers, line 2, insure the component of mortgage principal that exceeds 80 percent of the property's value and so are effectively exposed to the credit risk associated with high-LTV loans. RMBS pools (line 3), as well as banks and thrifts (line 4), hold a wide variety of different mortgage types, including traditional fixed-rate mortgages as well as variable-rate and junior liens.

The top right panel emphasizes that the housing GSEs hold very little credit risk. As shown on line 1, the average LTV at origination of GSE-guaranteed mortgages was 70 percent; based on regional house-price appreciation, the estimated current LTV of these mortgages (line 2) has fallen to 57 percent. The average credit score of the underlying borrowers (line 3) is also solidly in the "prime" category. Obviously, these average values mask some variation in the borrower population, which no doubt contains some higher-risk borrowers. However, as shown on line 4, 19 percent of the mortgages guaranteed by the GSEs carry some form of credit enhancement. If one of these mortgages defaults, the GSE receives a payment from the insurer, usually a private mortgage insurance, or PMI, company.

The middle left panel examines the health of the PMI industry. As shown by the black line (left axis), the ratio of total insured mortgages to capital, the risk-capital ratio, has declined steadily over the past 10 years, indicating that PMI companies have historically high capital on hand relative to the risks they insure. The red line (right axis) shows net underwriting income—that is, income from premiums less losses and expenses, relative to capital. After suffering large losses in the late 1980s, PMI companies have consistently recorded positive underwriting income. In sum, PMI companies appear to have built up a historically large cushion to absorb the losses that might be associated with a widespread drop in real estate values.

The middle right panel analyzes the risks posed to investors in RMBS pools. These pools contain some of the riskier outstanding mortgages. However, they are structured so that investors can choose their risk exposure. Further, RMBS pools are exceptionally transparent, so investors have extensive information on each mortgage in the pool. In principle, investors should have understood, and appropriately priced, the risks inherent in these mortgages. In practice, however, investors price these mortgages using loss models, which are estimated using relatively little data from major house-price declines.

The bottom two panels discuss the exposure of the 8,900 banks and thrifts in the United States to residential mortgage credit risk. The panel to the left divides institutions into quartiles by the fraction of their portfolios accounted for by residential mortgage assets, defined as whole loans, home equity lines of credit, non-GSE RMBS pools, and residual tranches on securitized mortgages. As shown, for institutions in the bottom quartile, mortgages account for less than 5 percent of total assets. This fraction rises by quartile until, for institutions at the top, mortgages

account for more than 40 percent of assets. Residential mortgage credit risk is more concentrated at these institutions than at the institutions in the lower quartiles.

The panel to the right shows the average size and capital-to-asset ratio of institutions in each of the quartiles. Reading down the first column, which gives average institution size, one can see that smaller institutions are concentrated in the first two quartiles, which have relatively little mortgage exposure. Reading down the second column, which gives average tier 1 capital ratios, institutions in all quartiles are extremely well capitalized. Thus, institutions with large amounts of mortgage credit risk on their portfolios are well positioned to handle severe losses.

To sum up, neither borrowers nor lenders appear particularly shaky. Indeed, the evidence points in the opposite direction: borrowers have large equity cushions, interest-only mortgages are not an especially sinister development, and financial institutions are quite healthy. Nonetheless, even the most sanguine analyst quails when contemplating a historically unprecedented drop in nationwide nominal house prices. Such a drop will obviously hurt both borrowers and lenders and will also no doubt expose weaknesses that will only be obvious in hindsight. Thus, perhaps it would be best simply to venture the judgment that the national mortgage system might bend, but will likely not break, in the face of a large drop in house prices. That concludes my prepared remarks.

MR. PEACH. Hardly a day goes by without another anecdote-laden article in the press claiming that the U.S. is experiencing a housing bubble that will soon burst, with disastrous consequences for the economy. Indeed, housing market activity has been quite robust for some time now, with starts and sales of single-family homes reaching all time highs in recent months and home prices rising rapidly, particularly along the east and west coasts of the country. But such activity could be the result of solid fundamentals underlying the housing market. After all, both nominal and real long-term interest rates have declined substantially over the last decade. Productivity growth has been surprisingly strong since the mid-1990s, producing rapid real income growth primarily for those in the upper half of the income distribution. And the large baby-boom generation has entered its peak earning years and appears to have strong preferences for large homes loaded with amenities.

One of the conditions of an asset bubble is that the price of the asset has risen well above what is consistent with underlying fundamentals. In the current debate, two measures of relative value have been applied to single-family home prices—price relative to income and rent relative to price. In the comments that follow I will concentrate on the price-to-income measure, but my conclusions apply equally to the rent-to-price measure.

In most analyses of the ratio of home price to income, the measure of home price that is used is the repeat-sales home price index published by the Office of Federal Housing Enterprise Oversight (exhibit 1). This index tracks changes in the

average price of homes purchased (or mortgages refinanced) with loans purchased by Fannie Mae and Freddie Mac, or conforming conventional loans. Therefore, it excludes cash sales as well as purchases or refinancings financed with FHA [Federal Housing Administration], VA [Veterans Affairs], and jumbo conventional mortgages. It is called a repeat-sales index because it is derived by observing the sales prices—or appraised values, in the case of refinancings—of properties at specific addresses at two or more points in time. Finally, it is a transactions-based index in that it reflects the prices of homes that are sold (or refinanced) rather than the entire universe of single-family homes.

A lesser known home price index is the constant-quality new home price index published by the Bureau of the Census (exhibit 2). This index is based on a sample of new homes sold, regardless of how the sale was financed. Hedonic methods are employed to hold the physical and locational characteristics constant over time. This index is part of the Census Bureau statistical program through which the single-family residential investment deflator of the national income and product accounts is derived. As shown in exhibit 3, the increase in prices indicated by these two indexes is quite different. For example, over the four years from 2000 to 2004, the OFHEO index increased at a compound annual rate of 8.2 percent, while the constant-quality index increased at a 5.4 percent annual rate. As shown in exhibit 4, the current ratio of price over median family income derived from these two indexes is vastly different. If the OFHEO index is giving an accurate picture of what is happening to home prices, I think one could say with some confidence that prices have been bid up to unsustainable levels. However, if the constant-quality index is a better reflection of reality, home prices actually look somewhat low relative to median family income, particularly compared to the late 1970s. I believe the constant-quality index provides a more accurate indication of what is happening to the price of a typical single-family home. In contrast, the OFHEO index is subject to upward biases that accumulate over time and distort ratios such as price-to-income and income-to-rents.

To help us understand the biases in the OFHEO index, exhibit 5 presents the distribution by value of all single-family homes in the U.S. in 2003, with the specific values at the 25th, 50th, 75th, and 80th percentiles.⁴ The median value in 2003 was \$150,000 with the distribution skewed toward the right. The value at the 25th percentile was \$90,000 while the value at the 75th percentile was \$250,000. We do not know with certainty where the OFHEO index falls on this distribution, as it is an index rather than a series of values. But we can be reasonably certain that it lies somewhere between the average price of all existing single-family homes sold and the average price of homes purchased with conventional loans. That means the OFHEO index is a closer reflection of what is happening at the 75th percentile rather than the 50th percentile. Moreover, it is very likely that over time the point on that distribution represented by the OFHEO index has been drifting to the right. One

⁴ In the American Housing Survey, home values are self-reported. Previous research has concluded that self-reported values tend to overstate somewhat the price at which a property would actually sell. We are limited to the 80th percentile due to top coding of the home value variable.

cause of this rightward drift is what I call transaction bias. As shown in exhibit 6, the American Housing Survey (AHS) data suggest that both appreciation rates and turnover rates increase as one moves out the home value distribution. For example, from 1997 to 2003 the compound annual rate of appreciation at the 25th percentile was 4.5 percent, increasing to 8.7 percent at the 80th percentile. Corresponding average turnover rates for the period from 1997 to 2003 were 5.9 percent and 7.4 percent. That means, of course, that the average rate of appreciation of the units that turn over is higher than the average rate of appreciation of the entire distribution. While the amount of bias in any one year is likely to be small, it does cumulate over time and becomes quite important when one is comparing levels versus income or rents.

Another potential upward bias in the OFHEO index is that while it is a repeat-sales index, there is evidence to suggest that it is not a constant-quality index. In addition to the strong pace of new housing starts, another aspect of the housing boom of the past decade has been a significant increase additions and alterations to the existing housing stock. Exhibit 7 presents in the top panel the ratio of the OFHEO index over the constant-quality index plotted over the period from 1977 to the present. In the lower panel are plotted real improvements per unit of housing stock per year over the same period. Over the past decade real improvements per unit have increased about 25 percent, which appears to be associated with a further increase in the ratio of the OFHEO index over the constant-quality home price index. Research suggests that higher-income households have a higher income elasticity of demand for improvements to their primary residences, suggesting that this source of upward bias is likely to be more pronounced in the right half of the distribution of all single-family homes.⁵

Another way of looking at the issue of home prices over income is to go back to the AHS data and see what is happening at various points on the distribution of all single-family homes. This information is presented in exhibit 8. At the 25th percentile the ratio of home price to income has been relatively stable, while it has increased sharply at the 75th and 80th percentiles, reminiscent of the price-to-income ratio computed with the OFHEO index. Let me pause just a moment and emphasize that I am comparing home prices at a percentile with the incomes of the people who live in those homes at the same percentile. This chart is likely the equivalent of the finding that the increase of home prices has been most pronounced in areas of the country where home prices were already relatively high due in part to relatively inelastic supply. It is likely that in these areas of the country, where land values are high, the inclination to make substantial improvements to existing properties is the greatest.

Clearly, not everyone agrees that the constant-quality new home price index provides an accurate indication of what is happening to the price of a typical single-family home. For example, it has been argued that most new construction takes

⁵ See Joseph Gyourko and Joseph Tracy (2005), "Using Home Maintenance and Repairs to Smooth Variable Earnings," Federal Reserve Bank of New York Working Paper Series.

place at the fringe of metropolitan areas where land prices may not be rising as fast as is intra-marginal land. There are several counter arguments. First, the theory leading to the conclusion that intra-marginal land values increase at a faster rate than land at the fringe is based on a theory of the development of a metropolitan area with fairly restrictive assumptions. Modern metropolitan areas have multiple commercial/employment centers. Many households have preferences for rural or suburban residences over urban residences. Restrictions on development to counter suburban sprawl have reportedly resulted in sharp increases in prices of parcels of land suitable for home building. Finally, I would like to note that the increases in land prices implicit in the constant-quality home price index, shown in exhibit 9, are substantial, particularly in the Northeast and the West. These estimates were derived assuming that land represents 50 percent of the value of the total property and that the prices of the other inputs increase at the same rate in all regions of the country.

In closing, I would like to comment on one other aspect of the housing bubble issue that has received substantial attention. Earlier this year a major real estate related trade association released the results of a survey indicating that a significant percentage of single-family home sales were of investment properties and second homes. This was widely interpreted as evidence of speculative buying of rental properties, another feature of a housing bubble. Again, I believe that such reports should be viewed skeptically. According to the AHS, in 2003 single-family investment properties, defined as homes renter-occupied or for rent, represented 14.2 percent of all single-family homes while second homes represented another 4.7 percent. Therefore, we should not be surprised that such properties represent about 20 percent of the sales that take place at any point in time. Moreover, the American Housing Survey data indicate that single-family investment properties have been declining as a share of all single-family homes for some time and declined in absolute numbers from 2001 to 2003. A principal reason the rental vacancy rate for single-family homes has risen in recent years is that the number of renter-occupied single-family homes has declined as people switch from renting to owning. So if a lot of people are buying rental properties, it must also be the case that a lot are selling as well. That concludes my report. Thank you.

MR. RUDEBUSCH. I will review some general issues related to monetary policy and asset prices. Let me start—at the top of page 1—by assuming that an asset price can, in theory at least, be separated into a component determined by underlying economic fundamentals and a non-fundamental or bubble component. An asset price may be in line with its fundamentals, so the bubble component is zero, or bubbles could be positive or negative—perhaps representing irrational euphoria or pessimism.

Two types of monetary policy responses to movements in an asset price have been proposed. I refer to the first type as “Standard Policy” because there is widespread agreement that it represents the minimum appropriate policy response. The Standard Policy responds to an asset price to the extent it conveys information to the central bank about the future path of output and inflation—the goal variables

of monetary policy. For example, a booming stock market is usually followed by higher demand and increased inflationary pressures, so tighter policy would be needed to offset these consequences. Even for the Standard Policy response, it will likely be useful to identify, if possible, the separate components of the asset price. In particular, the bubble component may exhibit more volatile dynamics and be a pernicious source of macroeconomic risk, so optimal policy would likely react more to bubbles than to movements in the fundamental component.

The second type of response, the “Bubble Policy,” follows the Standard Policy as a base case, but, in certain circumstances, it also takes steps to contain or reduce the asset price bubble. Proponents of a Bubble Policy argue that movements in the bubble component can have serious adverse consequences for macroeconomic performance that monetary policy cannot readily offset after the fact, so it is preferable to try to eliminate this source of macroeconomic fluctuations directly. Furthermore, because bubbles often seem to display a self-reinforcing behavior, a little preemption and prevention early on can avoid later excesses.

A best-case scenario for these two policies is illustrated in the lower half of the first page. Under ideal circumstances, the policymaker knows the fundamental and bubble components, and as history unfolds, the Standard Policy would likely recommend higher interest rates to offset any economic stimulus generated by the bubble before the crash and lower rates afterward. A Bubble Policy would go further and try to mitigate the fluctuations in the bubble and achieve an asset price path like AP'_t . This would likely require higher interest rates than the Standard Policy before the crash and lower rates afterward, and it will likely trade off near-term deviations from the central bank’s macroeconomic goals for better overall macroeconomic performance later on. The fundamental difference between the two policies is that the Standard Policy takes the bubble component essentially as given or exogenous, while the Bubble Policy takes into account the endogenous nature of the bubble component—specifically, a linkage between the policy instrument and the bubble.

A decision tree for choosing between the Standard and Bubble Policies is shown on page 2. In brief, it asks three questions: (1) Can policymakers identify a bubble? (2) Will fallout from a bubble be significant and hard to rectify ex post? and (3) Is monetary policy the right method to use to deflate the bubble?

The answer to the first question—can policymakers identify a bubble?—is “no” if the particular asset price appears aligned with fundamentals. Some have argued that this is nearly always the case because estimates of fundamentals are so imprecise and because asset prices reflect the collective information and wisdom of professional traders in organized markets. If policymakers cannot discern a bubble, then the Standard Policy is the only feasible response.

But suppose an asset price bubble is identified. Then the second hurdle is whether bubble fluctuations have significant macroeconomic fallout that monetary

policy cannot readily offset after the fact. A negative answer to this question is appropriate in two situations. First, if the bubble is in an asset market that is small in domestic economic terms—for example, a localized real estate market—then a central banker should avoid attempts at asset price realignment. Second, even when there are significant macroeconomic consequences from an asset price bubble boom and bust, if they occur with a sufficient lag so the policymaker can adopt a wait-and-see attitude, then the Standard Policy is again appropriate. This second case seems relevant if fluctuations in the bubble component have only conventional effects on aggregate demand and supply through changes in wealth, the cost of capital, and balance sheets. Then, to a first approximation, the lags involved in these channels are about as long as the lags in the monetary transmission mechanism; therefore, the Standard Policy should suffice. For example, fluctuations in equity prices will affect wealth and consumer demand, but a nimble central banker can essentially offset these consequences by changing interest rates in reaction to—that is, after—the equity price movements.

Now to the case where asset price movements have significant macroeconomic consequences and those consequences are hard to clean up after the fact through monetary policy. The most often mentioned possibility is that a bursting asset price bubble will lead to a broad financial crisis and credit crunch. Such financial instability is likely to be transmitted to the economy much more quickly than can be offset by interest rate policy. This may set the stage for invoking a Bubble Policy. Another example is when the asset price misalignment results in significant misallocations of resources, which distort aggregate demand and supply across sectors and over time and impede the achievement of the highest possible long-run economic growth. For example, the dot-com bubble spurred overinvestment in fiber optic cable and decimated the provision of venture capital for new technology startups for years. Of course, after the fact, it is difficult to unwind these problems with the blunt instrument of monetary policy, and, depending on the specifics, it is possible to conceive of a situation in which reducing the bubble in advance is a preferred policy strategy.

The final hurdle before invoking a Bubble Policy involves assessing whether monetary policy is the right way to deflate the asset price bubble. Ideally, for the Bubble Policy, a moderate adjustment of interest rates could constrain the bubble and greatly reduce the risk of severe future macroeconomic dislocations. However, bubbles, even if identified, often do not appear influenced by monetary policy actions in a predictable way. Furthermore, even if changing interest rates could alter the bubble path, such a strategy may involve substantial costs, including near-term deviations from the macroeconomic goals of the central bank as well as potential political or moral hazard complications. Finally, even if monetary policy can affect the bubble, alternative strategies to deflate it, such as changes in financial regulations or supervision, may be more targeted and have a lower cost.

This decision tree is a daunting triple jump, but not a total prohibition against bubble reduction. Indeed, page 3 suggests different real-time answers to these three

questions for two historical episodes. The first episode is the run-up in the stock market during the late 1990s. In 1999 and 2000, one could have made the case that there was an equity price bubble in the high-technology sector and perhaps in the overall market as well. Also, during that time, the possible capital misallocation from the run-up in prices and the possible financial instability that might have followed a bursting of the bubble may have appeared difficult to rectify. However, it was also unlikely that monetary policy could have deflated the equity price bubble without substantial costs to the economy. In the event, of course, a Bubble Policy was not followed, but arguably, the consequences from any bubble boom and bust have been manageable.

A different example is provided by the bond market collapse in 1994. One could argue that this “inflation scare,” which pushed up yields on 30-year bonds by over 2 percentage points, resulted in an asset price misalignment that was fairly apparent to the FOMC during the second half of 1994. If this bond bubble had persisted, the widespread propagation of the associated fears of higher inflation could have had severe consequences that would have been costly to unwind with monetary policy later on. Finally, with regard to deflatability, it did appear likely that monetary policy could guide bond prices back to fundamentals. Indeed, one interpretation of the FOMC’s actions in 1994 is that it purposefully and successfully contained a bond market bubble with sizable increases in the funds rate. It is an open question which of these two episodes is the more relevant one today. That concludes my remarks.

MR. WILLIAMS. I’ll be referring to the exhibits beginning on page 26. In my presentation today, I’ll lay out a few scenarios that illustrate the potential macroeconomic fallout resulting from a significant decline in house prices, and I will examine policy responses that minimize it.

I’ll start by describing the possible size of the current problem—assuming there is one. As pointed out in Dick Peach’s presentation, there are serious difficulties in accurately measuring both actual and “fundamental” house prices. But, for the purposes of my presentation, I will take as a working hypothesis that house prices are high relative to fundamentals—or, in terms of the decision tree that Glenn just laid out, I assume that the answer to his question 1 is “Yes, the asset price appears misaligned.” As Josh Gallin indicated, it would take up to a 20 percent decline in house prices to bring the price-to-rent ratio back in line with fundamentals. With housing wealth standing at around \$18 trillion today, such a drop in house prices would extinguish \$3.6 trillion of household wealth. That’s equal to about 30 percent of GDP. Based on a marginal propensity to consume from housing wealth of 3½ cents on the dollar, this decline in wealth would entail a nearly 1½ percentage point increase in the personal saving rate. And, according to estimates from the FRB/US model, it implies a 40 basis point reduction in the long-run neutral real funds rate.

It may be useful to put these figures into context by comparing them to those associated with the stock market overvaluation reached in early 2000. Stock prices

at that time were arguably some 50 to 70 percent overvalued. Correction of prices to fundamentals at that time would have implied a reduction in household wealth of \$6.7 trillion, equal to about 70 percent of contemporaneous GDP. In the event, stock market wealth fell by \$4.6 trillion between March 2000 and March 2001, and at its lowest point was down \$8.5 trillion. There is considerable uncertainty regarding the magnitude of the effects of changes in stock market and housing wealth on household spending; nonetheless, it seems clear the magnitude of the current potential problem is much smaller than, and perhaps only half as large as, that of the stock market bubble. Of course, if house prices continue to soar—and in the San Francisco Bay Area, at least, they show no signs of slowing—the magnitude of the housing overvaluation problem will rise as well.

A cautionary note worth emphasizing is that the monetary policy cushion available today, as measured by the prevailing federal funds rate, is noticeably smaller than it was in early 2000 at the peak of the stock market.

The first question that comes to mind is: What should monetary policy do, if anything, about the apparent overvaluation in house prices? The answer to that depends crucially on the answer to Glenn's second question: "Do bubble fluctuations result in large macroeconomic consequences that monetary policy cannot readily offset?" Therefore, I now explore the effects of a bubble collapse and the ability of policy to respond effectively to them.

I consider three scenarios in which a housing bubble deflates relatively quickly. I use the FRB/US model to quantify these effects. Note that for the materials posted last Wednesday, I based my simulations on the April Greenbook projection. I have since updated the simulations, and the ones that I will be showing today are based on the extended June Greenbook projection. In each scenario, I assume that house prices fall by 20 percent relative to the baseline over the next 2½ years.

In the first two scenarios, I consider the effects of exogenous declines in house prices that apparently come "out of the blue;" the third scenario considers the possibility of an interrelated decline in both bond and house prices. For each scenario, I consider two types of monetary policy response. The first is the optimal perfect foresight policy that is very similar to those reported in past Bluebooks. The path of policy is chosen to minimize the sum of the squared deviations of the unemployment rate and the core PCE [personal consumption expenditures] price inflation rate from their respective targets and the squared changes in the funds rate, with the latter receiving relatively little weight. Perfect foresight means that the policymaker today has advance knowledge of all future shocks to the economy. I assume that the inflation objective is 1½ percent and that the unemployment rate target is 5 percent, equal to the staff's estimate of the NAIRU [non-accelerating inflation rate of unemployment]. The second policy is one that responds only to events as they occur and does not respond directly to anticipated future developments related to house prices. For this purpose, I use a modified version of the Taylor rule, with a coefficient of 1 on the output gap and of ½ on the inflation

gap, and with the long-run natural rate of interest that appears in the rule varying in accord with sustained changes in housing wealth and bond premiums.

The second page of my exhibit shows the results from model simulations of a 20 percent decline in house prices, where only the standard channels included in the FRB/US model are in play. For comparison, I have also plotted the baseline paths, based on the June extended Greenbook projection but modified under the assumption that monetary policy is set optimally in the way I just described. Because a decline in house prices primarily influences demand, not supply, it does not pose a difficult tradeoff between policy goals. In addition, according to the model, the macroeconomic effects play out gradually and are moderate in magnitude, giving policy time to respond. The optimal policy calls for a path for the funds rate that averages about $3\frac{1}{4}$ percent during 2007 and 2008—about 40 basis points below the baseline path. Under this policy, the unemployment and inflation rates are nearly the same as in the baseline. The very small rise in inflation reflects the effects of the depreciation of the dollar resulting from the reduction in domestic interest rates.

The modified Taylor rule is able to mimic the outcomes under the optimal policy reasonably well, indicating that policy need not fully anticipate future house-price declines to be effective, but can simply respond to events as they unfold. Note that if the house-price decline were larger (or the marginal propensity to consume out of housing wealth bigger), then the policy implication would simply be to cut rates by proportionally more.

In summary, assuming that the FRB/US model does a good job of capturing the macroeconomic implications of declining house prices, such an event does not pose a particularly difficult challenge for monetary policy. One lingering concern, however, is that the model may be missing other important avenues by which large movements in house prices affect the economy. I now consider a scenario that entertains that possibility.

In the second scenario, I incorporate extra-model spillovers from falling house prices, presumably reflecting a decline in confidence and an extinguishing of household spending that had been fueled by equity extraction from mortgage refinancing, as described in the “heightened spending response” simulation reported in the June Greenbook. Importantly, the demand spillovers are assumed to have a very different dynamic from the model’s standard wealth effect: They kick in much more rapidly and eventually dissipate so that they have no long-run effects. As shown in the next page of the exhibit, owing to the extra drag from these spillovers, the optimal policy calls for a series of rate cuts, bringing the funds rate to $2\frac{1}{4}$ percent by the middle of next year. The funds rate does not again reach 3 percent until the spring of 2007. The optimal policy is able to stem the rise in unemployment that would otherwise occur at the cost of a modest and short-lived uptick in inflation.

The Taylor rule, however, is not as successful. It fails to anticipate the spillover effects and responds too timidly once they occur. Still, it contains the rise in unemployment to only about $\frac{1}{2}$ percentage point above baseline and moves inflation slightly more rapidly toward the assumed inflation objective. I should note that, given the uncertainty regarding the size and timing of such spillovers, the ideal outcome in the optimal policy simulation exaggerates the real-world ability of monetary policy to offset the effects of such shocks.

As I noted before, the thought experiment behind these first two sets of simulations is that house prices fall in a kind of vacuum, without any relationship to other events. Some commentators have argued that the current high level of house prices is the outcome of a history of very low interest rates and past house-price appreciation that has given rise to irrationally optimistic expectations of future appreciation. Indeed, a simple estimated equation relating the current price-to-rent ratio to the user cost of housing and past house-price appreciation does a reasonably good job of explaining much of the run-up in house prices over the past several years. If this explanation holds water, a potential risk to housing prices and the outlook in general lies in the path of longer-term interest rates—which have been surprisingly low, given prevailing economic conditions—and the usual behavior of term premiums. Bond yields could return to more normal levels and in so doing contribute to a downward trajectory in house prices.

I explore such a possibility in the final scenario, which builds on Scenario 2, and is the subject of the next page of my exhibit. I now add the assumption that the term premiums on long-term bonds rise by 75 basis points, relative to baseline, over the second half of this year and remain at these levels. This aspect of the scenario is similar to an alternative scenario reported in the June Greenbook. This shock to bond premiums by itself reduces the long-term equilibrium real funds rate by about 70 basis points. Optimal policy calls for the funds rate to fall below 1 percent by the middle of next year and for the funds rate to remain below 3 percent through 2008. The optimal policy is just able to contain the rise in unemployment without confronting the zero bound. The Taylor rule, on the other hand, responds too gradually to events, and, as a result, the unemployment rate reaches 6 percent in early 2007.

This scenario presents a difficult challenge for monetary policy, especially in light of the looming zero lower bound on interest rates under the optimal policy. More generally, it highlights that the risks posed by a house-price decline are magnified if they occur in tandem with other events that damp economic activity.

In addition, as Glenn mentioned, a house-price misalignment may misallocate resources to housing-related activities. These conditions suggest considering Glenn's question 3, whether an alternative policy is needed that aims to deflate a house-price overvaluation before it grows too large—the subject of the next page of my exhibit. The potential effectiveness of such a preemptive policy, however, is less than clear. The basic empirical relationship between house prices, interest rates, and

other factors, upon which such a policy necessarily would rely, is imperfectly understood and may have changed over time. Moreover, as seen in the earlier presentations, there remains considerable uncertainty over the degree of overvaluation. Thus, the successful use of monetary policy to reduce the magnitude of a misalignment of house prices would be a daunting task, even assuming that such a goal were deemed desirable. This concludes our prepared remarks.

MR. STOCKTON. We're here to answer your questions and to listen to your discussion.

CHAIRMAN GREENSPAN. Well, I believe there is a very critical statistical difference here which, before we get very far down the road, I think requires resolution. You three gentlemen are talking about different sets of reality, and you're using the same basic data system. You all use the American Housing Survey, you use OFHEO, and you use the Census price index. I've heard comments from a few of you periodically on such matters.

There are a couple of issues that I find striking here. One is how little we apparently know, at least as has been communicated to me, on the effect of the underlying land prices that are involved in all of these indexes. You can't get the land price out of the American Housing Survey. I don't believe it's in the decennial housing surveys. We do have farmland prices by county, and one would presumably be able to pick up what was going on at the fringe of various residential operations—it sounds like a tortuous job—but that still doesn't solve the underlying question of what the ratio of land is to other values. And it strikes me that we need to come to grips with some of these issues, if for no other reason than I think it's probably our job—because no one else seems to be taking it on—to try to second-guess the data that we're getting. Nobody is raising the question about the quality of the Loanperformance data and the fact that we're dealing with private pools, which I presume are in the data that are being put together with respect to the proportion of IO loans. I assume that conforming mortgages do not include IOs. Or do they? Are there parts of these pools that do?

MR. LEHNERT. An interest-only mortgage can be purchased by a GSE if it's below the conforming loan limit.

CHAIRMAN GREENSPAN. And how much of the GSE portfolio includes IO loans? Do we know?

MR. LEHNERT. At the moment only Freddie Mac, I believe, has a pilot program to buy these, and it's very small.

CHAIRMAN GREENSPAN. That was my understanding. Does Fannie do any?

MR. LEHNERT. Not yet.

CHAIRMAN GREENSPAN. So, for all practical purposes, since private pools have gotten very large but are still somewhat less than the sum of Fannie and Freddie, the Loanperformance data at best are large exaggerations.

There's also an interesting question about the second house issue. You're raising the data out of the American Housing Survey, and the last one was for 2003, but the actual acceleration of both turnover and presumed purchases occurs after that. We've been getting HMDA [Home Mortgage Disclosure Act] data on that for 2004, essentially doing it by month. In there, of course, are the mortgage originations for other than owner-occupied residences. One would expect that there's a little fudging on the part of investors about what the homes are to be used for, but if the bias is presumed to be fairly standard, we're going to learn something about the apparently uncontested assumption of the acceleration in turnover of existing homes and, indeed, the big increase in new home construction. All of that will be disaggregated into purchases for ownership, for investment, and for vacation homes.

The data that we have seen—confidential data from individual banks—do show a rather significant pickup. The numbers don't get as high as those from the National Association of

Realtors—23 percent or something like that—but they indicate a fairly substantial pickup. And of the sum of second homes, a disproportionately large number are purchased by investors; the investor share very definitely has accelerated. This is one set of data—for the very large banks—that does show a marked acceleration into 2004 and 2005. So, I think we need to know much more about this.

But let me just ask one simple question: Do we have any insight on the land component of those sales?

MR. GALLIN. Sir, I can address that a bit. Actually, Morris Davis, who is an economist here at the Board, has written a paper on that very subject, and—

CHAIRMAN GREENSPAN. Was that a year or so ago?

MR. GALLIN. Just about a year ago, exactly.

CHAIRMAN GREENSPAN. I read it.

MR. GALLIN. Okay. I can tell something from the tone of your voice. [Laughter] In any event, the idea there was to look at house prices and construction costs and to try to back out as a sort of mechanical operation—not an easy one—the value of the land. He shows that land prices have increased very rapidly and that the land share of the property values has gone up over time. As you mentioned, we know something about farm prices. But besides those two things, there really aren't—

CHAIRMAN GREENSPAN. As an example, the Chicago Bank publishes quarterly data—fairly detailed data—on land prices in all the states in its District. Does anybody else?

MR. MOSKOW. Agricultural land, yes.

CHAIRMAN GREENSPAN. Yes. These are your data? You collect them?

MR. MOSKOW. Yes, we collect the data.

CHAIRMAN GREENSPAN. So you actually have data on each individual farm. You have a database from which one could actually construct the price changes over time to at least learn what is happening as the urban fringe moves out. So you have at least one dimension, which is this issue that you raise with respect to new homes and existing homes. Has anybody tried to look at that? I ask because they are the only data that I'm aware of which actually show a level of land prices over a significant period of time. And no one uses them on the grounds that agricultural land prices have nothing to do with residential land prices. But that can't be true.

MR. MOSKOW. I agree, Mr. Chairman. Those data are being influenced in part by the expansion of residential areas out into what used to be farms or agricultural land. There are some interesting dynamics taking place because, in the Chicago metropolitan area, a lot of this land is now being used for residential purposes. However the sellers, for tax purposes, want to use the proceeds to buy agricultural land right away. So they then go downstate in Illinois and bid up the prices there. They are not as concerned about the price as long as they can make this tax-free exchange. So, that's one dynamic. The other interesting dynamic, of course, is that as agricultural subsidies have increased so rapidly—they are now about 50 percent of net farm income—there's less concern about the value of land coming down.

CHAIRMAN GREENSPAN. It's capitalized into the land price.

MR. MOSKOW. Clearly.

CHAIRMAN GREENSPAN. But you still have to pay the agricultural subsidy to buy the land to build a house. There's no way to get out from under that.

MR. STOCKTON. Mr. Chairman, we have, in fact, looked at farmland values and at the data that are collected by the Reserve Banks, and there has been an appreciable acceleration in farmland prices. It varies a considerable degree by District. For example, in areas like the San

Francisco District or the Richmond District, where the interface of the urban expansion into agricultural areas probably is greater, we've seen a much more pronounced acceleration than, for example, in the Dallas District.

