

**Meeting of the Federal Open Market Committee on
June 25-26, 2002**

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., on Tuesday, June 25, 2002, at 2:30 p.m. and continued on Wednesday, June 26, 2002, at 9:00 a.m. Those present were the following:

Mr. Greenspan, Chairman
Mr. McDonough, Vice Chairman
Ms. Bies
Mr. Ferguson
Mr. Gramlich
Mr. Jordan
Mr. McTeer
Mr. Olson
Mr. Santomero
Mr. Stern

Messrs. Broaddus, Moskow, and Parry, 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. Kohn, Secretary and Economist
Mr. Bernard, Deputy Secretary
Mr. Gillum, Assistant Secretary
Ms. Smith, Assistant Secretary
Mr. Mattingly, General Counsel
Ms. Johnson, Economist
Mr. Reinhart, Economist
Mr. Stockton, Economist

Mr. Connors, Ms. Cumming, Messrs. Howard and Lindsey, Ms. Mester, Messrs. Oliner, Rolnick, Rosenblum, Sniderman, and Wilcox, Associate Economists

Mr. Kos, Manager, System Open Market Account

Messrs. Ettin and Madigan, Deputy Directors, Divisions of Research and Statistics and Monetary Affairs respectively, Board of Governors

Messrs. Slifman and Struckmeyer, Associate Directors, Division of Research and Statistics, Board of Governors

Messrs. Freeman¹ and Whitesell, Deputy Associate Directors, Divisions of International Finance and Monetary Affairs respectively, Board of Governors

Mr. English, Assistant Director, Division of Monetary Affairs, Board of Governors

Messrs. Reifschneider² and Wascher², Assistant Directors, Division of Research and Statistics, Board of Governors

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

Mr. Brayton,² Ms. Dynan,¹ Messrs. Lebow,² and Roberts,² Senior Economists, Division of Research and Statistics, Board of Governors

Mr. Bomfim,¹ Senior Economist, Division of Monetary Affairs, Board of Governors

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

Ms. Low, Open Market Secretariat Assistant, Office of Board Members, Board of Governors

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

Messrs. Eisenbeis, Fuhrer, Goodfriend, Hakkio, Hunter, Judd, Ms. Krieger, and Mr. Rasche, Senior Vice Presidents, Federal Reserve Banks of Atlanta, Boston, Richmond, Kansas City, Chicago, San Francisco, New York, and St. Louis respectively

1. Attended portion of meeting relating to the discussion of economic developments.
2. Attended portion of meeting relating to a special agenda discussion of inflation.

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Afternoon Session—June 25, 2002

CHAIRMAN GREENSPAN. Would somebody like to move approval of the minutes of the May 7 meeting?

VICE CHAIRMAN MCDONOUGH. So moved.

CHAIRMAN GREENSPAN. Without objection, they are approved. Dino Kos, please.

MR. KOS.¹ Thank you, Mr. Chairman. I'll be referring to the charts that were just circulated to you. The intermeeting period in financial markets was characterized first by some signs of risk aversion in selected asset markets and second by a readjustment of expectations regarding the strength of the recovery and, in turn, the implications for the interest rate outlook.

The top panel on page 1 provides three snapshots of the Eurodollar futures strip, representing contracts out to December 2004. Between the March and May meetings of this Committee, the Eurodollar futures curve declined between 50 and 80 basis points. In the period since the eve of the May meeting through yesterday, the curve moved lower as much as 74 additional basis points, as market participants continued to revise down their growth forecasts and their expectations regarding the degree and pace of tightening by this Committee. Among the reasons for this shift were reduced forecasts for growth in Q2 and the second half of the year, falling equity prices, a new wave of earnings warnings by various companies, continued uncertainties regarding the geopolitical outlook, and comments by members of this Committee that were interpreted as suggesting that the FOMC would be in no hurry to tighten policy. Although market participants appear uniform in their expectations for short-term interest rates in the near term, they are less certain about the likely path of rates later in the year. The middle panel graphs the implied volatility of the December Eurodollar futures contract. It has risen over the last three months from about 30 percent to about 38 percent. With perceptions that short-term rates are likely to stay low in coming months, the focus is increasingly on the possibility that rates might change in the fourth quarter and hence more focus on and volatility in the December contract. This scaling back of expected short-term interest rates was reflected in Treasury yields. The bottom panels graph two- and ten-year yields, both of which have declined sharply since topping out in late March. Treasury securities may also have benefited from some risk aversion, as weakness in riskier assets may have sent investors toward Treasury securities. The rate declines at the long end may be due in part to speculative flows—in anticipation of potential hedging by mortgage investors looking to hedge duration changes in their portfolios.

¹ Materials used by Mr. Kos are appended to this transcript (appendix 1).

The top panel on page 2 graphs the dollar's exchange rate since March 1 against the euro, the yen, the Swiss franc, the Australian dollar, the British pound, and the Canadian dollar. The dollar's depreciation, which was beginning to manifest itself at about the time of the last meeting, continued during the recent intermeeting period. The dollar declined against a wide range of currencies. Looking at a broader sample of sixteen major actively traded currencies since the beginning of the year, the dollar has declined against all of them except the Mexican peso and the Brazilian real. Early yesterday the dollar traded at just above 98 cents versus the euro—its weakest level against the euro since February of 2000—and just below 121 yen. The decline against the yen came despite occasional intervention by the Japanese authorities in attempts to stem the yen's rise. On four occasions in late May and early June the Japanese authorities intervened in the market, purchasing a total of \$20 billion. They intervened again yesterday, buying another \$3.5 billion, thus bringing their total intervention over the period since late May to \$23.5 billion. The weaker U.S. outlook is the most commonly cited reason for the dollar's decline. But concerns about the outlook for equities and the seemingly constant flow of adverse reports pointing to weakness in accounting disclosure and corporate governance were prominently cited by market participants as reasons for foreigners to shy away from continuing to accumulate corporate securities. And, of course, concerns remain about the size of the U.S. current account deficit.

With the continuing depreciation of the dollar, implied volatilities—as shown in the middle panel—have ticked higher, especially in the past week. The one-month implied volatility on dollar/yen, the blue line, has risen about 2 percentage points, to nearly 12 percent. The implied volatility on the euro-dollar exchange rate, the red line, which had barely budged through most of the spring, also rose about 2 percentage points, coincident with the euro's rally in the last two weeks. While this level of implied volatility is notably higher relative to levels in the recent past, it is not very much different from its historical range. Still, with investors and corporations having been trained over the first three years of the currency's life not to hedge short euro exposures, it may not take much more of a rise in the euro to bring a burst of hedging from a variety of accounts.

In the late 1990s, one factor that market participants had discounted in explaining exchange rate moves was relative interest rate differentials. At the time, the explanation was that the dominant flows that influenced exchange rates were foreign direct investments and long-term equity investments. Currently, with the composition of capital flows changing, there is a small but growing minority that is focusing on interest rate differentials increasingly as a guide to help explain exchange rates, especially with respect to the euro. With the exception of Japan and Switzerland, the United States now has about the lowest short-term interest rates among the major industrialized countries. And at the long end, the situation is similar. The bottom panel shows ten-year government bond yields as of yesterday, June 24, for the United States and ten other major industrialized countries. With the exception of Japan, this country has the lowest yields of the group, whereas in 1999 and most of 2000, ten-

year U.S. government yields were as high as, and in most cases higher than, those in many of the countries listed in this graphic.

Turning to page 3, the U.S. equity markets have declined steadily and sharply at times since March 1. The same set of factors that boosted bond markets and weighed on the dollar—corporate governance, earnings shortfalls, geopolitical concerns, and so forth—are cited to explain the weakness in equities. In the middle panel is a graph of the S&P 100 volatility index, also known as the VIX, which has risen sharply in recent weeks to a high of about 32 percent, coinciding with the recent weakness in equities. That rise is somewhat unusual for this time of year. Often the VIX is seasonally soggy as we move toward summer. High volatility is often associated, by some analysts at least, with market bottoms. Nevertheless, the recent peaks in the VIX are not nearly as high as the peaks in the fall of 1997, the autumn of 1998, and the period after last September 11, when this index peaked between 35 and 50 percent. I should note that the weakness in equity markets has been a global affair. The bottom panel graphs a sample of major international equity indexes also re-indexed to March 1. Their price levels generally have moved lower with the U.S. market. We've had profit warnings as well by some major European corporations, worries about debt levels at some of the major telecom companies, and concerns about the pace of European recovery. Still, with the dollar falling and the drop in U.S. equity prices, overseas investors would have done better on a relative basis by staying at home.

Turning to page 4, let me say a word about spreads. Despite the concerns about corporate governance and risk aversion, the picture in credit markets is mixed. In the investment-grade sector spreads on balance are a bit tighter. Spreads in swaps and agency debt, shown in the top left panel, have tightened along with lower Treasury yields. As can be seen in the right panel, spreads on A-rated industrial corporate debt tightened slightly, although there is some noise in that series because of downgrades among some prominent names in the telecom sector. Still, on balance, spreads have tightened somewhat, as have those on mortgage-backed securities. Anecdotally, market participants report that a wide variety of institutions have been acquiring mortgage-backed securities, which have become sufficiently expensive that some of the government-sponsored agencies have slowed their pace of acquisition. In the case of Freddie Mac, it actually has reduced its mortgage-backed portfolio in each of the last two months. As can be seen in the bottom panel, among somewhat riskier assets there was more evidence of risk aversion. Unlike the tighter spreads in the investment-grade sector, spreads in the high-yield sector, measured by the black line, have widened modestly. Emerging-market bonds have had a more notable widening, especially with political and economic conditions deteriorating in Latin America, and in particular in Brazil.

Turning to domestic open market operations and a word on reserves, the top panel on page 5 depicts the recent pattern of currency growth and our forecast for the rest of the year, along with our forecast as of the May meeting. The Desk reacted to the strong growth in currency by stepping up the pace of our outright purchases for the

System Open Market Account (SOMA). So far this year we have acquired about \$39 billion in outright purchases of Treasuries. The bottom panel graphs for the period from 1996 to date our total outright purchases of securities. The breakdown depicted there shows net additions to SOMA in the blue bars while the gray bars reflect purchases necessary to offset redemptions caused by our guidelines on single-issue holdings. During the past few years of declining issuance by the Treasury, the Desk frequently could not roll over the full amount of maturing proceeds and therefore had to acquire other securities to offset the drain caused by the securities being redeemed.

I want to make three points about this chart. First, the needs for 2002 as a whole will be quite substantial. We forecast that SOMA will grow by about \$65 billion this year. Second, the changed fiscal picture has caused the Treasury to increase issuance. As a result, we have had no redemptions so far this year and don't expect any for the remainder of the year. And finally, with SOMA having grown in size from about \$400 billion to over \$600 billion in the past few years, the current \$12 billion leeway to increase the portfolio during the intermeeting period continues to shrink as a percentage of SOMA's now-larger size. Several times this year we have nearly hit the upper limit of the leeway, particularly in long intermeeting periods such as the one just concluded. The Desk has managed to remain within the current limit, and in the medium term I expect we can continue to do so. Still, given the expected growth of currency and in turn of SOMA's portfolio, this limit will become increasingly binding. Therefore, I expect to return at a future meeting to request an increase in the intermeeting leeway to a level higher than \$12 billion.

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

CHAIRMAN GREENSPAN. Questions for Dino? If not, Vice Chair.

VICE CHAIRMAN MCDONOUGH. Move approval of domestic operations.

CHAIRMAN GREENSPAN. Without objection, they are approved. I believe that you've all gotten a memorandum requesting the Committee's approval of authority for the New York Bank to enter into agreements with other Reserve Banks for the conduct of open market operations in an emergency. If anyone has any questions, please raise them. I didn't expect any, so I presume that the request is approved without objection. We now move to our staff briefings on inflation. The presentations will be made by Art Rolnick, John Roberts, and Dave Lebow, in that order.

MR. ROLNICK. Mr. Chairman, I realize that typically when I give talks like this I'm required to give a disclaimer. These are not the views of the Federal Reserve Bank of Minneapolis, its board of directors, or the Board of Governors.

CHAIRMAN GREENSPAN. Including yourself? [Laughter]

MR. ROLNICK.² In this case, I'm hoping they may become the views of those organizations. The title of my talk is "Are Phillips Curves Useful for Forecasting Inflation? 40 Years of Debate." It is based on work that our Reserve Bank published last year in our quarterly review. Before turning to the package of materials that was distributed, which I hope you all have, I would like to make a few introductory remarks. Then we will go through the handout.

At the heart of monetary policy discussions is a view that there is a stable relationship between unemployment and inflation. Such a relationship is embedded in the Board staff's model and implies that low unemployment today will mean future inflation tomorrow. This view of unemployment and inflation is based on what has become known as the Phillips curve. Indeed, some of the leading economic textbooks today tout the Phillips curve as one of the key principles in economics. Nevertheless, the conventional view of the reliability of the Phillips curve has been debated in academia for over forty years. Recent work by UCLA professors Andrew Atkeson and Lee Ohanian, former staff economists at the Minneapolis Fed, concludes that the debate is over. On both theoretical and empirical grounds, the Phillips curve fails. The unemployment-inflation correlation is not stable, and unemployment is not a useful indicator for forecasting inflation.

What I'd like to do now is to take you through the handout. Page 2 highlights the three points that I want to make: (1) the Phillips curve hasn't been stable; (2) the unemployment rate is not useful for predicting inflation; and (3) what we can say is that, in the long run, money growth is a reliable predictor of inflation. Page 3 is titled "The Phillips Curve: The U.S. Experience 1960–2000," and page 4 shows the Phillips curve from 1959 to 1969 that many of us grew up with. I remember graduate school under Walter Heller when he would present these data and make the argument that this was not just a correlation but obviously a very strong correlation that looked rather convincing. Furthermore, he and others—Paul Samuelson, for example—argued that there was an exploitable tradeoff between inflation and unemployment and that indeed it was up to policymakers to pick the right point on that curve. We spent a lot of time arguing about where we should be on that curve, about the cost of inflation versus the cost of unemployment.

But if you recall, and some of you may, there was a fairly heated debate joined by Milton Friedman, who argued that there wasn't an exploitable tradeoff between inflation and unemployment. He believed that if policymakers tried to exploit that

² Materials used by Mr. Rolnick are appended to this transcript (appendix 2).

relationship, it would shift and indeed might disappear. If you turn to page 5, you will see that, in fact, that is what happened as policy changed and we confronted the inflation of the 1970s and onward. One would have a hard time finding what I'll call the old Phillips curve relationship between inflation and unemployment in that period. If anything, in the 1970s the relationship went the other way, and some people were saying that it looked as though we got high inflation but also high levels of unemployment.

Nevertheless, a number of economists weren't going to give up on the Phillips curve, and indeed—if you'll turn to page 6—a new Phillips curve emerged between 1970 and 1984. The new Phillips curve was now a relationship between unemployment and *changes* in inflation. This led to the concept of the non-accelerating inflation rate of unemployment, which we all call the NAIRU. The idea behind that concept is that, if unemployment falls below the NAIRU, the economy will be heating up and that will cause inflation to accelerate. Alternatively, if unemployment rises and the economy gets weak, then inflation will decelerate. If you look at the data from 1970 to 1984 you can see a relationship like that. It convinced many that there was something to the NAIRU concept and that once again unemployment would be useful in understanding inflation.

Again the debate continued. Professor Robert Lucas argued that with this conceptual framework there was a problem with policy. His argument was that it might be true that, if policy is highly variable and inflation is hard to predict, we can get real effects and a new type of Phillips curve. That is, because unexpected changes in inflation are difficult to decipher and we don't know whether those changes involve a relative price change or a rate of change in inflation, there can be real effects. But in his models he shows that if policy were to stabilize and if inflation were to come down and stabilize, then this relationship should also disappear. And that's what we find. As you can see on page 7, the so-called new Phillips curve becomes less visible in the years between 1984 and 2000 as we were bringing inflation down. As inflation becomes more predictable and as policy becomes more predictable, it no longer appears that there is a NAIRU that tells us much about where inflation is going.

So, as I've noted on page 8, my first point is that the Phillips curve has not been stable. You might quarrel with this. I've taken some very simple views of the Phillips curve; you might take some more sophisticated views. You might not use unemployment; you might want to use a broader measure of economic activity. But I'm going to assert that whatever the measure used, we're going to find the same problem over this period. When we have tried to look at more-sophisticated Phillips curves, we found that they are not stable over this period.

Let me turn now to the question that the authors, Atkeson and Ohanian, pose more directly. Some economists still insist that the Phillips curve may be stable enough and that unemployment, therefore, can still be useful for predicting inflation. So the authors suggest a test, and their test raises this question: Can the NAIRU-based

models forecast better than a naïve model? What do they mean by a naïve model? As shown on page 10, their definition is simply that a naïve model is one in which inflation over the next period is predicted to be equal to inflation over the previous period—not a very high hurdle and obviously a very unsophisticated model.

On the question of whether NAIRU-based models can do better, page 11 provides a picture view of their answer, which is “no.” They compare a naïve model to the NAIRU-based Board staff model—and also to the Philadelphia Fed’s Survey of Professional Forecasters, which we think is NAIRU-based—and one can see that the predictions are roughly the same. They went on to evaluate a host of other NAIRU-based models, including many based on work done by Mark Watson and James Stock who have done a tremendous amount of writing and work on NAIRU-based models. So the authors looked at a large assortment of those models—132 of them—to evaluate them in terms of whether they predict inflation better than a naïve model.