As we put that all together, it is true that we don't have a good series broken down by regional land prices per se. But it's very difficult to believe that the acceleration we've seen in residential property prices doesn't reflect to a very significant degree an increase in land prices. While it may be difficult to do Morris's type of calculation, we just haven't seen anything like the acceleration in basic construction costs that would suggest anything other than a substantial increase in land values. And when we looked at those farmland prices to see if there was some confirmation of that impression in the agricultural land prices, it seemed pretty clear that we were seeing that. Again, that doesn't necessarily mean that the farmland is overvalued. I think the same questions are open on the agricultural land prices as they are in Dick's and Josh's debate about whether or not housing is overvalued, but there has been a substantial step-up in recent years.

CHAIRMAN GREENSPAN. We do obviously have BEA [Bureau of Economic Analysis] data on transaction costs and, one would presume, profit margins, so that in a way we have at least one element of the markup over cost. The differences that we're looking at here are so large that it's not a minor question. Indeed, if you take Dick's bubble—or lack thereof, I should say—you get the impression that deflation is probably going on. [Laughter] I'd be curious, frankly, to have Andreas, who has looked at this to a great extent, comment on Dick's paper.

MR. STOCKTON. I think Josh and Dick should have an opportunity to talk a little more about their differences of view in this area.

MR. LEHNERT. Not that I don't have an opinion. [Laughter]

CHAIRMAN GREENSPAN. I thought you'd be the ideal intermediary. [Laughter]

MR. PEACH. Well, let me make just a couple of observations.

CHAIRMAN GREENSPAN. Let me stop you. You've made your point. I think you were responding to the data of your two colleagues. Let them respond, and then you respond to them.

MR. GALLIN. Loosely speaking, what we're trying to do is to get a sense of changes in the price of a typical home—what has been happening to that price over time—adjusting for quality. I guess I'll start with my concerns about the constant-quality figure, and then I'll address Dick's concerns about the transactions price index that I used.

One reason I worry about the constant-quality number, and Dick alluded to it, is that it's a constant-quality price index for new homes, and new homes typically are not built where existing homes are already situated. You can see that when you drive out of any city, basically. The big developments are on the outskirts of the cities, and those outskirts are moving further out. I recognize that cities can be multi-centered and so forth, but new homes—while not always built on the cheapest available land—typically are built on the cheapest available land. And the constant-quality price index for new homes has only crude controls for location. So I don't think that index is able to fully handle that issue. That's why I like the repeat-transactions price index. As Dick mentioned, it basically matches up addresses over time and looks at the price changes.

CHAIRMAN GREENSPAN. Have you adjusted that for the modernization per housing unit?

MR. GALLIN. Yes.

CHAIRMAN GREENSPAN. How much does that take off?

MR. GALLIN. Well, as Dick pointed out in his briefing, there are data on improvements. So I use those data and divide that by the stock of housing and subtract it off. But on the other side of that argument is the fact that while many homes get additions made to them, all homes are also

deteriorating somewhat over time, which will bias things in the other direction. And we have data on that. So, improvements are affecting price appreciation one way, and depreciation is affecting it the other way. Once you take both into account, the net effect is only a few tenths a year. Now, these things can cumulate over time, but I use data on improvements and on depreciation to remove those biases from the published data. So, there are problems with the published data, but we don't have to make do with the published data.

Likewise, there's a transactions bias. Homes that appreciate more tend to transact more, and that's going to bias upward the published price index that I start with. But there are studies on the size of this transactions bias. Dick provided some data on it. I've taken estimates of the size of this transactions bias and removed it from the published data. So, I start with the published data, but I make various adjustments. One last point is that because the price index is based on mortgages purchased or securitized by the GSEs, it's going to miss FHA and VA loans and also jumbo loans.

There is a published private sector price index put out by Case and Shiller that actually goes to deed-level data, and they look at all home purchases. They do a repeat-transactions method, but they look at all purchases and throw out only refinancings and exchanges among families. That index actually shows faster appreciation since 1999. That would seem to suggest that the homes with jumbo loans may be appreciating faster and that by leaving out jumbos I am perhaps biasing things down.

So, my final takeaway from this is that there's no perfect way to measure house prices. All these measures have their various flaws. But I think that a properly adjusted repeat-transactions price index—one that uses not just the published data but makes adjustments for the shortcomings—is a better way to get a read on what's going on in the housing market.

MR. PEACH. I have just three comments. First, I'm not disputing that land prices where houses are being built would be lower than land prices closer to the center of a metropolitan area. The issue is the rate of increase of those land prices. And we don't really know what's happening to the rate of increase of land prices at different points along the continuum.

CHAIRMAN GREENSPAN. It's the weighting effect. As you move out, the price levels are lower, so there's a downward bias, whereas for existing homes that bias can't exist.

MR. PEACH. That's true. That assumes that there is this nice gradual gradient of price change for land as one moves out from the center of a metropolitan area. I don't know the answer, but my observation is that that is not what occurs. In the New York metropolitan area, for example, I think one could cite many locations where land prices closer to Manhattan, say in Newark, are not rising as rapidly as in Short Hills or in Hunterdon County. So, that relationship probably just doesn't hold in reality.

Another thing that we've observed, particularly in our metropolitan area, is that state and local governments are now aggressive bidders for parcels of land that are potential sites for residential development. So it's conceivable that the price of land on which one could build a home now is rising extremely rapidly—and perhaps even more rapidly than land closer in that has already been developed.

CHAIRMAN GREENSPAN. Is there any agreement about what proportion the land is currently—some rough order of magnitude—relative to the total value of homes sold? For example, is land 10 percent of the sales price, on average, or 20 percent or 30 percent?

MR. GALLIN. I think it varies substantially across locations. I think Morris found it to have become quite high; he estimated that the number had moved up above 50 percent.

MR. PEACH. The average lot size also has been declining rather rapidly, indicating that the price of land is going up rapidly.

CHAIRMAN GREENSPAN. I'm not asking for the change, I'm looking for the level. Governor Gramlich.

MR. GRAMLICH. Well, one more question on the data. Josh, you need the share of land to do the price-rent ratio, don't you? You adjust for improvements, but surely that's only on the structure, not on the land.

MR. GALLIN. Right.

MR. GRAMLICH. So the share of land in the value is increasing. Is that extracted from your price-rent ratio in some way?

MR. GALLIN. Yes. What you do is get the depreciation rate, and that's relative to the structure. It actually doesn't make too much of a difference exactly how you do it. But, again, I got land share numbers from Morris Davis, and one can basically tamp it down year by year.

MR. GRAMLICH. Okay. Then it's also a ratio. And the CPI tenant rent measure is for a constant unit over time. So what you try to do is to normalize on that?

MR. GALLIN. Yes. My price series and my rent series are both indexes to start with, so they are unit-less. Again, leaning on my colleague, Morris, we get a base-year estimate of rents for a constant-quality unit. We get the base-year dollar price and then multiply by that.

MR. GRAMLICH. Okay. John, I have one question for you. How do we interpret the optimal policy? We, the policymakers, know all the shocks. So when we move the funds rate on the red line, is that to be interpreted as acting in advance of the house-price change, simultaneously with the house-price change, or what?

MR. WILLIAMS. In the optimal policy simulations, from the beginning of the simulations, which is the third quarter of this year, you know the entire future path of house prices and any other shocks that I add. So you are acting in anticipation of those future price changes.

MR. GRAMLICH. So if we see house prices going up, we're in effect cutting the funds rate while the house prices are going up?

MR. WILLIAMS. That's correct. That's why I was trying to compare it with the Taylor rule—which doesn't have that aspect of responding to developments as they unfold—to see how well that would do.

MR. PEACH. I wanted to make one other point with regard to Josh's work, and that is that using the tenant rent component of the CPI and comparing it with the OFHEO index is, in my opinion, a real apples-to-oranges type of comparison. As I pointed out in my comments, the OFHEO index measures what is happening around the 75th percentile of the distribution of single-family homes where we know incomes are rising more rapidly. Using a rent component that on the one hand is looking at what is going on in the multi-family housing market to a large extent—

CHAIRMAN GREENSPAN. Actually, it's based on single-family homes which are rented but have the characteristic that they could be sold.

MR. PEACH. Not in the tenant rent component he is using.

CHAIRMAN GREENSPAN. The rent component I presume we're using is the owners' equivalent rent, are we not?

MR. GALLIN. Actually, it's not. But it doesn't make any difference. [Laughter] I could easily have done it with the owners' equivalent rent, but I would have had to cut off all my pictures in 1983 because that's when that series begins. I went with the tenant rent strictly for the length of

the time series. But if you look at the relative levels of these two series over time, while the growth rates do differ a little bit, you're talking about really small potatoes—on the order of 2 percent.

CHAIRMAN GREENSPAN. If you keep getting a significant rise in home ownership—meaning a shifting of existing families from rent only—you are going to bias that ratio.

MR. GALLIN. Absolutely. As an aside, but regarding that particular point, I've been working one day a week at the Bureau of Labor Statistics, and I have access to the confidential underlying micro data that they use to build up the CPI. So, some of my work is trying to get at just these types of criticisms. But from the underlying data, I have been able to look at rent appreciation for different segments of the rental market, trying to see—with home ownership rates going up—where the homeowner market is stealing, so to speak, from the rental market and how big the biases are. And it does look as if the higher end of the rental market has been showing somewhat smaller rent increases over time, suggesting that that's where it's coming from, but not dramatically.

CHAIRMAN GREENSPAN. That raises an important point because, as we know, wages of nonsupervisory workers, which are essentially payroll data, are going up 3 percent, whereas implicitly that of supervisory workers is going up double or three times that. That's changing; it has accelerated in the most recent period.

MR. GALLIN. Let me note just one last thing. The pictures are going to look the same as those Dick showed, whether we look at house prices relative to income or to rent. So, even if the rent series might have this problem or that problem—and it does have problems—house prices have grown quite dramatically using the adjusted data that I used relative to incomes as well.

CHAIRMAN GREENSPAN. Governor Ferguson.

MR. FERGUSON. I guess my question is addressed to Glenn and John. Obviously, the United States is unique, but we're not the only country where a central bank has been trying to deal

with this issue. We've seen recently that monetary authorities in the United Kingdom, Australia, and perhaps the Netherlands are all talking about the possibility of using monetary policy to try to deal with the house-price issue. So, what, if any, lesson can we learn from overseas? I recognize that our particular situation is unique, but we're not the only ones dealing with this problem.

MR. RUDEBUSCH. That's an interesting question. I think one of the points to be considered is that those countries are all smaller than the United States, and typically their residential property markets are centered in one or two cities—London or Sydney, for example. So perhaps that's a factor that just looms larger in the policy calculation. And that may be the reason why the central bankers in those countries have been perhaps a little more proactive, although that issue is still being worked out, I think. They have done a bit more jawboning, so to speak. But Australia, in particular, has been a little more explicit about factoring in housing market developments in the policy calculation. Again, they don't target house prices, but they certainly seem to take them into account a bit more than the United States does, in terms of setting monetary policy.

MR. FERGUSON. But have the results, generally speaking, been positive or neutral? I know this policy is in its early days, but is there any judgment one could make even at this early stage on whether or not more jawboning—or, in the case of Australia, actually moving rates—has been helpful?

MR. RUDEBUSCH. I think both Australia and the United Kingdom, to the extent they have conducted this type of policy, have felt it was fairly successful. They have been able to temper home price appreciation and restore some balance in the economy without any significant macroeconomic fallout. They have had lower home price appreciation but, again, their situations are perhaps very different from the situation for the United States.

CHAIRMAN GREENSPAN. President Poole.

MR. POOLE. I'd like to comment also on the policy discussion. It seems to me that to do this analysis correctly, the central bank really has to think about intervening more or less all the time because, if you have a one-off policy response and you promise that you're never ever going to do it again, it perhaps would not be all that useful. So it seems to me that policymakers would need to think about routinely having asset prices be a consideration in policy analysis.

I think that would be a terrible idea, and let me explain why. Let's look at it from an optimal control point of view and suppose hypothetically that we have a policy instrument that is absolutely ideal. It has no side effects, is completely independent of the federal funds rate, or the macro policy instrument, and has perfectly predictable effects. That's the ideal from a control-theoretic point of view. In that case, if the central bank were adjusting such an instrument and setting capital values, it seems to me that that would change the whole nature of the pricing mechanism in asset markets. And I think it would be a terrible idea in a market economy to have a government agency setting capital asset values. That's why I would not start to go down this route; I believe it is really a dead-end.

MR. RUDEBUSCH. I guess I'd make a distinction there, in that I think the proponents are talking not about setting asset prices in general but about trying perhaps to reduce the bubble component. Clearly, if asset prices are set equal to the fundamentals, that's going to lead to the proper functioning of—

MR. POOLE. But the point is that there could be a little bubble component or a big bubble component. Obviously, policymakers wouldn't apply the instrument when prices are regarded as reflecting the fundamentals, but the instrument would be continuously available. The whole point of such an instrument would be to keep the price right at the fundamentals. But then that would

change the whole nature of asset pricing in a market economy. I think a proper policy analysis really can't be done on a one-off basis in cases such as the stock market in the '90s or house prices today.

MR. RUDEBUSCH. I'm sympathetic to that view. It seems as if there might be a threshold. That is, policymakers might be more interested in certain asset markets or might be more interested in prices in asset markets in general at certain times. But I think you're alluding to the moral hazard or political complications that could arise from this type of intervention or from trying to use this bubble component as a monetary transmission mechanism.

MR. POOLE. Essentially, it's the same problem that arises with wage and price controls. Having that as a policy instrument that is sometimes used and sometimes not used completely changes the pricing mechanism in a market economy. I think that problem applies in spades to stock prices, equity prices, and bond prices. With house prices I think the problem is a little different, but I believe the same basic principle applies.

MR. RUDEBUSCH. People also have made the argument that if policymakers are going to clean up the mess after the fact, there may be other problems. If you let equity prices rise on the upside but then essentially make some sort of insurance agreement on the downside, that again is a distortion—though perhaps an asymmetric one—that may also have complications.

MR. POOLE. There's ample room, I think, for understanding the housing market within what you phrased as the standard policy. But I think going after asset prices directly is something very different. That's the point that I'm trying to make.

CHAIRMAN GREENSPAN. President Yellen.

MS. YELLEN. Thank you, Mr. Chairman. I just wanted to make a couple of comments and also ask a quick question. My first comment relates to the run-up in price-rent ratios that we've

seen. It seems to me that there might be a couple of factors that could explain at least some portion of the run-up, though probably not all of it, that weren't mentioned in the presentations.

First, it seems to me that financial innovations affecting housing could have improved the view of households regarding the desirability of housing as an asset to be held in portfolios and thus raised the equilibrium price-to-rent relationship for residential real estate. What I'm thinking of is the idea that equity held in residential real estate is a lot more accessible today than it has been in the past. Home equity credit at commercial banks is up fourfold since 1999, and many households obviously are now keenly aware that refinancing provides a low-cost avenue for tapping into the equity in their homes. So, in a sense, there might be less of a liquidity premium embodied in the return for housing. Also, if people feel that the liquidity constraints in holding housing as an asset are diminishing, that could explain a reduced need for precautionary saving in traditional liquid assets. It could even make people willing to put more of their wealth into down payments on houses and may have raised prices through that mechanism.

The other thing that occurred to me is that there might be effects from tax changes. We've had changes in the rules for tax exemption and in 1997 on capital gains from the sale of primary residences that would make holding real estate assets more attractive. And the changes in capital gains taxes more generally in 1997 and then again in 2003 would have worked in the same direction.

One of the things that we looked at that we thought was interesting was the behavior of price-rent ratios for residential housing and for commercial office space. Commercial office space price-rent ratios are highly cyclical—I guess they always have been—but it appears that the behavior of price-rent ratios in residential housing has closely mirrored what we've seen in commercial office space. The ratios for both have gone up about 30 to 35 percent since around

1998, though the dynamics are totally different. Commercial office space rents have been falling—it's not that the prices have been rising—but the price-rent ratios have moved very similarly.

A second comment I wanted to make concerns the relationship of creative finance to the housing market. One view that I think is very prevalent is that the use of credit in the form of piggyback loans, interest-only mortgages, option ARMs [adjustable-rate mortgages], and so forth, involves financial innovations that are feeding a kind of unsustainable bubble. But an alternative perspective on that is that high house prices, in fact, are curtailing effective demand for housing at this point and that house appreciation probably is poised to slow. So the increasing use of creative financing could be a sign of the final gasps of house-price appreciation at the pace we've seen and an indication that a slowing is at hand. Previously, lenders applied very rigid constraints on loan-to-value ratios, but essentially those constraints are now being eased at the margin through these creative financing techniques. And that's providing some elasticity to what was a firm roof. It may slightly diminish the price elasticity of the demand for housing, but the fact that it is blossoming now basically suggests that we really are at the ceiling where it's binding and will ultimately constrain appreciation.

Finally, with those two comments, a question. It concerns the presentation by Andreas and the numbers cited on loan-to-value ratios at origination. One of the things we're seeing in California and elsewhere in our District—and maybe this is true nationwide—is a growing use of piggyback loans. Loan-to-value ratios of 90 to 95 percent are common in California, and we've even seen combination loan-to-value ratios and piggyback loans going up to 125 percent. I guess that means two things, one of which is that the traditional first mortgage looks utterly conventional. Those mortgages have an 80 percent loan-to-value ratio and I suppose they are being sold off to Fannie and Freddie. The other thing is that with such conventional mortgages being sold to Fannie

and Freddie, there's no need for private mortgage insurance. So Fannie's and Freddie's books may look better in some sense—less risky—than they really are because of all of the second mortgages going up to possibly 125 percent.

CHAIRMAN GREENSPAN. It sounds like a CDO [collateralized debt obligation]. That's what it is, isn't it?

MS. YELLEN. Yes. So I wondered if that was something that you're aware of and something that is included in the numbers.

MR. LEHNERT. Yes. The data that you see on my first exhibit in principle include second liens, closed-end second liens. And in particular in the graph that you cite I use the newly available 2004 data from HMDA which for the first time has collected data on whether or not the HMDA loan is a junior or a first lien. So the picture that you see there should reflect the growth of piggyback loans.

CHAIRMAN GREENSPAN. Could I just ask a quick question? Do we have data on price-to-rent ratios of apartment dwellings? We do have data on prices of apartments, and we have rent. I think Dick raised a very interesting question about the numerator and the denominator. The way to square that is to get the same data for the same type of unit. Do we have that information and what does it show?

MR. GALLIN. We do have those data. There's an index that gives price per square foot and rent per square foot for apartments nationally and in various cities. And it shows a marked increase in the price-rent ratio.

CHAIRMAN GREENSPAN. Does it look like the ones that you were showing?

MR. GALLIN. It doesn't go back as far—it only goes back to 1986—but since 1996, yes.

CHAIRMAN GREENSPAN. Okay.

MR. GALLIN. It's quite a steep increase.

CHAIRMAN GREENSPAN. Is the level the same, can you tell?

MR. GALLIN. These apartment price data and rent data are by square footage. I guess I could make a calculation, but I don't have those data here.

CHAIRMAN GREENSPAN. It's worthwhile looking at that. Sorry about the interruption. Governor Olson.

MR. OLSON. I have a couple of questions. First of all, concerning the scenario of a 20 percent decline in housing prices: Is that weighted to any extent? Is it weighted so that it would reduce the froth or the increased valuation that had occurred up to a certain point? Or would that simply take the total amount of value and reduce that number by 20 percent?

MR. WILLIAMS. All I'm doing is the latter—reducing the overall housing wealth by 20 percent relative to the base.

MR. OLSON. With Josh's 20 percent, I assume that there is an implicit weighting, is there not? Would the 20 percent increase in value reflect to some extent the greater run-up in value in areas like California where there are large numbers of properties that have increased significantly more in value than others?

MR. GALLIN. It's basically a value-weighted measure.

MR. OLSON. Yours is. But is it the aggregate divided by the number of housing units? I would think that there would have to be an implicit weighting in your calculation. If, in fact, the decline in value—the Nasdaq effect, in other words—were to represent a return to normal from the increases that had occurred, would that have affected to any extent the risk exposure?

MR. WILLIAMS. In terms of the FRB/US model, the only way that house prices and housing wealth enter is through the aggregate.

MR. OLSON. I see.

MR. WILLIAMS. So, one of the shortcomings, even of a model with several hundred equations, is that it doesn't have the distribution effects.

MR. OLSON. There are two parts to that. One is the overall impact on the model. The second is that, to the extent there is risk embedded in the underlying mortgages, it would tend to be where the run-up has been higher. I'm going to talk a little bit about that tomorrow.

My second point is on land value. In the assessed valuation that I get from the county—I've been too frightened in recent years to look at it—doesn't it break out the land value and the improvements? I assume that's public knowledge, is it not? So, presumably, you could access that number. And my recollection is that for residential appraisals three different methodologies are used, one of which looks at the improvements vis-à-vis the land value. So I would guess that that information is available.

My third point is just a visual observation, having to do with the incidence of teardowns in a market like this. When there is an asymmetry between the land value and the value of the improvements, you see an increase in the teardowns. Locally, that trend started in D.C. and it has now moved out into our neighborhood. So that is a critical component, it seems to me, of any buying decision. And I think those data would be available.

I have one follow-up question on something the Chairman mentioned. Somebody suggested to me recently—I just heard a different figure on this—that the private pools of mortgage-backed loans are now larger than the GSE pools. Have you seen any recent data to that effect?

MR. LEHNERT. Not in the United States. I don't know what country or planet—
[laughter]

MR. OLSON. The planet was Earth. [Laughter] The country was the United States. And the person making the observation was talking about sales of the nonconforming product into what they see as a growing and undisciplined secondary market.

MR. LEHNERT. I'm sorry, I shouldn't have said that. Do you mean the flow or the stock?

MR. OLSON. Well, that's a good question. I think the statement was as to the flow.

MR. LEHNERT. Then I beg your pardon. Of course, the stock differences are enormous. As for the flow difference, on net, GSE guaranteed mortgages in both pools and to a small extent on the balance sheet hardly grew at all in 2004, while it was an explosive year for growth for the RMBS sector.

MR. OLSON. That's true. That's a good point. Thank you.

CHAIRMAN GREENSPAN. President Fisher.

MR. FISHER. Following up on Governor Ferguson's question, I would imagine that one of the differences here is that we have tremendous variations from market to market. And to the Chairman's question about the proportion of housing prices attributable to the land value, I would assume that it has to do with local regulation and restrictions on land use. For example, if you look at the numbers for homes being considered or under permit for construction in Southern California—that includes Los Angeles, Ventura, and Orange County—in the '80s it was in the 100,000 plus range. This year it's 37,000, in part because of the imposition of highly restrictive regulations on land use. If you look at permits for current construction of single-family homes in North Carolina, where there are almost no restrictions whatsoever, it's over 50,000.

So, the question is: Can you assume that land price as a percentage of house price is a function of regulatory and other restrictions imposed on land use and on construction? Is there a way to measure this? I ask because it strikes me—and I've been thinking about other countries as

well, and Spain is an interesting example—that monetary policy would be a very blunt general tool if, indeed, there are significant variations city by city, state by state, and market by market.

MR. GALLIN. I'll leave the monetary policy aspect to my colleagues. But let me make a couple of points about land use restriction. Certainly, land use restrictions, environmental restrictions, and those types of things have played a role in the rapid rise in house prices. That certainly is a factor. I mentioned in my briefing that I like to compare house prices to rent—and this is one of the reasons—as opposed to comparing them to incomes. If increased regulation boosts house prices, people are just going to have to pay more out of their income for housing because of the regulations put in place. But land use restrictions should affect rents as well. So, it should drive up the cost of buying a home, and it should also drive up the cost of renting a home. It can be a significant factor, but it should be in both of those elements.

And this is somewhat of an aside, but I find it interesting. I talk to a lot of builders as part of my day-to-day work here, and I've asked them about this very issue. They say definitely that land use restriction is a big concern for them. But I also went back and looked at newspaper articles written in '86, '87, '88, and '89, and it's truly remarkable how the view back then was that housing prices could never fall because, as people were saying left and right, there was no more buildable land left due to environmental regulations and land use restrictions. They were saying that right up to 1989 when house prices leveled out in nominal terms. I'm not saying these things aren't real—the builders say they are real—but they're certainly not new though they may be new in their effects. But just to get back to the point, I think they should be captured in the price and the rent data.

MR. PEACH. Just one follow-up comment. There's a lot of evidence to suggest that a good part of the reason for the rapid rise in home prices in California, Washington, D.C., and along

the East Coast, for example, is because of relatively inelastic supply—not that demand there is necessarily stronger. That’s pretty clear in the data. Whether it’s due to these land use restrictions or other factors, the fact is that these are already fairly densely populated areas and there’s definitely a more inelastic supply in these areas of the country.

MR. FISHER. I would imagine that it would be driven also by the kind of margins that the suppliers can capture. Just for verisimilitude, I talked to Hovnanian, who builds about 20,000 homes a year at roughly \$300,000 apiece. His margins are being squeezed in California, but in these less restrictive areas he can capture a greater amount, so obviously he gravitates to where he can capture the greatest margin. Now that’s just one example, but common sense would suggest that it applies more broadly.

CHAIRMAN GREENSPAN. The argument for the rapid rise in land prices in 1837 was that land was fixed in quantity. [Laughter] So, new ideas are very rare. Vice Chair.

VICE CHAIRMAN GEITHNER. I remember that bubble! [Laughter] I have two questions. My first is for John Williams or perhaps for Dave Stockton. What is the right way to think about dealing with uncertainty in considering the policy question? Put aside Glenn’s question about whether you know anything ever about the relationship between prices and fundamentals at a given point. What if what you don’t know is simply the likely path of home prices going forward? You could take the group here around the table and assume some path, but there would be a fairly fat band of uncertainty around that path. What does your regime imply, John, for policy in that particular circumstance? Do you basically ignore housing prices and look at all the other things we look at?

MR. WILLIAMS. I think that the Greenbook forecast, as I understand it—and maybe Dave should talk about this—is predicated on a particular assumption about the future path of housing

prices and takes into account the kind of models that Josh was discussing. The staff looks at all the empirical evidence, just as they do for every equation on every aspect of the economy. So, monetary theory would tell you to come up with the best, most reasonable forecast and adopt a policy that is appropriate to that path but also consider, as you're saying, all the risks and the distribution of the risks. It's along the lines of some of the charts in the Greenbook, which show the distribution of risks and then contemplate the implications for the current set of policy options over that distribution of risks.

I think the basic idea in the economic literature is that you first want to get a very reasonable path, and that would be more or less your baseline. It's not a path, I should say, that just keeps housing prices constant or keeps any asset price constant. It should be the best forecast of these asset prices that you can come up with, but subject, of course, to the fact that these are very hard to predict.

VICE CHAIRMAN GEITHNER. And you wait and see and then adjust course based on developments as they unfold.

MR. WILLIAMS. That would be the standard policy.

MR. GRAMLICH. Just on that point, isn't that the difference between the optimal policy and the Taylor rule? With the Taylor rule, you wait and see. In the optimal policy, you somehow know this so you can move earlier.

MR. WILLIAMS. Right. The Taylor rule would just be one example, of course, of a policy that takes into account the information you have up to that point. It's not optimal in some sense. It's just a simple equation. It does represent this wait-and-see approach. I was using the optimal policy to illustrate what you would do if you knew everything. It's kind of a comparison.

MR. REINHART. John can correct me if I'm wrong, but I think there is an important element to your question about what is the source of uncertainty. If the source of uncertainty is going to be the evolution of house prices, that basically is uncertainty of a linear type that's affecting aggregate demand. So you take your best shot and, therefore, set policy accordingly. The other possibility is that you're not certain how house prices will react as you change your instrument. That becomes multiplier uncertainty; and depending on the structure of the uncertainty in your model, you may either attenuate or not.

VICE CHAIRMAN GEITHNER. My second question is about policy, but not monetary policy. Glenn, in your note, you allude to other instruments if monetary policy doesn't seem to be the appropriate tool to address a concern about lower value prices. What do we know about the history of the use of the supervisory tool in past periods of concern about real estate bubbles or imprudent lending? Do we have a rich history on the use of those instruments that tells us something about the efficacy or about our foresight in deploying them?

MR. LACKER. It's called the real bills doctrine.

VICE CHAIRMAN GEITHNER. Since the bills doctrine. [Laughter]

MR. RUDEBUSCH. Since you're going to the British Embassy, I might note that in the United Kingdom they used to allow loan-to-value at origination of 120 percent. You could buy your property under water essentially by 20 percent. One of the recent restrictions they've imposed is a limit of 110 percent. So this time around they feel much better in the U.K about where they are with just 110 percent loan-to-value at origination. But the monetary authority there doesn't have supervisory responsibility—

VICE CHAIRMAN GEITHNER. I meant in our history. In our history, have we used that tool to good or ill effect? Have we used it wisely and with foresight?

CHAIRMAN GREENSPAN. You're biasing the answer. [Laughter]

MR. FERGUSON. The answer is obviously "yes." [Laughter]

MR. LACKER. My understanding is that we've used it fairly often in the postwar period, in the '60s, '70s, and '80s—in early 1980, for example. My understanding is that it hasn't worked very well. There have been times when we've tried to jawbone the banking system's allocation of credit.

VICE CHAIRMAN GEITHNER. Is the history one of using it too late, or of using it and its having no effect because there are other ways to get money?

MS. BIES. May I say something here? I don't have any quantitative studies on this, but based on talking to the folks who lived through it, I'd make a couple of observations. If we look at the 1980s—the most recent housing bubble that was nationwide. We saw the bubble bursting nationally as opposed to the pockets we've had with the California breakdown or the Boston breakdown, which really related to the local economies and local employment developments. I think the local economic employment situations were the drivers of delinquencies, and the regulators generally missed that because they missed the local economic impact. And I think people focus on the fact that those cycles were driven by local economic conditions.

I think the period of the 1980s involved a broader failure on the part of supervisors. If we compare the 1980s experience with what is happening now, in the earlier period a lot of financial institutions were on an exam cycle that went five or six years. So, nobody on the supervisory side was in there looking at what was going on. And that period was before the time when securitization became a prevalent practice, so most of the risk was carried on the books of the banks. Also, many of the banks that were hit very badly were following developers—going out of their footprint and lending on properties that they didn't know. And I think one of the risks we have today in our big

banks is that while we say they are diversified geographically, many of their loans are to investors or purchasers of second-home resort properties. So, the lenders again are following their customers out of the local area, and in the location of the new property the local lenders aren't looking at it; the customer's lender is handling the transaction. So, we still may have that risk embedded within the financial institutions. It's one of the things we're focusing on.

What is new about it this time, though, is that a lot of these nonconforming products are being securitized by the private sector. So the real question is: Where does the market discipline kick in? And as supervisors, can we fault an institution for responding to a market need when it is offloading the loans and the risk into these types of mortgage structures that Andreas has been describing? We clearly could if the financial institutions were buying the equity or mezzanine risk tranches and the risks were back on the institutions' books. But in many cases that clearly isn't what is happening. So, we have some different aspects this time around.

Just to let everybody know, the OCC [Office of the Comptroller of the Currency] and the Fed currently are putting together a horizontal review to look at the fringe kind of lending activities where we do need to send some signals. We wrote the HELOC [home equity line of credit] guidance that came out last month. We're working on this other one and hope to have it out in a couple of months. We don't want to turn off safe loans or the traditional types of lending activities, but we need to figure out where to go on some of these practices that are on the fringes. But we haven't done a sterling job. I think that's why we're trying to send out some guidance. We sent out the appraisal guidance a year or so ago. But some of the risky practices of the past are starting to be repeated, and it may be that the generation of lenders now didn't live through the problems before.

CHAIRMAN GREENSPAN. Shall we break for coffee?

[Coffee break]

CHAIRMAN GREENSPAN. President Moskow.

MR. MOSKOW. Thank you, Mr. Chairman. I wanted to make a few comments and then ask a question. First, I'd say that with all of the concerns about froth in housing markets, I found these presentations to be very informative, and I want to congratulate the people who spent a lot of time preparing them. I thought they were all very good presentations. But I also found the information comforting. We've all talked about the possibility of local housing bubbles and regional housing bubbles, and clearly there are some in the United States. But we never really looked at it on a national basis before. The net result for me was that I come away from the analysis not feeling any worse than I did before and probably a little better.

First, I thought it was very helpful to see quantified—I think this was in Josh's memo—the size of the potential bubble. He talked about a 20 percent drop in housing prices. But that was equal to only about 30 percent of GDP as compared to the drop in equity prices we had, which was more than twice that. Also, I had the feeling that appropriate monetary policy, as John said, could mitigate much of the distress that might occur. Moreover, the credit risk associated with home mortgages seems to be spread out across many institutions. Governor Bies said that a lot of analysis is being done now, and we'll want to see the results of the analysis that the Board and the Comptroller are doing. But on the whole, the financial institutions seem to be in pretty good shape. The role of securitizing mortgages is to lay off risks to parties who are willing and able to bear the risks. Capital levels of the financial institutions are relatively high, so it appears that these markets are performing their roles well. And in the event of a sharp drop in housing prices, the odds of a spillover to financial institutions seem limited. And as I mentioned, it was helpful to hear the suggestion that monetary policy can be effective in responding to a sharp drop—if there is one—in

housing prices. So I come away somewhat less concerned about the size and consequences of a housing bubble than I was before.

The question I had relates to what Governor Yellen was asking about—financial innovation. I was going to make a similar point. The fact is that there has been a great deal of financial innovation in housing markets in the United States. The average person can borrow very easily on his home these days. And I was wondering if there have been—or if it is possible to do—any international comparisons on this. I wondered whether the price-rent ratios in other countries that may not have had the same degree of financial innovation we've had differ substantially from ours.

MS. JOHNSON. Well, I trust you did receive or are aware of the background document we circulated on the foreign experience.

MR. MOSKOW. Yes.

MS. JOHNSON. We didn't do price-rent ratios, and given what Josh has described in terms of the care he has to put in before he feels he has something close to the right number, I think we might feel a little hesitant to do so. I take it back; there are price-rent ratios—[laughter] in the back portion of that paper. What data we have, we used. But there are huge variations in the financing practices in housing markets across foreign countries. There is some degree of securitization but less than here. Practices with respect to the tax-favored treatment of borrowing to finance houses differ relative to those in the United States. There's a host of different characteristics, in terms of variable-rate, fixed-rate, and other types of instruments used in various foreign countries.

But one of the things our paper was intended to point out was the prevalence of really rapid rises in house prices. According to this chart—the first few pages of which are right here anyway—that shows through to an increase in the price-rent ratios as well. So, I refer you back to this paper.

There is only a subset of the countries we covered for which we have price-rent charts, but there are some in the paper.

MR. MOSKOW. But you can't really associate it with the degree of financial innovation that we've had in the United States because of this great variability? Is that what you're saying, Karen?

MS. JOHNSON. I guess I wouldn't necessarily associate it with, say, the development of the secondary market or the ease of equity extraction, and those sorts of things, but I'm not saying they're irrelevant. For example, in this chart, Switzerland—which is a country that I think of as having made little progress in that regard—doesn't have much of a price-rent ratio increase. And the U.K., which does have a more market-oriented approach, has a huge one.

But it's also true that that's where the price differences have been. I think we'd be hard-pressed to link too tightly the increased liquidity that we ascribe to U.S. home equity as now having taken on the role of the single driving factor anyway. It might be relevant, but I don't know that it distinguishes these countries.

MR. MOSKOW. Thank you.

CHAIRMAN GREENSPAN. President Minehan.

MS. MINEHAN. Thank you, Mr. Chairman. I also want to thank the authors of the papers—the international paper as well as all of the papers that were talked about today—because I found them very helpful and reassuring, along the lines that Michael Moskow was discussing. I also thought that Janet's comments on the financial innovations were insightful. Despite the fact that it's hard to sort out the U.S. experience vis-à-vis other countries, the whole point of this—to me anyway—is that we're seeing a phenomenon in the housing markets. So the question is: Do the fundamentals explain it or don't they? And financial innovations are certainly part of the mix, in

terms of changes in the fundamentals. So, to the extent that they've made many of the transactions in the housing market easier to do, that has to have had some impact on the underlying asset prices. So I thought that argument was a very interesting one, and it will be interesting to see if there is any way one can tease out the effects of that.

My second point is that when you look at the relationship between rising prices on either the OFHEO or the constant-quality index against disposable income as opposed to median household income, you see an even more reassuring chart. And I would think there's at least a little bit of logic to doing that, based on Dick Peach's chart about the differences in house-price acceleration depending on income—with the value of higher-priced houses moving up faster than lower-priced houses. So I would think that there is some logic to looking at this with disposable income. I know that you have done those charts. I think we have every chart you could do! [Laughter] But it is interesting that one sees in that perspective somewhat less acceleration and a somewhat more reassuring picture.

Finally, and this is more of a question, we talked about a 20 percent decline in house prices and what that would do in terms of the basic macroeconomic effects of it. But, of course, that wouldn't happen overnight. Something would make it happen. And, as we consider our current policy stance, one of the conundrums—though I hate to use that word—is why haven't the 10-year yield and, therefore, mortgage interest rates, taken the same upward path as rates at the short end of the curve. So a question I was asking myself—and I think it's probably not so difficult to figure this out—was where the point is, as mortgage rates start to go up, when we look at that affordability curve and start to worry about households beginning to get into trouble. That would then have an impact on house prices. Obviously, higher interest rates would tend to level house prices off or take them down. They also would have an impact, other things equal, on people's ability to afford the

house that they're in. How far do interest rates have to go up before that affordability curve starts to move in the direction that causes a problem in that regard?

MR. GALLIN. If you look at the housing affordability picture—basically relating house prices and interest rates and income—it has been moving around in a fairly stable and favorable area for the last, say, 8 to 10 years.

MS. MINEHAN. Right.

MR. GALLIN. As you know, mortgage rates have been moving up and down but on balance they have flattened out a bit over the past few years, if you compare, say, 2003 to now. So what has been happening over that time period is that affordability is edging down to the lower end of the range in which it has fluctuated for a while. There's nothing scary about it, but affordability has been moving down. Certainly, we can take this argument a little further. If mortgage rates stay pretty stable and disposable income keeps rising at reasonable rates, affordability is going to start looking worse and worse if we keep getting the house-price gains that we've been seeing. That's not necessarily an argument for overvaluation or undervaluation. But it is an argument for the view that the recent increases in house-price gains are not sustainable. If rates flatten out, affordability will start to deteriorate fairly significantly.

MS. MINEHAN. If rates flatten out or if they rise?

MR. GALLIN. If rates flatten out; that's because we would not be getting a kick any more from lower rates. House prices can go up and housing remains affordable if rates are lower. But if they flatten out and stay flat, one might think that it's going to be hard for house-price gains to keep humming along the way they've been going. That's going to start to eat into affordability.

MS. MINEHAN. Okay. I guess I was coming at it the other way.

MR. GALLIN. I'm sorry, then.

MS. MINEHAN. No, no. Let me just think about that for a while. Go on.

MR. STOCKTON. Let me make one other point on the reasons why there may have been an increase in the equilibrium price-rent ratio, because I certainly agree with you and President Yellen that there are some good reasons. Those reasons could well include financial innovation, changes in capital gains taxation, and supply constraints. However, lots of asset price misalignments start out with situations where there are good reasons why those prices are rising rapidly. Productivity innovation and changes in business models, and so forth, were I think probably valid explanations for the increase in stock market prices, but that doesn't mean—

MS. MINEHAN. Right.

MR. STOCKTON. While they were probably valid explanations for the stock market rise in the '90s, they didn't necessarily, in the end, go all the way to explaining how far those valuations had moved, even if they had somewhat of a solid economic impetus to begin with.

MS. MINEHAN. I was thinking primarily about the affordability issue. I know the affordability ratio involves at least three things moving simultaneously—the value of houses, disposable income, and interest rates. I was more or less looking just at the interest rate component.

MR. STOCKTON. Okay.

MS. MINEHAN. I was wondering if interest rates were moving up instead of not moving up how that affects affordability.

MR. GALLIN. It's going to make housing significantly—

MS. MINEHAN. Well, yes, but where is the breaking point? If the 10-year rate goes up 1 percentage point, say, are we going to get worried about whether people can afford their houses? Or is there some range over which the rate can rise and we shouldn't be concerned?

MR. GALLIN. I certainly wouldn't want to say the breaking point is here or there. But again, going back to some of the conversations I've had with homebuilders, for what it's worth, they indicate that they're not going to be too worried unless we see an increase—and one that occurs fast—on the order of 100 basis points.

MS. MINEHAN. So 1 percentage point, or 100 basis points, in a short amount of time—

MR. GALLIN. Yes, but that's based just on talking to some builders, as opposed to any firm statistical analysis. So I would be very cautious. I would certainly hesitate to draw a firm conclusion about a particular increase being a tipping point or a breaking point.

MR. PEACH. If I could just add a point: In the spring of '87, we had a very rapid increase in rates—200 basis points—as we did again in 1994, and the housing market proved to be surprisingly resilient in the face of those fairly steep increases.

CHAIRMAN GREENSPAN. Governor Kohn.

MR. KOHN. Thank you, Mr. Chairman. I have three questions. The first one is on the price-to-rent ratio. We've been treating it as if most of the adjustment has come on prices. And I wanted to ask Josh particularly whether, as you've been looking at the micro data and thinking about this, the dynamics of some of these innovations that have led to a shift from renting to home ownership might have artificially depressed rents relative to prices. And I wondered, after that shift is over, if rents will start rising faster and close the gap that way—use up some of that 20 percent. My question is what you thought of that. And my observation is that that would present a much more difficult situation for us sitting around this table. It would be kind of like a supply shock because prices would be rising, inflation would be higher—and that homeowners' equivalent rent would be rising faster—and we'd face a more difficult situation. We pretty much know what to do

if house prices fall. That's a pure demand shock. But if rents start rising, that's another matter. So I wondered if you'd comment on that.

And then, while I have the floor, let me ask my questions of Glenn and John. Glenn, on the 1994 bubble analogy, I was surprised to see that classified as a bubble. I think there was some inflation scare then, but there was also a real rate adjustment at the same time. If you looked at any of the surveys, I think you wouldn't have seen much of an increase in inflation expectations. I agree that we had to raise real rates in order to prevent that from happening. But that seems to me a very different animal than equity price changes or house-price changes because we are responsible for inflation. So if we see inflation moving, we've got to do something about that, whereas we're not responsible for the relative prices of houses or equity and other things. So I wouldn't have put 1994 on a list of situations we might think about as we're looking at this issue of house-price gains. It seems to me very different. I'd like to hear your comment on that.

And finally, my other question for John has to do with this point about the misallocation of resources. Doesn't it matter what the state of the business cycle is? If we hadn't had so many houses built and so much consumption over the last few years, we would have had more unemployment. So it's not obvious that resources have been misallocated. The resources that went into building houses, furniture, and cars, and so forth might have been unemployed, especially if we had raised rates more in order to lean against the house-price increases. If we had, surely unemployment would be higher. So it seems to me that it's one thing to talk about misallocating resources between two states of full employment, but it's another thing to talk about a misallocation of resources where there would otherwise be slack in the economy. And the latter case I don't think really is a misallocation of resources. There's no opportunity cost.

MR. GALLIN. Did you want to start on rents? That will give the others some time to think.

I've looked at the rent side of the picture. As to this idea that perhaps prices are getting too high relative to rents, I'd argue that they're going to come back in line. Now, maybe rents are going to be doing some of the correcting, as it were. The work that I've done gives just a little hint of evidence that maybe rents do a bit of the correcting. So, what we might see going forward is rent growth slightly higher than it otherwise would have been. But statistically speaking, it's basically no different from zero. Statistically, it doesn't look like rents do any of the correcting. What really seems to be happening is that rents go up at some rate determined by economic conditions and then prices move around them.

MR. KOHN. You don't see anything in the current situation that would differentiate it from past history in that regard. I guess that was my question.

MR. GALLIN. I do not, certainly not with respect to the rents. I would like to say also that I agree with the comments that financial innovations could very well be a justifiable reason for house prices to be higher than usual relative to other prices. I do think some things are different. But I don't see anything to suggest that we have to be worried about rental inflation and, as a result, overall inflation.

MR. RUDEBUSCH. With regard to equity prices and bond prices, the reason I included that comparison was to make a couple of points. For one, the comment is often made that we can't second-guess financial markets or financial market participants. It seems as if that may be true for equity market participants but less true for bond market participants. There I take "inflation scare" or "credibility gap" or "conundrum" all to be another term for a situation in which we have an idea of where the fundamentals are and we're not sure what bond market participants are thinking.

Now, it's true that there's a difference in that you have a clear idea about the reaction function or where monetary policy is going and presumably can guide bond market participants

with transparency regarding your notion of fundamentals. So there is a clear difference between the markets. The housing market is different from both the bond and the equity markets, and the question is: Where can we draw the lessons? The regional disparity is completely different from both markets, and that's just a separate issue.

In any event, one reason behind the housing price appreciation, perhaps, is that we have very low long rates. This is a bond rate conundrum. Perhaps the misalignment in bond prices is leading to this misalignment in housing prices. So, one could perhaps make the argument that it's the bond price experience in 1994 that may be the relevant one for today. I think I'll stop there and leave it at that.

MR. WILLIAMS. In fact, the third scenario that I considered involved trying to emphasize that point—namely that, at least by some measures that people have come up with, there is a big difference in where bond rates are relative to standard estimates of fundamentals. It's actually a much bigger problem for the economy than just the house-price effect directly, at least according to the FRB/US model. More importantly, it could be one of the factors driving a big part of the house-price appreciation. In terms of needing strong house prices to keep the economy moving, the way I view your third question is that if it weren't for the house-price run-up, monetary policy would need to be easier, given current economic conditions. And I think that's absolutely right.

One way to think about my scenarios is just to reverse the signs, especially in scenarios 1 and 2, and think about it as this as the positive stimulus we've gotten from a 20 percent appreciation of housing prices and this is the positive effect we've gotten from some other factors. Especially scenario 1, I think you can see that way.

The reason I mentioned the misallocation of resources toward housing-related activities in my presentation is that in quite a bit of the economic academic research about bubbles, the emphasis

is that they actually lead to, as Glenn mentioned, a misallocation of resources. Therefore, these gaps between fundamental prices and actual prices should appear in the policymaker's objective function, in addition to inflation, output and employment. So there is a notion here that that's just another problem that you would want to balance off if you could.

Now, I'd like to emphasize in my closing remarks that the assumption that you could affect the bubble is very problematic. As Josh himself mentioned, these relationships between housing prices and interest rates are just not as strong as one would think and not as strong as economic theory would suggest.

CHAIRMAN GREENSPAN. Okay. President Poole.

MR. POOLE. Just for the hell of it, I'd like to offer the hypothesis that property values are too low rather than too high. [Laughter] If you believe that Treasury indexed bonds are a good measure of the real rate of interest—and we were getting into this discussion—the real rate of interest has been cut in half in the past five years. For any asset with a perpetual stream of returns, like land, the capital value has doubled. Now, it may well be that the issue is with the indexed bonds and not with the housing prices. It may be that the right way to state this hypothesis is instead to say that the conundrum is that there's a disconnect between the prices of some of these assets.

In any event, if we are going to be in a world in which the real rate of interest is truly much lower than it was before—if that is going to be the situation for some time to come—then it seems to me that we could expect some long-continuing appreciation of land values in particular.

Residential structures have a very long life, so they are almost priced that way. And let me link this analysis to the tear-down phenomenon that Mark Olson was talking about. I've been told—I don't know the data here—that houses replacing tear-downs may account for about 300,000 units a year,

which is a significant part of new building. Maybe someone knows the data on demolitions and replacements. I don't.

CHAIRMAN GREENSPAN. That's roughly the right number.

MR. POOLE. Okay. It's a significant part of total new construction. And I know in the community where I live—I thought this was real estate hype when we bought our house—we were told that we had bought the land and got the house for free. But that's just about the case, because the houses in my area—a subdivision built in the 1960s—are being torn down, and houses with 3,000 square feet are being replaced by houses with 6,000 to 8,000 square feet on nice one-acre lots. So the land value is significant.

On this question about what is really happening to land values in urban areas, I don't know whether the data are available to answer that. I suppose a detailed look at real estate records and tax records, if you had enough resources to do it, would enable you to look at properties where the houses are being torn down and replaced with new homes. And that would probably give you a pretty good measure of the underlying value of the land in those areas. In any event, when real rates of interest come down, one would expect to see increases in the value of the land relative to the structure. So one would expect, I think, to see more teardowns. I gather that, though it's not a brand-new phenomenon, the scale of it is probably much increased in recent years from 10 or 20 years ago.

At any rate, I offer those observations because, if we are in a world that is going to have much lower real rates of interest for some time to come, one would expect to see the price-to-rent ratio go up. Maybe this line in the chart has another 40 percent to go to get to equilibrium!

[Laughter]

MR. FISHER. Mr. Chairman, I'd like to propose that he buy my house in Washington, [laughter] given that confidence.

MR. POOLE. If I'm right, you won't need me to buy it.

CHAIRMAN GREENSPAN. Governor Bies.

MS. BIES. I have an observation and a question about what has been happening to the mix of mortgage products in the last 12 to 18 months. In 2003, we saw refinancings peak; and then in 2004, total originations went from \$3.8 trillion down to \$2.8 trillion. So they dropped and are continuing to be soft this year. But what happened during that 12- to 18-month period of time is that the number of ARMs shot up to about half of the originations. And based on anecdotal evidence, ARMs still seem to be running at least at that pace. Initially, with rates at record lows relative to those prevailing in the last 40 plus years, it made sense that rational consumers were locking in their mortgage rates and getting the houses they could afford.

Now, we embarked a year ago today on a path of raising interest rates. We haven't had a comparable movement at the long end, so long-term rates are basically about the same as they were. Why are so many more ARMs being generated? Is this an affordability issue? Is this a mortgage broker issue, where the brokers want to get a deal at any cost? What is happening? I've heard some folks say, "Well, the ARM is a way to do the loan now, and then we'll turn around and do the fixed rate next year."

MR. LEHNERT. Okay, let me try to answer that question. I can't really comment on the hype mentality or the mortgage broker who uses a high pressure sales tactic. But in 2004, for example, I believe that, of the ARMs that were originated, less than 10 percent were traditional ARMs with a one-year reset period. The remaining 90 percent were hybrids that had a rate lock feature where the borrower is protected from interest rate movements for some period of time. The

data on this are a little difficult to get, but it looks as if the median rate lock period was five years. If we think about people's typical tenure in houses, five years isn't a bad guess for how long people are going to stay in a particular house. A 30-year fixed-rate mortgage is, in effect, a hybrid mortgage that resets the day you move. So, I think of this to some degree as a financial innovation, and one that people are learning about through advertising or the press or whatever. And I believe this type of hybrid ARM probably makes sense for a lot of people who are making a decision on a mortgage loan.

The other point that I'd make is that the fraction of originations that are ARMs often can overstate the role of ARMs in the total mortgage market, because people refinance out of ARMs into fixed-rate mortgages frequently. In fact, I've read in the Wall Street newsletters that some people seem to believe that the current rate of refinancing is elevated by this flow out of ARMs into fixed-rate loans.

MS. BIES. Well, that was going to be my next question. The other part of this is that we have these older 3-, 5-, and 7-year ARMs, and 2005 is the initial wave of the 3-year ARMs having their first bump-up in rates or being refinanced out of existence.

MR. LEHNERT. Right.

MS. BIES. And the numbers I've seen suggest that in the next three years 60 percent of these ARMs are going to have the rate bumped up or be refinanced. So, as we look at the cumulative impact of this—I'm going back to the affordability issue—what do we really see happening going forward in these mortgages?

MR. LEHNERT. Well, as you say, the rates are going to reset, and households will make decisions about whether to refinance to a different point on the yield curve. Or people can decide to move. I don't think there's going to be a catastrophe on the average reset date that—

MS. BIES. No matter how fast rates move up.

MR. LEHNERT. Obviously, if rates went up sharply, that could be a problem.

MR. STOCKTON. You have to think in terms of the environment that we are forecasting to occur. It's a pretty tame interest rate environment; so it's not one that will necessarily generate significant concerns about the costs of those reset mortgages. Now, obviously, we could be wrong in both directions. One could imagine a situation where the rates rose faster. And that's one of the channels by which monetary policy has traction on the economy; if households face higher rates, they would curtail their spending in response to that. But presumably you'd only be raising rates more rapidly because, in essence, you needed restraint on aggregate demand. So you would welcome that result, as long as it wasn't precipitating some big nonlinear type of event in terms of people responding very, very sharply to that kind of change in the environment.

MS. BIES. The second question I have relates to the nature of the price decline risk. If some of these ARMs can't be refinanced and foreclosures actually start to occur—where financial institutions take over the property—are there any studies out there that indicate how much foreclosure volume could hit the market before it had a material impact on local house prices?

MR. LEHNERT. Not any recent studies that I'm aware of. We proposed doing a study jointly with a private data vendor company on precisely this topic but it didn't really go anywhere. The question is whether foreclosure clusters can have a pernicious kind of spillover effect. I would say that lenders and loan servicers aren't unaware of this problem. In my conversations with them, they've all said that their loss mitigation programs involve holding down the inventory of foreclosed properties that are on the market. They do not want to let them turn into this sort of "pocket of blight"—that is the term they used—as a result of the foreclosure process. That's all the reassurance I can offer you.

MS. BIES. We'll just have to see how they really are going to engineer those processes.

Thank you.

CHAIRMAN GREENSPAN. President Lacker.

MR. LACKER. Yes. I have just a couple of comments and a question. Clearly, there are some perspectives from which housing prices seem to have drifted out of the usual relationship with indicators of fundamentals, and Joshua documented some of them. But it seems to me as if there are a lot of plausible stories one can tell about fundamentals that would explain or rationalize housing prices. Obviously, low interest rates have to top the list. Strong income growth among homeowning populations would be on the list, as would land use restrictions, which were mentioned earlier, and the recent surge in spending on home improvement. I found President Yellen's suggestions intriguing. I'd like to offer my own, just in the spirit of adding potential explanations here. And it's really a version of something Governor Kohn observed, which is that housing prices are relative prices.

I've been struck by the fact that a collection of large metropolitan areas increasingly dominates the national housing figures and that house-price appreciation seems different across various urban regions. It suggests to me that housing values may be affected significantly by—I don't know exactly how to phrase this—sort of the relative microeconomic value of agglomeration. By that I mean the value of the amenities in a city or the enhanced productivity associated with living in or near where one works. Now, in this age of telecommuting and the Internet, it's easy to deduce that the value of living in a city has declined. But it seems plausible to me that the value of a thick labor market might be increasingly important for certain skill specialties. And it also seems plausible that the strong demand for urban amenities is evident in the recent vitality of many older

urban cores. So I'd be interested if any of our housing data experts have any information relevant to that issue.

While I have the floor, I'd like to make just an observation. It seems to me likely that a confluence of several fundamental factors might rationalize the current level of housing prices. So from that point of view, it's hard for me to see how it would be reasonable to place a great deal of certainty on the notion that housing is significantly overvalued, or that there's a bubble, or that it's going to collapse really soon.

I think these markets—this is echoing President Poole's discussion—are too complex. I think our quantitative understanding of them is too limited to warrant second-guessing market forces. And beyond that, the models that we have of bubbles—Glenn wrote it down—are just some statistical noise added to an equation. I don't think we have any models that give us any reason to hope that we can understand how interest rate changes would affect this little random statistical term added on to these equations.

Having said that, housing prices pose a dilemma for us and are going to pose challenges for us soon, I think. Rapid appreciations in asset prices can make monetary policy more difficult. They tend to be associated with tightening labor markets. At the same time, there is a rise in the downside risk. So, even though I'm not very far down Glenn's decision tree, these are still issues I'm paying attention to. It feels as if it could well occupy our attention here.

But I'd be interested in your reaction to this agglomeration story.

MR. PEACH. Well, I think there's something to it. There is the view that people, particularly higher-income people, place a high value on their time. If you don't want to be caught in Washington, D.C., traffic, say, you might decide to sell your house in the suburbs and move into

the city and in the process drive up land prices in D.C., which happens to be one of the metro areas with the highest rate of price increase.

I'm not a regional specialist, but I know there are people at our Bank who are working on this issue of agglomeration benefits. And I think their conclusion is that there are a lot of reasons, particularly labor market associated reasons, why there may be more agglomeration benefits now than previously. That is exactly the opposite conclusion a lot of people thought would be the case as we move to more telecommuting and that sort of thing.

MR. STOCKTON. That certainly seems possible. When I look at Josh's exhibit 3 on page 5, I see the Miami price-rent ratio at 64 percent above its trend. Now, it's possible that everybody just woke up and decided, boy, there are people in Miami who are just really terrific to be around—it's an exciting city and fascinating people live there. [Laughter] But it's also possible that that statistic could be an indication that people have unrealistic expectations about the rate of increase in house prices expected in Miami. And there is certainly a lot of anecdotal evidence that in that particular city there is a lot of flipping of properties going on as well as other developments that might not be reflective of a purely equilibrium move in house prices or of agglomeration economies.

So I'm still a little nervous about this. There are a lot of good reasons why prices ought to be high relative to rents and relative to incomes. And I think even President Poole's suggestion that maybe housing is undervalued can't be ruled out. We've done simple dividend discount-type calculations on rents and interest rates. And if you make a certain assumption about the growth rate of real rents going forward and the persistence of low interest rates, you can get figures showing further appreciation of maybe not 40 percent but rates that are pretty high. So we think that's within the probability distribution. But we're also worried that we're seeing in many markets and for the

nation as a whole a run-up in prices that certainly looks very unusual by historical standards. It could very well be that this time is different and it's all being driven by fundamentals. But we don't think you should rule out the possibility that you could be facing a period in which prices could be declining or just be softer.

One point that has been made is that we obviously don't know how the end will look—if there is an end. The end could come through a long period of just relatively subdued growth in nominal house prices. It wouldn't have to be associated with a 20 percent decline. As we noted in the Greenbook, that is an extreme drop. In fact, to get to John's scenario 3, a lot of extreme things have to happen. It takes an unusually large drop in house prices and a lot of spillover effects. As you recall, the first scenario was pretty tame; if you move down 50 basis points on interest rates, it offsets that. But if you layer on top of the decline in house prices a big drop in consumer confidence, a big equity extraction effect, or a much bigger wealth effect from housing—which looks to us to be pretty much on the edge—and throw in some covariance with a bond market event, the situation worsens substantially. But it takes a lot to get to a real disaster type of scenario.

So even though we feel that house prices have moved out of alignment with the fundamentals, we don't necessarily think the implications of that are that you're going to be confronted immediately with some large problem. In fact, our best guess would be that the misalignment would unwind in ways that would be quite feasible for you to offset and insulate.

There are questions on the supervisory side. There I don't think the historical evidence suggests that supervisory policy has been used effectively to head off asset bubbles or to elegantly deflate them when they occur. What you might hope to do is to have in place policies that will prevent the kind of spillover effects of John's scenario 2 so that you just have a wealth effect. In other words, house prices might go down or soften and that will show up on various agents' balance

sheets as a reduction in wealth. One might hope that they respond accordingly and that we won't have the complications with intermediation or other kinds of things that would add to that effect. So our story basically is that we're worried about valuations in the housing market, but we don't necessarily see that as having profound consequences for your policy going forward.

CHAIRMAN GREENSPAN. President Stern.

MR. STERN. Yes. I have a question for Karen about a couple of the charts. One of the things that struck me in looking at the charts for the United Kingdom—whether you look at price-to-rent ratios or real house prices—is that they obviously have gone through several very sharp swings. If you look at the U.S. historical charts, they're pretty benign. Dave was just talking about the possible fallout of sharp swings in those measures here, and I was curious whether we could learn anything about the macro consequences or the macro conditions associated with what has happened in the U.K.

MS. JOHNSON. Well, for one thing, the U.K.'s 1990 cycle was amplified by regulatory changes that preceded it, which led to mortgage lending that was excessive and not well supervised. It was a kind of blind-leading-the-blind situation: The regulator changed the rules and the financial institutions moved into the market and practices and norms changed. A great deal of lending took place. The supervisors were learning as much as the lenders were and—well, let me put it this way—it didn't go well.

In the past, there has certainly been a correspondence between household consumption and housing wealth in the U.K. So when they suffered the big drop in the 1990 rundown of housing prices, they also had a big change in household consumption out of disposable income, and so forth, and they had the makings of a recession as a result.

Now, a couple of the characteristics of the U.K. market have always led us to think that it's not a telling example. One is the prevalence of variable-rate mortgages, which causes the process of tightening monetary policy to contain the macroeconomy to have a bit of extra leverage over the discretionary income of households—to an extent that is not the case with fixed-rate mortgages. Obviously, there's a counterpart effect on the earnings of mortgage lenders, and so forth, in the U.S. economy that you need to take account of to fully understand that. But there is that characteristic. And there is the fact that house prices actually fell in the U.K., so they had big negative equity problems, which complicated the process of how to unwind the interaction of household behavior and financial intermediary behavior. To the extent people walked away from the houses, the financial intermediaries were getting collateral that perhaps no longer equaled the value of the loan. On the other hand, some households didn't walk away; they just remained in a negative equity position for some time. And that had a long, dampening effect on their spending patterns. So there were complex reactions involved.

But this time around, at least based on my conversations with U.K. officials, they think they've improved a lot of those things. So in that sense, there is something to be learned. Financial institutions now know better how to maintain their balance sheets and how to do this lending. The households know better, too; they've learned a bit. U.K. officials think they've seen a lessening to some degree of this tight link between housing wealth and consumption so that they're not both on the run-up and then, when it stops, extrapolating what the consequences would be.

On the other hand, I have to admit that I occasionally read my little machine while I sit here, and in the last hour it carried three statements from a member of the Bank of England's Monetary Policy Committee who must have been making a speech. And all three statements the media chose to pick up pertained to whether or not housing prices ought to be relevant for monetary policy.

[Laughter] And all of the statements were slightly two-handed, along the lines of: Monetary policy should not be driven by housing prices, but we must look at them closely. [Laughter]

I think there are lessons to be learned; I'm not saying there aren't. But certainly the 1990s episode had some characteristics that were far more extreme and that would never happen here because of institutional differences. And the present episode, which has remedied some of those earlier problems, I think is not such a bad deal. They've slowed the increase in housing prices. They aren't having negative equity. They don't have financial institutions that look like they're going to become or technically are insolvent. I think in that sense they moved to improve their infrastructure, so to speak. They talk about the issue a lot but I think they feel the situation is okay at this time.

CHAIRMAN GREENSPAN. May I raise a question, which puzzles me, on chart 13? That has the new home price index and the OFHEO index. I don't think there's a big problem understanding the prices of new homes ex land. Since homes are largely customized, one would expect that, as indeed the data show, the growth in productivity—and presumably in unit labor costs in residential construction—is less than the average. That would lead you to conclude that at constant margins the average real price of homes is going up. And the number is, as I recall, somewhere between 0.5 and 0.8 or 0.9, or something like that. Now, after a house is constructed and priced, the price from there forward either is flat or goes down—I don't think anybody presumes it goes up. This gets to the issue of whether the modernization or the depreciation overwhelms.

You have a system in which you have initial prices of new homes, and let's assume there's a decay rate. So, as the homes age, if the decay rates are all constant, clearly any measure of constant-age existing homes will exactly parallel the new home price. Looking at this chart, it's very evident

that prices of existing homes on average are rising faster—generally going almost all the way back—than those of new homes. That could imply that there is a change in mix. In other words, if there's a decay rate, then the presumption is that the average age of existing homes that are being sold is moving down. But none of the credible hypotheses—because that can't go on very long—explains this difference. We know that the constant-quality new home price is a hedonic, reasonably well-constructed series. How do we reconcile these data? What's happening?

MR. PEACH. Well, I think in part it may go back to one of the issues discussed earlier about the rate at which replacement is taking place. Now, I haven't done this in the most scientific way, but if you just take periodic estimates of the stock of housing, whether from the Census or from the American Housing Survey, and try to line up changes in the stock with new production, it appears that we're in a period when a lot of destruction of old housing is taking place. As you mentioned, the average estimate on tear-downs is 300,000, but I've seen estimates as high as 700,000 units.

CHAIRMAN GREENSPAN. Let me just say this. We have this series on vacancy rates and ratios, and that series actually has an implicit housing stock figure. If you take the figure for completions and match it up against that, for a good portion of the last 10 years you get negative replacement.

MR. PEACH. Right.

CHAIRMAN GREENSPAN. So it's not evident what those replacement numbers are. We're really at sea on what the actual total housing stock is, which is the problem we have with measuring population as well. So I'm not sure you can make the statement that you just made.

MR. PEACH. Well, I think for a shorter time horizon you can say that.

CHAIRMAN GREENSPAN. Do you mean like the period we're in now?

MR. PEACH. Yes, over the past four or five years, I think it does hold true.

CHAIRMAN GREENSPAN. You mean as far as the completion rate being so high relative to household formation—if you believe the household formation data.

MR. PEACH. Right. Well, and also to the estimates of the stock.

CHAIRMAN GREENSPAN. Okay. So you're suggesting that this is—but this pattern has gone on since 1980.

SPEAKER(?). Page 14, Mr. Chairman.

CHAIRMAN GREENSPAN. Page 14?

MR. PEACH. It has been going on for a long time, but I think the separation has been most pronounced more recently.

CHAIRMAN GREENSPAN. That's certainly true. But is it credible that we can have a consistently more rapid rise in prices of existing homes unless the value of the land is rising faster for those homes? Then there's the issue we discussed earlier about moving out into the suburbs, which undercuts the land price value of the new homes. Do we have any insight into that at all?