Page 12 conveys the basic idea underlying their method of evaluation. A better forecasting model has smaller average forecasting errors, right? The authors’ measure of success for a model, then, is the ratio of the average error of a NAIRU-based model versus the average error of a naïve model. The NAIRU model wins if the measure is less than 1. It loses if it’s greater than 1. So it’s a very direct test, and I would argue that it’s not a very high hurdle. The authors take a look at the Stock and Watson generalized versions of 132 different NAIRU-based models and compute these ratios.

You’ll see on page 13—and this chart needs some explanation—how the NAIRU models did. What we’ve done here is to show the range of that ratio. Again, if the ratio is over 1, the NAIRU model is losing. Take the record with respect to the models’ predictions of core CPI, for example, one of the inflation variables the models are trying to predict. The question asked is, Based on that ratio, how many of the NAIRU models have lower average forecast errors? The answer was none. For all of them the ratio was above 1. The authors looked at the forecasts of CPI and found that one or two of the NAIRU-based models actually tied the performance of the naïve model. They looked at the PCE deflator and could find one NAIRU-based model at most that did as well predicting that variable as the naïve model. So, looking at the performance of a variety of NAIRU-based models in forecasting three different major indicators of inflation, the NAIRU models could not beat the naïve model. That’s the summary of that page, and it makes the second point I want to convey: Not only has the Phillips curve been unstable, it is not useful for predicting inflation when measured against a naïve model.

So the conclusion that I draw from much of the work of Atkeson and Ohanian is that there are problems with predicting high-frequency inflation—or what is known as short-run variations in inflation—if we use unemployment. We’ve learned that that is also the case if we try using the money supply—even different measures of the money supply. We’ve had trouble using a money supply measure to predict inflation

for a long time, and that is one of the reasons this Committee has moved away from placing heavy emphasis on money growth in its policy decisions.

Nevertheless, we do know, based on various types of evidence, that over a long period of time money growth causes inflation. There are a number of different statistics I could have used to make this point. The one I'm going to show you on pages 15 and 16 happens to be my favorite. It is based on the experience of ninety-four countries from 1960 to 1990 averaged over twenty-five-year periods. It is work that was done by Warren Weber of our staff and George McCandless, one of our visiting economists. And it is work that was cited by Robert Lucas in his Nobel address regarding one of the clearest facts we have in economics, which is this long-run relationship between money and inflation. Again, we recognize that it is difficult to say anything accurate about short-run movements in inflation. But we can be fairly confident that, over the long run, countries or their central banks that print too much money are going to cause high inflation. That is my third point, as stated on page 17—that, in the long run, money growth is a reliable predictor of inflation.

Let me sum up with a few concluding remarks. The work that we have published on the Phillips curve is consistent with a number of articles and research papers by others in the System. The New York Fed, the Cleveland Fed, the Chicago Fed, and the Board have all published papers that are consistent with the findings of Atkeson and Ohanian. I think the bottom line is that the research calls into question the use of unemployment to predict inflation in the short run. Finally, let me say that, ex post, one can always find explanations for movements in inflation. That may be a very useful exercise for a number of reasons. But it does not change the results that I've presented here. Mr. Chairman, those are my comments and I'd be happy to answer questions.

CHAIRMAN GREENSPAN. Art, is there evidence that, in the long run, inflation is a reliable predictor of money growth?

MR. ROLNICK. Well, we have a theory, the quantity theory—as well as a number of other general equilibrium theories—that says money causes inflation.

CHAIRMAN GREENSPAN. Remember, we also have a theory that says that the NAIRU works.

MR. ROLNICK. Right, a theory.

CHAIRMAN GREENSPAN. So we're testing now to determine what conceptual framework is consonant with the facts. Clearly, the correlation that you show in and of itself—

MR. ROLNICK. The correlation I show is a correlation. I don't think we ever prove a theory. The best we can do is to say that we have a theory and these data are consistent with the theory. In this case, quantity theory and a number of general equilibrium models say that an increase in the money supply will cause inflation, and we have this correlation in the data that is consistent with that theory. Are you saying that we could have theories in which we predict that inflation will cause an increase in the money supply? I guess we could invent some.

CHAIRMAN GREENSPAN. Sure. You can make the hypothesis that inflation increases demand for money and the central bank caves in to that demand.

MR. ROLNICK. Right, absolutely.

CHAIRMAN GREENSPAN. So the question is—

MR. ROLNICK. Did they cave?

CHAIRMAN GREENSPAN. No. But we do have statistical techniques that can infer which variable is leading if there are leads involved.

MR. ROLNICK. We'd have to get Chris Sims here to discuss whether those techniques are good enough to determine causality. I think that's hard to do. Even with the best statistical techniques we have, it is difficult to get causality.

CHAIRMAN GREENSPAN. The relationship is not causality. It's basically lead association, and that's essentially what we're trying to determine. I'm not arguing the opposite. I'm just saying that if our basic purpose is to draw inferences from the data, we have to distinguish between when we construct a hypothesis and conclude results from it and, on the other hand, whether or not the data fit the hypothesis or are a mere inconvenience if they don't. Other questions? President Moskow.

MR. MOSKOW. Thank you, Mr. Chairman. This article that the Minneapolis Fed has published is obviously a very interesting one, and I think it is a timely reminder to all of us how difficult it is to forecast inflation. After that research was done, our staff did some further work on the Minneapolis results, and the results of our research were reported in our *Economic Perspectives* publication in the first quarter of this year. So I thought it would be helpful if I described our findings, which in some respects differ from what the Minneapolis study found.

The first point relates to the use of the Phillips curve in policymaking. The Minneapolis study, of course, talks about the magnitude of inflation—the impact of the Phillips curve in this type of analysis on the magnitude of inflation. But if we change that and talk about the direction of inflation, actually the results differ quite significantly because the naïve model obviously assumes no change in inflation going forward, so it doesn't help us at all in terms of predicting the direction for inflation. But if we use the Phillips curve models, they do. At least the analysis that we've done shows that if one goes out over either a twelve-month period or a twenty-four-month period, the Phillips curve model in seven out of the ten cases, 70 percent of the time, does accurately predict the direction of inflation going forward. So from a policy standpoint, that's not inconsequential; it's of some benefit.

Secondly, the period used in the Minneapolis study, 1984 to 2000, is a period when there was some structural change, as was pointed out in the Board staff's study. There really was a change in the way our central bank approached inflation. We became much more anti-inflation in the 1980s and the 1990s than we were before, and that is likely to have influenced the behavior of inflation. So to some extent then, the poor performance of these inflation-forecasting models that are estimated with data going back to the 1960s is not surprising. If we look at the Phillips curve models in the 1984 to 1992 period, right after the change in monetary policy, they

don't do well. But if we break the period differently and look at the interval from 1992 to 2000, they actually do well in forecasting inflation, much as they did in the period prior to 1984.

The third and last point I'd mention is that this study looked only at forecasting over a twelve-month period. When one looks out over a twenty-four-month period, the Phillips curve models do better than the naïve model. So clearly, there are limitations to these Phillips curve types of models, but I wouldn't discard them completely. I think there is some benefit to policymaking from these types of approaches.

MR. ROLNICK. I'm very familiar with that study, and I think it was an excellent study in a number of ways. Let me point out that the authors of that work found, too, that the Phillips curve was very unreliable and was not stable. They had their reasons for claiming it wasn't stable ex post; ex ante there was no such suggestion in the literature that the Phillips curve was going to shift the way it did other than by those who argued that Phillips curves are inherently unstable in the first place. So nothing that was shown in that study suggests that the Phillips curves are stable.

Secondly, they used a turning-point analysis—a different metric, as you noted—to try to determine turning points rather than the measure of inflation changes. They don't show that that gives a stable relationship either. In fact, that is also a relationship that changes over time. The basic message of the Minneapolis study was that these relationships are not stable, and that is the case whether one is looking at measurement or turning points. It is true that for certain intervals one can forecast very well with the Phillips curve. How do we know what kind of interval we're in? How do we know when the interval changes? What theory tells us when it changes? Potentially, policymakers can make large mistakes if we're in a period where the ability of the model to predict accurately is changing and they don't know that. So I think the argument

coming out of the Minneapolis Fed study is that to be confident—whether you want to use a measure of detecting turning points or not—you need a stable relationship. And until you find that stable relationship, you're facing quite a bit of uncertainty. As you pointed out, the success rate in predicting turning points was 70 percent. I don't know if that's high enough. Are we going to tell the Congress next year that we're 70 percent sure that inflation is going to decline? Is that good enough? I would think we'd want a success rate closer to 90 or 95 percent and we'd want a relationship that was stable. So I'm not sure, given the evidence we have, that we would be very confident in either type of metric—that is, the measure of inflation or its turning point. There is still a lot of work to be done to be able to argue that we could confidently predict a turning point in the rate of inflation.

MR. MOSKOW. I don't think the science of economics is ever confident in that type of prediction. It's certainly not at the point where we can confidently predict that. To me it's a question of what is helpful to the policymaker. And if in seven out of ten times we are able to point out the direction of future inflation, I'd view that as helpful.

CHAIRMAN GREENSPAN. Just remember that in a sample of ten, that .7 has a very large variance.

MR. ROLNICK. Thank you!

MR. MOSKOW. But I think it's better than 50 percent.

MR. ROLNICK. No, I think there is a question of whether it is statistically better than 50 percent. In this case there were not enough observations to do a very good job of testing whether that result was any better statistically than a flip of a coin. So while I think there may be something there, you don't have enough observations to say much confidently on that method of turning points.

MR. MOSKOW. My point is that I wouldn't discard it out of hand. I think it is still something for us to look at as policymakers; it provides some useful input.

CHAIRMAN GREENSPAN. Further questions for Arthur?

MR. PARRY. Art, your point 3 suggests that the model you would want to substitute for the Phillips curve is a quantity theory type of model. The question I have is, With such a model, in what ways would you expect the policy process of this Committee to change?

MR. ROLNICK. I thought you were going to ask me an easy question! [Laughter]

MR. PARRY. Well, I think I know what Milton Friedman's answer would be. But what are you suggesting that we do?

MR. ROLNICK. All I'm suggesting is that our current knowledge is that, for high-frequency observations or short term, it's very difficult to predict inflation. For the long term I think we can do a pretty good job.

MR. PARRY. Long term using what?

MR. ROLNICK. Using quantity theory. But if we're interested in short-run movements in the economy, I think the quantity theory has not done very well. After all, that's the reason we don't use monetary aggregates for short-run predictions of inflation. So as long as we're concerned about short-run movements in inflation—and I'm talking a year to two years—all I'm saying is that I think you have to continue to forecast but you might as well use a naïve model for forecasting inflation now until you find something statistically better. If you think unemployment is going to do it, I believe this evidence suggests that you should be worried about using that construct. In fact, when the unemployment rate fell well below the so-called NAIRU for the last three or four years, it was fortunate that this Committee did not respond to that—and I think for good reason. The message from this evidence is that looking at the

unemployment rate relative to a NAIRU is not a very effective way of predicting inflation. If the Committee had believed it was, I think it would have made some serious mistakes.

MR. PARRY. It sounds to me as though we would have a lot fewer meetings.

MR. STOCKTON. May I make just one point here about Art's work? I'm very sympathetic to President Moskow's point about not discarding this basic underlying structure. But at the same time I'm certainly willing to concede Art's point that in the last fifteen years the unemployment rate has not had as much predictive power for future inflation as it did previously. I don't view the enterprise of the Greenbook forecast as an effort to go out and, in some sense, find the most parsimonious structure upon which to forecast the economy. In fact, I'm not sure our big 120 stochastic equation model could do much better than a 4 or 5 equation vector autoregression. And I will admit that there are probably a number of people on our staff who would be quite thrilled to write the Art Rolnick Greenbook. It would be one page and two sentences and would say something like, "PCE inflation was 1.3 percent in 2001. And we project PCE inflation to be 1.3 percent in 2002." [Laughter] But I don't think that approach would necessarily provide you as policymakers with the kind of information that you need to grapple with the admittedly huge uncertainty you face about the economy. Art said he'd like you folks to have 95 percent confidence before you talk to the Congress about the economic outlook. If you could get to 70 percent confidence, I'd say you should call it a good day and probably quit.

One of the reasons for moving away from a naïve approach and more toward the complexity that we present in the forecast is that that complexity allows you to see where tensions begin to arise in the projection. And indeed, our experience in the late 1990s is a good example. It wasn't just that productivity was performing better than a simple time series model

of productivity would suggest. It was that we were seeing a pattern of errors across a large number of equations that suggested to us that some important aspects of the structure of the economy were changing in ways that you needed to respond to as policymakers. If we had been forecasting with Art's naïve model—or even with one that was a bit more complicated but still parsimonious—I'm not sure you would have been able to identify exactly what was going on as quickly as was possible from analyzing the pattern of our forecast errors. In our case, we were seeing stronger productivity, less inflation, more consumption, more investment, and a stronger stock market. It was all those pieces taken together that provided a context for you to understand what was happening.

At the end of the day, if the Congress would be satisfied with your using a twenty-five-year moving average of money growth to explain what your policy was going to be for the next year or two, I guess that would be great. And personally if you tell me I should be forecasting inflation twenty-five years hence, I'll be happy to use Art's regression. I'm planning to be here for only another ten years, so I'd be happy to forecast twenty-five years into the future.

[Laughter] But I don't think that is, as yet, a viable substitute as an alternative mechanism for forecasting inflation.

Indeed, one of the interesting things about modeling inflation has been that in the last twenty-five or thirty years we economists have not as a profession made a huge amount of progress. Many of the basic models that people are using today to forecast inflation were already evident in the 1971 or 1972 econometrics of price determination volume sponsored by the Federal Reserve Board. That had Bob Lucas's original work and the work of Otto Eckstein and Bob Gordon. And, as Art notes, we're still debating many of those issues. Some think we're making some progress, but I suppose I'm skeptical.

I think Art makes a very good point about the reliability of forecasts. In fact, a couple of years ago we submitted to the Committee a number of papers that looked at questions about how to make monetary policy in periods of significant uncertainty. We suggested then that you ought to put less weight on the forecast—as you did, I believe—and pay attention to what is actually happening. That procedure probably was wise and, I think, useful. Now, John and David will discuss shortly the issues that we have been struggling with and how we've been trying to explain what has gone on recently. But in terms of our being able to provide a context or an explanation for the behavior of the economy, we still feel strongly that the unemployment rate is an important transmission mechanism into monetary policy. It's not the only one, and it may not even be the principal one, but we believe it's an important one.

CHAIRMAN GREENSPAN. Vice Chair.

VICE CHAIRMAN MCDONOUGH. I could make a facetious remark and stop there, Mr. Chairman, to the effect that Art's presentation is particularly attractive if you have not devoted many years and much energy to getting a PhD in economics. The more important lesson from the various analyses that are used, however, is that—as David has pointed out I think quite well—they show us what we don't know. I have long felt that in public policy it is important to know what you don't know because then you're not likely to go happily along making policy decisions based on a view that you know more than you do. I do think that historians probably will say that one of the great performances of this Committee was in the 1996-97 period when we knew that some quite unusual things were happening. The staff did not pretend to say that all of our models were working; they were very straightforward in saying that the models were not working and that, therefore, we had to look at more figures and perhaps place greater weight on anecdotal information. But I do believe that it's important for us to keep digging and digging

into these various theories to see what we know or what combinations of theories can be put together to guide the Committee in making decisions. I am in the happy position of being able to say that I can't think of a decision we've made, at least in the nine years I've been here, that with the full brilliance of hindsight I would like to go back and change. That's all I have to say, especially if you're given to intellectual honesty, which I hope we all are. So I think the imperfect methodology we're using has served us rather well.

CHAIRMAN GREENSPAN. I think there's one hypothesis that has not been shut down yet, certainly not over the last five to ten years, and that is that the economic structure that drives this economy is under continuous change. That is, we don't have a set of fixed linear coefficients that abstract from reality and duly respond with a reasonable simulation or projection of what the economy is doing. One of the difficulties of having a simple model, if indeed there is a continuously evolving structure that we have to deal with, is that a simple model will go wrong and we won't know that it went wrong for quite a long period of time.

I think the point that Dave Stockton makes is really quite relevant because we have learned that the underlying structure of coefficients that was built into the Fed model, say, ten years ago was not depicting reality. The simulations coming off that model were creating very peculiar results. And indeed naïve forecasting—in the sense of merely letting the system run without any systematic endeavor to alter the add factors—was producing forecasts that were just very clearly wrong. What that says, obviously, is that there is something wrong in the underlying structure that is generating the forecasts.

I have a suspicion that until we can find some significant, stable set of relationships that seems to capture something fundamental and unchanging in the economy, we will have no choice but to move to looking at a wide variety of data and information, as the Vice Chair said.

From those very disparate types of evidence we can try to make inferences about the economy; and the more data we look at, the more we will be able to infer about the underlying structure that is governing economic activity in that period. A lot of people out there are asking why we can't come up with something simple and straightforward. The Phillips curve is that, as is John Taylor's structure. The only problem with any one of these constructs is that, while each of them may be simple and even helpful, if a model doesn't work and we don't know for quite a while that it doesn't work, it can be the source of a lot of monetary policy error. That has been the case in the past.

I hope we can find some stable structure out there. I suspect that we will not. I think we're going to find that the underlying evolution of our society is such that what we now presume to be stable coefficients are indeed variable. I'm not saying that they are random in variation. I'm saying that there is a systematic variation, but we don't know what it is—or at least we don't know as yet. At some point along the line we may be able to infer what that is and find ways of fitting it to the economy with coefficients defined as functions of other coefficients. The mathematics are awesome, as you all know. And the number-crunching capability of computers today provides the possibility of making very complex mathematical relations simple because you don't have to bother thinking—you just push a button and let the model run. That may be the solution to some of our problems. But my views reflect the same caution that I think both Dave Stockton and Bill McDonough raised. President Minehan.