MR. GALLIN. That is my opinion on the matter. If you put a new home into place on a plot of land and follow that over time, the value of the structure might rise, reflecting an improvement to the house, or it might deteriorate. But as for the land, once the house is built, it falls into existing house land. That's what it is from then on. And if the value of that package of land and structure is going up and you think the value of the structure is not, it's coming in through the land.

If you flip to the very last page of the handout, page 33, the lower panel shows levels of the repeat transactions prices in red, levels of the constant-quality price index for new homes in green,

and an estimate of construction costs. That basically reflects the cost of a bundle of construction materials over time—a certain amount of lumber, a certain amount of—

CHAIRMAN GREENSPAN. That can't be far wrong.

MR. GALLIN. If you look at the pattern of the green line, the constant-quality and the cost line move roughly together. Obviously, the constant-quality price index has increased more rapidly recently, because that index does capture partially, I think, increases in land prices. But I think that the gaps between the three lines are telling us quite a bit about what's going on with regard to the price of land sitting under the entire stock of housing.

CHAIRMAN GREENSPAN. You're implying, however, an answer to the question I asked you before which you refused to answer [laughter], which is the ratio of the land value to total value.

MR. GALLIN. There's a difference between refusal and inability. [Laughter]

CHAIRMAN GREENSPAN. The ratio is—unless you were inferring it between the two prices, which begs the question—

MR. GALLIN. Well, that's exactly what Morris Davis—

CHAIRMAN GREENSPAN. Yes, I understand that. But it raises the question of whether the price data are accurate.

MR. GALLIN. Absolutely. As I said, this is what I think is going on. In my view, that's what is capturing land prices.

CHAIRMAN GREENSPAN. Did you ever say what adjustments you make in the repeat-transactions OFHEO numbers?

MR. GALLIN. In my prepared text, no, I didn't. But I can go over them briefly. Would you like me to—

CHAIRMAN GREENSPAN. Can you do it quickly?

MR. GALLIN. Yes. I made an adjustment for improvement rate and depreciation rate. And there are actually two types of transaction biases I made adjustments for. One is the fact that homes that have greater appreciation tend to transact more and, therefore, they show up more in the repeat transaction database. So I made an adjustment for that. Also, two economists at OFHEO wrote a paper showing that there's another kind of bias—basically the high-end homes tend to appreciate faster than the low-end homes—and that's biasing the OFHEO as well. So I made an adjustment for that. Those are the three main adjustments that I made to the repeat transactions price data.

CHAIRMAN GREENSPAN. Governor Gramlich, did you want to make a comment?

MR. GRAMLICH. I have three quick points. On Sue's point earlier about foreclosures, I think foreclosure rates nationally are too low to do anything with analytically. But in my world of low-income housing, in certain urban neighborhoods they get up to 40 percent or so. One can't help but think that what happens—it's like the old redlining issue—is that first some foreclosures occur on a block, and pretty soon the values of the homes start going down, and then a lot of people stop making mortgage payments. I don't think that has macro significance, but it is a big problem in certain neighborhoods. And that's actually one thing I would like to work on when I leave here.

On the discussion between Josh and Cathy earlier about affordability measures, I think that Cathy was trying to get you to say, Josh, what would happen if interest rates went up and nothing else happened. But—pardon?

MS. MINEHAN. That probably wouldn't happen.

MR. GRAMLICH. Well, that's right. I understand that the link between interest rates and prices is weak. But really, there ought to be a full general equilibrium, if you will, calculation there.

Affordability rates may tend to be a lot more stable than we would think just from interest rates alone, if it turns out that they do have an impact on prices.

The third point: Janet raised what I thought was an interesting idea earlier that some people have picked up on, which is that maybe these credit innovations are endogenous. I recall a briefing that we had just a short time ago where the staff suggested that, in effect, what was happening—and I, frankly, was a little skeptical at the time—was that people were identified by how much they could pay for their house. And that, I think, makes the credit transaction automatically endogenous. That may be a better way to look at the whole situation, and I guess researchers at the Board have already started doing that. I don't know how complete their research is, but given our myopic society, that may be a much better way to look at it—how much you can pay—and then nobody worries about what the implications are down the road. But that explains the initial buying decision.

CHAIRMAN GREENSPAN. Is that a statement or a question?

MR. GRAMLICH. Yes. [Laughter] Do I have to say? If somebody wants to comment, they can.

CHAIRMAN GREENSPAN. Let's choose to leave it as it stands and we'll end this discussion with President Fisher. Do you want to make a comment?

MR. FISHER. No, sir. Mine was on a similar line, neither a question nor a statement.
[Laughter]

CHAIRMAN GREENSPAN. Dino, how long are your remarks?

MR. KOS. About 10 minutes.

CHAIRMAN GREENSPAN. Why don't we leave them until first thing tomorrow morning? Is that okay? Let's adjourn.

[Meeting recessed]

June 30—Morning Session

CHAIRMAN GREENSPAN. Mr. Kos will start this morning.

MR. KOS.⁶ Thank you, Mr. Chairman.

Most major asset markets were little changed in the intermeeting period. The exceptions were: the price of oil, which rose; the euro, which fell; and corporate credit markets, which faced some turbulence after the downgrade of GM debt.

The top panel graphs the 3-month cash deposit rate in black and the 3-month deposit rate 3 and 9 months forward in red. The 9-month forward rate has been in a tight corridor for several months, thereby compressing the spread both to the 3-month forward rate and the cash rate. This compression reflects the widespread expectation that the end of the tightening cycle is approaching.

Market participants briefly flirted with the notion that the tightening cycle would end as early as this meeting, after President Fisher's comments on June 1 and the weak employment report two days later. But subsequent remarks by the Chairman in his testimony and by other Committee members quickly reversed sentiment.

The 10-year yield fell 23 basis points in the intermeeting period. That, coupled with the rise at the short end, led to a further flattening of the curve. This caused a flurry of commentary about what signal the flattening was sending, and more ominously, the implications of a possible inversion of the yield curve. The middle panel graphs the 2- to 10-year Treasury spread since 1980. The light dashed green line is the average spread over that 25-year period. At its current level of 35 basis points, the curve is slightly flatter than the historical average.

The flattening in this cycle has been dramatic but is not without precedent. Note that the flattening in the early 1990s was of similar magnitude and was followed by a period of pretty robust growth. Second, the level of the curve, at 35 basis points, is not out of line with other periods. As shown in the shaded rectangular area, the 2- to 10-year spread is now at levels that were traversed in the second half of the 1990s. Moreover, the spread was only slightly steeper during the 1980s expansion—a time when both rates and risk premiums were no doubt higher. The conclusions that I at least draw from looking at the history are: that the current flattening has earlier precedent; that the current shape of the curve is well within historical norms; that inversions are rare; and that while an inversion caused by further tightening cannot be ruled out, the scenario that is at least as likely is for long-term yields to rise in response to higher short-term rates.

The bottom panel shows the 5- and 10-year TIPS [Treasury inflation-protected securities] breakeven rates for the first six months of 2005. Those breakeven rates

⁶ The materials used by Mr. Kos are appended to this transcript (appendix 2).

have declined recently after rising early in the year; they began to fall as inflationary expectations receded and the price of oil backed off from its earlier highs. In recent weeks oil and breakevens have diverged, with breakeven rates continuing to decline while oil rose to new highs above \$60. One explanation for this paradox is the revival of the notion that higher oil prices will act as a restraining factor on activity and thereby depress inflationary tendencies. TIPS traders, however, have been pushing an alternative explanation: that technical reasons related to the seasonality of price increases creates this pattern where breakevens widen early in the year and then fall back. In either case, the TIPS market is not sending out warning flares from the most recent burst in oil prices.

While the Treasury market has been relatively well behaved, the credit markets experienced some volatility related to the news surrounding General Motors and Ford. Two days after the Committee's May meeting, the debt ratings of GM and Ford were downgraded to non-investment-grade by Standard and Poor's. As shown in the top panel of page 2, GM and Ford spreads widened dramatically ahead of the decision and were both trading at spreads far above the high-yield index (the green line). Those spreads came in a bit but then widened again and are now near levels observed when the two companies were first downgraded. I should note that Ford was not downgraded by the other two rating agencies and thus was reinstated into the investment-grade index. Nevertheless, it trades at spreads that are well into high-yield territory.

As I mentioned at the last meeting, the transition of billions of dollars in debt from the large investment-grade market to the far smaller non-investment-grade market is likely to take months. Those investors needing to sell are likely to seek to avoid selling at fire sale prices. But the slow pace of divestment creates an overhang that is apparent to everyone and probably helps explain the wideness of spreads relative to the index. And yet the performance of the broader high-yield and investment-grade indexes was rather tame, as investors apparently did not extrapolate the problems of these companies more broadly.

The problems at GM and Ford, and for that matter some smaller auto parts companies such as Collins and Aikman, did show through into the credit derivatives market, which exhibited some signs of strain as pricing models and liquidity assumptions were modestly tested by this episode. As shown in the middle panel, the CDX index of credit default swaps widened—as did the high-yield index, which is not shown—as hedge funds and others used this index to hedge so-called “correlation trades” that began to behave unexpectedly. Although the index has retreated somewhat, dealers report that liquidity has not reverted to normal and that some hedge funds are still looking to exit bad positions.

The bottom panel depicts the year-to-date hedge fund performance according to one service that tracks hedge fund results. In aggregate, the funds reporting to this service have had losses of about 2 percent since January. That number is fairly modest relative to some of the more sensational headlines, and it suggests that most

funds have successfully managed their risks. Funds specializing in convertible arbitrage strategies fell more than 8 percent and were among the worst performing groups. Of course, these averages obscure a wide variance in performance, including some that did far worse and in some cases announced plans to close. The good news—from my standpoint at least—is that these funds decided to close rather than swing for fences in an attempt to recoup their losses. The remaining unknowns are just how many redemptions are still in the pipeline and whether there are losses still to be recognized by funds that are not adequately marking to market.

Turning to page three, Europe was squarely on the radar screen this past spring. With the French and Dutch referendums highlighting problematic politics and weak data highlighting flagging growth, sentiment toward euro-area markets was somber.

The top panel on page three graphs the 3-month cash deposit rate and the same rate 3 and 9 months forward since March 1. Earlier this spring the markets expected monetary policy to be steady, as it has been for two years running. But as the data deteriorated, the 9-month forward rate fell and is now trading below the cash rate as markets shifted to price in an easing of policy in the second half of the year. The recent easing by the Swedish Riksbank and the expected easing in the U.K. has fueled expectations that the ECB [European Central Bank] will shift gears relatively soon.

Interest rates further out the curve also fell. Meanwhile, with U.S. interest rates rising, a widening interest rate differential opened up favoring the dollar, as shown by U.S. and German 2-year yields in the middle right panel. With sentiment poor even before the French referendum, with interest rates favoring the dollar, and with random comments by fringe politicians suggesting that some countries might exit the single-currency regime, it's no surprise that the euro depreciated toward \$1.20.

The shift in sentiment toward the euro can be seen in the bottom panels. The bottom left panel graphs the 1-year risk reversal for the euro-dollar exchange rate, which recently favored euro puts for the first time in four years. The bottom right panel shows the more recent shift in positions among noncommercial traders on the IMM [International Monetary Market], as they moved from being long euro to being short the currency. Whether this trend will continue is now an issue that is occupying market participants. At this point there is a lot of bad news priced into asset markets, and sentiment is so bad toward the euro that this trade may be close to running out of steam. Meanwhile the depreciation of the euro has offered a bit of relief to European exporters.

The top panel on the next page depicts 10-year bond yields for Australia, the U.K., Canada, Germany, and the United States. Yields are on a gradually declining trend everywhere—countries in the midst of a tightening cycle, such as the United States, and those like the United Kingdom and Germany whose central banks are expected to ease soon.

Japan reported better GDP data recently, but many market participants expect Japanese growth to revert to its previous pattern. Hence, 10-year Japanese government bond (JGB) yields have also fallen back to about 1.20 percent. The middle panel graphs the JGB curve as of yesterday and as of one year ago. The weight of liquidity from the Bank of Japan's quantitative easing policy has pulled more of the yield curve toward zero.

Finally, let me say just a quick word on global equities. The bottom panel graphs the performance of selected equity indexes in local currency terms (the blue bars) and in dollar terms (the red bars). The stock markets of the U. K., France, Germany, Italy and Japan—toward the right side of the panel—all looked better than the S&P 500 in local currency terms. However, with the appreciation of the dollar, their performance turned negative. Interestingly, Brazil and Mexico exhibited the opposite effect: far better performance in dollar terms because their currencies rose against the dollar. If there are strains from the imbalances that are being talked about, it was difficult to find evidence of that in the past seven weeks.

Mr. Chairman, there were no foreign operations in this period. I will need a vote to approve domestic operations.

CHAIRMAN GREENSPAN. I'm fascinated by the correlations in the daily movement of rates among the five major countries shown at the top of page 4. I'm even looking to see whether or not it is apparent in the data that Australia is 12 hours behind the United States, and I can't tell whether we're following Australia or they're following us. But the convergence in these markets is getting to be notable.

On page 1, the bottom chart on the TIPS breakevens and the crude oil futures price, I can understand why there may be a debate with respect to the divergence from early May between the crude price and the TIPS. But the arguments that are made for that divergence then make me look at the previous period where the correlation is in exactly the opposite direction. So, it doesn't strike me that either explanation is particularly credible.

MR. KOS. I think that's one of the reasons some of the traders are looking for other explanations, such as technical explanations related to the seasonal pattern.

CHAIRMAN GREENSPAN. That would be a huge seasonal adjustment. It doesn't make any sense. I cannot believe, with all the hedge funds losing money, that the ability to pick up a seasonal and exploit it has not been ground away time and time again. Is there any evidence that seasonality still exists in these markets that are arbitragible?

MR. KOS. I haven't done the analysis. The way the story is told is that because the TIPS works off of the non-seasonally adjusted index, you do get these patterns because of pricing—

CHAIRMAN GREENSPAN. Yes, but we know what the seasonal is.

MR. KOS. Exactly. So, you would expect people to take advantage of that, which—

CHAIRMAN GREENSPAN. I think the explanation—based on my long-term recollection—is that people look at three years and they see, for three years, prices moving a certain way. Therefore, though there's no substantive reason, they base judgments for later years on that. And the fourth year, obviously, when they try to play it, they lose money.

MR. REINHART. I think the argument, Mr. Chairman, is that the residual seasonality is in the underlying. That is, the compensation you get is based on the not seasonally adjusted CPI, so the arbitrage is actually to have the real rate get a seasonal to offset the seasonality in the underlying. The one thing I would note in terms of the divergence between the near-term oil futures and the TIPS inflation compensation is that we've also seen a difference in the behavior of the front-month contracts and the longer-dated contracts in oil futures. During the latter part of the period where they've moved differently, it has been more of a parallel shift. That is, if you don't anticipate future declines in oil prices—if you were reading it off futures markets—whereas earlier you did, TIPS market participants would presumably price in anticipated future declines in oil prices and its consequence for the CPI. But in the last month or two, it has been flat.

CHAIRMAN GREENSPAN. Further questions for Dino? Mr. Vice Chair, would you move approval of the domestic operations?

VICE CHAIRMAN GEITHNER. So moved.

CHAIRMAN GREENSPAN. Without objection, they are approved. Let's move on to the chart show presentations by Steve Oliner, Dave Wilcox, and Mike Leahy.

MR. OLINER.⁷ We have received a fair amount of data since we closed the Greenbook. Just this morning, BEA reported that real consumer expenditures, shown in the top left panel, were flat in May. This was actually a bit stronger than we had expected, but there was also a small downward revision to April. For the second quarter as whole, shown in the inset box, we project that real PCE increased at a 3.1 percent rate, unchanged from the Greenbook forecast. Meanwhile, housing activity continues to be robust, with sales of new and existing homes (shown to the right) having remained at historically high levels in May.

Turning to business spending, we received new data on orders and shipments of nondefense capital goods after the Greenbook closed. As shown by the red line in the middle left panel, shipments edged up in May, while orders (the black line) softened a bit. These data were nearly spot on the Greenbook estimate and point to a moderate rise in real E&S [equipment and software] spending this quarter. Looking ahead, the results of the Reserve Bank queries on capital spending plans appear broadly consistent with a solid upward track for outlays. As shown in the panel to the right, 42 percent of the respondents expect to increase their spending over the next six to 12 months, while only 12 percent plan to decrease spending, similar to the results in January.

Moving to the lower left panel, the data on initial claims released this morning showed that the four-week moving average (the red line) edged down to about 325,000, a level that we estimate to be consistent with moderate growth in payroll employment.

Rounding out this review of recent indicators, we received new data this morning on PCE prices. As shown in the inset box to the right, the core index rose 0.2 percent in May, a tenth below our Greenbook forecast. Also, the increase in March was revised down a tenth, although that revision was confined to the nonmarket part of the index. The latest data leave the 12-month change in the core PCE index at 1.7 percent.

Your next exhibit briefly describes the key background factors for our projection. As shown in the upper left panel, we assume that the federal funds rate (the black line) will gradually rise to 3¾ percent by the end of next year, very similar to the path

⁷ The materials used by Messrs. Oliner, Wilcox, and Leahy are appended to this transcript (appendix 3).

in the April Greenbook. Long-term Treasury rates (the red line) are expected to hold about steady through next year, following a path just a shade below that assumed in April. As shown to the right, the impetus from fiscal policy steps down this year to $\frac{1}{4}$ percent of GDP and remains at about that level in 2006; these fiscal assumptions are essentially unchanged from the April Greenbook. Among the other key background factors, we have taken on board the upward surprises during the intermeeting period for equity prices (the middle left panel) and house prices (the panel to the right), which raised the assumed path for household wealth. In contrast, the higher oil prices in this projection (the lower left panel) and the recent appreciation of the dollar (shown to the right) were negatives for our growth forecast. On balance, the revisions to these background factors had little net effect on our projection of real GDP.

The next exhibit summarizes our forecast of growth and inflation. As shown by the black dashed line in the top left panel, we project that real GDP will expand roughly $3\frac{1}{2}$ percent this year and again in 2006, just a bit faster in both years than the growth of potential. As you can see in the table to the right, since January we have revised down the forecast of GDP growth about $\frac{1}{4}$ percentage point in both 2005 and 2006.

On our current forecast of GDP growth, we expect that the unemployment rate (the middle left panel) will hold steady at its current level of 5.1 percent through the end of the forecast period. As shown to the right, the projected path for the unemployment rate has not changed much since the January Greenbook.

With regard to inflation, the lower left panel shows that we project core PCE prices to rise a bit more than 2 percent this year and a tad less than 2 percent in 2006, up from the $1\frac{1}{2}$ percent increase recorded last year. The table to the right shows that the projections for this year and next are each up half a percentage point from the January Greenbook.

Dave Wilcox will now continue our presentation.

MR. WILCOX. As you know from the Greenbook and as is shown in the upper left panel of exhibit 4, the unemployment rate is currently just a tenth of a percentage point above our estimate of the NAIRU. To put the matter delicately, however, the most impressive aspect of our estimate of the NAIRU may be the imprecision of it: According to one representative econometric equation, a 70 percent confidence interval around the point estimate of the NAIRU extends 2 full percentage points from top to bottom. Accordingly, one might reasonably ask whether any evidence can be marshaled to corroborate our view that a smidgeon of slack still remains in the labor market.

The upper right panel presents one such bit of evidence. As shown by the black line, the participation rate has declined a percentage point over the past five years. To be sure, the model that we use to analyze movements in the participation rate writes off part of that decline as reflecting trend demographic developments, summarized by

the red line. But the larger part of the overall decline, according to the model, reflects a swing from a participation rate that was above its trend level through the late 1990s to one that has been below its trend level the last few years. On our interpretation, conditions in the labor market were sufficiently uninviting to cause some workers to take themselves out of the workforce. But as job opportunities continue to improve, these workers will be available to rejoin the labor force—and will do so in great enough numbers to hold the participation rate steady despite a declining trend.

The middle left panel shows a broad measure of conditions in the labor market—total hours worked relative to trend. This measure combines the effects of the unemployment gap, the participation rate gap, and the gap in the workweek relative to its trend, not shown but currently about zero. As you can see from the chart, total hours worked remain a little below the estimated trend despite the recent gradual improvement in labor market conditions.

The idea that some labor market slack remains is corroborated by a few other indicators. For example, as shown in the middle right panel, individuals still perceive jobs as somewhat harder to get than they were in the first half of 1997, when labor markets seemed roughly to be in equilibrium. Similarly, as shown in the lower left panel, the NFIB [National Federation of Independent Business] reports that small businesses still are not encountering quite as much difficulty filling positions as they did in the first half of 1997. I should also note that a few other indicators suggest that the labor market is at least as tight as it was in early 1997. For example, as shown in the lower right panel, the percent of employed people working part-time for economic reasons has fallen below its average over the first half of 1997.

That said, we still see the balance of evidence as suggesting that a little slack remains in the labor market, but that the margin is narrow, and narrower today than it was six months or a year ago. Moreover, such slack as may still exist will, on our projection, essentially be taken up over the course of the next year and a half.

Other things equal, in the past, labor market slack has restrained the growth of nominal compensation and thus has helped to keep price pressures in check as well. And yet, as shown in the upper left panel of exhibit 5, compensation per hour as measured in the BLS's [Bureau of Labor Statistics] Productivity and Cost [P&C] system soared more than 10 percent in the fourth quarter of last year and posted another hefty increase in the first quarter of this year. As shown by the black line to the right, even on a four-quarter basis, the growth of compensation per hour has picked up sharply in the last two quarters, raising the question as to whether underlying compensation pressures are building and whether they may be feeding price inflation.

We think not, for two main reasons. First, as shown by the blue line in the upper right panel, the other main indicator of compensation trends, the ECI [Employment Cost Index], has actually been decelerating slightly since mid-2003, suggesting that the compensation situation may be a good deal less alarming than one might conclude

based on the P&C measure alone. Second, we diagnose the recent bulge in compensation per hour as having been influenced by a spike in stock option exercises, which we think have little bearing on firms' pricing decisions. Indeed, the last time a bulge of this sort occurred in comp per hour, in 2000, core PCE price inflation—the red line in the upper right panel—responded little if at all.

The middle left panel reviews some of the considerations that lead us to implicate option exercises in this matter. For now, in the interest of time, I will only touch on the first and most obvious factor, namely, that option exercises are included in P&C compensation per hour but not in the ECI. The attribution of a sizable portion of the spike in comp per hour to option exercises is important, because growth in that form of compensation is not likely to persist at its fourth-quarter pace.

Indeed, to that point, the middle right panel summarizes our outlook for the growth of compensation per hour. As shown on line 1 of the table, we have the four-quarter change in P&C comp per hour coming back down sharply this year, as about half of last year's fourth-quarter spike is unwound. As shown on line 2, we have ECI compensation per hour moving up along a smoother trajectory, pushed up by the gradual tightening of labor markets, the continued pass-through of increases in structural productivity to real wages, and the lagged effects of higher consumer price inflation last year and this year. Overall, on our numbers, the growth of compensation will be moderate enough to allow a gradual deceleration in core consumer prices from here forward while still permitting firms to maintain the markup of prices over unit labor costs (not shown) noticeably above its average over the past 35 years.

But we could be wrong about all of that, and the bottom two panels illustrate the potential consequences of a misjudgment on our part. As outlined in the lower left panel, we sketched an alternative scenario in the Greenbook in which hourly compensation increases 1 percentage point faster than in the baseline over the remainder of this year and next. In addition, we assumed that firms have sufficient pricing power to protect their profit margins, and are able—by the end of the scenario—to return the markup to its baseline value. As shown by the dashed red line to the right, the resulting boost to core PCE price inflation is substantial: By the end of 2006, core inflation is running at a 3 percent annual rate and headed further north from there.

While we view a compensation-led spiral as a risk to the outlook, we do not see compensation as having been a major source of the recent upward creep in core inflation. But if not compensation, then what?

The top left panel of exhibit 6 steps back and reviews the scope of the recent run-up in core PCE price inflation. The red line in this panel shows the evolution over the past 18 months of our forecast for core PCE inflation during 2004. As shown by the leftmost point on that line, back in December 2003 we forecasted that core PCE prices would increase about 1.1 percent over the course of 2004. As shown by the

peak in the red line, by August of last year, we had marked our forecast up, on net, about $\frac{3}{4}$ percentage point, to 1.8 percent. Thus far, in any event, that August forecast has proved to be a little too pessimistic; as shown by the rightmost point on the red line, our latest estimate—which now simply tracks the published figure for 2004 from the BEA—is 1.6 percent.

The blue line similarly tracks the evolution of the forecast for 2005. There, as you can see, the upward revision in our forecast has been more pronounced. As shown by the rightmost point on the blue line, the current Greenbook calls for core PCE inflation to come in this year at 2.1 percent. As shown by the green line, we did not begin providing a forecast of inflation in 2006 until last September's Greenbook, but since then, that forecast has followed a similar upward trajectory. So what has been going on?

The panel to the right provides half of the answer: As you are well aware, oil prices have surprised both us and the rest of the world greatly to the upside. As you can gauge from the vertical distance between the dotted blue line at the bottom and the dashed black line at the top, the forecast implicit in oil futures contracts back in December 2003 for oil today was too low by about \$30 per barrel.

But other developments have worked in the same adverse direction. As shown in the panel to the middle left, the PPI for core intermediate materials prices also has risen considerably faster than we expected as of a year and a half ago, and is expected to continue along its current higher trajectory. Similarly, import prices (shown to the right) have risen faster, on net, than we expected in December 2003, even though events have unfolded a little more favorably than we had expected as of December 2004.

The table in the lower left panel traces through the implications of these developments for our inflation outlook. As shown on line 1, between December 2003 and last week's Greenbook, we've revised up our estimate of core PCE inflation in 2004 by 0.5 percentage point, on net, and have marked up our forecast for inflation this year 1 percentage point. Lines 2 and 3 show that the deterioration in the oil outlook can account for about half of the upward revision in both years, while import and materials prices can account for nearly all of the rest, leaving only a small amount, line 4, to be explained by other factors. We take some comfort from this result because we expect the upward impetus from the sources represented on lines 2 and 3 to prove transitory.

As shown in the table to the lower right, as those transitory influences wane, we expect the inflation picture to improve. For this year, as you know, we have topline inflation (line 1) coming in at $2\frac{1}{2}$ percent again, little different from last year, before dropping back to $1\frac{3}{4}$ percent next year, under the influence of the swing in energy prices. And, as shown on line 4, we have core PCE inflation stepping up $\frac{1}{2}$ percentage point this year before moderating slightly next year.

Given that oil prices have surprised so much to the upside, one might have expected our projections for the growth of real GDP to have been marked down substantially of late. But, as shown in the upper left panel of exhibit 7, that has been only partly true.

This panel does for the growth of real GDP what the one from the preceding exhibit did for core PCE inflation. Thus, the red line shows the evolution of our projection for real GDP growth over the four quarters of 2004. As shown by the steadily sinking portion of that line, which paralleled the feeling we had in our stomachs at the time, we marked down our projection for the growth of real activity substantially as the bad news came in during the first two-thirds of 2004. By contrast, our projections for 2005 and 2006 have been remarkably stable. How could this have been so?

The panel to the upper right shows that the increases in oil prices relative to what we had assumed in the December 2003 Greenbook in fact were, on our estimates, a major negative for the growth of real GDP both last year and this. As shown by the red line, we estimate that oil price increases trimmed half a percentage point from the growth of real GDP in 2004. And, as shown by the blue line, they will cut nearly a percentage point from the growth of real GDP in 2005.

Clearly, oil price effects can be only part of the explanation, because they fail to explain the full extent of the disappointment in 2004 and they explain too much in 2005. The middle left panel fills part of the gap. As you will recall all too clearly, our estimates as to the influence of the partial expensing provision proved rather wide of the mark. As shown by the declining height of the bars marked "2004," over the course of the past year and a half, we have progressively trimmed our estimate of fiscal impetus in 2004, explaining another 0.2 percentage point of our overall downward revision. By the same token, the bars marked "2005" show that the patching of the pothole plus some unanticipated defense spending have added to the projected growth of real GDP this year.

The table to the middle right summarizes the net effect of these two influences. As shown on lines 2 and 3, the increase in oil prices and the reduction in fiscal stimulus can explain about half of the shortfall in 2004 growth relative to our projection on the eve of the year. The remaining 0.7 percentage point was a puzzle in real time, and largely remains so today.

For 2005, the parsing-out exercise yields a tidier result: By our lights, oil prices were indeed a big negative, but that negative was almost completely offset by our miss on the partial expensing provision. Without doubt, other influences have been bearing on the growth of real GDP but, conveniently, they happen to net to zero in the arithmetic for 2005.

One implication of this exercise is that the underlying growth of demand—supported, to be sure, by low interest rates and appreciable gains in housing and stock

market wealth—has been pretty robust. Looking ahead, we expect oil to remain a negative for the level of real GDP, but not to any great degree for its rate of growth going forward. Thus, if oil prices flatten out, as we assume, we would expect the relatively robust pace of underlying demand to show through to topline growth.

The table at the bottom of the page summarizes our outlook for the growth of real GDP. As shown on line 1, for this year and next, we expect real GDP growth to average about 3½ percent per year. This growth rate is close to our estimate of the rate of growth of potential, so (as shown on line 7) the output gap closes only a little from its current level of about 1 percent. Throughout the projection period, domestic final sales are the key driver of aggregate demand, supported by interest rates that remain quite low. Net exports (line 5) subtract a little less from the growth of aggregate demand this year, but resume their more substantial pace of erosion next year. Inventory investment (line 6) is expected to be about neutral for real growth this year and next.

MR. OLINER. We will now focus on a set of key financial issues for the outlook. Your next exhibit explores whether markets appear to have built in sufficient allowance for risk—in effect, taking yesterday’s discussion of asset valuation to markets beyond housing. The top panel begins with the equity market, and plots the staff’s measure of the earnings-price ratio for the S&P 500 (the red line) and the real yield on a synthetic Treasury perpetuity (the black line). The gap between the two series provides a rough estimate of the equity risk premium. Currently, the gap lies within the range that prevailed from the mid-1980s to the mid-1990s, before the bubble period in the stock market. By this admittedly crude metric, stocks appear to be priced with an adequate allowance for risk.

The middle left panel explores the same question for corporate bonds. The shaded area shows our estimate of the risk premium in the high-yield bond market, calculated as the difference between the high-yield spread over Treasuries (the red line) and the part of that spread that compensates for the expected loss from defaults (the black line). Earlier this year, the implied risk premium fell to the lowest level since the go-go days of the late 1990s. However, the problems at GM and Ford appear to have sparked a renewed appreciation for risk among investors, boosting the premium back to a level that appears to provide appropriate compensation for risk in the current economic environment.

Yesterday’s discussion of whether houses are overvalued raises the same question for commercial real estate. As President Yellen noted yesterday—fully anticipating my remarks—the middle right panel shows that the prices of commercial properties (the red line) have been rising at a good clip in recent years even though the net operating income—or NOI—that they generate (the black line) has been falling. This divergence has pushed down the ratio of net operating income to property prices, the analogue to an earnings-price ratio for equities. The lower left panel plots the NOI-to-price ratio against the synthetic Treasury perpetuity yield. As you can see, the gap between the two series has narrowed in recent years and currently sits in the lower

part of the range observed over the past decade, which might be viewed as cause for concern.

However, the case for overvaluation in commercial real estate is not open and shut by any means. Net operating income has been held down by the unusually high vacancy rates that emerged several years ago. But, as shown in the panel to the right, the fundamentals for commercial real estate appear to be improving. The vacancy rate for office buildings—one of the hardest-hit property sectors—started to tip down last year and, according to preliminary data, it fell further in the second quarter. In addition, the market rent for available office space has turned up in recent quarters. If demand for space continues to firm, the apparently rich prices for commercial real estate may turn out to have been justified, as investors—in retrospect—will have correctly looked through a temporary period of weakness.

Your next exhibit addresses another question that has attracted attention: Is corporate credit quality starting to slip? The first point to note is that, at present, the corporate sector is in excellent financial shape overall. As shown in the upper left panel, the default rate on corporate bonds and the delinquency rate on C&I [commercial and industrial] loans at banks are both very low. In addition, as shown to the right, the share of cash flow that nonfinancial firms devote to meeting interest expenses (the red line) has continued to decline, and these firms still have a large stockpile of cash (the black line).

That said, we believe that the high point of the credit cycle is now behind us. For starters, firms have begun to disgorge the cash on their balance sheets. As shown in the middle left panel, cash payouts to shareholders jumped in 2004 and remained high in the first quarter of this year, reflecting increases in dividends (the dark blue part of the bars), share repurchases (the lighter blue part), and cash paid to the shareholders of target firms in mergers (the red part). These payouts may well represent the best use of otherwise idle cash, but they do lessen the resources available to repay the firms' creditors.