MS. MINEHAN. Well, I have a much less philosophical approach to this, although my thoughts are very much in line with yours and Dave's as well as Bill's and Mike's. It's not surprising to me, as complex as our economy is, that more than one factor might be responsible for changes in inflation, the direction of inflation, changes in relative prices, changes in the labor

force, and the kinds of challenges that labor is going to face. That is not startling at all. And particularly in an environment like the 1990s in which we've been successful in keeping inflation down, it is hardly surprising that a naïve forecast for only a year in the future is a pretty good way of estimating inflation because inflation hasn't changed that much, thank goodness. That's because we've been reasonably successful with our policy. I think if one went back to the years 1979 through 1982 and tried naïve forecasting using contemporaneous unemployment rates and inflation rates, the numbers would be quite different.

CHAIRMAN GREENSPAN. Further questions for Arthur? If not, let's turn to John Roberts.

MR. ROBERTS.³ Thank you, Mr. Chairman. Our presentation this afternoon, entitled "Explaining Low Inflation since the Mid-1990s" reflects joint work with Flint Brayton and David Lebow and will be presented by myself and David. As shown in the upper left panel of your first exhibit, the rate of unemployment fell through the late 1990s, eventually reaching a level not seen in thirty years. Nevertheless, core consumer price inflation—shown at the upper right—remained in the 1½ to 2 percent range throughout this period. This outcome struck many observers as being at odds with the view that low unemployment necessarily pushes up inflation. The objective of our briefing today is to provide an explanation for these developments. To do this, we find it helpful, as summarized in the middle panel, to step back and ask whether changes may have been occurring in the economy over a longer span of time that may have altered the inflation process. We then focus on the recent past and ask why inflation remained so low in the late 1990s, when unemployment was also low. Finally, in light of the changes that we identify as being important, we evaluate the likelihood that the recent conjunction of low inflation and low unemployment can be repeated in coming years.

By our reckoning, three factors account for much of the recent experience of simultaneously low inflation and low unemployment, as listed in the lower panel of the exhibit. First, a change in the way monetary policy has been conducted over the past two decades, compared with the 1960s and 1970s, may have reduced the short-run responsiveness of inflation to resource utilization. This factor is a relatively small part of our overall explanation for why inflation has remained so low. The second factor is the pickup in productivity growth that started in the mid-1990s. As output per hour advanced more rapidly, hourly compensation responded only gradually, and the pressure on prices from unit labor costs temporarily waned. This element is the largest part of our explanation for the late-1990s experience. Looking to the future,

³ Materials used by Mr. Roberts and Mr. Lebow are appended to this transcript (appendix 3).

the influence of the pickup in productivity growth on inflation should diminish over time as hourly compensation adjusts more fully to the faster trend growth in output per hour. Lastly, structural developments in labor markets may have caused the natural rate of unemployment today to be about ½ percentage point lower than in the mid-1980s. These effects are likely to persist.

I should note that our presentation does not discuss the influence on recent inflation of movements in the prices of imports, energy, and food. Although these standard “supply-shock” variables have at times had significant effects on the year-to-year pattern of inflation, we see their net contributions to the good inflation performance of the past several years as being relatively small.

The framework for our analysis, the FRB/US model of inflation dynamics, is sketched out in exhibit 2. This model and others like it help inform the staff projection. In this framework, inflation (π) is a function of lagged inflation, expected future inflation (π^e), the difference between the unemployment rate (U) and its natural rate (U^n), relative price shocks (such as movements in food, energy, and import prices), and unit labor costs. In FRB/US, households and businesses form expectations of inflation based on their knowledge of the structure of the economy, including the manner in which monetary policy is conducted.

The factors we examine fit into this model as follows. First, for reasons we will expand on shortly, changes in the conduct of monetary policy alter the influence of the unemployment rate on expected inflation. Second, changes in labor productivity growth affect inflation through unit labor costs. Finally, the labor market developments we highlight influence the natural rate of unemployment directly and thereby alter the amount of inflation impetus associated with any given level of the actual unemployment rate.

Although economic slack, as measured by the gap between the unemployment rate and the natural rate of unemployment, clearly affects inflation in this framework, the equation also makes clear that unemployment is by no means the only determinant of inflation. According to the FRB/US model, since the mid-1960s, movements in this unemployment gap account for only about 20 percent of the variation in consumer price inflation, when measured in terms of its year-to-year change. This estimate includes the direct influence of unemployment on inflation shown in the equation as well as the indirect influence that is transmitted through the behavior of expected inflation.

The top panels of exhibit 3 show the change in inflation from one four-quarter period to the next plotted against the unemployment rate over the past forty years, with a split at the end of 1983. In each panel, we present the simple regression line. As you can see, the lines are downward sloping, indicating that periods of high unemployment tend to be associated with declining inflation. But it is also clear that the points in the post-1983 period are clustered in a narrower range than in the 1960-83 period. And as Art Rolnick noted earlier, the average slope of the relationship is

considerably shallower in the post-1983 period than in the earlier period—indeed, the slope falls by about half.

The change in the relationship between inflation and unemployment could have occurred for many reasons, but we find it plausible to attribute at least some of it to a change in the way that monetary policy has been conducted. As highlighted in the first bullet point of the lower panel, many studies suggest that since the early 1980s monetary policy has moved more aggressively to stabilize the economy than it did in the 1960s and 1970s. In the staff's FRB/US macroeconomic model, such a change in monetary policy reduces the sensitivity of inflation to unemployment by altering the way households and businesses form their expectations of inflation. In particular, under a more aggressive policy, low unemployment is no longer as strong a signal of higher future inflation, and so expectations are better "anchored."

Based on simulations of the FRB/US model, we find that a conventional representation of this change in policy would reduce the sensitivity of the change in inflation to unemployment by about a third and thus would account for more than half of the reduction in the sensitivity seen in the top panels. Other models imply similar reductions, although the precise results are sensitive to the model used and the exact specification of the change in policy. While the policy shift predates the low-inflation episode on which our attention is focused, this timing means that by the late 1990s the change in policy had been in place long enough that it was likely reflected in the expectations-formation process. As a consequence, the low unemployment rate of the late 1990s induced less deterioration in inflation expectations, and thus in actual inflation as well, than would have been expected from the average historical relationship between inflation and unemployment.

It is important to keep in mind that policymakers cannot "exploit" the new, lower sensitivity of inflation to the unemployment rate. If policymakers were to respond to this lower sensitivity by moving less aggressively when unemployment fell below the natural rate, this reversion to a less aggressive policy would, over time, alter the way in which expectations are formed, leading to an increase in the sensitivity of inflation to economic slack. David Lebow will now continue our presentation.

MR. LEBOW. Exhibit 4 addresses the role of productivity in holding down inflation in the 1990s. In the long run, a faster rate of productivity growth implies faster growth of real wages and has no implications for inflation. But in the short-to-medium run, we find evidence that productivity does affect inflation. This occurs because, in the equations we examine, hourly compensation responds only gradually when productivity accelerates. In our view, the slow reaction of compensation stems in large part from the costs that firms and workers face in acquiring and processing information relevant to setting wages, as well as from other institutional features that lead to inertia in wages more generally. Firms' and workers' decisions about wages depend on perceptions about conditions throughout the economy, and it may take quite a bit of time for a change in economywide productivity growth to work its way fully into economic conditions.

The sluggish adjustment of compensation implies that unit labor costs rise less rapidly and profit margins increase following an acceleration in productivity, thereby helping to hold down price inflation. Put differently, faster productivity growth allows a lower unemployment rate to be consistent with stable inflation. Although this effect may be quite long lived, it is not permanent. Eventually the faster pace of productivity growth becomes fully embedded in wage-setting behavior, and productivity has no further effect on inflation.

The blue line in the middle panel shows an estimate of structural productivity growth—that is, productivity growth abstracting from purely cyclical movements that tend not to affect firms' pricing behavior. The measure shown here is similar, but not identical, to the staff estimate of structural productivity growth built into the Greenbook forecast. The red line shows our estimate of the effect this productivity growth has on the increase in compensation per hour. For our analysis, the fundamental observation is that, when productivity growth picks up, the associated compensation increases lag behind. Thus, when productivity growth increased in the 1990s, it took time for this increase to become incorporated in wage setting, and increases in unit labor costs slowed, as evidenced by the widening gap between the blue and red lines. When productivity growth was declining in the 1970s, this process worked in the opposite direction.

The lower left panel presents one way to describe the influence of these productivity-driven movements in unit labor costs on price inflation. The measure plotted in the exhibit is the deviation in the unemployment rate from the long-run natural rate that would be needed to maintain stable inflation in the face of these productivity effects. According to these estimates, the slowdown in productivity growth in the 1970s generated upward pressure on inflation that would have required a higher unemployment rate to offset. By contrast, in the 1990s, the productivity acceleration allowed a lower unemployment rate to be consistent with stable inflation. As we indicated earlier, we would expect this effect of faster productivity growth on inflation to be temporary, and the chart suggests that it may have about played itself out by now. However, the staff has assumed that a recovery in capital formation going forward will again boost structural productivity growth, in which case some further beneficial effect may occur for a while longer, before eventually returning to zero.

Although the evidence in favor of these productivity effects is compelling enough to persuade us of their importance, we do not want to overstate the strength of that evidence. The lower right panel lists some caveats. First, the speed with which changes in productivity growth influence wages is very uncertain. Many different adjustment speeds fit the compensation data about equally well yet have noticeably different implications for the dynamics of inflation. Moreover, the adjustment speed might not be constant and might have been affected by changing compensation practices in recent years. The effect of uncertainty about this adjustment speed, as well as uncertainty about the other relevant parameters in our equations, is shown by

the shaded area in the bottom left panel, which presents a 70 percent confidence interval around our estimates. As can be seen, this confidence range is rather wide. Furthermore, this confidence interval understates the full amount of uncertainty, as it omits, among other things, the sensitivity of our results to the measure of structural productivity used.

In exhibit 5, we delineate a number of recent labor market developments and their possible implications for the natural rate of unemployment. The top panel groups these developments in terms of the direction of their likely effect on the natural rate in recent years. While this list may be incomplete, it identifies many of the key issues that researchers have explored. As noted in the middle column, some of the more familiar factors that may have had important effects on the natural rate historically—such as the minimum wage, unemployment insurance, and shifts in the demographic composition of the labor force—have had roughly neutral effects in recent years.

The left-hand side of the middle panels of the exhibit presents indicators for a number of factors that may have pushed down the natural rate in recent years. Two developments—the rise in the incarcerated population, shown as the green line, and the increase in the share of the working-age population collecting disability insurance, the blue line—both work to reduce the natural rate for similar reasons: Both developments lead to the withdrawal from the labor force of individuals who would otherwise have had above-average rates of unemployment. The rise in employment at temporary-help-supply firms—the red line—may cut both ways in terms of its effect on the natural rate of unemployment: On the one hand, the availability of jobs with temporary-help firms may make it easier for some individuals who would otherwise be unemployed to find work. On the other hand, some individuals who might otherwise have had more-stable full-time jobs are now in the temporary-help sector, where they may end up being unemployed between assignments. On balance, the unemployment-lowering effects probably dominate, but the net effect is likely to have been small. Worker insecurity may have played a role in holding down wage increases in recent years, thereby allowing unemployment to be lower than it otherwise would have been. The middle right panel shows one survey-based measure of worker insecurity. This measure rose to a high level in the mid-1990s. It fell back in the booming labor market of the late 1990s but remained at an elevated level. Returning again to the top panel and its left column, the fifth factor we list as possibly holding down the natural rate is the improved job-matching made possible by the Internet. While the Internet has helped many workers find jobs—and helped many firms find workers—we suspect that the effect on unemployment so far has been small, at least in part because Internet use is highest among better-educated workers, who are less likely to be unemployed.

One factor that may have worked to raise the natural rate in recent years is welfare reform. As shown in the bottom left panel, the number of families receiving welfare has dropped substantially since the mid-1990s. While surveys indicate that a large majority of former welfare recipients have found jobs, these surveys also

suggest that former welfare recipients are somewhat more likely to be classified as unemployed—that is, looking for work—than when they were collecting welfare.

The bottom right panel summarizes the implications of these developments for the natural rate of unemployment. Our assessment—based on some rough calculations informed by the available research on these effects—is that, demographics aside, these developments may have reduced the natural rate about ½ percentage point compared with the mid-1980s. As with most of the other results we are presenting today, there is a high degree of uncertainty around this calculation. And reasonable alternative assumptions about the unemployment consequences of these individual developments could imply anything from no change at all in the natural rate to a reduction of as much as a percentage point. One reason we don't believe the shift is much larger than ½ percentage point is that we have not observed large, persistent errors in models of hourly compensation in recent years. If the natural rate had fallen more significantly, not only price inflation but also compensation inflation would have been surprisingly low in recent years, and this has not been the case.

Your last exhibit shows simulations of the price-and-wage sector of the FRB/US model to quantify the amount by which the shift in the conduct of monetary policy, a faster rate of structural productivity growth, and favorable labor market developments have held down core consumer price inflation over recent years. The calculation involves comparing the predictions for core inflation from two simulations, each of which starts in 1995 and runs through the first quarter of this year. In the first simulation, all three of the factors we have highlighted today are included. In this case, as indicated by the red line in the figure at the top left, the simulation has inflation falling from 1995 to the present by about as much as inflation, on net, in fact declined. In the second exercise, the three factors are omitted. That is, the pickup in productivity growth is assumed not to have occurred, the ½ percentage point reduction in the natural rate is removed, and inflation expectations are generated in a manner consistent with the way monetary policy was conducted prior to the 1980s. The green line in the figure shows the model's prediction that inflation, rather than falling, would have risen more than 2 percentage points.

Additional simulations were run to calculate the contribution of each factor separately to the 3 percentage point difference between the most recent points on the green and red curves, which correspond to the first quarter of this year. As seen to the right, almost two-thirds of the difference is due to the pickup in productivity growth, about one-quarter to labor market developments that have lowered the natural rate, and only a small amount to the shift in monetary policy regimes. Of course, we have emphasized throughout this briefing the uncertain nature of our analysis, and these estimates must be taken in that spirit.

As noted in the middle panel, we believe that there are some clear connections between our analysis and the apparent view of many firms that they lack “pricing power” in the low-inflation economy. This perception may be a natural consequence of the creative destruction that has accompanied the productivity acceleration.

Because the benefits of productivity innovations are not spread equally across firms, innovations create winners (such as Wal-Mart) and losers (such as Kmart), and the participants in the accompanying competition, especially the losers, may naturally view themselves as lacking pricing power in this environment. Furthermore, in our view, an acceleration in productivity is likely to be followed initially by a rising profit share as productivity moves up ahead of compensation and then a declining profit share as compensation catches up and widened profit margins are competed away. The latter phase especially, which the data suggest has been under way in the past few years, may be perceived as a period of declining pricing power. Finally, a lack of pricing power itself could arguably have played a role in driving the acceleration of productivity. Greater competition associated with globalization, deregulation, and low inflation may have contributed to an environment in which firms have less pricing power. This reduced pricing power could be a factor that spurs firms to be especially aggressive in seeking new productivity-enhancing technologies.

Looking ahead, our analysis indicates that part of the explanation for the economy's recent ability to experience both low inflation and low unemployment is likely to continue and part of it may not. If monetary policy remains aggressive, the smaller sensitivity of inflation to unemployment should continue. However, this does not lower the rate of unemployment that is consistent with stable inflation. Similarly, in our view, an increase in the growth rate of productivity will not permanently reduce the rate of unemployment consistent with stable inflation. The benefits for inflation from productivity may persist a while longer, however, given the expectation that capital deepening will pick up as investment rebounds. Moreover, we do not yet know whether the acceleration of multifactor productivity has come to an end. Of the three elements that we have identified as having led to the low inflation-low unemployment episode, the reduction in the natural rate associated with various labor market developments is most likely to have a durable effect on the inflation-unemployment nexus. Thank you.

CHAIRMAN GREENSPAN. Going to exhibit 2, how are you fitting those coefficients?

MR. LEBOW. Those coefficients are estimated on data for the last thirty-five years.

CHAIRMAN GREENSPAN. These are reduced-form models?

MR. BRAYTON. No, really there's a pair of equations—one for price inflation and one for wage inflation—that are estimated together. We're assuming in the process of estimating these two equations that expectations are formed in a manner consistent with a view of how monetary policy operates to move the federal funds rate. Built into that estimation is a view that

monetary policy was conducted in a different manner in the 1960s and the 1970s then it has been more recently.

CHAIRMAN GREENSPAN. As modeled by what?

MR. BRAYTON. Well, the specific way that we characterize monetary policy is in the form of a “Taylor rule” equation—a dynamic form of the Taylor rule that has a lagged interest rate in it. We’re using different coefficients in this Taylor rule to characterize the two different views.

CHAIRMAN GREENSPAN. Are you imposing this on the model, or are you inferring it from the data?

MR. BRAYTON. We are imposing it on the model, but we are taking our coefficient estimates from studies that other people have done based on analyzing the data. We are not doing our own independent estimates.

CHAIRMAN GREENSPAN. But this is structured on the basis of a number of independent submodels, effectively. In endeavoring to infer relationships and to build this system up you do so in a manner obviously in which you’re not testing it in the macro sense. It is part of the fallout of an earlier system. In other words, you don’t confirm this by the data. You are drawing inferences from other research about the sign and relative size of coefficients and largely imposing it on the structure that you have.

MR. BRAYTON. To be clear, we’re imposing coefficients only as they relate to the conduct of monetary policy. But we do estimate the other coefficients—for example, the beta and gamma that are explicitly shown in the exhibit.

CHAIRMAN GREENSPAN. So what is the size of beta?

MR. BRAYTON. Well, we have more than one lag on inflation, but if we summed up the individual coefficients on all the lags, beta would be about .65, I think.

CHAIRMAN GREENSPAN. So it's somewhere between a first difference equation and a level equation in a sense?

MR. BRAYTON. Yes, though the answer to that does depend upon how inflation expectations are formed.

CHAIRMAN GREENSPAN. That gets to my last question. What proxy are you using for that?

MR. BRAYTON. Well, we're actually generating proxies ourselves from a small VAR model, one of the elements of which is an equation for the federal funds rate in the form of a Taylor rule type of equation that I described earlier. So we're not using survey data.

CHAIRMAN GREENSPAN. That's a point I don't quite get. Could you just explain it to me again?

MR. BRAYTON. In the process of estimating the wage-price structure in the FRB/US model, we are actually generating our own proxies for expected inflation. And those proxies are the forecasts that would be generated by a small VAR model of the economy, assuming that embedded in that small VAR model is a particular view of how monetary policy is formed.

CHAIRMAN GREENSPAN. What are the variables in the VAR model that you're using there?

MR. BRAYTON. The federal funds rate, the gap between the unemployment rate and the natural rate, and the rate of consumer price inflation.

CHAIRMAN GREENSPAN. Do you have any ex-post tests on that model? Art Rolnick would argue that his data say that shouldn't fit.

MR. BRAYTON. Well, one could ask whether that model is stable, and certainly—

CHAIRMAN GREENSPAN. One could ask a lot of questions! [Laughter]

MR. BRAYTON. One could say that the interest rate equation in it is not stable, reflecting the shift in policy, and we do take account of that. And that's really the only test we would apply. One could actually look closer at it.

CHAIRMAN GREENSPAN. Governor Gramlich.

MR. GRAMLICH. Well, as long as we're into that, I had a few questions about your model, too. First, as I understand it, on U^n you take the demographic adjustments that Dave has talked about and incorporate them into the variable. Is that right? You take from outside the relative price shocks and unit labor costs you talked about and again just build that into the model. As for these estimated coefficients, is it right to say that the π^e is like a first-stage variable? You put in that first-stage equation and then it's done so that the betas and the one minus betas sum to 1. That's basically how you do it?

MR. LEBOW. That's correct.

MR. GRAMLICH. Okay. Let me make a couple of comments about Art's paper. First, I think there are two problems with using the time period of the last fifteen years. One was mentioned by the staff and also by Cathy Minehan, which is that, if the central bank is successful in holding inflation close to, shall I say, a target, then any coefficient is going to have very small effects. That's because essentially you are going to reduce all the systematic variables from the right side and you'll just have a series of residuals. So I think there is that problem, which I gather is being called the optimal control problem. There is also another problem. Let's say there is still a Phillips curve out there that monetary policy hasn't totally emasculated. As is apparent in your chart, the variance of unemployment actually hasn't been very large over the

past fifteen years either, so one is going to have a little more difficulty in estimating the coefficient there. I don't know if it's biased up or down, but there has to be a significant variation in the independent variable to be able to estimate a coefficient. So that might be an issue, too.

The second point is that I wonder what you would have us policymakers do. That's the thought that occurred to me when I read the paper that was circulated. After all, we have to anchor inflation somehow, and if you don't want us to use unemployment, what would you have us use? You've answered that in a way by saying that you would go to a quantity theory rule, which is fine. But I think you gave that a little easier test. There you were just seeing if you could hit the target over a twenty-five-year period. And it strikes me that it might be harder to hit the target one year ahead than twenty-five years ahead, at least for the quantity theory. So I'm not sure that you had a symmetric test for the two hypotheses.

One last comment on the whole meta issue, if you will. Being a structure person, I side with the others who spoke before in preferring what the Board staff has done in exhibit 2, where the inflation process is broken up into different components. We look at expectations and at productivity shocks and whatever, which I think is better because in the long run we will learn more that way. And in my view the Committee has been well served by that.

CHAIRMAN GREENSPAN. Vice Chair.

VICE CHAIRMAN MCDONOUGH. Looking at the second panel on your exhibit 4, where structural productivity growth was taking off—with a drop-off recently that is about typical of the reduction in productivity growth during a recession—I would think that the improving productivity trend is still very much alive. The question, I think, is why it took place. It seems to me that the lack of pricing power, which you suspect is at least part of the explanation

of what was driving the productivity improvement, is in fact very important. That's especially the case for the improvement in productivity that came from the use of information technology in the non-tech sector. I think the main reason that people running firms were investing in such technology is that in a global economy they simply couldn't raise prices. They had to give some increases in wages and benefits, and the only way to avoid financing that out of profitability was to invest in productivity enhancements and not share the benefits from that with the staff. It seems to me that the economy we will be looking at in the foreseeable future—say, the next five years—is going to be that same kind of economy. Now, a little of the discipline may come off unless Karen can get the dollar strong again because clearly a strong dollar enhanced that discipline even more and made businesses invest in improvements in productivity. I think we're still going to have a lot of that discipline, and it will continue to be a big factor. You say that it may be long lived but not permanent; I'm old enough that permanent doesn't matter too much to me. So if it goes on for another five or ten years—and I think it's likely to—I believe it will serve the nation well.

CHAIRMAN GREENSPAN. President Parry.

MR. PARRY. Thank you, Mr. Chairman. I certainly agree with the three factors that the staff has pointed to as having played a significant role in restraining inflation. But I do have a question about the weights assigned to them in terms of their relative importance. And it seems to me that the recent experience of other developed countries might provide some interesting information for us. I say that because in the mid- to late-1990s other countries besides the United States also experienced the puzzling combination of low and stable inflation and declining unemployment rates.

Let me just pick two, though not arbitrarily, Britain and Canada. First of all, they both achieved low, relatively stable inflation and low rates of unemployment, which would suggest that perhaps there is some common explanation for countries that have experienced that. However, those two countries did not see at all the kind of productivity pickup that we've seen in the United States. But in these countries and others as well there was a shift in how monetary policy was conducted. I wonder, if you were to take a more international perspective in this study, whether it might not change your views about what the relative weights of these factors might be in explaining what was really a global process.

MR. BRAYTON. One comment I might have on that is that the weight we give to monetary policy in the experience of the last five years is associated with our notion that policy changes the sensitivity of inflation to the gap between unemployment and the natural rate. For monetary policy to receive a bigger weight in our analysis there would have to have been a bigger gap between actual unemployment and what we estimate is the natural rate for policy's quantitative effect to be dramatically larger than we estimated. So that's a more or less mechanical explanation of why in our way of thinking we can't give policy too much more weight. But obviously we have a variety of uncertainties here, so we wouldn't rule out a different parsing.

CHAIRMAN GREENSPAN. President Jordan.

MR. JORDAN. Thank you, Mr. Chairman. First a comment: Microeconomic principles would have led me to think that a move from a high inflation environment to a low inflation environment would cause an increase in what we call productivity, though I don't know how I would go about directly trying to test or reject that hypothesis. Next I have a question, though I'm not sure it's going to sound very different from the question that Bob Parry was just raising.

Certainly we have data problems with the phenomenon that we call inflation. We have problems with the unemployment statistics—who is counted in the labor force and who is counted as not working—and clearly we have problems with how we measure productivity. And as far as I know, the data measurement problems are getting worse not better. Nevertheless, if we look at a cross-section of currency zones around the world, the similarity in movements of what we measure as inflation is striking while the divergence in what we measure as productivity and unemployment is equally striking. How would you explain that?

MR. LEBOW. I'm not sure we have an explanation for that. One general point I could make is that although the change in monetary policy is part of our story, there's nothing that says that the change in monetary policy—this speaks to President Parry's question as well—was the same across all countries. In some countries that had more of a history of inflation than the United States, the change in monetary policy could have been more striking and thus had a larger effect. On the basis of the way heads are nodding, I think we all agree that taking a more international approach would be very interesting. But not having done that, I'm not sure that we have very many answers for you.

CHAIRMAN GREENSPAN. President Broaddus.

MR. BROADDUS. Mr. Chairman, I don't have any questions, just a couple of comments. Let me say first that I very much enjoyed working through both of these papers. They focus on issues that a lot of us have been dealing with for heaven knows how many years, and I think they do shed some new light on the subject of inflation. For me the most interesting question, though, is what conclusions one draws from the results of both sets of studies. I'm talking first about the role that monetary policy played in bringing the inflation rate down and

stabilizing it and secondly about how we should conduct policy going forward in order to sustain the low inflation we have now.

Against that background let me make a couple of comments about each paper. I thought Art did a very nice job of summarizing the Atkeson-Ohanian paper. Of course, the main result is that, at least over the last fifteen years, Phillips curves models don't forecast inflation any better than a naïve model. At first blush that might seem discouraging from the standpoint of someone conducting monetary policy, especially if the policymaker depends on those kinds of forecasting models. It might seem to suggest that inflation has a life of its own and, if we can't forecast it, how can we possibly hope to control it over time? But on the contrary, I think on reflection these results can be interpreted as evidence of the critically important and constructive role of monetary policy in stabilizing inflation. This just repeats the point that I think Cathy was getting at and that Ned made also, though I may be saying it a bit differently. If you imagine a world where the Fed is stabilizing inflation perfectly, then in that situation we would be moving the funds rate in exactly the way we would have to move it to offset the effects of a range of macroeconomic variables and temporary shocks on inflation. And hence none of these variables would have any predictive content for inflation because essentially we would be offsetting those effects with monetary policy.

The results of your paper, Art, suggest to me that we have largely achieved this condition of stable inflation—or certainly we're a lot closer to it than we were before—despite all of the measurement problems and other problems that have plagued the data we deal with in conducting monetary policy. In other words, I think one can interpret this result as suggesting that, on average, we have stabilized inflation more successfully over the last fifteen years than earlier. And I take some comfort from this, especially now, since we are stabilizing the inflation

rate more effectively at a very low rate. By the same token, I'm not surprised that these various macro variables have helped to predict inflation in earlier periods when we were conducting monetary policy differently because stabilizing inflation has not always been a priority for the Fed. For example, low unemployment had priority over stable inflation in the 1970s, as I think we all know. However, we deliberately and aggressively disinflated in the early 1980s under Chairman Volcker. So in periods like that, one would expect these other variables to help in predicting inflation going forward, I think.

On the Board staff's paper, I have to tell you that your conclusion that the role of monetary policy in bringing the inflation rate down over the 1990s amounted to only about 10 percent was a bit of a blow to me. My reaction was that maybe I ought to spend less time on the FOMC and more time on ITOC. And maybe I'll see if I can get Cathy to let me re-up for the FSPC!

MS. MINEHAN. Oh, but you wouldn't do that, would you?

MR. BROADDUS. I'll get back to you on that! [Laughter] Seriously, while I'm not questioning the econometrics, I just think it would be a mistake to draw the broad conclusion from these results that policy played a secondary role in reducing inflation in the 1990s. I'm not necessarily suggesting that you're saying that, but I see that interpretation as a danger when one looks at those results.

I would note in particular that if one looks at the details of this study, basically the model assumes that the inflation target is a moving average of lagged actual inflation. In other words, the study assumes that we move our implicit inflation target in line with recent changes in actual inflation. In still other words—to use some ancient terminology that Don and a few others around here will certainly recognize—the study models monetary policy as implicit inflation

targeting with base drift. The point is that just as the FOMC chose, at least implicitly, to let our M1 money target drift up with actual money growth in the 1970s—which was a bad choice as it turned out—we chose in the late 1990s to let our implicit inflation target drift down with actual inflation. And, of course, this turned out to be a very good approach, and it produced good results.

Viewed from this perspective, I think the Fed had much more to do with the 1990s disinflation than the 10 percent econometric result might at first blush seem to suggest. In some sense we had everything to do with it since we chose to pass the downward effect of rising productivity growth on actual current inflation onto trend inflation. We could have done it differently. We could have followed a more stimulative policy, which might have resulted in less disinflation. So in that sense I believe we had everything to do with these results.

I want to make one final point if I may. While a policy of letting our implicit inflation target drift with actual inflation was felicitous in the late 1990s—to the extent that it allowed us in fact to achieve price stability—this opportunistic disinflation or whatever we want to call it seems to me clearly to have outlived its usefulness. We obviously don't want the current low inflation to turn into deflation, and we don't want it to turn back up into increased inflation. We don't want it to drift at all. Against that background, we now have what strikes me as a wonderful opportunity to fix the target and announce it explicitly. [Laughter] I always get back to that, Mr. Chairman!

MR. STOCKTON. Mr. Chairman, may I make one clarifying comment just so there isn't any confusion about what David and John have shown on exhibit 6? In our model of the economy, inflation is a monetary phenomenon. And you as policymakers take all the credit and all the blame for the long-run movements of inflation, including the disinflation of the 1990s.

What that decomposition in the table is showing is the portion of the *unusual* behavior of inflation in the second half of the 1990s attributable to those factors. It does not indicate the contribution that monetary policy made to the disinflation that occurred because ultimately that is in the hands of this Committee. In trying to explain the unusual developments, that breakdown indicates that about 12 percent of that is explained by the change in the way you conducted monetary policy.

MR. BROADDUS. I just want to make sure we get credit not only for the 12 but for the 63 and the 25! [Laughter]

MR. STOCKTON. Another part of this chart that is not shown is the rise in inflation to 14 percent in 1979 and the decline to 5 percent in 1982. That's all on your plates as well!

VICE CHAIRMAN MCDONOUGH. I think David's record on psychology and diplomacy has just gone up to match his skill as an economist! [Laughter]

CHAIRMAN GREENSPAN. President Poole.

MR. POOLE. I think most of us agree that, in the long run, money growth determines the price level. I don't think there's any argument about that. But certainly money growth is not very helpful for predicting inflation in the short-term periods that we work with around this table. I think one of the problems here is that, with all the difficulties of the Phillips curve, we need a horse to beat a horse. We need something better but we don't have a framework that is a whole lot better. And the framework that emphasizes money growth, although I'm probably the one who gives more weight to it than almost anybody else around the table, just doesn't do the job that needs to be done over the short horizon.

We all agree from the debates of the late 1960s and early 1970s that there is no equilibrium relationship between the rate of inflation and the unemployment rate. What we have

here is an effort to make the change in the inflation rate depend on the labor market in some way, let's say the unemployment gap and some other variables. Now, there is no theoretical structure behind that, as is true of adjustment mechanisms in general. For example, in the investment world there are some crude regularities—adjustment-cost arguments that try to motivate investment—but there is nothing that we would regard, I think, as worthy of being elevated to the rank of theory behind any detailed empirical models.

It is certainly true that the equilibrium unemployment rate—call it the natural rate—does depend on institutional features of the economy and the labor market. That is part of what is going on here; we're trying to figure out what some of those features might be. And that's perfectly consistent with what we know or think we've known for a long time. I would view the discussion of the role of productivity growth in the same way. It makes a lot of sense to me that firms would understand the effects of the productivity changes that are taking place a lot more quickly than the employees and, therefore, that we would get a result that would fit this way. We might extract some empirical regularity, but I certainly wouldn't want to go very far in relying on it. It might help us understand what has been going on, but I certainly wouldn't want to mortgage my house on the basis of such a relationship, if I may put it that way.

I would offer an observation that the staff endeavor—certainly in what we have seen before us—seems to put a lot of effort on the institutional features in determining the natural rate of unemployment. I would hope that there is at least as much work underlying this on what I would call employment rate or participation rate issues because it seems to me that some of the more striking recent developments relate to the fraction of the working age population that is employed. We may have some interesting issues ahead of us, with changes in the proclivities of people over age 65, a category for which I am now qualified, to continue working. So we may

find that the unemployment rate itself will not be telling us a lot of the information that is available out there.

I also think that what we call lack of pricing power depends critically on the assumption of entrenched low inflation going forward. In my view, inflation expectations are a critical part of this phenomenon, and that, of course, comes back to the way in which monetary policy is conducted. And the way the change in the conduct of monetary policy shows up in this model is, I guess, with a change in the beta and gamma. I suppose gamma particularly would be getting a lower weight over time in the equation in exhibit 2.

One can see the importance of expectations just by thinking about what has happened recently in Argentina. No one would want to project what's going to happen on the day the currency board disappears. One would not want to project inflation on that day on the basis of any of the variables—such as the unemployment rate or the recent history of inflation—in a model like this. There would be a powerful change in the outlook as a consequence of something that had happened, and one could not project inflation in any reasonable way based on conventional macroeconomic variables of this kind.

I make that observation because this Committee, unfortunately, in the space of a relatively few years is going to be dealing with the transition of the chairmanship. And that is going to set the stage potentially for a significant change in the outlook for the economy. Certainly there will be a natural amount of uncertainty. Trying to extend the policy we've had in recent years and the expectations of that policy to a new chairmanship will be something critical to the way things evolve in coming years.

CHAIRMAN GREENSPAN. Governor Ferguson.