Two developments in the bond market are noteworthy as well. First, bond issuance has shifted toward weaker firms. As shown in the panel to the right, high-yield firms accounted for more than 40 percent of the bonds issued by nonfinancial companies in 2004, the highest share in more than a decade. The high-yield share thus far this year, while down from 2004, remains well above its historical average. Second, the use of the proceeds from high-yield bond issues has shifted in a direction that is less supportive of credit quality. As indicated in the lower left panel, from 2001 to 2003, fully 70 percent of the proceeds from these issues were used to refinance existing debt, as firms focused on improving their balance sheets. However, that share declined last year and fell again in the first half of this year. This drop has been mirrored by a sharp increase in the use of bond proceeds to finance LBOs [leveraged buyouts], other merger activity, and payouts to shareholders.

Ultimately, the financial health of the business sector depends on its capacity to generate profits. As shown to the right, the profit share for domestic nonfinancial firms, measured as economic profits divided by sector GDP, now stands at a relatively high level. We expect this share will retreat somewhat over the forecast period, as it normally does in a maturing expansion. Even so, we anticipate that profits will remain strong enough to prevent a sharp deterioration in corporate credit quality.

Your next exhibit turns to the question of whether households are facing significant financial stress. Judging by the delinquency rates shown in the upper left panel, which are all relatively low, the household sector appears to be doing reasonably well. Moreover, lenders seem to have a sanguine view of household finances. As shown to the right, the most recent Senior Loan Officer survey—taken in April—indicated that banks, on net, have been easing their lending standards for consumer loans.

To dig beneath these aggregate indicators, the staff has begun to analyze the household-level data collected from the 2004 Survey of Consumer Finances (SCF). As noted in the middle left panel, the results are preliminary and will be subject to some revision as the SCF staff continues to process the data. I should stress that the results are confidential until the public release of the 2004 data, which is scheduled for January of next year.

The black line in the panel to the right plots the share of households that reported having any debt payments at least 60 days past due. As shown, the share in the 2004 survey—at nearly 7 percent of households—was higher than in any prior survey, indicating that financial stress has become more widespread. This trend would appear to conflict with the low delinquency rates I cited a moment ago. However, those series were based on the dollar amount of delinquent debt, while the black line in this panel measures the fraction of SCF households with a late payment. The red line puts things on more of an “apples-to-apples” basis with the upper left panel by presenting the share of aggregate debt held by SCF households with a late payment. As shown, these households accounted for $4\frac{3}{4}$ percent of total household debt in the 2004 survey, a figure within the range from earlier surveys. Thus, from a macro perspective, the SCF data suggest that repayment problems are not unusually severe, although the incidence of stress has risen.

The lower left panel summarizes some additional findings from the survey with regard to household balance sheets. First, the substantial rise in household assets from 2001 to 2004 was driven by the appreciation in house values and was fairly widespread across income groups. At the same time, the survey revealed rapid debt growth throughout the income distribution. For households with income near the median, assets and debt moved up by about the same amount, leaving net worth little changed between 2001 and 2004. However, net worth rose quite a bit for high-income households.

Turning our attention back to aggregate data, the panel to the right indicates that we expect household net worth, scaled by disposable personal income, to rise a tad further before edging down next year with the assumed slowdown in house-price appreciation. Taking account of the lagged response of spending to changes in net worth, this contour implies that wealth effects will make a sizable positive contribution to the growth of real consumer outlays this year and will be roughly a neutral factor in 2006.

Mike Leahy will now continue our presentation.

MR. LEAHY. The top left panel of exhibit 11 presents our outlook for foreign real GDP growth. We forecast total foreign growth to move back up this quarter from a soft first-quarter pace and to rise a bit further going forward. The pickup is modest and reflects our assessment of the balance between some opposing forces. On the one hand, higher oil prices, while supportive for some economies, are expected to damp activity, on balance, for our foreign aggregate, which is weighted by U.S. exports. On the other hand, financial conditions appear to be more uniformly supportive of growth abroad. Many foreign currencies have depreciated against the dollar since the beginning of the year and, as shown on the right, stock prices in emerging-market and industrial economies have moved up since the middle of last year. Emerging-market bond spreads, shown in the bottom left panel, backed up a bit from their lows earlier this year but are still tight by historical standards. And benchmark long-term interest rates abroad have moved substantially lower, as shown by the red line in the bottom right panel.

The widespread decline of long-term rates has been a prominent topic of discussion recently, and many hypotheses have been offered to explain it. I do not propose to resolve that debate. [Laughter] However, the extent to which rates have declined has varied across countries. Why this might be so is the subject of your next exhibit. As shown in the top left panel, the yield on the German government bond was essentially equal to the 10-year Treasury yield in October 2003, a date that falls before any of the central banks discussed on this page began tightening monetary policy. Since then, the bund yield has declined about 120 basis points and is currently just off its record low of 3.10 percent. The yield on the Canadian bond, shown in the next column to the right, has declined nearly as much, at 110 basis points over the 20-month period. These developments contrast with the smaller net decline of 80 basis points in the United Kingdom, and the much smaller net declines of 40 basis points in the United States, and 20 basis points in Japan. The size of the decline may have been more limited in Japan than in the other economies because of the proximity of the zero lower bound on nominal interest rates.

As shown in the middle row of panels, most of the decline in foreign long-term yields appears to be related to a slide in real interest rates. Inflation compensation, as measured by the spread between these nominal and inflation-indexed interest rates, has not changed appreciably on balance for these economies over the past 20 months.

The relative size of these real and nominal yield movements appears to reflect monetary policy actions taken during the period as well as expected future actions. With the exception of Japan, long-term rates have fallen more in economies where tightening has been the least. None of the major foreign central banks has tightened monetary policy as much as the FOMC has over this period. As shown in the first panel of the bottom row, monetary policy in the euro area, where the largest decline in bond yields occurred, has been on hold since June 2003. Market expectations that the ECB might soon raise rates, a view heavily promoted in ECB rhetoric of only a month ago, have all but vanished. In Canada, where bond yields have declined substantially also, the Bank of Canada has lowered policy rates on net since October 2003, but markets appear to expect the tightening that occurred in September and October of last year to resume in future months. In contrast, the Bank of England, the first of these central banks to start tightening, in November 2003, has raised its policy rate 125 basis points over the period, and at this point markets appear to expect that the next move for the Bank will be to lower the policy rate. Nonetheless, long-term rates are down whereas short-term rates are up. Monetary policy at the Bank of Japan (BOJ) has not changed significantly. The BOJ has continued to pursue quantitative easing, and reserve balances stepped up over the period.

The low level of real long-term interest rates in the euro area and Japan should help smooth the way for more robust expansion of activity in those economies. Other financial factors, presented in your next exhibit, should also lend support. Positive equity earnings forecasts, shown at the top left, should help lift stock prices and reduce the cost of equity finance for firms. Forecasts of earnings per share, drawn from surveys of equity analysts in mid-June, put earnings this year above last year's, and forecasts for 2006 show further increases. BBB corporate bond spreads, shown to the right, are relatively low, which implies that corporate bond financing costs have generally followed government yields down. And the recent depreciation of the euro and yen in foreign exchange markets, shown in real effective terms in the middle left panel, should provide some boost to net exports going forward.

Despite these positive financial conditions, higher oil prices, firms' reluctance to invest, and worker concerns about wages, pensions, and employment are restraining growth, especially in the euro area. As shown by the black and blue lines in the middle right panel, confidence in the euro area has taken a beating, with industrial confidence dropping sharply and consumer confidence remaining low. All told, we see euro-area growth, shown in the bottom left panel, slowing some this quarter before eventually edging higher, to about 1¾ percent in the second half of this year and next year. The outlook for Japan, while not much stronger, at least has a slight upward trend, driven by a slow but steady further increase in employment and incomes. As shown at the right, Japanese GDP growth rebounded sharply in the first quarter, led by strong gains in consumption and investment spending. Inventory accumulation also contributed positively. We expect growth this quarter to drop back, as inventories are run down and as consumer and business spending growth moderates.

Your next exhibit examines the potential implications of recent changes in the behavior of Chinese trade. The top left panel shows a 12-month moving sum of China's merchandise trade balance over the past 20 years. In recent months, the Chinese trade surplus has jumped to record levels. As shown on the right, exports have continued to grow along trend, but imports appear to be decelerating. The counterpart of the lower import growth is showing up elsewhere in Asia as a slowing of exports to China. As shown in the middle left panel, the growth of exports to China from Taiwan, Korea, and Japan, three of the region's largest economies and also three of China's top trading partners, has dropped from very rapid rates to near zero. We see two developments that are consistent with this shift. One is that economic activity in China is decelerating. Policy measures adopted a year ago to restrain runaway investment spending, which had increased more than 40 percent over the four-quarter period immediately prior to the implementation of the measures, may be beginning to show through to GDP. Our forecast for growth in China, shown in the middle right, has growth stepping down to 7½ percent by the end of this year, as we regard the double-digit GDP growth rates of the recent past as unsustainable. The other development is that China may be turning inward for some items that it had been importing, including heavy industry items like iron and steel and road vehicles. As shown at the bottom left, exports of road vehicles have ramped up since 2002, and exports of iron and steel rocketed up last year, as capacity to produce steel internally came on line.

As shown in the bottom right panel, China's extraordinary growth does not seem to have triggered broad-based inflation pressures. The consumer price inflation bulge in 2004 came almost entirely from increases in food prices, and they have not persisted.

Your final exhibit presents our outlook for commodity prices and the U.S. external accounts. As shown by the black line in the top left panel, prices of nonfuel primary commodities have increased substantially in the past three years, boosted in part by global growth but lifted also by the depreciation of the dollar, shown at the right. The metals price component of this index (the red line) has registered the largest price gains. Over the next year and a half, primary commodity prices are forecast to change little, as world demand is expected to stay strong and supply response comes on line.

The spot price of oil, shown in the middle left panel, has continued to rise, as has the price implied by futures contracts maturing about six years out, shown by the red line. Increasing doubts about future supply from Russia, Venezuela, Iran, and Iraq have apparently cooled expectations that oil prices will retreat much from their current, elevated levels. Potential supply shortfalls are of particular concern because OPEC has little spare capacity and world oil demand is expected to continue to be strong.

Our outlook for the U.S. current account deficit is shown to the right. The deficit is projected to widen from about \$780 billion in the first quarter of this year to

\$960 billion, or about 7¼ percent of U.S. GDP, by the fourth quarter of 2006. With the dollar projected to depreciate only modestly from its current level, U.S. GDP growth on a par with or above aggregate foreign growth, and oil prices remaining high, the trade balance, shown at the bottom left, deteriorates \$113 billion further over the forecast period. The projected decline in net investment income is almost as large, at \$79 billion. The growing negative contribution of net investment income to the deficit reflects expanded net holdings of U.S. liabilities and an assumed increase in U.S. short-term interest rates.

MR. OLINER. The final chart displays your economic projections for 2005 and 2006. As shown in the top panel, the central tendency of your projections for the growth of real GDP this year came down slightly from the projections in February, while the central tendency of the projected rise in core PCE prices was revised up a bit. The central tendency for the projected unemployment rate in the fourth quarter of this year is now a shade below that in February. For 2006, your central tendencies indicate essentially no change in real GDP growth from this year's anticipated pace, no change in the core PCE inflation rate, and no change in the unemployment rate. If you should decide to update your projections, we request that you submit your revised forecast to Dave Stockton by the close of business tomorrow.

We would now be pleased to take any questions you may have.

CHAIRMAN GREENSPAN. On chart four, suppose we took the lower left chart, "Jobs Hard to Fill," as being representative not only of small business, but literally of the economy as a whole. Wouldn't that, in fact, be the best measure we could possibly get to determine the slack in the system? Wouldn't that be measuring it right at the point where it matters?

MR. WILCOX. I think there would be something to be said for that. As I look at these indicators, I see profiles that look very similar across the six panels, and so—

CHAIRMAN GREENSPAN. Do they ever diverge significantly, as far as the signal they are giving?

MR. WILCOX. Well, our interpretation has been that the labor force participation rate, shown in the upper right panel, has been sending a little different signal from the unemployment rate over the last year or so. That the participation rate—whose sources we understand imperfectly—declined suggests that there is a little more productive capacity remaining or more of

an underutilization of labor resources than one would infer from the upper left panel on the unemployment rate.

CHAIRMAN GREENSPAN. On exhibit 5, in looking at P&C compensation, it's not only that it surged at the end of last year, which we attributed largely to bonuses and the exercise of stock options, but it has surged really since the second quarter of 2004. Since that time the quarterly increases have been 6.0, 5.5, 10.2, and 6.3 percent. How do we interpret that? Do we basically have the same story for those data, or is something else going on?

MR. WILCOX. As I look at the upper right panel, I see two indicators that seem to be swinging around each other. P&C comp per hour had been a little to the soft side of the ECI for a time and then it moved a little to the high side of that. I don't have a particular story for the change in the profile from earlier.

CHAIRMAN GREENSPAN. Mainly it was the second and third quarters of last year that were significantly above expectations and, indeed, quite above the ECI. Yet I don't recall our attributing that to stock option exercise or anything like that.

MR. WILCOX. No.

CHAIRMAN GREENSPAN. I assume it's not just benefits but wages and salaries also.

MR. WILCOX. I think that's correct.

MR. STOCKTON. We didn't think at the time that we needed much special explanation because, as you can see in David's upper right-hand panel, the four-quarter change in comp per hour was still below 5 percent and it only edged a bit above the ECI. So, we didn't really see that as a divergence. As David noted, we went through a period from mid-2001 through mid-2003 where comp per hour was running below the ECI. We were viewing the acceleration that occurred in the P&C measure through the middle of last year as a series being just a bit noisier and running a little

above the earlier pace. It was really when we got to the fourth quarter and had that extraordinary increase—which we do think reflects to some degree the stock option exercises and bonuses—that we thought that story was an important one in explaining the divergence.

CHAIRMAN GREENSPAN. Now we have the April and May data. Roughly, what do they tell us about the second-quarter annual rate?

MR. WILCOX. Well, in a sense, we're carrying two sets of books. And this mystery isn't going to get unwound for quite some time because it won't be until August that the UI [unemployment insurance] data are incorporated for the first quarter, and that will give us the beginnings of a read on whether we were right or not.

CHAIRMAN GREENSPAN. So, essentially, the BEA wage and salary data are merely extrapolations. Indeed, from an economic point of view, they don't really give us new evidence; they are just extrapolating the basic change.

MR. WILCOX. Our understanding is that they've taken down a wedge—to run off some of that—but we think it's going to come down a lot more in the final statistics.

CHAIRMAN GREENSPAN. Yes, but that doesn't tell us anything. That just tells us what they are guessing at.

MR. WILCOX. That's exactly right. I have here the quarterly pattern that we have written down for comp per hour, and I'd be happy to give it to you. It's a little misleading because what we've done is assumed that that runoff is going to happen over the course of 2005.

CHAIRMAN GREENSPAN. You actually have answered my question. You won't have any real new data until August.

MR. WILCOX. That's correct. That's when the UI data will be incorporated for the first quarter.

CHAIRMAN GREENSPAN. Governor Gramlich.

MR. GRAMLICH. Sticker shock question: In the history of the world, has a country ever run a \$1 trillion current account deficit?

MS. JOHNSON. I don't think so. [Laughter]

CHAIRMAN GREENSPAN. Is that your question?

MR. GRAMLICH. Yes. I didn't say it was heavy! [Laughter]

CHAIRMAN GREENSPAN. That's called truly rhetorical. President Hoenig.

MR. HOENIG. I may be asking your question over again, Mr. Chairman, but I'm looking at exhibit 6—at the PCE projections and the explanations for why core PCE is increasing. I guess what you're saying is that these are the reasons why. Then, going back to your discussion of labor costs, there's no discussion of productivity. So, are you more or less dismissing that as a factor in terms of having a follow-through and pushing up core PCE? Are you saying that labor is not that significant a factor? The issue of productivity coming down seems to me to be more relevant than suggested here.

MR. WILCOX. You're correct. In our analysis, these are the key drivers, in terms of the factors that are shaping the contour of—

MR. HOENIG. Not compensation and not the possibility of productivity coming down and being less able to absorb that factor in the future?

MR. WILCOX. No, that's correct. In terms of the factors contributing to the deceleration in core PCE price inflation between 2005 and 2006, what I've shown here—energy prices, import prices, and these other relative prices that I've chosen to proxy by the intermediate materials prices—are taking off somewhere between $\frac{1}{4}$ and $\frac{1}{2}$ percentage point from core PCE inflation, in our estimation. At the same time, we think that some of the past increases that have occurred have

gotten built into the structure of inflation a bit. Whether one labels that “inflation expectations” or “inflation momentum,” it is awfully hard to disentangle. As for productivity, we think that it’s mainly structural productivity that matters for firms’ pricing decisions, not fluctuations in actual quarter-by-quarter productivity. So we have that as essentially a neutral influence on inflation over the projection period. The fact that we tie pricing decisions to structural productivity developments rather than actual productivity may be what is colliding with your intuition.

MR. HOENIG. Part of what leaves me uneasy is that in the Greenbook the last several times we have recognized that PCE inflation has been higher than we thought it would be and we are projecting it to turn back down again. In this sense, there’s a continuation of the view that these things are temporary and that they will back off at some point.

MR. WILCOX. This chart is trying to get at exactly that sort of iterative process of a futures market that, meeting by meeting, ratcheted up its expectation of oil prices, as illustrated in the upper right-hand panel. And yet, meeting by meeting, the futures market—and we along with it—figured that oil prices would level out from that point forward. Sometimes, for our inflation outlook, the absence of a negative is a positive—in the sense that with oil prices not moving up further in our projection, we don’t have that upward impetus.

MS. JOHNSON. The way we handle the oil price is really a technical assumption.

CHAIRMAN GREENSPAN. Futures prices of oil cannot move up at an exceptionally rapid pace and stay significantly beyond the cost of storage and interest because there’s an arbitrage there that will convert the forward demand back to the spot demand. So, if you have a run-up in spot prices, it’s almost never the case that the futures market will be at that same pace. So this type of environment would tend to bias those projections down.

MR. WILCOX. I agree with that, but the profile of oil prices is markedly different now, with an extraordinary skyrocketing of the far-dated futures. One of the most amazing developments over the last—

CHAIRMAN GREENSPAN. I'm really surprised. I mentioned that in a speech recently; the spread between the six-year futures price and the spot price has closed. And no one has picked that up. It's unbelievable.

MR. WILCOX. It's illustrated in Mike Leahy's exhibit 15, on the chart in the middle left panel. There has been a marked change in the relationship between near-dated and far-dated futures.

CHAIRMAN GREENSPAN. I get quoted on everything under the sun that is irrelevant, but that was a really meaningful insight and it got lost! [Laughter] Vice Chair.

VICE CHAIRMAN GEITHNER. Let me just follow this conversation a little further. If I get this right, what is new in the forecast, based on this conversation today, is that you're anticipating a little more persistence in what we view as the underlying rate of the core PCE deflator. And it ends the forecast period higher than we previously expected. Again, that is in the context of a forecast where you're expecting both oil and commodity prices—and import prices, too, I think—not to be a source of negative pressure. They constitute a sort of positive factor on the inflation dynamic. And you're expecting structural productivity growth to stay fairly high. What is interesting, I think, is that you haven't changed your implied path for the fed funds rate significantly. I guess my question is: Why is that? It's not that your growth forecast has come down and is significantly softer. It's not as if you're substantially more pessimistic on the outlook for growth relative to potential. So why wouldn't that view on inflation, if it's right, have induced you to prescribe a slightly higher path?

MR. STOCKTON. In part I'd answer that question by saying that I don't view our funds rate path as a prescription. We are not trying to convey to you what you should do. In our thinking about this, we were confronted with a couple of crosscurrents in the forecast this time around that led us just to leave the funds rate path unchanged. One was that we got higher inflation and higher inflation forecasts, which might have been pushing us up. On the other hand, much of that was a supply-shock kind of effect where we were getting higher oil prices and a stronger dollar, and those factors would have been weakening GDP had we raised the funds rate. So, that confronts you as policymakers with the choice. It's not that we think you ought to pick the funds rate path we wrote down as the baseline forecast. It's a case in which you're confronted with a shock, and that has made the tradeoff less favorable for you, and you're going to have to think about how much of that you would want to take in lower output and how much in higher inflation.

So, you're right, we could have raised the funds rate path. We showed an alternative simulation in which you tightened a bit more aggressively and that brings the inflation rate down to $1\frac{3}{4}$ percentage point at the cost of something on the order of 3 percent GDP growth going forward. That's about all I'd have to say on that.

VICE CHAIRMAN GEITHNER. If I understood the Bluebook discussion of this correctly, in that optimal control exercise, whatever its merits, with your assumption about the symmetrical tolerance or intolerance to deviation from your objectives, still you have the nominal funds rate going to 4 percent with an inflation objective assumption of $1\frac{1}{2}$ percent in that context. And the difference between that view and the view that you put into the Greenbook, which I realize is not a prescription—I'm sorry I used that term—is what explains the difference between those two things?

MR. STOCKTON. I think part of the purpose of putting that in the Bluebook was to suggest that if you in fact view your objective as $1\frac{1}{2}$ percent on core PCE inflation and you want to

react in the way that optimal path suggests, you would need to be tighter than in the baseline assumption in the Greenbook. Those differences are pretty small because while I don't follow that path precisely, I use that as some guidance in thinking about where to set the funds rate path for the Greenbook. Our goal is to put a forecast on the table that would be helpful to you in your discussion.

VICE CHAIRMAN GEITHNER. But are you assuming a higher implicit inflation objective in the way you think about the Greenbook construct?

MR. STOCKTON. You could view that either as a higher inflation objective or, as I'm assuming, more patient monetary policymakers—a case in which you achieve that objective over a longer period of time.

VICE CHAIRMAN GEITHNER. I wanted to ask a different question on the international side. Karen, on the external forecast, how much of a change is this view of where the current account-GDP ratio goes relative to your expectation six months ago or thereabouts? It seems to me that it looks slightly darker.

MS. JOHNSON. I think it's the dollar.

VICE CHAIRMAN GEITHNER. Yes, that's my point. Where do you expect it to stabilize now?

MR. LEAHY. The dollar?

VICE CHAIRMAN GEITHNER. No. What happens to the current account if you project out a little longer than the forecast horizon you have now?

MS. JOHNSON. Sticker shock, sticker shock, and more sticker shock.

VICE CHAIRMAN GEITHNER. I know, but it crosses 8 percent and goes to what?

MR. LEAHY. It depends on how far into the future you want to go. It's an unsustainable path.

MS. JOHNSON. Absent a dollar depreciation that's now probably on the order of 8, 9, or 10 percent, the deficit is going to steadily worsen. If the dollar were to start depreciating, that would slow the rate of deterioration. If the dollar depreciation that we put into the forecast were to get as high as 8 or 9 percent, that might plateau the deficit.

CHAIRMAN GREENSPAN. One thing we can be sure of is that the value of the dollar will be worth 100 cents. [Laughter]

David, do you contemplate that the end-of-month NIPA revisions could alter the intermediate history, which could have an effect on the forecast?

MR. STOCKTON. At this point, obviously, what we don't know dwarfs by several orders of magnitude what we do know. We do know from the Annual Survey of Manufacturers that the M3 data probably overstated the growth rate of capital spending in 2003. That could be a source of downward revision. And the annual retail sales revisions also pointed to a little softer path for consumer spending. I wouldn't want to make a big deal out of those things, simply because there's so much else that we will learn that could completely offset them. But if we had to guess now, we'd expect the changes to be in the direction of a small downward revision on the level of GDP.

CHAIRMAN GREENSPAN. Gross domestic income has started to run well ahead of gross domestic product. Is that something that is likely to be exaggerated or ameliorated? Do you have any notion of that at all?

MR. STOCKTON. If I had to guess, I'd say ameliorated in the sense that in the last couple of quarters when that gap has gotten quite large, it was being driven by the very rapid gains in compensation per hour. Now, another reason for us to think that these increases are probably

reflective of something like stock options is that if you wanted to measure output from the income side, what the income side would be saying is that there must have been an explosion of growth in output over the fourth and first quarters. We just don't see that confirmed by other evidence either in physical product data from industrial production or labor market developments. We see nothing that would suggest that that in fact occurred.

We're expecting that the BEA is still not going to know anything for probably another couple of years in terms of getting income data that would actually allow them to pin this down. But our expectation is that there probably would be some downward revision to corporate profits in 2004 to reflect the fact that some of that involved stock option exercises that have not yet been picked up in corporate reports.

MR WILCOX. Even there, though, the timing within the year is very uncertain. We don't know how they parse it out across the quarters and whether it would line up tightly with the stock option story.

CHAIRMAN GREENSPAN. President Poole.

MR. POOLE. I want to take up the issue of oil sticker shock and particularly the distant futures prices. The revisions over the past 18 months or two years have really been extraordinary—essentially a doubling in the long-term price of oil. My impression is that the market revisions have been driven probably by upward revisions of the impact on oil demand associated with long-term growth in China, and perhaps India as well, and also questions about production capacity in the Middle East. Some of the reserve numbers have been revised down, and that sort of thing. But I haven't seen much discussion about the long-run demand elasticity. You'd think that with this big a price change that would be an issue—and also elasticities of alternative supplies of which I suppose the most important over a horizon of five years would not be nuclear but coal; the latter has

possibilities of significant expansion. What do we know about the longer-run demand elasticities that might start to come into play over the next few years and that might check this upward momentum in the long-run price of oil?

MR. LEAHY. I think we're seeing attempts now in some parts of the Middle East, such as Saudi Arabia, to try to expand capacity for oil. As for these alternative sources, I don't know if we've reached the trigger points yet where expanding their production has become profitable.

MR. POOLE. I understand that with alternatives like shale and that kind of thing. But how about the more conventional alternatives, which I guess would be coal, by and large? There must be expansion opportunities there; it's important for generating electricity.

MR. LEAHY. I'm not sure.

MS. JOHNSON. To the extent that China's electricity system is a source of demand, China has a lot of coal reserves, whereas they have no petroleum reserves. So in principle they could expand their electrical capacity—which is obviously a big part of the infrastructure effort that's going to be necessary for China to keep growing—by using coal.

Most of the thoughts about the long-run picture in this regard relate to the uncertainties imposed by environmental considerations—whether it's refining capacity, expanded use of coal for the generation of electricity, more use of LNG [liquefied natural gas] to spread the natural gas resources of the world in ways more in tune with demand for natural gas, and so forth. All of these things pose fairly substantial environmental hazards or have shortcomings, and they get tied up in the politics of it. Now, we're fairly convinced that in the long run these elasticities are powerful. But the people who trade on these forward curves know at least as much as we do, and they probably know a whole lot more than we do. So we're implicitly saying that we think this is built into that forward curve.

MR. POOLE. What about on the demand side? What do those longer-run elasticities look like?

MS. JOHNSON. One issue is the fact that some of these countries subsidize. That is, the price run-up to date has been passed through only partially to consumer demand in many of the emerging Asia countries. And as a consequence, some of these governments have had a big hit to their budget deficits because of these subsidies.

Now, if you think about 2004 versus 2005, the run-up in oil prices last year proved to be a transitory phenomenon, and I think they believe that that policy worked well. They buffered their populations a bit, and they didn't take the political heat about higher oil prices. And they were right; the oil price came down and all was well. They tried it again this year, and they are now confronting these high futures prices that Mike was emphasizing. So some of them are now relenting and are proposing to pass through into consumer prices, over some staggered path, the price increases that we've seen. I would assume that will have a measurable effect.

MR. POOLE. What would the demand elasticity be in the United States? We passed those through pretty quickly.

MS. JOHNSON. I can't give you an actual number, but I'm sure in the longer run it's minus 1 or something like that. People will say that in the short run it's almost zero. I think even that is an exaggeration. You can always turn down the heat, or whatever. But I think you'd get a reasonable number like minus 1 if you looked over a five-year period.

MR. POOLE. You think it's even as big as minus 1? Over the horizon here, these long-term futures—that's six years out—you'd probably get a good part of that over a six-year horizon, if it's viewed as a permanent—

MS. JOHNSON. We know from past history that the oil intensity of GDP stepped down in the period immediately following the oil price shock event, but it did not continue to improve continuously. That chart is very much like a step-function; most of the gains occurred early on when we first experienced the significant changes in relative oil prices. We also know that there's a lot of difference across countries in oil intensity. Some people conclude that that means we can all be as efficient as the most efficient country, so there's a lot of room to improve. That's a little naive because some of those differences reflect industrial structure and the like. Somebody has to produce the aluminum, right? We can't all save money—save oil and energy—by not producing aluminum. So, some of those differences are more permanent. But some of them involve just a failure to take the steps that others have taken. There's scope there, too. I think there's no better solution to this problem than to let prices show through.

CHAIRMAN GREENSPAN. Governor Ferguson.

MR. FERGUSON. I'll continue to plow that ground just for one minute. I'm struck a bit by the fact that the stories on the run-up in commodity prices and oil prices are all about China and India. You have a forecast here where China's growth falls off fairly dramatically. Growth in the rest of the world I would describe as maybe more of a downside risk. You point out the uncertainty in Europe and Japan and you've even marked down economic growth in the United States. Yet your commodity prices tend to be rather flat. All this run-up was associated with China, India, and global growth. You have global growth dampening, but we don't seem to recover much in the way of these commodity prices—oil being one, but others in general. I'm obviously missing something. What is it?

MR. LEAHY. In part it is the supply response in some of the metals and presumably in food and other—

MR. FERGUSON. You've told me in the past that the supply response in copper tends to take a year or two. The price has not been high enough necessarily, but one would have thought we'd start to see some supply response, getting these prices to come down even more quickly.

MR. LEAHY. These forecasts are based on the futures quotes. There may be some differences in view between our forecast for China compared with what the futures markets are thinking. They might be a bit more upbeat about the outlook for China. But we do have a little downward tilt here, and I think it's consistent with some slowing in China.

MS. JOHNSON. Yes. And remember, what we've done is just decelerate foreign activity; and we've hugely decelerated commodity prices.

MR. FERGUSON. I think that's a fair point.

CHAIRMAN GREENSPAN. Governor Bies.

MS. BIES. Thank you, Mr. Chairman. Steve, I want to ask some questions about your exhibits 8 and 9, having to do with the high-yield debt market. If I put together the middle left panel of exhibit 8 and the middle right panel of exhibit 9, I begin to get worried about whether the market is pricing for risk appropriately. The upper left chart on exhibit 9 shows that defaults jumped in the 2001-2003 period. From your chart, it looks like those bonds were issued in 1997 and 1998, and it appears that that was the last time spreads were so skinny. We're back to skinny spreads now. We've got another bump-up in issuance. And I know banks are easing credit standards. Is the market being too sanguine about the inherent risks in these? If there's something like a three-year cycle, should we expect to see in 2006 another jump in high-yield defaults?

MR. OLINER. Earlier this year, we were really concerned that the market was underpricing risk. If you look at the panel you referred to at the middle left of exhibit 8, when the gap narrowed to its narrowest point there, we really did not understand what had caused that. Our view is that

defaults are going to rise somewhat. You can see our forecast in the black line in the middle left panel of exhibit 8. That's our estimate of the compensation for both defaults and losses due to less-than-full recoveries that would be needed in the current environment. We have that drifting up some; we don't have it rising dramatically. In our view what is different now from, say, the late '90s is that a tremendous amount of balance sheet restructuring has occurred. That has left even high-yield issuers, on net, in a better position with regard to their interest service capabilities and their cash on hand than they were in that earlier period. We see them starting from a very healthy position after a tremendous amount of restructuring and turmoil in that sector. We think it's downhill from here, but not steeply downhill in our judgment. So, we're taking a middle-of-the-road view in expecting things to worsen but not dramatically over the forecast period.

MS. BIES. Thanks.

MR. STOCKTON. Mr. Chairman, could I just correct something that I said earlier? On the revisions to GDP, we have received data that we think will ultimately result in a downward revision to E&S spending, but it's not clear that they actually are going to get incorporated in the annual revision that comes out this year. Evidently the Census schedule currently calls for their revised data to be given to the BEA after the annual revision, so they won't be picked up. That's the biggest of the components of the data that we've gotten toward revised GDP.

CHAIRMAN GREENSPAN. President Minehan.

MS. MINEHAN. I think I'm going to cede my time, Mr. Chairman.

CHAIRMAN GREENSPAN. President Santomero.

MR. SANTOMERO. I found the exhibit 6 discussion on the evolution of the Greenbook forecast interesting and informative. There's one thing that I'm still a bit puzzled by as we look forward from here. The forecast has a gradual deceleration of price increases between this year and

next. At least some of that is a deceleration associated with import prices. I guess the question I have for you is: How confident are we that import price deceleration will give us the kind of inflation moderation that is in the forecast?

MR. LEAHY. Is the question about the import prices or about going from import prices to the inflation measure?

MR. SANTOMERO. The import prices.

MR. LEAHY. Well, our forecast, obviously, is for import prices to decelerate. That's based on forecasts that the dollar will flatten out, roughly, or decline only moderately going forward, and that commodity prices will also be relatively flat. So, to the extent you put a lot of confidence into those forecasts, I think you could transfer that to our outlook for import prices. That's how we do the forecasts.

MR. SANTOMERO. Okay. Let me put it more pointedly. Do you put much trust in those? I can do the arithmetic, but do we believe it?

MR. LEAHY. I think forecasting asset prices has a high standard error around it; it's not a very precise art.

MR. SANTOMERO. This is really an extension of the first point that President Geithner made—that the context in which we're making these policy decisions is a framework based on a forecast of inflation. To the extent that we're getting this—I'll call it exogenous—decline in the inflation pressures associated with imports, that says something about the optimal strategy from a monetary policy point of view. On the other hand, to the extent that that's an assumption in which we have little confidence, the implication is that we may find ourselves back at exhibit 6 again. We would be ratcheting up our expectation of inflation because what was supposed to reduce it—namely, the reduction in inflation of import prices—didn't materialize.

MR. WILCOX. But the risk that you are pointing to, President Santomero, is illustrated in the middle right panel. That shows the step-up from the trajectory in the December 2003 Greenbook (the dotted blue line) to the December 2004 Greenbook (the dotted red line). Now, as it happens, the revision to the outlook since December 2004 is a little to the favorable side in terms of U.S. inflation performance, as shown by the downshift from the dotted red line to the dashed black line. So there is risk. I think Mike's point is that we think we have the risks reasonably balanced. The risks are two-sided. So we could be coming back to you with an exhibit 6 that would have a figure in the lower left that was revised down or revised up from the 0.4 of a percentage point. It's not a one-way risk; that's the point.

MS. JOHNSON. The dollar could well continue up. Much of this more favorable outlook owes to the fact that the dollar, on balance, has risen rather significantly over the course of 2005; and indeed it has risen rather significantly over the past six weeks. In looking at the global economy and listening to the chatter out there, I think there's no reason that one could ever say with confidence over a horizon of one year—or even two or three years—that we know the dollar will be lower at that future point than it is today. We don't know that. We know that probably a lot of things that are consequences of the dollar continuing to rise will lead to some buildup of pressures to eventually stop that rise. But over the kind of horizon we deal with in the Greenbook, we have learned the hard way that the random walk is the best attitude to have.

CHAIRMAN GREENSPAN. President Fisher.

MR. FISHER. I just have a quick question, going back to the oil issue. There are some 770,000 outstanding futures contracts on the NYMEX. If you look at the CFTC [Commodity Futures Trading Commission] data, 11 percent of those are noncommercial players—what they call Wall Street and city refiners. To the extent that the staff measures that as an influence, I'm curious

as to what percentage of the spot price or of futures prices do you consider to be weighted by the nonfinancial players? Are they a driving force or are they inconsequential?

MR. LEAHY. Well, we've certainly been hearing a lot about so-called speculative players in the market. With respect to oil markets, inventories actually have been trending up a bit even as prices are going up. So, there's some kind of speculative activity going on currently, it would appear. But as for parsing out exactly how much reflects the traders on the exchange, I don't know.

CHAIRMAN GREENSPAN. We do, obviously, have the data weekly on the net positions of noncommercial parties. And they are effectively a claim against the inventories, which by definition are held only by commercial parties. My recollection is, however, that the information has not been terribly useful in projecting prices. There doesn't seem to be a systematic component in the crude price pattern that is mirrored in those data. I think these are largely hedge funds and the like, and they basically follow trends. Even though they're not all that small in terms of the contribution to the overall demand and supply contracts, it's hard to use them as you indicated. We've tried.

MR. FISHER. I was just curious about whether we know or feel that they can exacerbate trends in a direction.

CHAIRMAN GREENSPAN. Yes, they probably do. But the explanatory part of the price moves owing to that particular set of data is less than significant—or at least we haven't been able to infer any significance.

MR. FISHER. Thank you, Mr. Chairman.

CHAIRMAN GREENSPAN. Who would like to start the Committee discussion?
President Moskow.

MR. MOSKOW. Thank you, Mr. Chairman. In recent weeks we've heard a wide variety of views about business conditions in the Seventh District. Most sectors have good news as well as some bad news but, overall, conditions are positive and seem consistent with an economy growing near trend. Evidently, accommodative policy is offsetting the drags from energy and the international sector.

Within manufacturing, heavy equipment producers continue to report strong sales growth. For example, all 21 of Caterpillar's business units are above plan. This year some of their product lines have sold out for 2006, and they have begun taking orders for 2007. In contrast, one of our directors who is the CEO of a large diversified manufacturing company reports a surprisingly sharp slowdown in orders, although he concedes that business had been growing at an unsustainably high rate. The Chicago Purchasing Managers' Index, which will be released today, edged down from 54.1 in May to 53.6 in June.

In retail, apparel sales are generally strong and mall traffic seems good, but a retailer in home furnishings reported a marked slowdown in sales during the past six to eight weeks. In motor vehicles, GM noted strong sales in response to its new marketing program. GM and Ford both continue to forecast light vehicle sales of about 16.8 million units in 2005—the consensus forecast from our recent auto outlook symposium had similar numbers for 2005—and they expect sales to remain near this pace in 2006.

Labor markets continue to improve. Temporary-help firms report that growth is moderate, not spectacular. They say demand is soft for low-skilled workers, but it is stronger for professional, technical, and clerical workers. And average temp wage and benefit increases have held steady in recent weeks.

The news on the price front is similar to what we've seen in the last few meetings, with increases for plastics, rubber, and heavy machinery—and, of course, energy. Integrated steel producers are burdened by high coke and iron ore prices. In contrast, steel scrap prices have fallen 35 percent from their peak in November of last year, which reduced the costs for the mini mills.

Turning to the national outlook, since our last meeting we've learned that the soft patch was temporary, as many of us expected. Furthermore, the core inflation numbers improved but energy prices moved up even further, as we've just been discussing.

Looking forward, our outlook is very similar to the forecast in the Greenbook, with growth slowing in the current quarter but picking up somewhat in the second half of the year. On balance, we project that GDP will increase at a rate near 3½ percent both this year and next. The story underlying this forecast is a familiar one. Accommodative monetary policy and the trend in underlying productivity appear sufficient to offset the current drag from higher energy prices.

On the inflation front, we don't see broad-based resource constraints pushing up prices. The pass-through of cost pressures to consumer prices has been modest. In fact, Mr. Chairman, after you left our board meeting two weeks ago, my directors gave me a hard time regarding the suggestion that businesses had any pricing power at all. In addition, inflation expectations remain contained, even with the most recent increase in energy prices. So we see core PCE price inflation peaking at 2 percent this year and edging off a touch next year.

Of course, we should not be too sanguine. It would be unfortunate if underlying core inflation drifted above 2 percent, and there is some risk of that happening. Resource slack has narrowed, as Dave Wilcox pointed out earlier. And given our uncertainty as to the true level of potential output, we may already have closed most meaningful resource gaps. With oil prices reaching \$60 a barrel, we have to be very careful that inflation expectations do not increase. This

could happen if we are perceived to be improperly monetizing the higher oil prices. Therefore, it will be important for us to continue to remove policy accommodation in order to contain inflationary pressures and inflationary expectations.

So at this meeting, we should increase rates by 25 basis points. For the remainder of 2005, we may need to increase rates more than currently expected by the futures markets. I agree with the view expressed by some people during the chart show: Risk management suggests that a path with higher interest rates would be a better course for our policy than the one outlined in the futures market. And given the risks to the inflation outlook, a flat federal funds rate of 3¾ percent throughout 2006, as the markets expect, is simply too low.

CHAIRMAN GREENSPAN. President Santomero.

MR. SANTOMERO. Thank you, Mr. Chairman. Economic conditions in the Third District softened somewhat in late spring, but this appears to be temporary and our business contacts continue to expect gains in line with recent trends. Retail sales fell in May. For many area retailers, this was attributed to cold and rainy weather in the early spring, and early reports in June suggest that sales have picked up with the return of warm weather. The outlook for auto sales, however, remains subdued. Earlier in the year, dealers had been optimistic that auto sales would improve. Now they expect fewer sales this year than last.

Manufacturing activity in the District also weakened in June. After showing a sizable rebound in April, the index of general activity weakened in May and turned negative—with a reading of minus 2.2—in June, which is consistent with flat manufacturing activity. The indexes on new orders and shipments remained in positive territory, and our respondents did not expect this lull to last. They generally expected activity in employment to pick up over the next six months.

As part of the Board staff's survey, we polled the District's business contacts, including those in manufacturing, retailing, and services, on their plans for capital spending over the next 6 to 12 months. About half of our firms reported that they planned to maintain capital spending at current levels. Plans for increased spending were more prevalent among nonmanufacturers than manufacturers, while planned reductions were scattered across both types of firms.

Activity in other sectors of the region continued to expand in the intermeeting period. The downward trend in nonresidential construction appears to have bottomed out, and commercial real estate leasing activity has been rising. There have been six consecutive quarters of positive absorption. The pace of home sales has risen since the winter and was about steady during May, at a very strong pace. House-price appreciation continues to be strong.

Regional employment continues to grow, although not as strongly as in the first quarter. Employment rose in each of our three states for the first two months of the second quarter. The three-state unemployment rate declined from 4.8 percent in the first quarter to 4.5 percent in April and May. Business contacts continue to report that it is difficult to find employees to fill openings. One of our contacts says the labor shortage in southern New Jersey has reached crisis proportions. One pharmaceutical firm in the District is bringing in workers from its plant in Seattle, while a large energy company in our District is trying to attract skilled labor from as far away as Alabama. Other companies report that it's taking much longer to hire people than was true a year ago.

Price pressures in the District continue to build but at a slower pace than earlier this year. The current and future price indexes in our manufacturing survey moderated in June, but remained at relatively high levels. A special manufacturing survey question in May revealed that nearly half of our participants had raised prices of their product lines since the beginning of the year, and about 40 percent said they expect further increases this year. Retailers report that, while wholesale prices

of the goods they are purchasing have been roughly steady, fuel surcharges are common on goods shipped to them.

In summary, economic conditions in the Third District softened a bit in the late spring, but indications suggest that this is temporary. Regional business contacts remain upbeat and generally expect an improvement in the region's economy in the months ahead.

My assessment of the economic conditions in the nation is similar to what it was last month. The expansion continues with the fits and starts one expects to see as the economy approaches a sustainable growth rate and full employment. The revised data suggest that there was not much, if any, soft spot in the first quarter. While some of the recent monthly data have been on the soft side—for example, May employment growth and retail sales—these follow months where the data were on the high side. Payroll employment has averaged 180,000 per month this year, consistent with our forecast. Although the second quarter is likely to be softer than the first quarter, averaging through the monthly volatility shows an economy that is growing near its potential and is close to full employment.

Higher oil prices will likely have some dampening effect on economic activity and put some upward pressure on inflation, but the effects need not be strong enough to divert the expansion. The economy has proved quite resilient as the price of oil increased from \$30 a barrel at the beginning of 2003 to over \$60 a barrel more recently.

I'd like to compliment the Board and Reserve Bank staff on the housing price discussion. I found myself somewhat comforted by the analysis showing rather benign effects, at least at a macroeconomic level, from the potential drop in real estate values. And I also wanted to compliment the staff on the analysis of the behavior of long-term interest rates. It was useful to

review the various potential explanations for the decline in long rates as short rates have risen and to think about their different implications for monetary policy.

That said, I find the arguments that lower long rates might be signaling a persistent economic slowdown unconvincing. None of the forecasters we poll is predicting such a scenario. For example, our most recent survey of professional forecasters suggests sustained output growth over its forecast period. I find the explanation that focuses on an increase in demand for long-term debt relative to supply more interesting. But as the staff points out, the reason for the outsized demand would be relevant, as would information concerning its expected persistence. The implication for monetary policy would presumably depend on the source of the demand and its perceived persistence.

Putting the pieces together, our forecast is similar to that in the Greenbook. We both see the economy expanding at near potential and closing in on full employment. The major difference is that the Greenbook projects a decline in core inflation between this year and next, while we are projecting a rise in core inflation; hence, my question earlier. We think there is less slack in the labor market, so we expect growth in hourly compensation to run above productivity gains and to accelerate modestly in 2006, leading to a modest rise in unit labor costs. This rise in unit labor costs translates into a slowly increasing core inflation rate. We also anticipate some depreciation of the dollar, which will cause a modest rise in import prices, and we anticipate some pass-through from the energy price increases into core inflation. I believe inflation will remain well contained over the period, provided we remain focused on our goal of price stability.

Consistent with all of that, our forecast incorporates a steeper path for the fed funds rate than does the Greenbook. Given my assessment of economic conditions and the forecast, I believe it's prudent to take another measured step in removing policy accommodation. As we discussed at our

last meeting, it seems likely that we will continue to raise rates until we actually come to what we perceive to be the end. Given the underlying strength of the economy, the potential for increased inflation, and the fact that policy remains accommodative, I do not think we're at the end of the tightening cycle.

Regarding the language, I'll leave the specifics to the policy discussion. But our discussions last month persuaded me that we have sufficient flexibility with the current language and that the time to make significant changes may be when we pause and feel uncertain about the future direction of policy or when we think a significant change in policy is required. Thank you, Mr. Chairman.

CHAIRMAN GREENSPAN. President Guynn.

MR. GUYNN. Thank you, Mr. Chairman. Anecdotal reports from our regional contacts and the most recent data releases suggest that business conditions in the Southeast have remained positive since our last meeting. Florida, as has been the case for some time, has been dominant in terms of both employment growth and the pace of economic activity, given the strength in sectors such as tourism and housing.

Coincident indicators, like personal income and state tax revenues, suggest that our District's growth over the past several months has averaged about 3 percent, with major contributions coming not only from Florida but also from Alabama and, to a lesser extent, Georgia and Mississippi.

District employment growth has been averaging roughly 35,000 per month until the disappointing report of only 3,000 new jobs in May. Our regional unemployment rate has been running about 0.2 percentage point below the national average. However, absent Florida, the rest of the District underperformed the nation as a whole.

The apparent slowing in employment growth was a concern in terms of the regional outlook, although I would say that recent anecdotal reports on hiring are more encouraging than the official data. It seems to me that the key question from a policy perspective is whether there are signs of regional imbalances on either the price or the real side that might shed light on the national picture and on the broader risk to either growth or inflation.

With respect to growth, the capital spending survey suggests that planned investment spending in our District remains solid. And the motivations for this are now more rooted in the expectation of increased sales rather than the need to cut costs, improve productivity, or to replace obsolete technology. Having said that, let me note that we received some interesting and sobering anecdotal comments from our directors. One director from the paper pulp and forest industry expressed concerns, perhaps selfish concerns, about the overexpansion for certain manufactured building supplies. He indicated, for example, that production capacity for building products such as gypsum wall board, concrete, and manufactured lumber was on a pace to expand 30 to 35 percent worldwide over the next three years. In the specific case of one product that is dear to his heart, oriented strand board, he said that the increase looks more like 40 percent. He characterized the industry's very aggressive investment spending plans as preparing to, and I quote, "jump off the cliff yet again." [Laughter]

Our reports indicate that investment spending has also increased in the air cargo freight area, driven by international demand. Our bankers tell us that commercial and industrial lending remains highly competitive, with a resulting narrowing of spreads, although credit quality continues to be good. Our director from the forest product sector noted a continued softening in paper box demand, which he has found to track nondurables very closely.

Finally, there is the housing situation, which we talked about for a long time yesterday afternoon. As I've been reporting for several meetings, some of our markets, especially those in coastal areas of South Florida and the Florida panhandle, are experiencing a level of building activity and price increases that are clearly, in my view, unsustainable. Nearly every major Florida city now has experienced increases in the double-digit range, and some, like Miami, Palm Beach, Sarasota, and West Palm, have been reporting increases in housing prices on a year-over-year basis of between 25 and 30 percent. While our discussion yesterday did not seem to indicate a consensus on a national housing bubble, based on past experience I'm reasonably comfortable characterizing the housing feeding frenzy in some of our markets as being a bubble or a near bubble.

For example, the number of major projects planned or under construction in Miami now totals 114, most of which are high-rise developments. That includes 61,000 condo units—eight times the number that were built in the last decade—and a total of 100,000 new parking spaces. I know we don't have any process for introducing exhibits into the record, but I'd like to pass Dave Stockton this pictorial of the new projects in Miami, so that he can continue to worry a little bit along with me. [Laughter]

My supervision and regulation staff thinks this is an accident waiting to happen in our area. And while the local market excesses probably do not represent systemic national risk, the shakeouts could have serious regional consequences. My bank supervision staff points out that housing-related credit risks to our bank lenders are not so much from defaults on permanent mortgage financing that we talked about yesterday, but rather from lending for land acquisition, development, and construction.

The ugly picture we have seen before—and that they think we may very likely see again before long—goes something like this: the drying up of sales of new units; the painful decision of

developers to go ahead and complete the construction of additional units to make them saleable, further depressing the market; and speculators who had hoped to see big capital gains walking away or defaulting on their contracts, giving their properties back to the lender. Perhaps it's because of where I sit, but I am less comforted than some of my colleagues about the housing situation.

As for the national economy, my view is that real GDP growth is most likely to remain on its recent path, averaging around 3½ percent, which we judge to be very close to trend. Consumer spending seems to continue to be roughly in line with GDP growth, confidence has rebounded, investment spending is still supportive, and manufacturing has seemed a bit brighter in recent data reports. I would characterize employment growth as better than the “improving gradually” language would suggest, and I think it should be sufficient to at least keep the unemployment rate around current levels or perhaps nudge it even lower.

I am less sure about the prospects for underlying inflation. But given the amount of policy accommodation that remains in place, and that will remain in place even if we raise our target rate another 25 basis points today, I believe the inflation risks are now on the upside. While the most recent monthly inflation numbers dipped a bit, the overall path for the last year has clearly been up. And the Greenbook forecast and other forecasts of inflation have been raised for the remainder of this year and into next year. Until further evidence is available, there is the risk of putting too much weight on the high-frequency numbers, such as the May PPI and CPI releases, and losing sight of the longer-run inflation path.

Even more important than this, however, is the presence of the longer-term imbalances that we've talked about, which increase the risk to the economy. Most of these are largely beyond our control. I have in mind here not only the fiscal deficit and the trade situation, but also the continued

troubles in our domestic auto industry and, of course, problems in the airline industry. Both of these latter problem areas may have undesirable spillover effects to financial markets.

It also looks as if higher energy prices are here for a while, and this is reflected in futures prices. Higher energy costs will clearly squeeze energy-dependent businesses first, but I think we'll also have uncertain trickle-down effects that can't be good for other industries.

I've already expressed my concerns about the unstable path of housing in at least some important local markets. I believe that the least risky policy strategy through these unusual times is to set monetary policy so that it does not contribute to unsustainable activities. Therefore, I believe that continuing on our recent policy path for the next few meetings would be the best course of action. Thank you, Mr. Chairman.

CHAIRMAN GREENSPAN. Let's take a break for coffee. But owing to what must have been a record question period after the chart show, we're running a little behind schedule, so let's return quickly.

[Coffee break]

CHAIRMAN GREENSPAN. President Hoenig.

MR. HOENIG. Thank you, Mr. Chairman. First of all, our view regarding the national economy is basically similar to others I have heard here. We agree with the consensus of GDP growth running about 3½ percent, slightly over our potential rate. And we see that going forward through the rest of this year and into next year.

I also would say that the anecdotal evidence coming from our region is very consistent with this above-trend growth rate. Consumer spending continues to grow solidly, with retailers reporting that sales were generally above plan and higher than a year ago through the first and second

quarters. Tourism continues to expand briskly, boosting occupancy rates at hotels and resorts in our region. And energy activity remains high.

One of the interesting anecdotes arose during a recent visit I made to the Cessna plant in Wichita, which is booming right now. They have back orders for their jets—general aviation aircraft—running well into 2007, with prices running from a mere \$2½ million to a little better than \$20 million for their Citation 10, which flies at 0.8 mach. And the demand is incredible. So the general economic environment reflected in these parts of our region really is consistent with a strong growth rate going forward.

On the national inflation outlook, I understand the arguments given today for why inflation should continue to ease off. For that to occur, it is critical in my view that we continue to move policy out of its current accommodative stance. If we don't, I think we are stimulating demand—I think it's reflected in some of the other comments here and in some of the anecdotes that I've pointed out—and I think we will have future upward adjustments in inflation as we move forward. So I think it is critical that we get ourselves closer to that neutral zone that we talk about, which no one can pinpoint with certainty but which is probably somewhere between 3½ and 4½ percent. I'll leave it at that.

CHAIRMAN GREENSPAN. President Minehan.

MS. MINEHAN. Thank you, Mr. Chairman. New England continues to expand but probably more slowly than the nation. At our last meeting, I spoke of a couple of bumps along the road to a stronger regional economy. Those bumps remain—in particular, rising concerns about slow job growth, rapidly growing input costs, the strength of demand, and the availability of skilled labor.

Moreover, with the base realignment and closure (BRAC) proposals by the Pentagon now public, there are clear challenges to be faced in both Connecticut and Maine, which together bear about half of the related job losses for the whole nation. While there will be extensive efforts in Washington by New England legislators to modify the BRAC results through the work of the BRAC Commission, judging by the outcome of the last four rounds of base closures, little will change. This will be particularly difficult for Maine, with its smaller and less differentiated economy. And I expect the news of the MBNA/Bank of America merger won't go over well in Maine either. So it's not hard to see why the general tone in New England seems a bit on the soft side.

Employment in our District is growing but at a slower pace in May than in the three previous months. Unemployment has edged up, and most other indicators of economic health show only modest growth. Indeed, business confidence has trended down sharply, and commercial real estate markets remain sluggish across the region.

Regional manufacturers—those contacted for the Beige Book, those who sit on our New England Advisory Council, or those who participate in our economic forums—are for the most part experiencing rising demand and volume growth. But they view increases in costs as a particular impediment. They see the costs of raw materials of all sorts, including energy and transport, as problems. And they believe passing on such costs is difficult, except when they have unique or technologically advanced products. Many talked about margin pressures and, as compared to the last several meetings, fewer talked about pricing power. Perhaps this is because energy surcharges already have been implemented and accepted but other pricing changes are proving more difficult. Health care costs are a concern as well. And the rising costs—or unavailability of—necessary skilled labor are issues.

To end the regional discussion on a little more positive note, there are industries that are clearly doing well. As a generic category, the leisure and hospitality industry is growing. Tourism is solid and hotel margins are good. Retailers are more optimistic as well, though the wet weather in May dampened sales [laughter] and caused inventory levels to rise. Many software companies are facing good demand for their products, and business service firms say that job markets are tightening, especially for technology workers.

And I'd have to say that in my 11 years of reading the notes on Beige Book discussions, I've never seen a description of the business outlook quite like the one I read in our recent notes, which was, I quote, "Crazy, busting at the seams." That was the case for one very large regional producer of aircraft integrated systems. For this company, demand from the airlines for retrofits and for fuel management and diagnostic systems has taken off, literally. [Laughter] So, not everything is growing slowly in New England.

Turning to the national scene, there is clear evidence that the economic softening we noted at the last meeting has reversed course, at least partially. The so-called soft patch in the first quarter is in the process of being revised away with the changes to net exports and inventory levels. And while the second quarter will suffer some from the unwinding of auto inventories, there does seem to be a solid pattern of underlying growth.

Looking further ahead, there is very little difference between our forecast in Boston and that in the Greenbook. Through late '05 and into '06, we continue to see an evolving handoff from policy-stimulated, consumer-led growth to a solid pace of underlying demand led by increased business spending that is being driven by relatively sound fundamentals. Incoming data, while bumpy, continued to suggest that this evolution will occur.

We, like the Greenbook, see four-quarter growth rates in both 2005 and 2006 in the mid-threes, unemployment close to the staff's estimate of full employment, and both core CPI and core PCE edging downward. This isn't terribly different from our outlook at the previous meeting. But while some aspects of the earlier soft patch have gone away, new or perhaps more sharply drawn risks have emerged. In particular, oil prices continue to surprise on the upside. This could both dampen growth and contribute more to inflation than we currently expect. The baseline forecast sees inflation moderating over the next year and a half, but that assumes that oil prices flatten and don't continue their upward climb.

By the end of the forecast period, some slack remains, but there are risks on the upside that resource pressures could occur sooner. Indeed, some compensation measures may be hinting at this, and slowing productivity could also contribute. Risks exist on the downside as well, in particular that the drag of higher energy prices will slow worldwide growth even further, working to create greater slack here in the United States.

The other major area of risk, as I see it, involves a wide array of asset and financial variables. We've discussed whether there is a housing bubble or just symptoms of froth in some markets. While much of the rise in house prices can be explained by rising incomes and demographics, low interest rates clearly have been a contributing factor. They have also contributed to what most market practitioners view as a sense of reaching for risk in markets and to relatively narrow credit spreads. The complications of some of the newer, more intricate, and untested credit default instruments caused a bit of market turmoil recently. This was far from a systemic event, but it does I think illustrate the fact that nasty surprises can occur when markets overdo.

I found the papers prepared by Vincent and his colleagues on the conundrum of low 10-year Treasury yields very interesting and very helpful. I happen to fall into the camp of those who put

more credence in the low 10-year yield as a signal of increased financial ease rather than potential economic weakness. But the case for both interpretations I thought was well made.

For both these major risks—rising oil prices and excesses in asset and financial markets—there are possible downside effects on growth and upside effects on inflation and market volatility. So how should policy react? Or, more pointedly, when should we pause from our “measured pace” to assess where things are?

Given the Greenbook forecast and reasonable assumptions about remaining slack, one could look at the downside risks and say that a pause should occur sooner rather than later. But one could also look at the upside risks and decide a pause should come at a later point. Frankly, I think the latter course is less costly. That is, if we err on the side of tighter policy, easing can be done quickly if it’s necessary—and at little relative cost. Higher rates, if approached sensibly and cautiously, will help to wring out of the system some excesses and protect against unexpected surges in inflation. If we stay too accommodative for too long, then the price of correction in terms of economic growth may well be higher.

But, really, pausing is not the question for today. I think our best course of action should be to repeat what we’ve done over the last several meetings and move the funds rate up. I know we’ll have more to say later about the language in the statement, but for now let me emphasize once again that I think saying what we did and why we did it should be enough. I know there will be no desire to change the statement in any fundamental way until we take a pause or decide to move faster. That may be wise, and it has worked pretty well so far. But I continue to believe that there is a risk in continuing to imply that we know more than we do about what the future course of policy will need to be.

CHAIRMAN GREENSPAN. President Fisher.

MR. FISHER. First, let me say that I'll eschew any and all sports analogies in my presentation and give it to you more or less straight up.

The oddity about our District is that we have almost no banks but we have enormous producers for the economy. For example—and I'm prefacing my remarks this way for a purpose—together with the maquiladoras in Mexico we have two million manufacturing workers. We have two of the largest airline companies. We have some of the largest railroads. We have Dell, Texas Instruments, EDS, and so on. And I have assiduously been calling around and talking to the CEOs of those companies in order to get a feel not only about developments in our District but also in the national economy. And this is my report to you.

First of all, Mr. Chairman, our District lagged the nation in recovery and really didn't come out of the recession until 2003. We are now growing on pace with the national economy, at a rate of around 3½ percent plus. That's the good news.

On the price front, obviously, there have been increases in the price of oil—and we do have some major oil companies and oil producers. But other than in oil, oil field workers' wages, prices of ranch land that may have mineral rights, and in health care, we see no evidence of the price pressures and pricing power that we've talked about before.

I've taken some liberties, and with my colleague's permission I've talked to a neighbor to the north who is an officer of the nation's largest retailer—Wal-Mart. The COO, whom I used to advise in my previous capacity, and I had a conversation two days ago and I was struck by his statement that “We've been surprised at the lack of inflation across the store.” It's a rather large store, I might add. He indicated that the dynamics of the world economy are exerting downward price pressures, still to this day—deflating prices in electronics, clothing, and almost all retail sectors. There is one exception, which is a 4.6 percent price increase in diapers. But other than that,

my contact noted that they were having trouble making any price moves other than in a flat to down direction.

This was confirmed by the CEO of Penney's. It's a different price point. They have about a 46 percent overlap with Wal-Mart. But in household furnishings and apparel—again, there are concerns driven by Chinese production levels—they are trying to make up in volume for what they see as continued downward pressure on prices. This is despite the existence of quotas in certain areas. And, in fact, my contact pointed out that they are forecasting that such pressure will continue for several years to come.

In terms of residential construction, as I mentioned yesterday, I talked to someone at one of the nation's largest homebuilders—a builder of 20,000 homes who has about \$6 billion a year in revenue. Interestingly, with construction costs—the cost of materials: plumbing, furnishings, and fixtures—there is continued price deflation. Again, that is based on imports coming into the United States. The two areas where they do see constant prices—cement and lumber—Mr. Chairman, are largely due to trade restrictions; lumber sales from Canada and cement sales from Mexico are being restricted by trading arrangements.

The largest paper product company, Kimberly-Clark, is in our District. Interestingly, its CEO reported only one product line where they feel the ability to pass on costs based on energy prices, which again was the diaper market. That has been the subject of quite a lot of discussion in our District! [Laughter] The story is different for prices of paper-based hospital products, which constitute a growing market because of linens being unsanitary. They have a labor component; and because of the labor component from China, the Philippines, Estonia, and elsewhere, there is continued price deflation.

Our contacts in the chemical industry, which is substantial in our District, report that they cannot pass on price increases and have no pricing power. In the IT [information technology] sector, our sources at Dell, TI, and EDS say that hardware and telecom costs continue downward. And India has begun to exert an effect that is keeping a price ceiling on software costs. As for the shippers, I spoke with CEOs of three shippers—one again a former client in another District—and they report that they see growth “a tad bit slower.” They are constrained by competition from DHL and the U.S. Postal Service and by their inability to pass on cost increases other than standard fuel surcharges.

The CEO of the largest railroad in our area reports soft patches in the economy. He noted particularly that growth in shipments for trans-Pacific trade has slowed to the high single digits from significant double digits. Most notably, by the way, this is occurring in steel where prices have come off dramatically.

Most interesting of all were the discussions we’ve had with shippers. I previously served on a Norwegian shipping board—got off at just the right time—but have used those contacts to get a better understanding of the shipping industry. And I think here are some interesting data: Other than the category of LNG tankers, which was covered by the *Financial Times* adequately this morning, the Baltic Dry Index, for example, has been dropping dramatically. In fact, the cost of shipping at one point, as you remember, exceeded the cost of goods shipped. Last year, it cost \$100,000 a day to charter a ship to carry iron ore for the manufacture of steel—as we saw in the charts—from either Brazil or India to China. Now the cost is \$31,000.

But here is the clincher. China has entered the shipbuilding business in a dramatic way. It currently accounts for 14 percent of the shipbuilding market; 40 percent is produced by Korea and 32 percent by Japan. China will double its shipbuilding capacity in the next five years, and the data

show that an additional 60 percent of the existing container fleet and 27 percent of the existing tanker fleet will come on stream in the next three to four years. Needless to say, there is no pricing power in shipping.

So in summary, Mr. Chairman, while the Eleventh District has caught up with the nation, soundings in our District and nationally indicate no pricing power. And I detect a slight, but noticeable, shift among the people we speak with toward concerns about slower growth and away from concerns about inflation. Thank you.

CHAIRMAN GREENSPAN. President Pianalto.

MS. PIANALTO. Thank you, Mr. Chairman. Business activity in the Fourth District has not changed very much during the intermeeting period. Business conditions in the region are okay, but not great. Many of the business contacts I talked to report that their business is better in other parts of the country than in our District.

Recent credit downgrades of debt issued by GM, Ford, and some of their suppliers have received a lot of attention in the District. Longer term, companies in the automobile supply chain are bracing for consolidation, as Ford, Daimler-Chrysler, and GM grapple with their cost structures. My District, though, has a number of Honda and Toyota plants and suppliers to those plants. So the longer-term adjustments in the District are not likely to be quite as severe as in other parts of the Midwest. Nevertheless, the Fourth District companies that sell to the automobile supply chain are not optimistic about the sales and profitability outlook for that sector. One banker I talked to confirmed that his customers in the automotive supply chain have become very cautious about their investment spending recently.

At the time of our last meeting, my greatest concern was that the pace of real economic activity might slow and that the pace of core inflation might pick up. As it turns out, economic

growth has held up fairly well and inflation has held fairly steady. Nevertheless, I'm not feeling any more confident or certain about the outlook—especially the outlook for inflation—than I was in May.