MR. FERGUSON. Thanks. I'd like to pick up on a point that President Poole made in passing, this whole issue of the so-called supply shock and the beneficial nature of it. Your point about why it is that we have benefited from this makes a lot of sense. But then another point you make is that to some extent the question now is our resolve and how much further we can go. There has been a huge amount of discussion about this so-called productivity surprise. I would think that at this stage workers are no longer as easily fooled about it. Also, I believe that some of these changes are structural, particularly the Internet and perhaps developments in help supply. One change you didn't put in your exhibit is the fact that variable pay had become important and may well become less important. All these developments might leave this Committee relatively quickly—no more than the five years that Bill McDonough talked about—in a potentially more difficult situation of higher productivity growth but still more-rapid adjustment in wages. I'd like to know if there are any early signs that you look at or if you have any thoughts about how much time we have here because in some sense we are living on borrowed time.

MR. LEBOW. I'd like to make one clarifying point about the productivity story that relates both to what President Poole said and what you just said. I don't think it's necessary in explaining the productivity story to believe that workers are fooled and that they don't know for a long time what aggregate productivity growth is. I think most people don't know what aggregate productivity growth is. What they do know is how they feel about their jobs, and they may have some sense of what other jobs might be available if they were to look elsewhere. Mobility is a characteristic of the labor market. When productivity increases occur, they are concentrated in certain firms and certain industries, and over time those firms raise their demand for labor.

MR. FERGUSON. Absolutely.

MR. LEBOW. So the job opportunity aspects are realized gradually.

MR. FERGUSON. Well, that's what I meant by the Internet and help supply and all those job market developments that tend to allow that competitive pressure to go through more quickly into wages. It's not just that workers are fooled. Ultimately I guess my question is this: Given these structural changes, aren't we likely to see a situation sooner rather than later in which this increase in productivity does in fact play through relatively quickly to wages? And, therefore, the one-time benefit that we get from a so-called supply shock will elude us.

MR. LEBOW. Indeed, on the productivity story per se, we have tried to emphasize the uncertainty about the adjustment speed. But having said that, we believe we are probably coming to the end of it fairly soon, if we have not already. As for the other factors we talked about perhaps having more-durable effects on the natural rate, I don't know. John, do you have any comment on that?

MR. ROBERTS. We think the productivity effect indeed may be just about played out, but we do believe that the other labor market developments are going to be more durable. So that portion we expect to continue.

MR. BRAYTON. May I add one more point to the answer to your question? There's no sense that there is any payback from the benefits of productivity that has to be met at some point. So while we're saying that the productivity story has played out, we have reached this lower rate of inflation. In our view, there's no reason for inflation to have to move up in the future because workers haven't gotten their full response to it. So we've settled in at a new—

MR. FERGUSON. But this does get to a point that I think Al Broaddus was making, which is that the opportunistic disinflation that has occurred over the last several years, in part

because of the productivity shock, is not something that we can be complacent about. And since in some sense I've mortgaged my house based on keeping inflation low and stable, I think it's pretty important that we understand that. This is the only job I've got! [Laughter]

CHAIRMAN GREENSPAN. Governor Bies.

MS. BIES. I found the papers very interesting. I think a few of you know that I have been trying to learn more about where the research stands on productivity and monetary policy. But as someone coming from the private sector there is one comment—an observation—I'd like to make. When I look at exhibit 5 and the factors you show as having had effects on the natural rate of unemployment, there's only one item on the list that to me reflects what business actually was doing in this period, and that's what I would call help supply. Also, I think there's an area on which companies have been working in the last decade that we may not be capturing here.

Let me start by prefacing my remarks with this comment: CEOs and CFOs think in terms of nominal earnings growth, not real earnings growth. So as inflation started coming down in the 1980s, they were challenged to retain the kind of growth in earnings they had been getting in order to keep their stock prices up. In the 1980s companies tended to resort—and this is a broad statement—to financial leverage. There were a lot of leveraged buyouts and a lot of excesses that created problems and led to the recession we had in the early 1990s. As a result, business executives had to go to the next type of leverage that a company can control to improve profitability, and that's operating leverage. So the decade of the 1990s became increasingly complex as firms really began to focus on widening operating margins. As the decade moved along, companies ran into a bottleneck in their efforts to become more efficient. They found that, as unemployment dropped, they were hiring workers who were further down on the skills ladder. And because they were hiring people who had few skills, making that operating margin

wider from the cost side was becoming more difficult. So in part I think the increased investment and greater focus on investment where productivity results could be achieved—as opposed to firms taking a view of let’s just see if this works—has been driven by the scarcity of labor skills. As we go through a period where labor becomes more available, that scarcity may not be as evident. I would love to see the staff follow up on the suggestion of looking at the experience of some other countries because anecdotally we hear reports that some of the countries with shortages of labor have seen spurts of productivity too. So thinking about it from the demand for labor side might be another area where this cross-country type of research might be helpful.

CHAIRMAN GREENSPAN. Governor Olson.

MR. OLSON. This follows up a bit on what Susan was just saying and also on what Vice Chairman McDonough was talking about. I was very interested when I read the material on the relationship between productivity and pricing power. It struck me as I was reading it, that this is a zero-sum game—there are winners and losers—and there’s an extent to which that would tend to encourage investment in new technology. At a time when there is not an obvious “killer app” in new technology, it would seem to me that there would be less tendency for business executives to return to a mindset of increasing capital investment. Wouldn’t there be more caution? Would that be one of the reasons we’re not seeing a rebound in capital investment? I say that in a meeting where we are celebrating uncertainty—or at least acknowledging that there’s a great deal of uncertainty. So though I’m not certain, as I read this material at the end of last week, it struck me that that could be the case.

MR. ROBERTS. It certainly is a story for why investment collapsed and why it might not rebound right away. I think you are right that people do seem to be more cautious now.

MR. OLSON. But I hadn't thought of it from a timing perspective. If indeed timing is an issue now that the economy is soft and caution seems to be the watchword, then timing would also be important once the economy turns around. It would suggest that the participation rate might move a lot faster on the upside also. I don't know, but I think that could be the case.

CHAIRMAN GREENSPAN. President Minehan.

MS. MINEHAN. I was going to say something very similar to what Governor Bies talked about. I was surprised that it took as long as it did in this staff paper to get to the role of pricing power. I think the issue is to some extent a question of what comes first—the chicken or the egg, the low inflation environment or the concern about pricing power. Is there causality? Also, there's the issue of the severe shortage of skills and its impact on productivity. And in the context of having to pay for skills, there is the interaction between that cost and the very real feeling on the part of businesses, which President McDonough mentioned, that they don't have pricing power. How does all of that interact on the larger stage? I think there are a number of areas here that would be fruitful for further research. Everywhere I go, business people, at both big and small companies, always talk about their lack of pricing power and the fact that even with the looser labor markets they really need skilled people that they can't get. Either those workers aren't available, or these firms can't afford them. Mostly the complaint is that they can't find the skilled workers; generally they would be willing to pay for them because they believe they're worth it.

I don't know how to frame a research question that would appeal to your research types. [Laughter] Every time I mention globalization and all of that to the people who work for me, they tell me that traded goods are only a small part of it, blah, blah, blah. [Laughter] But I think

there's something here that would be worthwhile looking into. I wish I could put it in a more rigorous context for you.

MR. STOCKTON. President Minehan, one aspect of what we saw in the late 1990s certainly lends some support to that view. One hypothesis, or one of the previous empirical stylized facts, was that late in expansions we get sags in productivity as lower-skilled workers are brought into the labor force. But what happened in recent years was obviously just the opposite. So it seems at least possible that some of the productivity gains were in fact being stimulated by firms in essence trying to work their way around that declining quality of the available labor pool. And I do think it would be a very interesting research project.

CHAIRMAN GREENSPAN. On the global issue, we obviously observe considerably less pricing power, at least from our data systems, for manufactured goods or tradable goods generally. What is not clear is whether the difference is an issue of productivity, which is internal, or whether it relates to the competition coming from tradable goods. One difficulty is that our pricing data on so-called non-internationally tradable goods is dubious in too many respects. If we took the data literally, the argument for globalization being a critical issue in the loss of pricing power is put up against the issue that somehow we get better productivity out of goods production than we do out of services production. I don't know what economic principle stipulates that that has to be the case. I was wondering whether, with all of these uncertainties, we had the ability to infer anything about the lack of pricing power by having, say, a horse race between globalization and productivity. The productivity effect apparently shows up in the manufactured goods area and creates that lack of pricing power. But the latter also happens with regard to tradable goods. And one can argue the reverse of that argument—namely, that it is a

lack of pricing power that engenders the productivity. Do you have the capacity to disentangle all of that?

MR. ROBERTS. Our reading of the literature on where productivity comes from and where technological progress comes from is that whether or not greater competitive pressure is a factor driving greater productivity growth seems to be an open question. One shred of evidence in that regard comes from international comparisons of growth that suggest that more-open economies do tend to grow faster than less-open economies. So there's one shred of evidence that actually draws a link from—

CHAIRMAN GREENSPAN. And I assume we would infer from that that it's the productivity and not the population growth that is relevant in that regard?

MR. ROBERTS. Absolutely. I meant productivity growth. In open economies output per person grows faster.

MR. POOLE. May I offer an observation on pricing power? If you think about what happened in the medical area in the mid-1990s, the change in competitive conditions pushed down the rates for hospitals or at least controlled them. But clearly prices can't be pushed down so far that it sends companies into bankruptcy. What has happened in more recent years is that there has been a lot of consolidation among hospitals and their rates have gone up substantially. We've seen very big increases. And there doesn't seem to be any problem with pricing power on the health insurance premiums that most of us are paying for our employees these days. Those rates are going up and up; we've seen increases of about 20 percent a year for a couple of years now. So it has to depend on the competitive conditions and also on the productivity that allows companies to stay in business with prices that keep being shaded down.

If we look at airlines today, we find that some of the major airlines are in very serious condition, on the brink of bankruptcy. I didn't read this morning's newspapers, so maybe somebody has already filed today! I don't know. On the other hand, airlines like Southwest and Jet Blue that have a different production process are doing just fine. So it's got to be a combination of competitive conditions and productivity that allows the price declines to still yield profits so that companies stay in business.

CHAIRMAN GREENSPAN. You know, it's not at all clear that medical prices are going up. What we do know is that the aggregate dollar amount spent on medical care and insurance is going up. But we have no way from the data system that exists to argue against the hypothesis that unit medical prices haven't moved at all in recent years.

MR. POOLE. I don't disagree with that except that there is a significant change from the trend in the mid-1990s. For example, if medical prices today are going down per unit of value delivered, they're not going down as fast as they were five years ago. That's my only point there.

CHAIRMAN GREENSPAN. That may well be. In other words, deflation in medical prices is assuredly less than it was five years ago if indeed those prices are deflating.

MR. POOLE. Exactly. And another example would be universities; we're seeing a lot of tuition increases now. State universities in particular are putting through increases because of the pressure on state budgets. I don't know whether there's a productivity story you want to try to tell there [laughter] but that's certainly a different—

CHAIRMAN GREENSPAN. There I will stipulate that it's hard to find.

MR. POOLE. Those are real price increases.

CHAIRMAN GREENSPAN. To be sure. President Moskow.

MR. MOSKOW. This is just a further elaboration on the point Roger Ferguson was making earlier that the productivity effect will fade but may persist a while longer. And, of course, your point that the productivity acceleration represents 63 percent of the difference between the two simulations makes it extremely important. I was wondering if you've looked at this trend in compensation and productivity in relationship to labor's share of the total income pie. I remember these data very well. As we all know, labor's share came down from 1990 to 1997 and then started to go up in 1997 and is now near its historical highs. The reason I remember these data so well is that in 1996, at the request of our Bank's chairman, who at the time was the head of the Chicago AFL-CIO, we gave a presentation to our board of directors on compensation trends. He saw the nonlabor share going up and, of course, got very concerned. After he left our board, that share started to come down. [Laughter] I've always been meaning to bring him up to date on these data. So, I was just wondering if you've thought about that in the context of the analyses that you've done in this paper.

MR. BRAYTON. Well, one answer is that the model we're using to provide these quantitative estimates makes use of the labor share as one of the explanatory variables that enters into the dynamics of inflation—price inflation and wage inflation. But the view of this model is that the labor share goes up and down over a period of time but it's ultimately going to equilibrate at some constant. Viewed over the broad span of the last thirty or forty years, the labor share tends not to have a trend in it. I guess our view would be that, measured relative to trend productivity, the labor share is pretty close to its historical average at the moment. When productivity took off, the labor share was depressed for a while, but it has been rebounding as compensation has caught up. Does that answer your question?

MR. MOSKOW. It's helpful. I guess I had thought that the labor share was near its historical high now, not the average. Am I wrong on that?

MR. ROBERTS. The labor share has come back up to near its average.

MR. MOSKOW. To its average?

MR. ROBERTS. Yes. And in our view, that is indicative of the productivity story having played itself out. We would expect, as the productivity story is played out, that the labor share would tend to come back to its historical average.

MR. MOSKOW. So, underlying your statement that the growth in productivity may persist awhile longer is a view that it is getting less and less likely?

MR. ROBERTS. The key is that we're anticipating some acceleration in productivity again as capital accumulation picks up. So we expect to get an additional benefit for a while.

MR. LEBOW. But it probably will be small relative to what we've seen in the past several years.

MR. MOSKOW. So our job gets more difficult going forward.

CHAIRMAN GREENSPAN. Vice Chair.

VICE CHAIRMAN MCDONOUGH. Two remarks, Mr. Chairman. As my earlier comment indicated, I think the staff may be confusing cyclical and secular trends. That is, I believe the pickup in participation of labor is a result of the recession and very likely will not continue. On the international comparisons of productivity, we've been spending a fair amount of time in New York looking at a question that I believe is a matter of considerable concern in many ways, and that is, Why has productivity in the United States since the mid-1990s been so much better than that experienced by our friends in the European community? There are no high-quality studies on the whole European community, but there are some very good studies on

the big four—Germany, Italy, France, and Holland, which though much smaller than the first three is actually quite a lot larger than the other small countries. And if one looks at the area in which tradable goods are involved—in the pure tech sector—the productivity improvement in the European four in that sector is just about the same as it is in the United States. And in the rest of manufacturing it's quite similar.

The remarkable area where the United States is hugely ahead of the European four is in the services sector. When one tries to look for an explanation, first I would note that in the services sector in Europe there is not as much international competition. Also, I think the strength of their views on the role of the state—in terms of the state being responsible for the individual—and the strength of the trade union movement play through in very, very little productivity improvement in the services area, whereas in the United States, it is in some of the services areas where the use of information technology has been most helpful in very substantially improving productivity. I found it very interesting that it was productivity in the services sector that accounted for virtually the entire explanation of the differential in our favor.

CHAIRMAN GREENSPAN. Arthur, do you want to have the closing words? Since you terminated your presentation there have been a lot of implicit attacks on your paper.

MR. ROLNICK. Yes, there is one comment I'd like to make. A number of people have made the point that Robert Lucas made a number of years ago, which is that in an environment with high and variable inflation we're going to see this correlation between unemployment and inflation. And indeed, unemployment then helps us predict inflation. But when we stabilize inflation and move to a stable environment, as we've done, that relationship disappears. I think we all believe we're in such an environment. So going forward, assuming we're going to maintain that environment, the question is this: Are we still going to rely on a Phillips curve to

help us predict unemployment, or are we going to acknowledge that there is another model and that it is a simple naïve model? At the minimum I would argue that we should be putting less weight on the Phillips curve's ability to tell us anything about the future course of inflation. It shouldn't have the weight that it has had in the past. I'm not arguing against structural models. I'm not arguing that there is nothing we can learn by trying to understand underlying behavior in this economy. But it is important to notice, and I think many of you did, that the relationship between unemployment and inflation is dependent on policy. We are now in a very stable inflation environment, so we should be putting less weight on that relationship. Thank you, Mr. Chairman.

CHAIRMAN GREENSPAN. Shall we take a break? It has been an excellent conversation and I compliment all of the participants. It was very useful.

[Coffee break]

CHAIRMAN GREENSPAN. We'll now go to the chart show, which will be presented sequentially by David Stockton, Steve Oliner, and Karen Johnson.

MR. STOCKTON.⁴ Thank you, Mr. Chairman. We're going to be referring to the package of materials entitled "Staff Presentation on the Economic Outlook." Your first chart presents a broad overview of the staff forecast. The upper left panel provides an update of our Greenbook projection of real GDP growth by including data that we received late last week on foreign trade and defense spending. Taken together, those data point to an upward revision of about ¼ percentage point to the growth of real GDP in both the first and second quarters—a revision that returns us close to our May forecast. The basic contours of our longer-run projection also remain largely unchanged from May. Stimulative monetary and fiscal policies, among other things, are expected to encourage a gradual re-acceleration of final sales—the red line in the panel to the right. Growth of real GDP—the black line—shows an even sharper improvement than final sales, as an end to inventory liquidation and then some restocking adds impetus to production. In the near term, the lingering softness in labor markets is expected to result in a further rise in the unemployment rate—the middle left panel—which we project will reach a peak of about 6 percent this summer. Meanwhile, PCE price inflation—the black line in the panel to the right—rebounds from levels that were depressed last year by sharply

⁴ Materials used by Mr. Stockton, Mr. Oliner, and Ms. Johnson are appended to this transcript (appendix 4).

falling energy prices. Core inflation—the red line—is expected to move sideways. The lower left panel compares our current projection with the one that we presented in the January Greenbook. As you know, we have strengthened considerably the projected growth of real GDP in both 2002 and 2003. This faster growth of real output has led us to revise down our estimate of the unemployment rate a bit this year and next. Dare I say it? Less slack in labor and product markets [laughter] and a sharper turnaround in non-oil import prices than we had projected in January more than offset some favorable supply-side revisions to our forecast, and we expect PCE price inflation to run a bit higher than in our earlier forecast. As shown in the panel to the right, the $\frac{3}{4}$ percentage point upward revision to projected growth of real GDP this year is composed of almost equal-sized positive contributions from household spending and business fixed investment, with smaller and roughly offsetting changes elsewhere.