I approached this meeting thinking about inflation in the same way that David Wilcox did in his presentation. The Greenbook baseline projection for core PCE is close to 2 percent for nearly all of this year and next year and only very slowly returns to my preferred rate of 1½ percent. And I find this long time frame to be discouraging. Even more discouraging is the prospect that inflation could very well turn out to be greater than that baseline projection.

As David pointed out in his exhibit 6, in early 2004 the Greenbook baseline projection called for core PCE to increase over the four quarters of 2005 at a rate of 1 percent. By the end of last year, that was moved up to 1½ percent. Then over the past six months of this year it has been moved up another ½ percentage point to 2 percent. I'm not repeating these numbers to cast aspersions on the staff projections because, after all, when they were made I thought those were very reasonable projections and I agreed with them. As a group, we reported to Congress in February that our central tendency projection for core PCE was 1½ percent to 1¾ percent this year and the same for next year. And, as Steve pointed out this morning, in our preliminary numbers, the projection for core PCE has been moved up to 1¾ to 2 percent for this year and next.

I know that I have consistently underestimated inflation. And now we're facing oil prices of close to \$60 per barrel and there is a risk, I believe, that unit labor costs could trend up. Assuming that the real side of the economy does hold up, the potential inflationary consequences of these developments give me second thoughts about pausing too soon in our removal of policy accommodation. But I'll hold my comments on policy for later on in the meeting. Thank you, Mr. Chairman.

CHAIRMAN GREENSPAN. President Stern.

MR. STERN. Thank you, Mr. Chairman. Anecdotes from our directors and others, incoming data on the regional and national economies, and the results from running our forecasting models all appear to me to be consistent with real GDP growth of 3 percent or more. Personally, like many others, I expect growth of around 3½ percent—the kind of expansion we have been experiencing.

I've been struck most recently, as I reviewed the latest anecdotes and the incoming evidence on the economy, by the breadth of the positive reports, though of course much of what we have been seeing is a continuation of what has been going on for some time. So I'll just cover the positive things very, very quickly: sustained strength in home prices, sales, and residential construction activity; incipient improvement in nonresidential construction activity; expansion in manufacturing in the aggregate; moderate gains in employment; continuing increases in consumer spending; and a positive situation with regard to capital spending.

As Sandy Pianalto just noted, there are parts of our economy—what I guess I would call “old industrial America”—such as domestically owned automobile producers and their suppliers, and though not industrial, the hub-and-spoke airlines, where there are lots of problems. But it seems to me that the forecasts adequately allow for those circumstances already. So, to me, the economy and the economic expansion appear to be on solid footing.

As to inflation, I have not changed my forecast, but I must admit I am a little less comfortable about the situation than I was formerly. That's partly because we've gotten a little more inflation this year and last year than I had earlier anticipated. But also, as I listened to Dave Wilcox's attribution analysis, I got a little nervous. I've had a lot of experience doing those kinds of things, and one can always parse the numbers that way. What I think it misses from time to time is

the underlying dynamics or interactions of the price performance. So I'm a little more concerned than I was formerly that inflation, if not tilted to the upside, is at least getting locked in at a somewhat higher rate.

Having said all of that, it seems to me that as far as policy is concerned we have been on the appropriate course and we should continue on that course. I think the policy implications are really rather straightforward.

CHAIRMAN GREENSPAN. President Yellen.

MS. YELLEN. Thank you, Mr. Chairman. At our last FOMC meeting, I worried about a slowdown in growth and a pickup in inflation. I hypothesized and hoped that both would prove transitory. On the whole, I consider recent data reassuring that the soft patch in the spring was just that—maybe not even that—and not a precursor of a more entrenched slowdown.

While the Greenbook subscribes to the view that the slowdown in growth was transitory, the staff has made an upward revision, by a couple of tenths, to its forecast for core PCE inflation for this year and next year, now projecting inflation of about 2 percent in both years. I'm a bit less pessimistic on inflation than the staff. Recent data on core inflation have been pretty good of late. Moreover, I see the fundamentals—namely, the pressures on future inflation—as providing room on balance for some optimism. The most worrisome factor is that oil prices have risen further, although this should tend to boost core inflation more this year than next year.

As David noted, the recent jump in compensation per hour should probably be discounted, since it appears to be due to one-time factors. On the encouraging side, I see a noticeable decline—about 17 basis points—in inflation compensation at both the 5- and 10-year horizons, high markups, an appreciation in the dollar, a leveling off of commodity prices, very modest increases in the ECI, still rather robust structural productivity growth, and some indications of remaining slack.

The situation with regard to slack, as David noted and emphasized, is complicated because the unemployment rate is relatively low, near most estimates of NAIRU. But several other measures, as he pointed out and as we also routinely monitor—including the employment-to-population ratio, capacity utilization, the output gap, and the other indicators that David showed us—do suggest that slack remains.

One final point on the inflation outlook is that one of the best forecasters of future inflation is past inflation. And I'm told that this is a point that was emphasized at a special topic session a couple of years ago. On this score, things look fairly good, with core PCE price inflation at 1.7 percent over the past 12 months.

While I guess I can and have quibbled a bit about the inflation outlook for the next year, overall I think the Greenbook forecast seems reasonable. Real GDP appears poised to grow just slightly above its potential rate, gradually eliminating remaining slack. And core inflation, while currently near the upper end of my comfort zone, at least to me seems likely to moderate a bit over the next few years.

The Greenbook forecast depicts an almost textbook scenario of an economy continuing along the path toward a rather attractive steady state. Going forward, there are obviously some sizable risks, and I count the unwinding of possible house and bond market bubbles as one or two that are high on my list. But I think the most likely outcome is—as in the Greenbook projection—that we will continue to move in a positive direction over the next couple of years. And given what we now know, I think the funds rate path assumed in the Greenbook, which is very close to the market's current view, is appropriate. That is, we are likely to need to raise rates a couple more times before slowing the pace of tightening rather substantially. And I want to emphasize that, in my view, the well-calibrated monetary policy we've had has played an important role in keeping the

economy moving along this textbook path during a period characterized by some quite difficult circumstances.

I know that Monday's pre-FOMC briefing emphasized that economic activity has been burdened by some major drags over the past year or so. These include the oil shock, the deterioration in the trade balance, and the still low level of investment spending relative to GDP. The result is that we've had to keep interest rates exceptionally low for a long time, just to get respectable economic growth. In fact, respectable and not stellar growth is all we have gotten, even with exceptionally low long-term yields and unexpectedly rapid gains in house prices. And those are two factors that, on their own, would be working to push up the equilibrium real funds rate.

So the merely respectable growth in the economy has really rested on the backs of just a few interest rate-sensitive sectors: business investment, consumer durables, and housing. From that perspective, it's really not all that surprising that house prices have risen a great deal, and it's not surprising to hear our directors and other contacts comment that liquidity is abundant and that lending is taking place for deals that one of our directors simply characterized as "stupid." I think he meant by historical standards. [Laughter] My point is that to offset the drags, we've needed to give the economy a strong dose of stimulus, which inevitably boosted the housing sector—and that just to get reasonable economic growth. That is equivalent to saying that the equilibrium real fed funds rate is unusually low—1.4 percent in the Greenbook path.

So, for me, the policy imperative that follows is that we need to be careful not to overdo the pace of policy tightening. I noted that in recent months several FOMC members have commented that we usually know we've come to the end of the tightening phase when we have tightened one or two times too many. I think we should be especially attentive to this concern this time around, because the expansion does depend so heavily on just a couple of interest-sensitive sectors. And

John Williams's analysis yesterday highlighted the fact that if house and/or bond prices fall, the zero bound could become an issue we would be discussing again.

To conclude, I'm all for raising the funds rate by 25 basis points at this meeting, and I believe the language in the press release should seek to maintain the path for the expected fed funds rate that now exists in the market. My worry is that unless we're careful in crafting the language as we raise the rate today—and likely again in August—markets will start to build in more increases in subsequent months than they have so far. I think we are nearing the point when we will need to start pausing, and I hope we can maintain that expectation in the market in the period ahead.

CHAIRMAN GREENSPAN. President Poole.

MR. POOLE. Thank you, Mr. Chairman. I want to start by saying that I thought the staff presentation was very comprehensive and very sound, including the discussion of risks and standard errors. So I congratulate the staff on a very fine job there.

Let me just summarize very quickly key anecdotal information that I have gathered. First of all, my sense from my contacts is that the real economy is growing moderately, continuing the growth of about the past year or so. Second, labor supply of hourly workers is plentiful. There are lots of anecdotes of that type, but a dramatic example is a new Wal-Mart store opening in San Diego, where there were 10,000 applicants for 400 jobs. That's a very typical story; the margin may not always be that big, but it's a very typical story. I get the same kind of information from my contacts in the transportation industry. The only exception there seems to be truck drivers, a position for which qualified applicants seem to be in chronic short supply.

Third, managerial and technical skills are becoming in somewhat short supply. A contact with a major software company told me that their outsourcing to India was actually more a matter of the supply of those skills—with many of them just not readily available in the United States—rather

than the cost. This is, I'm sure, for standard sorts of software code writing. Another item in that vein is that later this year we could see a strike of UPS and FedEx pilots. There are ongoing negotiations. The contract expired some time ago, or at least became available for a reopening some time ago. And the pilots apparently are quite far apart from the companies in those negotiations.

Fourth, I don't think there's any doubt that energy prices are having a significant effect on the purchasing power of, let's say, the lower half of the income distribution. Wal-Mart has been talking about that for some time in terms of their same-store sales. But another very interesting Wal-Mart anecdote was that they've observed among their own employees a reduction in health care utilization—that is, fewer doctors' visits—but an increase in emergency room visits. Apparently employees are struggling some to make the co-payments and that kind of thing, again emphasizing the stress that exists in many lower-income households. That's where I'll stop. Thank you.

CHAIRMAN GREENSPAN. President Lacker.

MR. LACKER. Thank you, Mr. Chairman. Economic activity in the Fifth District advanced moderately in May and June. The survey results we released earlier this week showed that manufacturing shipments edged higher and that revenues of service firms grew somewhat more quickly this month. New orders in manufacturing seemed to slip this month, however. Growth in retail sales moderated in June, as our big ticket sales index contracted slightly after having moved sharply higher in May. District housing markets remained fairly hot—maybe not as hot as Miami, but fairly hot. Home sales continued at high levels. Bids above asking prices were common in popular locations. Markets for beach properties and for condos in downtown areas are especially strong. Business optimism seems to be holding up. Survey respondents expect the pace of demand

growth to pick up over the next six months. Our contacts also expect an upturn in capital spending growth over that period, and price pressures in the District remain contained.

Indications are that the national economy continues to perform well, although concerns about the housing market and energy prices are causing jitters in some quarters about the sustainability of the expansion. Average net job growth for the three months ending in May exceeded 150,000 per month—a rate sufficient to keep up the steady improvement in labor markets we've seen since last year. And the Greenbook expects real GDP to average above 3½ percent through the end of 2006, slightly faster than potential.

To me, the most striking revision in the June Greenbook was the 0.2 increase in the projected path for core PCE inflation through 2006. Expected inflation is now 2.1 percent for '05 and 1.9 percent for '06. I found this revision striking, because 2 percent is the upper limit of my own comfort zone for core PCE inflation. Moreover, market participants are aware that the core PCE index is the Fed's preferred inflation measure. And if we allow it to drift much above 2 percent, we run the risk of unhinging longer-run inflation expectations, especially if energy prices spike up further as well.

Having said that, I take heart from the fact that inflation expectations have fallen somewhat in the past couple of months. TIPS inflation compensation, both near-term and longer-run, has continued to decline even in the face of climbing oil prices. Of course, inflation expectations build in beliefs about our future behavior. I read declining inflation compensation, along with the apparent fall in inflation uncertainty for which Vincent's staff apparently finds evidence, as implying that markets expect us to do whatever is necessary to hold the line on inflation.

I see three main risks to the outlook. First, with oil markets as tight as they are, the world economy is obviously vulnerable to a supply disruption that could send prices significantly higher.

Second, we've been anticipating a handoff from housing investment to business investment over the course of this recovery. While business investment has continued to pick up, the demand for new capital appears to be limited now by the rate at which firms expect their output to grow. So the potential problem is that businesses may be reluctant to pick up more slack before they see that housing is headed for a soft landing. Yet that reluctance would interfere with or impede a smooth handoff, making it more difficult to achieve.

Third, I find myself worrying about the possibility of an inflation scare in the bond market, despite the recent decline in TIPS spreads. It's not clear how likely this is, but if it happened, it would be very costly. A spike in long-term yields could be particularly harmful today for elevated housing prices. It would raise long-term mortgage rates directly, obviously. Moreover, it would force us to raise short-term real rates. And in such circumstances I think it would be even harder for us to facilitate this handoff of investment from the housing sector to the business sector without an intervening recession. Thank you.

CHAIRMAN GREENSPAN. Vice Chair.

VICE CHAIRMAN GEITHNER. Thank you. We're somewhat more confident in the strength and sustainability of the expansion than we were in May. Our view is very similar to the staff forecast. We expect real GDP growth to average roughly 3½ percent over the forecast period. We expect core PCE to follow a somewhat higher path and to end the forecast period slightly higher than we expected in May, at just under 2 percent.

This forecast assumes that we'll continue to tighten monetary policy, perhaps by a bit more than foreseen in the staff forecast and than is currently priced into the market. To us, the risks to this forecast seem roughly balanced. We see no new sources of potential risk. This is not to say that the usual sources of uncertainty and the usual candidates for a negative surprise are not

daunting. It's worth noting, though, that these risks—from a cliff in housing prices to a sharp increase in household saving, to a larger and more sustained oil shock, to less favorable future productivity outcomes, to a sharp increase in risk premia or to declines in asset prices—in general are risks that we can't really mitigate substantially ex ante through monetary policy.

However, by making sure we get the real fed funds rate up to a more comfortable level we can help. The alternative strategy, to oversimplify it, would be to follow a softer path for monetary policy to provide a preemptive cushion against the negative effects on employment of a fall in housing prices, a rise in risk premia, some rise in saving and a fall in consumption, and so forth. This would, I believe, be a less prudent strategy.

Although there have been persistent concerns about the vulnerability of this expansion and about some of its less robust characteristics, the two most remarkable aspects of this recovery are encouraging. The first is its resilience. So far, each episode of incipient softness has proved to be shallow in depth and short in duration. Despite very prolonged and substantial headwinds in the context of an oil shock, a large ongoing drag from net exports, a significant tightening of financial conditions, a modest withdrawal of fiscal stimulus, etc., quarterly GDP growth—as Janet said—has shown impressive stability around a 3½ percent annual rate over the last year and a half. And this is a dramatic reduction in realized macroeconomic volatility. It makes the much-heralded “great moderation” look turbulent.

The second positive feature of this period has been the behavior of underlying inflation and inflation expectations. Of course, underlying inflation seems to have moved up a bit, but large changes in oil and commodity prices and import prices have produced periods of substantial acceleration in headline inflation without, at least to this point, causing more than short-lived upward moves in core inflation or inflation expectations.

The behavior of productivity growth and expectations about future productivity growth explain some of this. Also important, of course, is the credibility engendered by the record of the FOMC. Changes in the structure of the financial system must matter, too. There are almost surely other factors—luck for one—that are at work.

Among the choices in Vincent Reinhart's note on interest rates, I'm inclined to support the more benign assessment of the recent behavior of forward interest rates and term premia, even though these factors can't fully explain those moves, and even though the future may prove to be more volatile and adverse than the markets now seem to expect and than those explanations would imply.

So what about monetary policy going forward? There are two salient dimensions of the forecast. One, of course, is growth slightly above trend from a starting point where the remaining amount of resource slack, if any, is substantially diminished. The other is an underlying inflation rate—just to focus on the core PCE—that now seems to be running at a modest margin above 1.5 percent and that we expect will end the forecast period above 1.5 percent. And inflation expectations, at the horizon over which monetary policy operates and with reasonable adjustments to translate them into a view on the PCE deflator, are still some margin above 1.5 percent.

We don't consider this inflation forecast a cause for serious concern. We anticipate upward pressures on inflation from some firming of compensation growth and from higher unit labor costs. We expect those pressures will face the countervailing forces of relatively moderate inflation expectations, strong competitive pressures, still substantial profit margins, the potential for some increase in the labor force participation rate, and pretty strong expected future productivity growth.

And yet it should matter to us that, even in a world where the nominal fed funds rate peaks at 4 percent, models envision a relatively extended period during which the core PCE deflator stays

meaningfully above 1.5 percent. The range of estimates in the forecasts and model simulations before us, and the expectations we can derive from the market, place the terminal rate of the nominal fed funds rate now between $3\frac{1}{2}$ and $4\frac{1}{2}$ or between $3\frac{3}{4}$ and perhaps $4\frac{1}{4}$ percent. These estimates have moved down a bit over the last few months, but the shape of the path has steepened a bit. I don't think we really know how much confidence we can have in these estimates, even if the forecast unfolds as we expect today. But my view remains that we are better off following a path that would put us at the higher end of these estimates than in taking the risk of doing too little and stopping prematurely or trying to manage the communication challenges of a temporary pause when we still believe we have further to go. Thank you.

CHAIRMAN GREENSPAN. Governor Ferguson.

MR. FERGUSON. Thank you, Mr. Chairman. The issues before us at this meeting are two. The first is: Are we going to be dissuaded from the announced strategy of another modest tightening in monetary policy? And second: Is there palpable need to adjust market expectations of policy going forward?

We might be dissuaded, or feel obliged to change market expectations under one of four circumstances; and I will go through each of them in order. The first is if we thought the baseline forecast itself, which I think is built basically around the announced strategy, was unacceptable. I find the baseline forecast basically acceptable, although I am somewhat concerned, as are President Lacker and a few others who have already spoken, that the inflation drift seems to be upward. So I think there is some risk there, but by and large it's basically an acceptable forecast.

The second reason I think we would change strategy or change policy in terms of our announcements is if the incoming data made a basically acceptable forecast seem highly unlikely. And here I'd say that the incoming data, at least on the real side of the economy, are pretty much

consistent with the baseline forecast. Consumption is likely to hold up well, as outlined in the baseline, because labor markets do appear to be gradually improving. As David Wilcox indicated, not only has the unemployment rate edged down a little but, more importantly from my standpoint, the broader indicators of labor market conditions seem to be consistent with improvement.

Economic conditions have strengthened enough to bring some individuals back into the labor market, as evidenced by a gradual rise in the labor force participation rate. There is also a decline in the share of individuals working part-time, for economic reasons, as shown on exhibit 4 in the chart show as well. And I think the tone in the survey data from both businesses and households has been relatively positive. Moreover, I continue to believe that low interest rates are likely to support wealth creation in the housing market, as we discussed extensively yesterday, and I have very little concern about a sudden fall-off in that regard. And, finally, with respect to business fixed investment, I would say though the investment-to-GDP ratio has been relatively low—a point I will return to later—I agree with the assessment in the Greenbook that the fundamentals are at least consistent with ongoing business fixed investment.

On the inflation side, I would say that David handled the incoming data well in terms of why one should not put too much weight on some of the data. The one point that he didn't touch on was unit labor costs. They rose quite dramatically in the fourth quarter of last year, but I think the good news is that in the first quarter of this year the increase in unit labor costs on an annual basis, quarter over quarter, seems to have subsided somewhat. So there may be less inflation pressures in that regard. So by and large, in terms of the second reason, I'd say the incoming data are consistent with a pretty good outlook.

The third reason that might force us to change our views is if the market signals indicate that our read of the economy is likely to be flawed. And here, as others have indicated, the work that

Vincent and the staff have done I think firmly outlines at least some of the issues. The fixed-income conundrum has been much recognized. Additionally, risk premia in the fixed-income universe are also quite low. In the equity markets, I think the signals are somewhat contradictory. And here I pick up a little from exhibit 8. One thing that's not shown there is that the implied share price volatilities of both Nasdaq and the S&P 500 are really quite low, and yet the risk equity premium is relatively wide—toward the wide end of the norm that we've seen over the last decade. So in lieu of decrying these conundra with which we are confronted, let me at least do what Michael wouldn't do, which is venture a hypothesis on why some of these things are true.

With respect to the fixed-income markets, I have reached the conclusion—from these various observations of low rates and the flat yield curve—that the explanation probably relates to the fact that, at the global level, domestic absorption has fallen. I'm not trying to sort out investment versus consumption. Overall I think it has fallen below what it would have been otherwise. This suggests to me a fall in the neutral rate, not a global slowdown—to cite the two choices that were in Vincent's model. I am heavily persuaded by the work that we saw on Monday, which Janet mentioned, about the number of real-side factors that may be holding back the economy and therefore reducing the neutral rate.

I'd also say that the investment-GDP ratio, which has been quite low, has fed into fixed-income market performance because it has led to a change in the corporate financing gap. Between 1991 and 2000, the financing gap rose from less than \$35 billion to a peak of more than \$300 billion. That rise reflected the very sharp increase in capital expenditures that we saw and have talked a great deal about in the telecom, high-tech, and transportation sectors, etc. But the important thing is that the financing gap fell abruptly in 2001 and 2002, turned negative in 2003, and stayed negative until the fourth quarter of last year. Due to the Microsoft dividend and the expiration of the

accelerated tax depreciation, the financing gap returned to slightly positive territory in the first quarter. But overall the negative financing gap, which has been widespread across industries, indicates to me that the business sector as a whole is generating enough cash to purchase capital expenditures without borrowing.

It is also true that the dividend payout ratio has been relatively low. The dividend payout ratio as a percentage of S&P operating earnings turns out to be, based on a report that I've just received, about 29 percent versus the 48 to 50 percent it has averaged over the last 40 years or so. So it's clear that corporations are really sort of hoarding this cash.

Since corporations do not tend to invest in equities, they do tend to invest in a number of fixed-income securities relatively short term. I think that's one of the things that have been driving these relatively low interest rates. And just to put a final point on that, since the beginning of 2003, liquid assets in the nonfinancial corporate sector rose from about \$310 billion, or more than 30 percent, to a total of \$1.3 trillion. While the rate of accumulation of liquid assets has slowed, I think the ratio is still a factor that has been driving this relatively low interest rate.

In equity markets, my read of the data is that the low volatility is telling us a better story than the rise in the equity risk premium we've seen. As Steve pointed out, or at least implied, the earnings-price ratio part of the equity risk premium really hasn't changed very much over long periods of time. It is still in the 5½ to 6 percent range. So it really is the fixed-income side that has been driving the slight widening of the equity risk premium.

The final market signal that I think would be important to us is the read on interest rates. Some people have already talked about the interest rate signals we've seen. I won't belabor the issue. I will pick up a point that Janet made, which is that there are a number of different measures of inflation that come not just from the markets but from others. Our Greenbook turns out to be one

of the best forecasters of inflation. It's not the only reasonably good one. From the Philadelphia Federal Reserve District, for example, the survey of professional economists also has a fairly good track record on forecasting inflation. And as Janet pointed out, a random walk—or at least looking back to recent inflation history—has been a good forecaster. The good news for us is that almost all of those forecasts fall in a range that's very close to the Greenbook forecast, which gives us perhaps some comfort that the Greenbook has the forecast on inflation about right.

The final point I'd make—if you remember, there were four reasons—is: Would we be dissuaded from raising rates or would we change the signal if we thought it would create some financial instability? In this regard, I asked the staff to do a very quick simulation of the effect of a rapid 1 percentage point rise in the fed funds rate over what is in the Greenbook forecast. It turns out that if we were to be so rash as to dramatically raise rates by 1 percentage point over the baseline forecast, that would create by the end of 2006 a rise in the financial obligation ratio of only about 6 basis points. I won't go through all the math of it, but obviously it has a fair amount to do with the fact that a vast majority of the mortgages in this country are fixed-rate mortgages. And second, by definition, if we were to raise rates so dramatically that it would result in a slowing in the economy, we would see individuals take on less debt. But the bottom line is that I think the strategy we've outlined, if executed in a reasonable fashion, should not create financial instability.

Let me conclude by saying that I think the strategy we have is about right. I don't believe there's a reason to change market expectations quite dramatically. I do think there's some downward pressure on the neutral rate, and I think the Greenbook has picked that up. So, by and large, I think the appropriate course is full steam ahead. Thank you, Mr. Chairman.

CHAIRMAN GREENSPAN. Governor Kohn.

MR. KOHN. Thank you, Mr. Chairman. I made only small revisions to my forecast from last January. We've seen some notable fluctuations in data and sentiment over the last five months, but basically I think we've ended up pretty close to where we started, with prospects for growth that are close to the growth rate of potential, perhaps a bit above, and core PCE inflation stable at a little over its rate of last year.

The data we received over the intermeeting period reinforced this favorable outlook, assuaging some of the concerns on both the demand and inflation fronts that I had at our meeting in early May. Growth in private final purchases has been good, with the second-quarter forecast to be around 4 percent. Slack in labor markets has continued to erode gradually. Core CPI inflation slowed, supporting the notion that some of the earlier pickup was a product of the pass-through of previous increases in energy and other import prices, and core PCE inflation has been stable. Commodity and intermediate goods price pressures have abated, consistent with the moderate pace of increase in production and a judgment that the global economy was not facing significant bottlenecks, except possibly in energy markets. And importantly, inflation expectations fell on balance despite the further increase in oil prices. The recent further rise in oil prices will indeed put some upward pressure on core inflation, but that should be limited in time, and increases in the prices of other imports should abate considerably, owing to the strength of the dollar.

Moreover, the behavior of most measures of labor compensation suggests to me that labor markets are not in the process of overheating and may even have some degree of slack remaining. And declines in inflation expectations provide some assurance that past increases in energy and other prices aren't likely to become embedded in persistently higher inflation.

Over time, of course, it is appropriate monetary policy that will keep the balance between demand and potential supply and inflation in check, and I actually found that thinking about the appropriate path for policy was harder than thinking about the outlook.

In a fundamental sense, the favorable outlook rests on a judgment that over the last year or so monetary policy has been well calibrated to the evolving situation. Market participants seem comfortable with policy to date and with their expectations for the future. The simultaneous decline in expected funds rates and inflation expectations over the intermeeting period indicates confidence that inflation will be contained. And the rise in equity prices and still fairly narrow risk premiums in credit markets must rest on expectations of continued solid growth.

I think we can be fairly confident that appropriate policy is likely to require additional tightening even beyond this meeting. That's what is built into the yield curve, and that structure of rates seems to be consistent with growth continuing around or perhaps a little above the rate of potential and with the output gap about disappearing. And with output probably close to its sustainable potential and inflation already having picked up a little, I agree with the rest of you that we're at a point in the cycle at which we need to be especially careful about keeping inflation pressures contained. But how much further we need to tighten in order to accomplish that, and at what pace, are the interesting questions.

The staff and markets have built in a leveling out of the funds rate at about $3\frac{3}{4}$ to 4 percent. That's quite low by historical standards. The Greenbook has an implied short-run r^* of only $1\frac{1}{2}$ percent. Still, that's not implausible, judging from the experience of the last few years when very accommodative policy has been associated with growth only moderately in excess of potential. And the recent downward revisions to market expectations for growth abroad—and expected policy paths abroad—reinforce the possibility that low equilibrium rates appropriately reflect weak global

demand. Nonetheless, the underlying truth is that we really don't know how much we need to tighten, and, fortunately, we don't need to figure that out today.

I recognize that the 25-basis-points-per-meeting path is not an optimum policy. As we can see from the Bluebook simulations, an optimum policy would tend to flatten out the trajectory as we get close to what we think is a stopping point. The risk is that the 25-basis-points-per-meeting pace will tend to ratify your prediction, Mr. Chairman, that our last tightening will be one too many. Given the lags in the effects of policy, if we wait to see confirming signs that past increases have slowed growth on a sustainable basis—and we aren't seeing just another soft patch—we probably will indeed have overshot the mark. The path could be especially problematic if it extends into the fall when our meetings get closer together. Surely, the pace of tightening shouldn't be dictated by the meeting schedule rather than economic needs. But I do take some comfort in the expectation that policy doesn't have to be that precise. The market will tend to compensate for any overshooting by building in a reversal, provided we let it know that we are open to that possibility when the time comes.

For now, sticking to our path of gradual rate increases would seem to be the most prudent course, but such a path is conditional on the economy following its expected path. We should be willing to deviate either way, even as early as August, should the data indicate a very substantial deviation in the path of spending or prices. And our statement today should not be read as implying anything about our expectations beyond August. That will depend on data. The higher we go with rates, the more we need to keep an open mind about stopping places and possibly even the pace of tightening. Thank you, Mr. Chairman.

CHAIRMAN GREENSPAN. Governor Bies.

MS. BIES. Thank you, Mr. Chairman. I thought I'd focus my remarks today on the topic we discussed yesterday—the housing markets. And then I'd like to talk a little bit about some of the liquidity issues in housing markets and relate that to monetary policy.

Let me start by saying that overall I agree that there is not a major risk of significant problems in the housing markets. But there is momentum building in the housing area that is raising some issues about which I am not as sanguine as many of the staff who gave the presentations yesterday. But I want to compliment the staff from both the Board and the Reserve Banks. I thought they did a fantastic job in pulling all of the information together

While inflation overall is apparently well contained, I, too, am generally concerned about the continued ratcheting up of our expectations. The one thing that stands out is how much housing prices have jumped relative to overall price levels. We know that the average price for new homes in May was up 8 percent from a year ago. Existing home prices were up 10.2 percent, as was said yesterday. But inventories remain relatively lean, even though the supply has risen by about half a month since the beginning of the year.

When I look at the jump in housing prices, I'm trying to see if consumers are saying, "We have good, strong income growth and we're able to afford more." Or are they seeing these price increases and trying to jump in while they still can afford a house, before home prices get totally out of their range? Are they viewing real estate as an alternative for investment purposes, after being stung in the stock market drop of a few years ago? Really, all of these factors may be at the heart of the strong demand for housing.

But I also think that the financing markets are sending different signals in these areas. I know Mark is going to talk about some of the specifics but I want to discuss some of the macro aspects of this. When the refinancing boom got started about three years ago, mostly we saw

customers going to banks to refinance and take advantage of low, long-term fixed interest rates. So most of the mortgage originations in the 2001-2002 period were predominantly fixed-rate loans or they were ARMs that had fairly long fixed-rate periods before becoming adjustable. What is striking is how this has been changing in the last 12 months. ARMs of all types have jumped from about 16 percent of originations in 2001 to about one-fourth in 2002 and 2003, to over half of mortgage originations last year. This is happening in a period when short rates are rising and long rates are flat to down. If bankers are really working to the benefit of their customers, why aren't they locking in long rates in this environment?

It is also the case, when we look at the mix of products, that more of the mortgages are subprime products. Subprime originations have climbed to over 18 percent of total originations. In terms of where these mortgages are being parked—whether they are on the books of banks and other financial institutions or are being securitized—about two-thirds of originations continue to be securitized. So the use of the markets is about the same. But the types of mortgages being securitized are changing. Again, these are predominantly ARMs, and more of them tend to be option ARMs—the higher-risk kinds of structures.

As we saw in the information presented about the real estate mortgage pools that are being created, the risk profile in those pools is changing. Interest-only mortgages were basically nonexistent in those pools two years ago; they are now running over 3.6 percent of them. Whereas a lot of these IO mortgages had very conservative loan-to-value ratios—under 80 percent—more and more of them now have loan-to-value ratios in excess of 80 percent. And about 9 percent of the IOs in these pools are going to subprime borrowers—that is, the riskiest customers. Yet those loans require interest-only payments, no amortization. Two weeks ago S&P required additional guarantees on a few of these mortgage pools, which is another signal of concern.

HELOCs are being used more for purchase money down payments. People no longer have to save to make a down payment. And when we look at HELOCs in general, for the last three years they've grown at a compound rate of over 30 percent a year. As would any supervisor, when I see a product growing 30 percent a year for three years, I tend to get a little nervous about the concentration risk. Where is the liquidity coming from for these? Again, a big chunk of it is going to the securitization markets. I think one of the challenges we have as bank supervisors is that, to the extent the banks are originating these loans with the intent to sell them to the market, they're looking to the market for the credit definitions.

We know from our QIS-4 [Quantitative Impact Study 4] results, looking at the Basel II exercise, that we had a huge disparity in the results on loss expectations on home equity loans and other mortgage products. A lot of these are new types of products. The confidence intervals around the expected defaults, I think, are a lot wider for them than for those that have traditional structures.

We also know that there's a lot of correlation risk that could happen here. If the housing price bubble does break in a market where employment is dropping, people could be leaving an area and we could have more defaults. In addition, we know that the dropping of home prices, in and of itself, tends to create more defaults, especially with negligible equity in these properties. Also, to the extent that people default and the banks have more properties to foreclose, there are neighborhood effects, with losses getting bigger when the defaults do occur.

So, what I am concerned about from a liquidity perspective, since these are being securitized and moving into the markets—and there is plenty of appetite in the market to take these products—is the lack of discipline relative to previous periods. In the ancient days, when mortgage loans stayed on the books of financial institutions, liquidity limitations forced them to choose the higher quality credits. This isn't happening today. And it isn't clear if the marketplace currently

understands the structure of these loans any better than some of us do in terms of pricing the risk, as evidenced by the S&P move two weeks ago.