Turning to your next chart, the most recent near-term indicators have been broadly consistent with our view that economic activity is continuing to expand but at a considerably more subdued pace than earlier in the year. Manufacturing IP, shown in the upper left panel, has been increasing steadily since the turn of the year, and we expect that the gradual recovery under way in this sector will continue. One reason is that inventories have moved into more comfortable alignment with sales. Days' supply of manufactured goods—the right panel—has about returned to its low point in early 2000. In addition, the orders picture has shown improvement in recent months. The ISM index of new orders—the middle left panel—has been fluctuating around a reasonably robust level in recent months, lending support to the view that the recent pickup in factory output has some staying power. More broadly, the labor market seems to have turned up in recent months. As shown to the right, there have been small increases in private payroll employment in the past two months, after more than a year of nearly steady declines. Spending also appears to be increasing this quarter, though at a much slower pace than in the first quarter. In particular, the increases in consumer outlays over the past few months, shown in the lower left panel, have been much smaller than earlier in the year. Even though housing starts—plotted to the right—jumped in May, they returned to a level about matching that of the first quarter, implying that residential investment will make only a small contribution to the growth of real GDP in the current quarter, after being a significant plus in the first quarter. Tomorrow morning we will receive data on orders and shipments of capital goods in May, an important piece of the business spending picture.

Chart 3 highlights the policy environment that shapes our forecast. The upper left panel displays our model-based estimates of the equilibrium real funds rate. With the real funds rate hovering close to zero, we believe that monetary policy is set to foster a return to above-trend growth later this year and into 2003. In recent months, there has been a considerable convergence of the staff's policy assumptions and market expectations. As shown in the right panel, the staff assumptions—the solid black line—incorporate a bit less tightening than is anticipated by the markets—the solid red line. But those differences are now very small in comparison with the wide gap

in expectations that existed in January—shown by the two dashed lines. The stock market—the middle left panel—is projected to be about flat through year-end before trending up in 2003. The loss of household net worth over the past couple of years is expected to be an ongoing drag on domestic demand during the projection period. However, the anticipated gradual decline in the foreign exchange value of the dollar—the middle right panel—should help to fill that shortfall by boosting exports and restraining imports. Fiscal policy also is expected to provide a substantial boost to aggregate demand this year and next. Fiscal impetus, plotted in the lower left panel, exceeds 1 percent of GDP this year and remains above ½ percent of GDP in 2003. Policy actions, the cyclical weakness of the economy, and the substantial shortfall in tax receipts this year have led to a significant deterioration in the federal fiscal position. As shown to the right, we are now projecting unified deficits of \$154 billion and \$127 billion in fiscal years 2002 and 2003, respectively. Steve Oliner will now continue our presentation.

MR. OLINER. Your next two exhibits survey the financial backdrop for our forecast, starting with the corporate sector. On the whole, we think this sector is in reasonably good financial shape, though there are clearly pockets of stress. One indicator of this stress, shown in the upper left panel, is the elevated default rate on corporate bonds. The rise in defaults has its roots in the buildup of corporate debt in the late 1990s. As can be seen to the right, such debt expanded in real terms at roughly a 10 percent annual rate during 1998 and 1999. Although the rapid debt growth has created difficulties for some firms, we do not anticipate that a debt overhang will be a major constraint on business spending. Even among lower-rated firms, debt problems are the exception rather than the norm, as indicated by the middle left panel, which plots interest expense as a share of cash flow for speculative-grade firms. As you can see from the red line, this measure of interest burden has risen sharply for the firm at the 75th percentile of the distribution. But for the median firm—the black line—the interest burden remains well below its peak a decade ago. In addition, as shown to the right, nonfinancial corporations have a lot of cash to service their obligations. The ratio of liquid assets to short-term liabilities rose sharply last year as firms used the proceeds from heavy bond issuance to bolster their balance sheets.

Ultimately, the financial health of the corporate sector depends on its ability to generate profits. The lower left panel plots the annual relationship between the growth in economic profits (the vertical axis) and the growth in nonfarm business GDP (the horizontal axis), with each dot representing a single year. As shown by the red dot for 2002, the staff's outlook for profit growth this year is stronger than the historical relation would suggest, while the forecast for 2003 is a little below the regression line. Averaging across the two years, we're expecting a fairly normal pickup in profits conditional on the pace of output gains. We worry, though, that the profit growth in our forecast will fall short of market expectations. As shown to the right, securities analysts forecast that earnings per share for S&P 500 firms will increase more than 19 percent in 2003 and will post long-term gains of 12½ percent at an annual rate. Analysts tend to be a bullish lot, so in the second column we have

restated these forecasts on a bias-adjusted basis. We have written down ranges rather than point estimates because the estimated bias depends on the time period over which it is measured. Even the bottom-end figures appear overly optimistic given our view that trend growth of the economy, in current-dollar terms, probably is in the neighborhood of 5 percent annually. Hence, the bias-adjusted ranges imply a large and persistent rise in the profit share of GNP, which seems unlikely. It is this concern about market expectations that led us to write down the rather anemic baseline path for stock prices that Dave noted earlier and to include the Greenbook simulation of a significant decline in the stock market.

Your next exhibit turns to financial conditions in the household sector. Households have taken on a lot of debt in recent years, which—as shown in the top left panel—has lifted the aggregate debt service burden nearly back to the peak reached in the 1980s. The high level of debt has created problems for some households. For example, delinquencies on auto loans to nonprime borrowers—the blue line in the panel to the right—have jumped over the past year. However, broader measures of household loan performance look much less worrisome. Auto loans extended by the financing arms of the Big Three carmakers—the red line—have continued to perform well. And the aggregate delinquency rate on all consumer and home mortgage loans at commercial banks—the black line—remains well below the level seen at the end of the 1990-91 recession.

Although the financial press has often highlighted household debt burdens, we think the real story is on the asset side of the household balance sheet. The middle left panel displays total household assets and liabilities, both scaled by disposable income. As shown, household assets are currently about six times the value of liabilities, and movements on the asset side account for almost all the variation in net worth, the difference between the two series. Thus, in assessing the influence of household balance sheets on spending, our focus is on the key drivers of asset values—namely, equity prices and house prices.

Dave has already discussed our outlook for equity prices. The panel to the right plots changes in real house prices over the past twenty-five years—as measured by the repeat sales index for existing homes—along with our forecast. As you can see, these prices have moved up sharply over the past couple of years; indeed, the 72 percent rise from mid-2000 to mid-2001 is the fastest four-quarter change shown in the chart. The rate of price appreciation has come down somewhat of late and, for the forecast, we assume that house price gains will moderate further.

The rapid appreciation in recent years has prompted talk of an emerging house price bubble, similar to the boom-bust cycle of the late 1980s and early 1990s. While we would not entirely dismiss these concerns, we believe they are overblown. The lower left panel presents a key piece of evidence in this regard. Here we have plotted real house prices (in red) against real per-capita income (in black) for a set of major cities on the East and West coasts. We focus on these coastal cities because this is where house prices were subject to the widest swings in the last cycle. As shown,

house prices in these cities zoomed relative to per capita income in the late '80s and then corrected back down to the income path over the next several years. More recently, house prices have again risen relative to income, but the gap between the two is considerably smaller than in the prior cycle. Given the slowing in house price inflation already under way, we do not expect prices to diverge from income to the extent observed in the late '80s.

Before concluding this tour of financial conditions, the lower right panel makes a very brief stop at the banking sector. Quite unlike the situation a decade ago, banks are in good shape overall. The aggregate return on assets—the black line—has remained high, and the share of assets at well-capitalized banks—the red line—continues to hover close to 100 percent. Accordingly, we anticipate that the banking sector will not impede the recovery, in contrast to the headwinds that came from this sector in the prior cycle.

A key issue in the staff projection is the outlook for business investment, the topic of your next exhibit. As shown in the top left panel, we estimate that real business fixed investment (line 1) edged up in the current quarter, which would be the first increase in more than a year. We look for moderate gains in spending over the second half of this year, followed by more robust growth in 2003. The initial impetus for this pickup comes from stronger outlays for equipment and software (line 2), as construction spending (line 3) is expected to decline further in coming quarters and then to stage only a tepid recovery next year.

The current picture for high-tech equipment—an important driver of total E&S outlays—is decidedly mixed. The good news is that real outlays for computing equipment turned up late last year and appear to be on a solid, if unspectacular, growth path. The panel to the right plots real computer shipments (in red) along with domestic production of semiconductors (in black), which we have found to have some leading information for these shipments. As you can see, semiconductor output continued to rise through May, which bodes well for further growth in computer outlays. We expect the spending gains in the second half to remain close to those recorded of late, consistent with anecdotal reports that see no breakout—on the upside or downside—from recent trends. In contrast, the news from the telecom sector remains downright abysmal. The industry still has too much capacity, and as shown by the red line in the middle left panel, analysts are continuing to mark down their estimates of year-ahead earnings growth for telecom service providers. In this environment, we expect no upturn in spending on telecom equipment before next year. That said, telecom equipment is only a small part of total E&S spending, and we think the outlook for aggregate outlays is considerably brighter. The panel to the right shows the historical relationship between the growth in real E&S spending—on the vertical axis—and the acceleration in business output—on the horizontal axis. As you can see, our forecast for 2002 is very close to that implied by a standard accelerator, while the projection for next year is somewhat above the regression line, in part because we expect spending to get a noticeable boost from the partial expensing allowance that expires in 2004.

The near-term outlook for nonresidential construction activity, shown in the lower left panel, is rather bleak, reflecting the widespread overhang of available space. As you can see from the red line, contracts for nonresidential projects—which tend to lead actual construction—have continued to trend down, suggesting that the decline in activity has not yet run its course. However, we believe that the ongoing supply adjustment is sowing the seeds for a recovery, albeit a mild one, next year. The panel to the right illustrates this point for the office sector. As shown by the black line, real office construction peaked in late 2000 and has since fallen by about one-third, which contrasts with the much slower adjustment in the late 1980s. The wide shaded area shows that it took five years, from 1985 to 1990, for construction spending to drop as much, in percentage terms, as during the latest five quarters, even though the high vacancy rates at that time clearly signaled an excess supply of space. The faster contraction today likely reflects the greater discipline now being exerted by lenders and the financial markets. As a result, we do not expect anything like a repeat of the prolonged dislocation in the earlier period.

Your next exhibit presents the outlook for household spending. The top panel documents the unusual behavior of these outlays during the recent recession. As shown on line 1, PCE and residential investment spending typically increase slowly leading up to the cyclical peak, edge down during the recession, and then rebound sharply during the first year of the recovery. In contrast, during the current episode, real outlays remained on a solid uptrend through the recession. Given that there has been no spending decline to recover from, and with negative wealth effects still at work, we anticipate that the gains over the forecast period will be well below the cyclical norm. The unusual nature of the current cycle is also evident from the behavior of stocks of consumer durable goods and housing, shown in the middle panel. The growth of the durables stock—the black line—normally slows sharply during recessions and then rebounds during the first couple years of recovery. This time around, the stock of durables continued to expand rapidly through the recession. The high current level of outlays on durables, combined with our forecast of a moderate further rise, keeps the stock growing at a historically fast pace. The story for the housing stock—the red line—is roughly the same: Its growth was well maintained during the recession, and our outlook for residential investment spending implies no slowdown through 2003.

Obviously, we do not agree with those who say that household spending has “hit the wall” after several years of rapid growth. Our outlook is more favorable because we expect productivity to remain on a strong uptrend, which will generate sizable gains in real income. The longer-term relationship between productivity and income growth is shown in the lower panel, where we have plotted percent changes from five years earlier for both series in order to smooth through some of the cyclical effects. As you can see, these smoothed series are highly correlated, and with productivity gains expected to remain hefty, we anticipate that households will have the wherewithal to keep spending on an upward track. Dave will now discuss our outlook for productivity in more detail.

MR. STOCKTON. Your next exhibit presents our current take on the strong performance of productivity growth in recent quarters. The upper left panel addresses the simple question, “Did it really happen?” In this panel, I use two independent measures of output—one measured on the product side and the other measured from the income side. I also use two independent measures of hours worked—one from the establishment survey and one from the household survey. The remarkable finding is that it doesn’t matter how you combine these measures; the growth of productivity appears to have increased over the past year—a period of noticeable weakness in the economy.

One explanation for the unexpected strength is that underlying productivity growth has been faster than we had earlier estimated. Indeed, in previous forecast rounds, we responded to these developments, in part, by revising up our estimates of the growth in structural productivity. As shown to the right, we now estimate that structural productivity will rise 2 percent this year and 2½ percent in 2003; these figures are about ¼ percentage point faster than our estimates at the beginning of the year. Structural productivity growth in 2003 is expected to nearly match its performance in the second half of the 1990s. However, the composition of those gains is expected to be different. We are expecting less of a contribution from capital deepening—the middle left panel—owing to the modest rebound we are expecting in capital spending. And we are expecting more of a contribution from multifactor productivity—the middle right panel—reflecting its recent strength.

Another explanation for the buoyancy of productivity over the past year or so is the influence of adjustment costs—an issue you may recall that was explored by our colleague, John Fernald, at the Chicago Fed in a paper circulated to the Committee last year. In brief, the idea is that firms incur costs, such as downtime and training, when they install new equipment, whether it be a computer system for office workers or machine tools on the shop floor. This represents time and effort that would otherwise have been devoted to producing final output. In a period of rapid increases in the capital stock, these adjustment costs could be sizable and might distort the assessment of underlying productivity growth. Likewise, a sudden decline in investment, such as has occurred over the past year and a half, might result in a sharp drop in these adjustment costs, leading measured productivity growth to overstate the advances in underlying productivity.

Line 1 in the lower panel reports the standard measure of labor productivity in the nonfarm business sector. Lines 2a and 2b present figures for productivity growth that net out the effect of high and low estimates of these adjustment costs. Firm-level data suggest that these adjustment costs are relatively small, consistent with the estimates on line 2a. Macro-based estimates, such as those developed by John Fernald, tend to be larger, similar to those on line 2b. Between 1998 and 2000, when investment was booming, growth of labor productivity net of adjustment costs exceeded measured productivity growth. However, in 2001, in the wake of the investment collapse, productivity net of adjustment costs slowed more sharply than measured productivity

growth. In effect, some of the apparent favorable performance of productivity over the past year may reflect the fact that firms incurred fewer adjustment costs as investment declined. Still, these calculations suggest that this has not been a large part of the story, and empirically, our estimate of structural productivity is not much affected by these considerations.

The upper left panel of chart 9 displays a third element in our interpretation of recent productivity developments. We continue to believe that firms have remained uncertain about the strength of the recovery and have been squeezing more out of their existing workforces. This has been reflected in a movement of actual productivity above our estimated structural trend. Our baseline forecast incorporates growth in labor productivity of about 1 percent at an annual rate in the second half. The employment implications of the baseline projection are shown to the right. After a projected gain in private payrolls of 75,000 in June, we forecast a gradual acceleration to average monthly gains of 150,000 in the third quarter and 200,000 in the fourth quarter.

Recognizing that considerable uncertainty surrounds this aspect of our projection, I also show the employment consequences of slower and faster productivity growth. In the slower productivity scenario, I assume no growth in labor productivity in the second half—an outcome close to that projected by our models. Holding our output forecast constant, such an outcome would be accompanied by very rapid employment gains and a fall in the unemployment rate to about 5½ percent by year-end. The faster productivity growth scenario assumes growth in productivity of about 2½ percent through the end of the year, similar to the pace we think has occurred in the current quarter. Such an outcome would produce, in essence, a “jobless” recovery, with little net change in payroll employment and with the unemployment rate rising above 6½ percent in the fourth quarter. This is, of course, a very partial equilibrium analysis, but it does give a rough sense of how alternative productivity outcomes could shape near-term labor market developments. In that regard, initial claims for unemployment insurance—the middle left panel—have fallen to a level consistent with our projected June employment gain of 75,000. But some further declines will be necessary over the next month or so if we are to reach our projected average increase in the third quarter of 150,000. Household impressions of labor market conditions—shown to the right—also have remained relatively lackluster to date. Overall, we are expecting soft labor market conditions to hold the growth of hourly labor compensation over the next year and a half below the rates of increase posted in 2001—measured by either the employment cost index—the red line in the lower panel—or by nonfarm business compensation—the black line.

As can be seen in the upper left panel of chart 10, the subdued growth in hourly labor compensation and the relatively strong gains in structural labor productivity together suggest that structural unit labor costs—the black line—will not be exerting much pressure on prices over the forecast period. The projected depreciation of the dollar is expected to result in a modest acceleration in non-oil import prices—the upper right panel. Moreover, energy prices—the blue bars in the middle left panel—

will give a small boost to inflation this year, after providing considerable relief in 2001. Despite these crosscurrents in the outlook, survey measures—shown on the right—suggest that inflation expectations remain well anchored. As can be seen in the lower panel, that should not be very surprising. The light shaded area highlights the envelope formed by our major measures of core inflation. If one looks hard enough, it is possible to see some small disinflation from 1995 to 1998 and a slight acceleration between 1998 and early 2001. We are projecting inflation to edge down again between 2001 and 2003. But overall, the picture has been one of general stability in the rate of inflation in recent years, a pattern we do not think will be disturbed over the next year and a half. Karen Johnson will now continue, with the international portion of our presentation

MS. JOHNSON. Your first international chart presents financial market developments in the major foreign industrial countries. The top left panel shows the decline in the nominal exchange value of the dollar that has occurred since shortly after the January chart show in terms of the euro, the yen, and the index of the currencies of the major foreign industrial countries. This index has returned to a level last recorded in January 2001, falling 9 percent from its peak in late January of this year. Despite the headlines and market chatter, the dollar has retraced only a fraction of its 40 percent rise between 1995 and earlier this year. Nevertheless, market tone has shifted toward the view that a prolonged downward adjustment of the dollar may have begun in response to heightened risks. Concerns have increased about robustness of the U.S. recovery, revealed weaknesses in U.S. corporate governance, the questionable attractiveness of holding ever larger claims on the U.S. economy, some move toward protectionist policies by the Administration, and political and terrorist uncertainties. To provide some perspective, I have shown in the right panel the adjustment of the exchange value of the dollar from its peak in 1985 in terms of the German mark, the yen, and the Canadian dollar. From early 1985 to mid-1987, the average value of the dollar fell about 35 percent. The mark and the yen both bore a substantial share of the change, with the dollar declining nearly 50 percent against each of these currencies. In contrast, the Canadian dollar moved only slightly.

The middle panels trace the shifts in market expectations about future euro and yen interest rates since your January meeting. From their January values, shown in red, euro three-month futures rates first moved up, as markets became more optimistic about the pace of global recovery and came to expect more-aggressive tightening by the ECB. However, after peaking in late March—the blue lines—rates have since more than retraced that shift for 2003, resulting in a curve for yesterday's rates—the black line—that is flatter and the lowest of the three. A move by the ECB from its present refi rate of 3.25 percent is still expected by the end of the year. Three-month yen future interest rates have changed little since January, sagging slightly lower for rates in 2003.

The table at the bottom left depicts spot short-term and long-term interest rates and their changes since the January meeting. Three-month rates show little net change, whereas ten-year rates have declined somewhat. Stock prices, shown to the

right, have moved down quite sharply in the United States and Europe. Japanese stock prices have fluctuated quite a bit over the past several months and, on balance, are now close to their late January level.

Our outlook for recovery abroad is summarized in the top two panels of your next chart. Total foreign growth—the blue bars in the left panel—show a rebound to 3 percent during the first half of this year from essentially no growth last year. Data for first-quarter GDP in several key regions as well as more recent indicators confirm that turning points have been reached and activity has generally started to accelerate abroad. Over the forecast period, we expect that this expansion will gain some additional pace, with growth abroad averaging 3½ percent over 2003. The staff forecast calls for U.S. real output growth to exceed average foreign growth over the forecast period. The right panel displays the extent to which the projected rebound in emerging Asia, captured by the blue bars, outshines that elsewhere.

Some of the evidence for recovery in the industrial countries is illustrated in the middle panels. Industrial production has turned up sharply in Canada and moderately in Japan and the United Kingdom. In the euro area, industrial production through April is only slightly off its recent low toward the end of last year, but over the period shown it has recorded the strongest performance. As shown to the right, the positive swing evidenced by business confidence in all four regions should help to support domestic spending and allow the recovery to become established. A rebound in exports is also an important factor for these regions, as can be seen in the bottom left. Particularly in Japan, the upturn in the export sector is a key ingredient to prospects for positive growth in the future.

The table to the right gives the staff baseline forecast for these countries. The vigorous performance expected in Canada (line 4) stands out relative to the others. Canadian first-quarter growth registered 6.0 percent, with final domestic demand accounting for 3.4 percentage points of that. In contrast, Japan's outlook (line 3) remains sluggish. With fiscal policy mildly contractionary, the financial sector still largely broken, and monetary policy effectively unable (or unwilling) to provide additional stimulus, we expect that a swing in inventories and support from export demand can provide support for only weak output growth over the forecast period.

The contrasting experiences of the Asian and Latin American emerging-market countries are the subject of your next chart. Selected Asian nominal dollar exchange rates are shown in the top left panel. On balance, the dollar has depreciated against these currencies since the start of the year. The Korean won has appreciated about 10 percent, much of it in the most recent weeks. Offshore dollar spreads for China, Korea, and Thailand—in the middle left panel—are low and have fluctuated narrowly during 2002. Both of these financial developments are consistent with the quite favorable recent macroeconomic performance of most of the economies in the region. Strong rebounds in real GDP growth have generally been recorded for the first quarter, particularly in the economies that specialize in exporting high-tech products. In addition, expansion of domestic demand has been solid in countries such as China

and Korea. While we recognize that there are risks to continued robust growth in emerging Asia, our baseline forecast (at the bottom left) is for growth in the region to be well maintained through the forecast period.

The outlook for most of Latin America is far less positive, with only Mexico displaying any economic strength. Dollar exchange rates for Mexico, Argentina, and Brazil are shown in the top right panel. The dollar has appreciated more than 300 percent against the Argentine peso since officials ended the one-to-one peg in early January. This is consistent with the huge spread on Argentine dollar debt in the middle right panel and the continuing state of crisis that characterizes Argentina currently. In recent weeks, new worries concerning Brazil have roiled financial markets—returning the *real* to its lows against the dollar of last September and widening the spread on Brazilian dollar debt, which touched 1,700 basis points. Markets are reacting to the political winds blowing in the presidential campaign and are unhappy about the lead in the polls of the left-wing candidate. With a sizable domestic debt of the public sector that must be managed and rolled over on an ongoing basis, the bond and exchange markets have expressed their displeasure with the political trends. Although it appears that the government has sufficient cash to pay obligations due between now and the October election, complete cancellation of regular bond auctions would likely cause pressures in other places, such as the exchange market, to intensify. For now, the government is partially rolling over maturing debt at rates it deems acceptable, taking steps to increase the banking system's holdings of public sector bonds, and running down cash to fill any gap. It has just arranged to draw \$10 billion from its existing program with the IMF, with some of the additional funds available to counter downward pressure on the currency. Whether these tactics will be sufficient to avoid a more serious financial meltdown remains to be seen. As reported in the table at the bottom right, we expect the Mexican economy to return to growth of about 4 percent as it benefits from the recovery in U.S. GDP. For Argentina, we do not see an end to the decline in activity this year and have written down zero for next year with no real conviction. Brazil experienced a recovery in output in the first quarter, but we expect growth for this year overall and next year to be fairly low. However, circumstances there are very uncertain, with the political risks dominating other developments.

The top left panel of your next chart reports some of the trade data for April that were released after the Greenbook forecast was completed. Relative to revised first-quarter figures, imports and exports of goods (lines 1 and 5) both rose somewhat, whereas services (lines 3 and 8) were little changed. The increases in both exports and imports of goods were widespread across categories of goods, including capital goods. The monthly deficit (line 10) widened to a new record level, triggering some notice in exchange markets. In response to recent market developments and our sense that market participants are now questioning the attractiveness of adding to their claims on the United States—given market disappointment with the pace of U.S. recovery and some heightened risk aversion as evidenced by shifts out of equities in global markets—we have incorporated as our baseline forecast a further moderate depreciation in the real value of the dollar in terms of the other major currencies. As

you can see in the panel on the right, this contrasts with the strategy of a flat dollar going forward that we followed in January. Our projected rate of depreciation is quite gentle, and in real terms would only return the dollar at the end of the forecast period to its value in mid-2000.

Our outlook for economic activity in the rest of the global economy and for dollar exchange rates lies behind the rebound we are projecting in both real exports and imports. Total exports of goods and services, line 1 in the middle left panel, are projected to accelerate over the forecast period, reaching nearly 8½ percent growth next year. Exports of goods (line 3) account for most of this recovery, but service exports contribute importantly. Within the goods component, we look for core goods (line 4) to pick up significantly as foreign growth firms and as relative prices boost these exports going forward. Total real imports of goods and services—line 1 to the right—should accelerate sharply as well. Imports of goods (line 3) account for more of this improvement, with core imports (line 4) picking up and services contributing only slightly. The recovery in U.S. output, along with our high propensity to import, more than accounts for the increased expansion of imports, as positive relative price effects wane and then turn negative over the next six quarters.

The contributions to U.S. GDP growth of exports and imports are illustrated in the bottom panel. The global slowdown of activity and trade caused imports and exports to decline last year, resulting in a negative contribution from exports and a positive contribution from imports. The normal pattern resumed in the first quarter, with imports particularly strong. Going forward, we see a slowly rising positive contribution from real exports, but a sustained and larger negative contribution from real imports.

Your final international chart reports some information from the balance of payments data for the first quarter, which were also released after the Greenbook was completed. The top left panel shows that the staff forecast implies a widening of the current account deficit over the forecast period to about 5 percent of GDP in 2003. The panel on the right provides some detail on the composition of capital flows in the first quarter and suggests some trends in the nature of those flows. Net private capital inflows (line 2) were lower in the second half of last year than they had been earlier, and that reduction was maintained through the first quarter. Of these private inflows, foreign purchases of U.S. securities (line 3) moved down in the second half of last year and slipped further in Q1. Stock purchases (line 4) held up in Q1, but bond purchases fell sharply. U.S. purchases of foreign securities, importantly equities, (lines 5 and 6) also moved down over the past several quarters and switched to net sales. Foreign direct investment in the United States (line 7) was greatly reduced in the second half of last year as the global slowdown and events of September 11 lessened merger activity. That inflow recovered somewhat in the first quarter, but remains well below earlier rates. On balance, the realized net capital inflow in the U.S. economy expanded with the current account in the first quarter, but it came about through reduced gross flows in both directions and significantly lower private capital inflows than in the first half of 2001. This pattern lends some support to the

view that investors now see acquiring claims on the U.S. economy as less attractive than they previously did. At the same time, U.S. investors seem to have a reduced appetite for claims on the rest of the world.

The bottom panels use the staff model to explore the consequences for the rest of the world of a substantial dollar depreciation. The black lines in each of the boxes show the Greenbook baseline forecast for real GDP for each of the four regions. The red lines are the alternative presented in the Greenbook for the negative shock to the dollar of 20 percent against most currencies, but only 10 percent against the Canadian dollar and Mexican peso. As reported in the Greenbook, the depreciation is mildly stimulative for U.S. real growth. For these foreign regions, the effect is to weaken real output, particularly in developing Asia, where the economies are very open and dependent on exports. With Japanese growth already very weak and Japanese officials having used intervention repeatedly in light of exchange rate developments over the intermeeting period, we recognize that a further appreciation of the yen of the size considered in this shock could trigger a reaction among market participants and/or Japanese officials. So, to explore the implications of a shock that was much more concentrated on the euro, we ran another simulation—the blue lines. That simulation yields the same overall impact on the weighted-average dollar and on U.S. activity but is distributed toward the euro and away from the yen and the currencies of developing Asia. The Canadian and Mexican currencies are left to be as near the Greenbook baseline in this alternative as they were in the Greenbook alternative. Monetary authorities everywhere are assumed to react based on Taylor rules to the consequences of the initial shock. The result of a nearly 35 percent decline in the dollar in terms of the euro and the pound is to derail the recovery in the euro area and cause output to weaken absolutely and relative to the Greenbook baseline. In contrast, in both Japan and developing Asia, the effective depreciation of their currencies relative to the euro actually causes output to be boosted relative to both the Greenbook alternative and the baseline. In this simulation, the ECB uses all of the room to the zero bound on interest rates to offset the effects of the exchange rate on output and inflation.

Declines of the dollar of the size explored in these simulations are comparable to what occurred in the 1985-87 period. However, the Japanese economy is far weaker now than it was then. And interest rates are generally significantly lower, bringing the zero bound on interest rates into consideration for those regions experiencing sharp appreciation. Let me turn the floor back to David for some concluding remarks.

MR. STOCKTON. The final chart presents your forecasts for 2002 and 2003. As seen in the upper panel, you have revised up your projection for the growth of real GDP in 2002 and lowered your forecast of the unemployment rate. Your projection for PCE prices this year has been raised a touch. Your projections for next year are displayed in the lower panel. The central tendency of those projections shows growth of real GDP between 3½ and 4 percent. This is accompanied by an anticipated reduction in the unemployment rate and stability in the rate of PCE price inflation. Mr. Chairman, that completes our presentation.

CHAIRMAN GREENSPAN. Thank you very much. I ought to comment that any revisions in these forecasts that you may wish to make should be submitted to David before close of business on July 5. Questions for our colleagues? President Hoenig.

MR. HOENIG. Karen, I have a question on the dollar and capital flows. You broke out the reduction in capital flows between equities and other U.S. securities. Is there any insight that you can share with us on that? Why the larger drop-off in bonds, other than perhaps inflation fears? Why, with a declining dollar, do we see capital flows slowing and bond issuance falling?

MS. JOHNSON. At this point, these data are sufficiently new to us—and the revisions actually caught members of my staff by surprise—that I don't have any further explanation. Since bond issuance has been fairly strong, there is no obvious explanation as to why it should go down. I think the answer is that I don't really have a good answer.

MR. HOENIG. Fair enough.

CHAIRMAN GREENSPAN. Any other questions for our colleagues? President Moskow.

MR. MOSKOW. My question is on the alternative simulation with the weaker dollar. I understand that you had a 20 percent reduction in the dollar, but was it spread out over a year?

MS. JOHNSON. Yes, four quarters.

MR. MOSKOW. Four quarters. I was just wondering if you had any thoughts on what would happen if that weakness occurred sooner—say, in the next several months—in terms of the impact on output, employment, and also our policy response.

MS. JOHNSON. Well, to be honest, I don't think my model would tell us anything very interesting about the differences in those two alternatives because the model is quite linear. There would be some little differences here and there. The monetary policy reaction function

would behave differently, which would have some effect. But certainly the current tone of the financial press on the subject and the comments that are being made publicly distinguish hugely between a gradual and orderly depreciation of the dollar—one similar perhaps to the 1985-87 experience—and something that would be described as abrupt. The latter would be disruptive of market psychology and disruptive in terms of risk-aversion behavior. People are concerned that, if the dollar were to fall rapidly, it would trigger reactions and expectations that would become almost self-fulfilling.

The biggest issue is obviously the U.S. stock market. We on the staff struggled a great deal as we tried to think about how to express this outlook—not wanting to put down language that suggests the dollar is falling because U.S. stock prices are falling or even vice versa because foreign stock prices are falling too. Indeed, foreign stock prices in some respects have declined more than U.S. stock prices. So there is no relative difference that we can point to there. But we interpret the decline in stock prices as indicating a degree of risk aversion in the behavior of some investors. They are moving toward investments that they perceive to be safer.

Foreign investors, if they see the dollar falling rapidly, will recognize that the value of any dollar investment they might hold will reflect not only whatever capital gain or loss it might experience but will suffer from any depreciation of the dollar that might be forthcoming too. So one could imagine the change in market psychology if expectations about the pace at which the dollar will adjust were to be revised. If the dollar's depreciation were expected to be even more rapid, that would enter into some people's calculations about any dollar assets to buy and would probably be reflected in our bond prices and our equity prices.

So there is a psychological element involved that is difficult for us to pin down. The models do not capture it. But I think it would show through under those circumstances. And

oddly, developments in Brazil—or, say, Mexico, which is thought to be very dependent on the United States—could begin to produce market effects here, and we could get feedback loops on risk aversion in other ways. It could become a more generalized problem.

CHAIRMAN GREENSPAN. President Stern.

MR. STERN. Thank you. Karen, the commentary in the Greenbook seems to suggest that foreign economies in general are expected to do a bit better going forward than we had earlier anticipated. My question is, Does that reflect something fundamental going on abroad, or is it primarily just an extrapolation of the most recent information, which looks a little better than at least I would have expected.

MS. JOHNSON. More the latter than the former in that we had some positive surprises. Emerging Asia was even a little stronger than we expected—and not only in the high-tech countries. Thailand, for example, which we don't ordinarily put in that category, had a very strong first quarter. Canada surprised us a bit on the upside. I'm a little fearful—in this country the first quarter looked good, too—that April and May will be disappointing abroad, but we don't know about the performance of their economies quite as fast as we know about the U.S. economy. We haven't corrected for that. But on the whole, we've had more positive surprises than negative surprises, so on the margin we adjusted our outlook.

MR. STERN. Okay.

CHAIRMAN GREENSPAN. President Minehan.

MS. MINEHAN. Looking at chart 5 on financial conditions and the health of the banking sector and recognizing that at times banking performance variables lag the rest of the economy, I'm wondering how confident you are about the rather optimistic perspective there. We're starting to see more CAMELS downgrades than upgrades. And that predictive system,

the SEER or whatever it's called, is starting to suggest that there might be more of that in the wings. Obviously we could see ratings deteriorate at large banks and even at midsize banks. I just wonder about the level of optimism you've communicated.

MR. OLINER. I'm not really trying to say that I think all these ratios will look as good one or two or three quarters down the road as they do now. I'm just saying that the starting point right now is very different from what we experienced ten or fifteen years ago.

CHAIRMAN GREENSPAN. Further questions? If not, let me just remind you that we're due at the British Embassy at 7:30 p.m. and that vans will pick up the presidents at the Watergate at about 7:10 this evening. We will resume tomorrow at 9:00 a.m.

[Meeting recessed]

Morning Session—June 26, 2002

CHAIRMAN GREENSPAN. Good morning, everyone. Dave Stockton has some new information to report.

MR. STOCKTON. Mr. Chairman, I thought I'd just bring the Committee up to date on the orders and shipments figures for nondefense capital goods that were released this morning. Somewhere in front of you on the table you should see a sheet of paper that we distributed. It shows the orders and shipments figures for nondefense capital goods excluding aircraft, which is the component that actually goes into the national income accounts. It also has the figures for the three major subcomponents of that category: computers, communications equipment, and everything else.