So, again, I'm not overly concerned. Especially with the record profits and capital in banks, I think there's a huge cushion. But the implications of this for housing wealth and for investors who take the ultimate risk in these securities could create some problems in terms of the way economic growth proceeds going forward. And it's something that I think was appropriate to spend the time talking about today.

CHAIRMAN GREENSPAN. Governor Olson.

MR. OLSON. Thank you, Mr. Chairman. As Susan indicated, I, too, looked at the mortgage market in anticipation of the theme of our discussions yesterday. But I also had a concern about the extent to which the mortgage market might be creating froth in the market. I interviewed several of the largest mortgage originators. I talked to contacts at banks, nonbanks, and one of the large subprime lenders and asked them to approach the question from the same perspective. That is, I asked them: What are you finding that is new or different in your market? What attracts your eye because it's new, and where do you see the risks embedded in the nature of the mortgage market today? This does not address the question that President Guynn raised about the risks associated with the activities of contractors or real estate developers, which is a separate and very significant risk. It may get at the question that President Yellen asked as to where the ultimate source of the stupidity is in the market—not whether or not there is stupidity in the market.

In conclusion, mortgage terms are indeed becoming more flexible and less restrictive, creating certain defined risk exposures. While each of the risk exposures appears to be both manageable and, to an extent, managed as isolated risks, they pose heightened risk in some areas

due to the layering of the exposures. It's the layering that really causes the risk. And, in part, it means that the most significant body of the risk exposures is in identifiable markets and lenders.

There is a lack of consensus as to how the relaxation of credit standards will impact safety and soundness. To date, loan delinquencies have remained modest, both within and outside of the banking industry. However, the undiminished appetite, particularly for the nonconforming mortgage product, has allowed for the flexibility to continue. And there is no slowing in sight, despite all the warnings that we have heard and indications in some markets that there has been a leveling, and even a decline, in some property values.

While that environment is clearly likely to produce unrecognized risk somewhere in the financial system, it seems unlikely that that risk will be in any of the portfolio lenders, including the bank lenders, to any significant extent, because of the avaricious nature of the MBS [mortgage-backed securities] market. The risks, as Susan and others have mentioned, are pretty obvious. The IO loans, now for terms of up to 10 years, may account for 50 percent of total loans in some markets. So there's a greater risk of negative amortizations. Also becoming more popular is what is known as the alt-A mortgage product, which makes loans based on stated incomes and stated assets, and carries a higher interest rate in exchange for fewer verifications of the income and asset figures provided by the borrower.

Let me give you an example of how the layering that causes the risk can work. Let's take as an example a loan in a high-end market such as California. The mortgage sought by the borrower would exceed the maximum of Fannie or Freddie, automatically making it a nonconforming loan and automatically removing the risk parameters that are embedded in the conforming product. Because it is nonconforming, it opens the opportunity for the Alt-A product, which means that it may be an IO loan or allow a more aggressive loan-to-value ratio. The risk premium that should be

associated with that instrument does not seem to be captured in what the secondary market is looking for. So the secondary market will buy it. The originator of the loan is able to meet the competition and rid itself of that risk.

That said, there are some identifiable risks that are clearly being managed. According to some lenders, about 20 to 25 markets bear careful watching, and lenders have started to exercise restraint in those markets. Most of the markets were mentioned yesterday, but obviously they include places like Florida and Las Vegas.

There is also an ability to look at investor properties and subdivide that category into three groups. One of them is the typical purchaser of a vacation home; Jack Guynn is buying in the Blue Ridge Mountains, for example. Or, as Susan mentioned, another good example is the investor who is concerned about the equity markets and wants to move into residential real estate. So that isolates those in the third group—the most high-risk borrowers. They are the ones who want to get by with the greatest amount of leverage. That is the borrower who is simply looking to take immediate short-term advantage of any increase in value. And that is a buyer those careful mortgage lenders can address with more specificity.

A great deal of uncertainty, frankly, surrounds the interest rate risk exposure, because there have been very few adverse interest rate periods in recent years and the industry experience is limited. But the availability and proliferation of FICO scores means that interest-only and high loan-to-value mortgages are given only to those within certain FICO bands, where the lender has the greatest confidence in the borrower's repayment capability, which is based on the historical experience of that borrower in terms of his or her debt repayment record.

To date, foreclosures have been limited and minimal at banks and bank mortgage subsidiaries in the prime markets for nonbank lenders. That has a lot to do with the nature of the

secondary market. One lender told me that they are using the secondary market first of all for their conforming products; second, for their nonconforming products; third, for their HELOCs; and fourth, for loans on first delinquency. And for the latter, this lender is selling them at only a 2 or 3 percent reduction to book. So that loan is going off the books, and in some instances, they are even selling the residual in the secondary market. So there are five different channels through which this lender is able to use the secondary market. It sounded to me very similar to what the 1960s New York Yankees were doing with the old Kansas City A's under Charlie O. Finley—using them to improve asset quality. [Laughter] They were unloading high-risk properties, and doing so without any expectation of compensation from the counterparty. And they were doing it annually. So it's much the same thing that is happening now.

As for the secondary market, why is that market so avaricious? I'd cite a number of reasons. There are many new investors, including the hedge funds, with minimal experience in dealing with market uncertainties. There are many new products; 50 percent of the mortgage-backed products are either alt-A or nonprime. That's the flow, as we discussed yesterday. There is evidence of a lack of secondary market discretion, including the ability to price for risk; the risk premium simply does not reflect the risk embedded in that product. There have been some indications that the secondary market is starting to tighten its standards, one of which Susan mentioned, which is the new guidelines from Standard and Poor's. The other is the beginning of some change, particularly in the AAA tranche, where a slight price increase recently was passed on.

In summary, the activity in the mortgage market shows no signs of abating. The risk exposures remain, and the risk exposures seem most likely to be in the MBS market. The place to look for the first evidence of weakness would be in the first-loss position, wherever that first-loss position happens to be. It's not clear at this point if the MBS market will be an efficient distributor

and disseminator of risk or if those in that market will be the last to recognize the risk that's embedded in what they're doing and know how to price it.

Mr. Chairman, I did not address the statement today because I see no need to adjust our "measured pace" language or to make any other significant adjustment to our statement at this meeting. Thank you.

CHAIRMAN GREENSPAN. Governor Gramlich.

MR. GRAMLICH. Thank you, Mr. Chairman. I'll let Tom respond on behalf of the Kansas City Royals. [Laughter]

This will be my 62nd and last statement at one of these meetings, and if you'll bear with me I'd like to give a few parting thoughts before I ride off into the sunset.

I believe most of us think about monetary policy in terms of what I will call a modified Taylor rule. We don't necessarily follow the explicit Taylor rule outcomes of the Bluebook but we look at inflation and unemployment and try to make them hit our target values, at least over some horizon. From time to time, we may shade our judgments based on some other factor that may seem relevant, which is fine. But the basic focus remains on inflation and unemployment. I strongly agree with this basic focus, and I get very irritated when I see columns suggesting that we are trying to inspire or should be trying to prick a housing bubble, for example. There is no way to do that and still maximize the inflation/unemployment outcome.

Monetary policy is broad and has broad effects. When we take rates down in a soft economy, we probably will be creating some bubbles, or at least mini bubbles here and there—not because we want to, but because it is inevitable. In the late '90s, holding out against raising rates and hence letting the economy achieve very low unemployment rates probably did add to the Internet bubble. In the past few years, keeping rates down for a considerable period probably did

add to the housing bubble, if, in fact, there is a housing bubble. Given our primary focus on inflation and unemployment, I'm not sure there is anything we could have done about either bubble, and I am sure it would not have been wise to go out of our way to try to prick either bubble.

Today's policy challenge is to reverse the highly accommodative policy we followed a few years ago in response to what I still think was a real threat of deflation. There has been lots of speculation about the so-called neutral level of the federal funds rate, as if once we hit neutrality we can stop raising rates. First off, this speculation is naive in the sense that whatever neutrality is, it is more likely a zone than a precise rate. Moreover, neutrality would only be desirable if the rest of the economy were in balance, which is probably never strictly true, and certainly isn't true now. For these reasons, I've always been disdainful of the search for neutrality.

Whatever neutrality is, I think in the current circumstance we ought to take rates somewhere north of it. The reason is simple: lags. We have taken the funds rate very low in response to threats of deflation. That means that at the magic moment when we hit neutrality there will be still some accommodative policy in the pipeline—policy that would have to be offset with at least a slight overshooting on the other side. This is a well-known shower problem that has enlivened countless macro classrooms. One can also see this overshooting in the optimal policy simulations in the Bluebook.

One issue that has always been important to me involves national saving. I continue to be a national saving freak. Our rate is too low; no two ways about it. Continued low national saving implies either a drop in investment, which is undesirable, or continued international borrowing, which is unreliable. Like others, I would greatly prefer to correct the problem through fiscal austerity. But despite some welcome bulges in federal revenue, we all know that this is not real fiscal austerity and that we are quite unlikely to get real fiscal austerity any time soon.

Given that fiscal policy is not measuring up, can we do something about national saving with monetary policy? Unfortunately, I think the answer is no, at least as long as we are operating under a modified Taylor rule. Basically, our approach can determine the level of total output but not its composition between consumption and investment. Regarding this composition, there is an interesting new development resulting from the financial innovation we talked about yesterday. I admit to having always been skeptical of the empirical importance of interest rates on consumption. I would have thought that the form of housing wealth, whether cash or not, should not matter to rational consumers and that these consumers should realize that interest rates have ambiguous effects on their lifetime optimization decision. However, if consumption in fact does depend strongly on interest rates, as our econometricians say, at least some of the crowding-out impact of higher interest rates will be felt by consumption. So I will swallow my empirical misgivings and at least hope that our present easy fiscal and slightly harder monetary regime will be at least slightly less restrictive on investment and slightly more restrictive on consumption.

Another issue is, of course, the housing bubble. My own view is that there probably is now a slight macro housing bubble, with the problem obviously being worse in selected real estate markets. As argued above, it would be a great mistake for the Fed to renounce its primary focus on inflation and unemployment and start fighting bubbles. But might it be possible to shape policy in the direction of fighting bubbles? The question sounds very reasonable. The problem comes when one tries to get specific. A few months ago there was a conference at Princeton to address this very question. What should monetary policy do about bubbles? I was enlisted as a speaker in this session, and I then characterized my views in Gilbert & Sullivan terms as, "Well, never. Oh, hardly ever." [Laughter]

There are several arguments why we should hardly ever try to prick bubbles. Asset bubbles may be too small to matter much in macro terms; they may be endogenous—the result of expansionary policy we have consciously followed; and pricking bubbles may run at cross-purposes with the monetary policy properly based on inflation and unemployment. But I think the real problem with pricking bubbles can be seen from yesterday’s discussion. How can we make that type of policy stabilizing? If one reads the press or listens to Europeans—and I did that this weekend at Basel—the high level of house prices should lead us to raise interest rates higher than we otherwise would. If one reads the Greenbook or the staff documents we talked about yesterday, the high level of house prices relative to rents leads to the expectation that house prices are more likely to decline than to rise, so that stabilizing policy would be to keep interest rates lower than we otherwise would.

In that sense, the bubble policy conundrum is similar to the bond market conundrum. Great analysis, guys, but do we move rates up or down? In general, I think we aren’t going to know. House prices are high. Do we respond to the expectation by lowering rates to fight the anticipated collapse? To put it mildly, this policy would be very hard to explain and carries the risk that our more accommodative policy would drive house prices even higher. Imagine what Steve Roach and John Makin would say about that! If I can coin a term, this would be viewed as a Greenspan “shotput.” [Laughter]

On the other hand, do we do what the press would have us do—raise rates and likely destabilize? This is a tough, perhaps impossible, question. And our best approach is most likely to do nothing. In that sense, maybe my Princeton answer should have been a straightforward “never.”

Whatever the case, I'm happy to raise the funds rate another notch today and to continue with the "measured pace" rhetoric. For the future, my own five dollars says that you will never figure out what neutrality is, but I am confident that you will be able to tell when to stop raising rates.

This leads me to my final point, which is to say how much I've enjoyed working with all of you. These meetings have been interesting, challenging, and productive. I can't say that monetary policy is the hardest thing I've ever done in my life, because I did spend three years trying to get diverse people to agree about Social Security, but it was hard. And I think we did well. The staff has been superb. I can't imagine better preparation for meetings like this than from reading the Greenbook and the Bluebook. All of you have been consistently interesting and sensible. And the Chairman has run great meetings and has admirably melded our diverse views into a coherent and effective monetary policy. I will be eternally grateful for having been a part of it. [Applause]

Thank you.

CHAIRMAN GREENSPAN. Governor, I don't recall when anyone got applause.

[Laughter] I think what they were applauding was not necessarily your speech but your character.

SEVERAL. Hear, hear.

CHAIRMAN GREENSPAN. Vincent, I hate to put you in a position to follow that.

[Laughter]

MR. REINHART.⁸ I'm fairly confident, Mr. Chairman, that this will not end with applause. [Laughter] I will be referring to the materials that were handed out during your break.

No one would be surprised if you admitted that you agreed with Yogi Berra's characterization that it "feels like déjà vu all over again." Once more, the market backdrop for your deliberations is, as shown by the black line in the upper left panel of your first exhibit, one in which expectations seem firmly fixed on a quarter point firming today. In addition, it's hard to find any market participant who believes that there will be any material deviation from the scripts of the past few meetings in the announcement this afternoon.

⁸ The materials used by Mr. Reinhart are appended to this transcript (appendix 4).

There have, however, been some changes: Market participants, apparently taking comfort in incoming economic data, revised down their expectation of the end point of this firming cycle, shifting from the expectation in early May of around 4 percent (the red dotted line) to the current reading where the black line flattens out at under $3\frac{3}{4}$ percent. With a quarter point hike today seen as a certainty, this implies that market participants also foresee a pause sometime soon. The black bars at the upper right show that investors assign about three-fourths probability weight to your being done before November and a ninety-five-out-of-one-hundred chance of your finishing up by the last scheduled meeting of the year.

The issue before you today would seem to be how to describe the reasons for your action and whether to ratify current market expectations of a pause sometime soon—decisions that, in turn, likely depend importantly on the answers to two questions related to the economic outlook and policy strategy. For one, what do you make of the further decline in the 10-year yield? That yield, plotted with the black line in the middle panel, ended the intermeeting period a touch over 4 percent, further narrowing its spread over short- and intermediate-term rates.

As can be seen in the lower left panel, the nominal 10-year Treasury yield—line 1—is now 79 basis points lower than its level just before your meeting one year ago, back when the funds rate was 1 percent. As noted in lines 2 and 3, indexed debt quotes indicate that this decline was two-thirds real and one-third inflation compensation. With short rates rising and long coupon yields falling, the arithmetic of the term structure requires that far-ahead forward rates fall by more than the note yield. Indeed, the 1-year forward rate maturing 10 years hence—line 4—shed 179 basis points over the past year. Also of note, the decline in Treasury yields showed through to private yields, with the AA corporate rate in line 5 of the table dropping a like amount. Similarly, the yield conundrum is not a domestic phenomenon alone, as Mike Leahy showed. Euro swap yields, for example, have declined by more than dollar ones.

The bottom right panel makes one last point: The decline in yields over the past year has come as a surprise. By the expectations approach to the term structure, the upward-sloped yield curve of one year ago—the dotted line—predicted that its successors would shift up and flatten over time. Instead of the long dashed curve that was predicted one year ago to prevail now, we observe the very flat solid line. Market participants got about right what would happen at the front end of the term structure—probably because your actions were so telegraphed—but after that, they went increasingly astray.

The flattening of the yield curve is put in a longer perspective in the upper panel of exhibit 2. The sharp decline in the spread of the 10-year over the 1-year yield may not seem so scary if you ascribe it to shifts in the demand and supply of longer-duration securities, the subject of the two left panels. As discussed in the memo I sent to the Committee last week, the allure of longer-duration fixed-income securities

might have increased of late if investors perceive the macroeconomic environment—both nominal and real magnitudes—to be more predictable. An appreciation of the significant demographic shift in our near future may also have encouraged some shift toward longer-term assets by institutional fund managers. At the same time, the U.S. Treasury has been making relatively fewer of those obligations—with the average duration of Treasury debt outstanding declining by about one-half year since issuance of the 30-year bond was discontinued. Lastly, befitting the global dimensions of the decline in long yields, the downward pressure on domestic yields may owe to burgeoning saving relative to shrinking investment internationally, including the efforts of foreign official entities to direct their own surpluses toward dollar assets.

Changes in demand are difficult to measure. And it is incipient demand that needs to be measured, not quantities realized after asset prices adjust. One way to quantify the relative shift in demand is to consider the predictions of multifactor models of the term structure. Those models try to explain the behavior of yields across maturities as parsimoniously as possible while making sure all assets are priced consistently. The models we keep in-house predict, as in the lower left panel, that a substantial portion of the reduction at the long end of the forward rate structure owes to a lessened term premium. The current reading of 5/8 percentage point is indeed low in its historical range, but those estimates do tend to be volatile. If that represents an exogenous shift in investor preferences, then it also represents increased financial accommodation that warrants a higher policy rate than previously expected. But not much is really exogenous when you talk about financial markets. If investors are buying more long-dated Treasuries, what are they buying less of? That is, the financial impetus associated with a lower term premium might be trimmed by lower stock prices and a higher foreign exchange value of the dollar than would otherwise be the case.

The flattening of the yield curve would seem more worrisome if you thought investors were predicting that short rates should be lower than previously expected—perhaps because, as in the middle right panel, they expect further restraint on spending from high oil prices, some rebound in the domestic saving rate, or continued drag from the external sector. Note that the flattening of the yield curve need not be predicting slower growth, only that you will run policy on the easier side than previously expected to deliver good macroeconomic outcomes. As shown in the bottom right panel, predictions of GDP growth from a simple regression employing the term spread indeed have come down appreciably. But levels matter; and a forecast of 3 percent growth over the next year in an environment in which slack has been materially reduced may not seem so unwelcome.

As estimates of resource slack narrow, Committee members might be particularly intent on ensuring that policy accommodation is correspondingly removed. If it is any consolation, the top left panel of exhibit 3 shows that the current setting of the nominal funds rate, the black line, is well within the policy prescription of the standard rules that we follow. Moreover, recent increases in the real funds rate, the

black line in upper right panel, have pushed that indicator closer to the range of estimates of its equilibrium value.

As Secretary to the Committee, I spend some time worrying about the documentary record of your deliberations. Thus, I can recognize a pattern in these meetings. You repeatedly predict that your last policy move will be a mistake. Stated so bluntly, it is a paradox worthy of Bertrand Russell, but practically it means that, as in the middle left panel, you may be close to the point where you should worry about what can go wrong. And that is the second major question pertinent to your policy choice I put before you.

Logically, there are two possibilities, as in the middle left panel. You might be worried that you will stop firming policy too soon or too late. If market participants came to believe that you were behind the curve in policy tightening, inflation expectations could become unmoored and a good portion of your subsequent action would probably be directed to reasserting your inflation-fighting credibility.

That risk is why the Committee highlighted its watchfulness about price developments in the rationale part of the statement and added a sentence to its statement underscoring its vigilance against inflation. Such a risk seems well contained, at least as judged by the measures of inflation compensation derived from the Treasury market plotted at the middle right. Inflation compensation—based on the CPI—has moved well south of 2½ percent over the foreseeable future.

The other mistake you could make would be to stop too late—that is, move the funds rate up beyond the level required to work down resource slack and keep inflation controlled. This could prove problematic if the Committee subsequently took some time to recognize its mistake or desired particularly compelling evidence to reverse itself. However, the Committee has been relatively nimble—say, in 1989 and 1995, as seen in the lower left panel—in unwinding some of its policy restraint. Besides, with corporate risk premiums as low as shown in the bottom right panel, it seems unlikely that market participants view you as about to overshoot in policy firming sometime soon.

As laid out in the matrix at the top of exhibit 4, in drafting the Bluebook, we tried to capture the implications for policy choice given the potential answers to these two key questions. That is, you could take the yield curve as signaling (as along the column headings) economic weakness or a decline in term premiums and you might fear (as along the row headings) stopping either too soon or too late. Accordingly, alternative C offered both a firmer stance of policy and words that would lead market participants to project even more firming to come. Alternative A was structured to express more concern about the outlook and to signal that the tightening cycle may be drawing to a close. The passage of time may make some of the words of these alternatives relevant for future meetings, but they're probably not today.

You may see little reason to diverge at this point from what seems to have worked fairly well thus far—measured policy firming—and therefore be attracted to alternative B. Although aggregate spending and output growth evidently slowed in early spring, the economy appears to remain reasonably robust. Moreover, the recent evidence may be read as indicating that the pace of expansion is likely to rebound during the second half of the year to a rate somewhat above that of potential output, even with further modest policy tightening. And if inflation expectations were seen as well contained in May, they would seem even more so now.

Not to nag, but the structure of the existing statement will become increasingly strained over time at the four stress points listed in the bottom panel. You currently describe policy as accommodative, productivity growth as robust, the risks as balanced, and the pace of tightening as likely to be measured. An issue of strategy going forward is whether the statement should be patched up as the situation warrants or left intact until the time comes when you believe additional policy tightening is no longer likely. If the latter, you'll have to come to grips with just how much guidance you want in the statement in the future.

For completeness, I've enclosed the latest version of Table 1, which was distributed this Tuesday and varies only slightly from what was in the Bluebook. That completes my prepared remarks.

CHAIRMAN GREENSPAN. Thank you. Questions for Vincent? If not, let me proceed.

This is a quite interesting meeting in the sense that we're obviously approaching the transition.

We're not quite there but we're debating all the various elements of it, and I suspect that's the right thing to be doing at this stage. Indeed, I suspect it's the only sensible thing we can be doing.

For the moment, the underlying economy, from my point of view, does seem to be moving forward. The industrial production index for June, judging from the weekly data, looks reasonably robust. The first figures on initial claims—the ones that came out this morning—indicate an economy with ongoing strength. The weekly industrial production data plus the initial claims may be the most current global data that we have for the U.S. economy, and both suggest that no immediate deterioration is occurring.

We had a long discussion about housing yesterday. It's very evident from the backlogs of the major builders that new home sales will continue apace, as the backlogs presumably at some

point wind down. The buildup has taken a very long time; and even though there's some evidence of topping, there's really no meaningful evidence in the markets that housing demand is falling. Indeed, if anything, it's still on an upward track, and the feeling is not that it will fall apart but that it will get much stronger and create some really serious problems in the adjustment periods.

So, all in all, I myself am not uncomfortable with the 3 percent plus rate of growth in GDP going forward. But I do worry about the fact that oil and gas costs are beginning to eat into profit margins of non-energy-producing corporations in the United States. And even though our overall data indicate that margins continue to move up, when you disaggregate the segments of the corporate sector into energy and non-energy, it's fairly apparent that the margins for non-energy firms have already peaked out and presumably at this stage may be moving down. And remember, this is not only oil, but gas as well. A significant amount of the product inflation that we have seen is being partially offset by improved productivity in the use of energy, but not enough to prevent a significant rise in unit costs. As a consequence, pressures seem to be mounting in that area.

I am particularly concerned about it because even though we are publishing fairly large increases in output per hour—in fact 3 percent plus in the first quarter—when we disaggregate the quarters into monthly data, it's apparent that the reason the productivity gains in the first quarter are as high as they are is that we moved into the quarter from a very high level. December was high and, as best we can judge, there doesn't appear to have been much in the way of gains in output per hour from December through April. These data are subject to significant revision, but it's fairly apparent that the momentum, at least for a while, has been lost. Nevertheless, the Greenbook does not project any particular strength in unit labor costs, largely because it forecasts a 2.3 percent increase in compensation per hour. This, as I believe David was mentioning, is a flattening to a trend value. That's more hope, I think, than forecast.

What concerns me is that we are looking here at a potential pickup in the pace of unit labor costs overall and especially for non-energy corporations. Moreover, a number of you have cited anecdotal evidence indicating that pricing power, after exhibiting some signs of potency, is beginning to be restricted. This, of course, is the usual sign that profit margins are under pressure. Indeed, if we start with unit labor costs and the evidence of diminishing pricing power, we're obviously beginning to look at the process of pressures on prices.

That has two potential implications. One, the history tells us that when margins turn down, the economy invariably runs into some difficulties one or two quarters—sometimes a little more—later. We're not quite there yet. We're close to the peaks in total, and in this respect I'm not sure one should look strictly at non-energy corporations because energy is an industry in this economy. And the domestic earnings of the oil and gas companies are quite substantial—much more so than they used to be because a goodly part of domestic oil earnings is now in refining and marketing, areas where for a long period of time the numbers were negligible. So, it's in the system. It's expanding, but we seem to be peaking out here. Having said that, it's not clear to me that we're seeing any underlying weakness yet, but I think we have to be careful because we've had a substantial ongoing expansion and that has occurred in the context of fairly good productivity numbers. If it turns out that the recent data on productivity are accurate—and as you know, the Greenbook projects a 0.6 percent annual rate increase in productivity for the second quarter and a return to our normal trends in productivity—then this weakness will gradually dissolve. And the reason it will dissolve is that unit labor costs will start to flatten and margins will open, as they do in the Greenbook.

The problem with inflation, however, is that if margins start to come down and you are confronted with rising unit labor costs and you don't have the buffer to absorb the rise, it does begin

to give you a cost-push type of inflation, the likes of which we have not seen for a very long time. The numbers have been cause for a little despair, at least in recent months, and that does suggest that we have to be careful on this.

Having said that, I think the risks are clearly balanced with respect to the outlook for both output and inflation. But I conclude from all of this—and a number of you have indicated that you've reached the same conclusion—that when you're dealing with a situation like this, policy tends to get created not by your economic outlook, but by your loss function. And here I believe it is reasonably clear, at least to me, that if we err in stopping too soon and are proved wrong, the costs are very high. If we persist and it turns out that the economy is moderating and the disinflationary pressures, especially the worldwide ones, are as strong as indications suggest they may be, then we can recover relatively quickly. And I don't perceive the cost of making that type of mistake as one we need to be greatly concerned about.

I conclude, therefore, despite the fact that the risks to the outlook are truly balanced, that our actions should take into account that very clear bias in interpreting the loss function. Accordingly, I would propose that we make another 25 basis point move on the funds rate today and change the language as little as possible, recognizing that there is going to come a time—it may be at the August meeting or it may be later—when the markets and the data will have given us a considerable amount of information as to when we ought to start to flatten out the funds rate path. My guess is that at the point we have a meeting and decide that we're going to change the language and skip an increase, the markets will have been three weeks ahead of us. When we do it, I think we're more likely to do it in the context of very little market reaction because that will be the general consensus of the market as well as our own. So, I don't think we have to fret excessively about how we're going to get there; the markets will help us.

I must say to you that this is not the way the markets were functioning in terms of being informative when I arrived on the scene. We now have a federal funds futures market. We have every sort of financial indicator. Everybody is involved in forecasting what we're going to do and, indeed, they do it for the reasons that we would. So, it's actually easier to implement monetary policy now than it was when I first arrived here. And I guess for my last meeting I will pull a "Gramlich" and go over this in some detail. Ned has been here a long time, and he has been a major leveling influence on the rest of us. Like Ned, I have been here a long time—maybe too long already. But it's fascinating to look at how the system has changed and where the signals are changing.

In any event, I put the recommendation of 25 basis points on the table and the language that appears in alternative B, which will be distributed by Michelle. Vice Chair.

VICE CHAIRMAN GEITHNER. Mr. Chairman, I support your proposal to raise the fed funds rate another 25 basis points, and I support the language in alternative B, which I believe is accurately represented on this piece of paper. In my view, this statement is as close to neutral as we could get relative to current expectations, and I think that's the appropriate signal for us to deliver at this time.

CHAIRMAN GREENSPAN. President Minehan.

MS. MINEHAN. I, too, agree with your recommendation, Mr. Chairman, and with the language of the draft. I particularly concur with your assessment of the loss function in terms of how we should think about policy. While I'd like to make ongoing changes in this statement, now is not the time to do it. So, I'm on board.

CHAIRMAN GREENSPAN. President Fisher.

MR. FISHER. I support the 25 basis point increase in the funds rate. My only concern about the statement is the word “elevated” in reference to pressures of inflation. But, like President Minehan, I don’t think this is the time to argue.

CHAIRMAN GREENSPAN. Governor Kohn.

MR. KOHN. Thank you, Mr. Chairman. I agree with your recommendation, and I agree with the alternative B statement that you proposed. I have two comments: One is that you said markets would be three weeks ahead of us. But one thing that’s different is that we’re providing them with more guidance now. So I think we need to be very careful not to provide them with too much guidance. I hope that’s clarified at least in the minutes if not in the statement. And my second comment is that the way you described what might be coming, with weaker growth and higher inflation, I think we’ll all be jealous of Ned after a while. [Laughter]

CHAIRMAN GREENSPAN. Governor Gramlich.

MR. GRAMLICH. I support everything, Mr. Chairman. I would have never guessed that this tautological balance of risk statement would outlast me. [Laughter]

CHAIRMAN GREENSPAN. President Stern.

MR. STERN. I, too, support the recommendation and the language, Mr. Chairman.

CHAIRMAN GREENSPAN. President Guynn.

MR. GUYNN. I support your recommendation, Mr. Chairman.

CHAIRMAN GREENSPAN. President Hoenig.

MR. HOENIG. Yes, I’m fine with your proposal.

CHAIRMAN GREENSPAN. President Yellen.

MS. YELLEN. Mr. Chairman, I support your recommendation. Like President Fisher, I’m concerned about the language describing inflation. I think it will be somewhat of a surprise to the

market, which is taking some comfort from recent inflation data, and it may well perturb expectations upward. But I support the recommendation.

CHAIRMAN GREENSPAN. President Moskow.

MR. MOSKOW. Mr. Chairman, I support your recommendation on both the language and the increase in rates. I would just add two points. One, in the go-round there was a clear concern that core inflation forecasts have gone up, and a number of people said that the forecasts were now in a range that was at the upper end of their comfort zone. I'd be delighted if the forecasts come down, but I think that's a low probability. Second, to Ned's point about the tautology, I can assure him of one thing: At some point the balance of risk statement will come out. [Laughter]

CHAIRMAN GREENSPAN. Governor Ferguson.

MR. FERGUSON. I support both parts of your recommendation.

CHAIRMAN GREENSPAN. Governor Bies.

MS. BIES. Mr. Chairman, I support your recommendation.

CHAIRMAN GREENSPAN. President Santomero.

MR. SANTOMERO. Mr. Chairman, I support your recommendation and the wording. I also like the way you expressed the loss function; it corresponds closely to my own view on the matter.

CHAIRMAN GREENSPAN. President Poole.

MR. POOLE. I support the recommendation on the policy action and the statement.

CHAIRMAN GREENSPAN. President Lacker.

MR. LACKER. I support your recommendation, Mr. Chairman.

CHAIRMAN GREENSPAN. President Pianalto.

MS. PIANALTO. I support your recommendation, Mr. Chairman.

CHAIRMAN GREENSPAN. Governor Olson.

MR. OLSON. I support the recommendation.

CHAIRMAN GREENSPAN. Would you read the appropriate resolution?

MS. DANKER. I'll be reading the directive from page 30 of the Bluebook and the balance of risk assessment from the draft statement: "The Federal Open Market Committee seeks monetary and financial conditions that will foster price stability and promote sustainable growth in output. To further its long-run objectives, the Committee in the immediate future seeks conditions in reserve markets consistent with increasing the federal funds rate to an average of around 3¼ percent." And for the statement: "The Committee perceives that, with appropriate monetary policy action, the upside and downside risks to the attainment of both sustainable growth and price stability should be kept roughly equal. With underlying inflation expected to be contained, the Committee believes that policy accommodation can be removed at a pace that is likely to be measured. Nonetheless, the Committee will respond to changes in economic prospects as needed to fulfill its obligation to maintain price stability."

CHAIRMAN GREENSPAN. Call the roll.

MS. DANKER.

Chairman Greenspan	Yes
Vice Chairman Geithner	Yes
Governor Bies	Yes
Governor Ferguson	Yes
President Fisher	Yes
Governor Gramlich	Yes
Governor Kohn	Yes
President Moskow	Yes
Governor Olson	Yes
President Santomero	Yes
President Stern	Yes

CHAIRMAN GREENSPAN. Let me ask that the Board of Governors repair to my office for the consideration of other subjects.

[Recess]

CHAIRMAN GREENSPAN. The Board of Governors has just approved an increase in the discount rate to 4¼ percent, as requested by all 12 of the Reserve Banks.

Our next FOMC meeting is scheduled for August 9. We'll now go to lunch and honor our departing colleague.

END OF MEETING