In brief, the numbers were stronger across the board than we had incorporated in our forecast. This is one of those releases where the devil will be in the details, and before we give any precise figures on the revisions, we'll need to look at those details. But it looks as if the computers and communications equipment components were stronger and the "all else" component was considerably stronger. That greater strength may translate into something on the order of several percentage points for total E&S spending in the second quarter, which could be 0.3 or 0.4 on overall GDP. That would move our forecast for GDP back closer to the neighborhood of 2¼ to 2½ percent. Obviously, we will have some thinking to do about this. We'll have some information coming in on inventories as well, so we'll know whether some of the shipments came out of inventories or not. But right now the picture on investment spending looks more positive than we had incorporated in the forecast.

CHAIRMAN GREENSPAN. Thank you very much. We're now at the point for Committee discussion. Who would like to start off? President Parry.

MR. PARRY. Thank you, Mr. Chairman. The pace of economic recovery in the West has been moderate since our last meeting, although employment growth has remained lackluster. Consumer spending continues to be the primary driver of the recovery, fueling growth in retail trade, travel and tourism, and many service-producing industries. Heavy discounting, however, remains a drag on profits. The ongoing resiliency of household spending is most apparent in District housing markets. Although the pace of home-price appreciation has moderated in recent months, home prices and home sales are increasing in a number of states, with conditions definitely favoring sellers. Residential real estate markets are especially strong in California, where multiple bids and selling prices above asking prices are becoming commonplace. The sustained strength in housing demand is spurring new building, especially in areas attractive to retirees like Southern California and Arizona. The pickup in homebuilding is a welcome boost to the construction industry, which has seen a sharp drop-off in demand for commercial development.

Signs of improvement are emerging in the District IT sector, especially for high-tech manufacturers. New orders and sales have increased since the fourth quarter, helping many factories draw down inventories and increase output. Increased use of existing capacity has prompted some IT businesses to reinstate investment plans postponed in 2001. This is having a positive effect on makers of measurement and controlling devices and other production equipment. Semiconductor equipment manufacturers, for example, are seeing new orders surpass sales for the first time in more than a year. The pickup in production also is boosting work hours and salaries of IT workers. Contacts report greater use of overtime and fewer forced furloughs; and many companies are rescinding moratoriums on salary increases and incentive pay. That said, the industry outlook remains uncertain, especially concerning IT employment.

Last week, a number of District companies revised downward their earnings expectations, citing slowing demand and significant price pressure. More fundamentally, a number of high-tech manufacturers are using the lull in activity to rethink their production strategies, sometimes moving fabrication and support functions offshore.

The reality of budget shortfalls is beginning to affect state and local government spending. Some scheduled public construction projects have been put on hold and hiring and salary freezes for government agencies are being put in place. Most importantly, officials in many Twelfth District states are concerned that further budget cuts will be needed, given the slow pace of recovery.

Turning to the national economy, recent economic news overall has been on the low side of what we had expected, and we've reduced our second-quarter forecast of real GDP growth to 2½ percent. Looking at the next year and a half, we continue to see a moderate expansion as the most likely outcome, with the recent declines in equity prices and the dollar tending to offset each other's effects on aggregate demand. Assuming that the funds rate begins to rise in the fourth quarter and reaches 4 percent by the end of next year, we project real GDP growth of about 4¼ percent in 2003. And we continue to expect inflation to remain well contained, with the core PCE price index averaging about 1½ percent both this year and next.

While our basic view of the outlook hasn't changed, recent financial developments highlight some risks. Growing concerns about corporate accounting and governance appear to be adding to the already existing downward pressure on U.S. stock markets and may be raising borrowing costs for some firms. In addition to the risks from the stock market for consumer spending, eroding confidence in U.S. corporations also may be undermining business investment by raising the cost of capital. The chances of the expansion taking off this year would be greatly

reduced if the incipient recovery in equipment and software spending were to stall. These developments may be giving us more breathing room in deciding when to begin the process of raising the funds rate.

However, the policy implications could be the opposite if eroding confidence in U.S. corporations were to add to the already existing downward pressure on the dollar stemming from a persistent current account deficit. As illustrated in an alternative simulation in the international part of the Greenbook, we could end up with little net effect on U.S. output together with faster price increases, which would suggest a tighter policy. For now, however, it seems appropriate to wait a while longer before beginning to raise the funds rate.

CHAIRMAN GREENSPAN. President Moskow.

MR. MOSKOW. Thank you, Mr. Chairman. Reports from our contacts in the Seventh District continue to validate our basic outlook. Our economy is recovering but at a moderate pace. As we discussed last time, some sectors are recovering faster than others, so it's not surprising that reports continue to be mixed. We're still not hearing about any significant strengthening in capital spending plans; rather, most contacts report that investment plans either are on hold or are being managed cautiously. In contrast, our housing sector is holding up quite well.

Consumer spending slowed somewhat in May, but our contacts suggest that this was only temporary. Several retailers reported that sales bounced back in early June, and home-related products, such as appliances and furnishings, continued to be very strong. Light vehicle sales also seem to have bounced back in June, to an annual rate reported to be in the mid-16 million range. Moreover, longer-term prospects remain positive. The consensus of participants at our recent auto outlook symposium was for sales of autos and light trucks to total 16½ million units

this year and to be at the same level in 2003. Last December the consensus was for sales of 15½ million units this year.

Even outside of the auto sector, manufacturing in the region has continued its modest pickup. The Chicago Fed Midwest Manufacturing Index rose in April for the fourth straight month, and the gains over that period were stronger than for the nation. And while the Chicago Purchasing Managers' Index, which will be publicly released on Friday, slipped a bit from 60.8 in May to 58.2 in June, that's still solidly in the expansion range. Although most firms still have very little pricing power, we're beginning to hear reports of some attempts to raise prices for products such as construction materials and packaging. And, of course, steel prices are rising.

Labor demand appears to have improved slightly. After trailing for six years, our year-over-year employment growth is now equal to that in the country as a whole. And District manufacturing employment, though still soft, shows more significant signs of improvement than that in the nation. Contacts at two large temporary-help firms that are headquartered in our District report higher orders for workers, particularly from manufacturers. Firms remain cautious about bringing on new regular employees, which is good news for the temp industry. Our contacts also note that, with each downturn, client firms have increasingly recognized the flexibility offered by temporary help. So, as after previous recessions, they expect to see another ratcheting up in the share of temporary workers.

Turning to the national outlook, similar to the Greenbook we continue to project that real GDP growth will run somewhat above potential in the second half of this year and in 2003. We see core inflation little changed through next year. But there are clearly some downside risks. The improvements in manufacturing production and orders may be only a transitory response to inventory rebuilding. Moreover, the recently weak retail sales and consumer sentiment reports

remind us that consumers are unlikely to fuel an acceleration in final demand. Instead, negative wealth effects in the stock market may make households turn more cautious. Also, the list of factors weighing on business and consumer confidence seems to be getting longer and longer. Accounting irregularities, corporate nongovernance, the war on terrorism, unrest in the Middle East, and threats of nuclear war and dirty bombs are all keeping people awake at night. And yesterday's WorldCom announcement is another one of these factors.

However, on the upside, strong productivity growth should support further gains in wages while keeping unit labor costs in check, which will be good for profits. Rising home values should offset some of the stock market declines. And, of course, we still have substantial monetary and fiscal stimulus in place. So while it's natural at this stage to be focusing on the downside, we think the risks to our forecast are reasonably balanced.

Finally, let me note that we had a meeting of our Academic and Business Economists Advisory Committee last week, and they basically agreed with our outlook for real activity. They also agreed that inflation was likely to remain benign in the near term, but most voiced concern that the Fed may be getting behind the curve in returning to a neutral policy stance, given the long lags in monetary policy. My personal assessment is that we don't need to move today, given the moderate nature of this expansion. However, we will need to begin moving back toward a neutral stance of monetary policy even while reports on the economy are still mixed and we are still hearing a lot of negative anecdotes. But we have some time before we need to make that decision.

CHAIRMAN GREENSPAN. President Minehan.

MS. MINEHAN. Thank you, Mr. Chairman. Since the last Federal Open Market Committee meeting we have had regular meetings of our small business and academic advisory

councils; we've held three bankers' forums in various areas of the District, involving a couple hundred or so regional bankers and bank directors; and we've met with groups of investment professionals. It's clear from these contacts that where you stand on the condition of the New England economy depends a lot on where you sit—in which state and in what industry.

The available data and anecdotes suggest that economic activity in New England, while not exactly growing, is not contracting at the pace it was either. And two states, Maine and Rhode Island, have passed their pre-recession employment highs. Moreover, while high-tech manufacturing and some software industries, particularly anything to do with telecommunications, remain in negative territory, other firms involved in more “old economy” and service industries— and even in certain types of software—seem to be doing fairly well.

One large manufacturer of cardboard packaging, whose company also trades in paper products worldwide, reported a pickup in demand both domestically and internationally and a prospect for rising prices midway through the summer. This existence of some demand—rising demand in fact—has been a surprise to some businesses. They've been hunkering down and cutting costs, and now they are experiencing, in the words of one council member, “recession costs and recovery demand.” Obviously, this bodes well for profit margins.

Bankers in many areas reflected the same optimism, as did their small to medium-sized customers. For some, this has not yet been a recession. But bankers in other areas, most notably suburban Boston, were much gloomier. Talk about gloomy! The investment professionals I met with could see almost nothing good about equity markets and very little if any light at the end of the tunnel. They believe that market sentiment is being driven by fears of event risks—geopolitical events as well as the possibility of another Enron, Tyco, Imclone, or now

WorldCom. They see considerable potential for both a falling stock market and a declining dollar.

In sum, the data we have on the region as well as the anecdotes from all of our contacts suggest an uncertain picture. There is some strength in demand. One can see it in the region's housing markets, in rising consumer and business confidence, and in sales in some industries. Moreover, employment in labor markets is gradually flattening out and perhaps beginning to firm. Businesses are wary about costs; but where it seems possible, they are investing to improve productivity. But the hangover from the party of the 1990s continues to affect those that seemed to be having the best time. Full recovery, it seems, is going to take a little longer.

On the national scene, the Greenbook forecast doesn't differ much from our own. Actually, if that forecast turns out to be accurate, I think we will have gotten through this period with about as good an outcome as possible. But as we discussed yesterday, forecasts very rarely do unfold as predicted, and I must say I have some worries about this one. We, like the Greenbook staff and almost every other forecaster, see a second half that is a good deal stronger than the second quarter. I would, however, like to see more of that growth start to happen. And maybe this upturn in orders is just what the doctor ordered.

Certainly, the severely negative trends in terms of job losses and the declines in business investment in computers and software have moderated. Industrial production is rising steadily; we've had some good news on orders; and auto and housing sales retain some strength. But the overall tone of the current financial climate doesn't inspire confidence. Equity markets are a clear source of uncertainty. Some stocks are not doing badly, but others have been hit very hard by investor risk aversion. Credit markets have been buoyed by a healthy banking sector and a vibrant bond market, but risk spreads have widened. And banking performance variables, which

tend to be lagging indicators, show some signs of stress. The increase we're seeing in CAMELS downgrades and in predicted downgrades doesn't bode well if the economy does not recover as quickly as in the forecast.

It is true that monetary policy is accommodative, and I agree with President Moskow that we do have to think about when we are going to get back to a neutral policy stance. Fiscal policy is stimulative as well. But if I were going to take exception to any aspect of the Greenbook forecast, it would be in the area of state and local spending in 2003. Perhaps not all states face the same difficulties as Massachusetts and some of the Western states that Bob Parry mentioned, but I know some are close.

The decline in the value of the dollar may buoy U.S. manufacturers. It also brings with it the specter of price pressure. But for the present anyway I'm inclined to discount that on the assumption that strong global competition will keep import prices down and curb U.S. domestic prices as well. The rest of the world may be improving—at least that seems to be the case for the Asian tigers, Canada, the United Kingdom, and maybe even Japan and Europe—but not really by enough to drive strong external demand. With the future murky, despite what seems to me to be a fairly positive forecast, steady as she goes may be the best we can do right now.

CHAIRMAN GREENSPAN. President Santomero.

MR. SANTOMERO. Thank you, Mr. Chairman. Data received since our last meeting suggest that the recovery is proceeding at a moderate pace in the Third District, which is consistent with our forecast. The manufacturing sector continues to improve. In June our Business Outlook Survey index of general activity posted its sixth positive reading in a row. New orders and shipments have been expanding, and the indexes are at healthy levels. Responses to this month's special survey question suggest that technology spending in the

District should increase at least modestly this year. While a majority of the firms plan to keep technology spending at current levels, 6 percent more firms plan to increase such spending than to decrease it for the remainder of the year. Those increases should occur relatively soon, with half of the planned increases coming in the third quarter.

We expected retail sales to come in weaker in the second quarter than in the first, and the data have been consistent with that expectation. According to our contacts in the region, retail sales of general merchandise rose slightly in May, and auto sales were steady. This is a bit stronger than we saw for the nation as a whole. Pennsylvania sales and use tax collections rose slightly in April and May, reflecting an increase in non-motor-vehicle sales.

Regional real estate markets are consistent with what we see nationally. Housing sales and residential construction continue to expand, and housing prices have risen on strong demand. In contrast, commercial real estate markets in the region have eased since the winter. Large amounts of subleased space have become available, depressing rents and boosting vacancy rates. The suburban vacancy rate rose above that of center city Philadelphia earlier this year. This reflects two factors: First, the patterns of the job losses in both the city and suburbs were comparable; and second, there's been very little new commercial building and no speculative building in the city over recent years. Most recently, the value of nonresidential construction contracts awarded in the region has increased slightly because of casino expansion in Atlantic City, warehouse construction in several parts of the District, and educational and other institutional building in the region. It's too early to know whether this is the beginning of a turnaround in nonresidential construction.

Labor markets in the District remain stable, with little sign of improvement or deterioration. The unemployment rates in Delaware, New Jersey, and Pennsylvania remain

below the national rate. One of our directors runs a temporary-help firm and she reports that demand for workers has been strong, especially in manufacturing. On the other hand, many college graduates, unable to find permanent positions, are placing applications with the firm. Our BOS employment index went slightly negative in June, indicating little change in manufacturing employment in the region this month. The future index suggests that manufacturers plan to add to their payrolls over the next six months.

Although inflation remains modest in the region, tempered by productivity gains and weakness in demand, we're beginning to see some signs of price increases in a few sectors of our region. For example, our BOS indexes on prices paid and prices received have been positive since March.

My view on the national economy is consistent with what we are seeing in the District. The data appear consistent with a recovery that is proceeding at a moderate pace. And a moderate recovery was what we expected in part because the recession was a mild one. Manufacturing is recovering, consumer spending is showing moderate growth, and there are signs from the orders and shipments data that business fixed investment spending has stabilized and that equipment spending is beginning to move back up. These data are consistent with our forecast in which we show real GDP growth slowing in the current quarter, followed by a pickup to about potential in the second half of the year. The pickup is driven by a resumption of moderate expansion in consumer spending, a return to moderately positive inventory investment, and some pickup in equipment investment. We have not yet seen much of a decline in the unemployment rate, and we do not expect to see much this year since expansion in output is expected to be only around the rate of potential during the second half. With strong productivity growth and continued slack in the economy, inflation ought to remain subdued. Next year as the

recovery progresses, we expect GDP growth to accelerate to somewhat higher than potential, causing the unemployment rate to come down a bit more rapidly and inflation to rise a bit. Obviously, there are uncertainties and risks in this forecast. But in my view these risks are balanced, with risks on the upside as well as the downside

I should note that our forecast is similar to the Greenbook's with a few exceptions. For example, while the Greenbook sees inflation on a downward path over the forecast period, in our forecast period it has an upward tilt. Given the error bands around these forecasts, one would be hard pressed to say there is much difference between them. What we can say is that both envision a modest recovery and one that will require monetary policy to move at some point in the not-too-distant future. But I'm becoming a bit nervous that the markets are not going to be prepared for such a move when it comes.

History tells us that turning points are hard to gauge and that we will very likely receive mixed data into the recovery. We have now had very low interest rates—at recession levels—for probably six months into the recovery. History tells us that forecasters consistently underpredict the strength of the economy at the beginning of recoveries and underestimate the effect of monetary policy on economic activity. All of this suggests that when we start seeing better employment data and the financial markets have reached a trading range, we will have to make a policy move. I think it's important that we start preparing the markets for this outcome. We need to let market participants know that we believe the recovery to be on track, we expect it to be a moderate one, the data are coming in consistent with that forecast, and it is not prudent to maintain a very accommodative monetary policy stance for too long. If we prepare the markets, the first move will be less disruptive. Thank you.

CHAIRMAN GREENSPAN. President Hoenig.

MR. HOENIG. Thank you, Mr. Chairman. The Tenth District's economy has continued to show signs of improvement over the past several weeks since our last meeting, although some sectors obviously remain weak and businesses are still acting in a cautious manner. Prospects for District manufacturers actually have improved further though, with new orders rising above year-ago levels for the first time since the end of 2000. Retail sales excluding autos remain solid, with strong sales at both high-end stores and large discounters making up for somewhat slow sales in other stores. Home sales have continued strong in most of the District, and energy activity has picked up rather noticeably in our region lately.

Of course, not all signs are positive. Layoff announcements were up in May and appear to be up in June. Auto sales weakened somewhat, and commercial real estate remains in a slump in our area. Also, while optimistic about future sales, District manufacturers appear reluctant to hire enough new workers to meet the anticipated increase in demand. They are relying extensively on temporary help, preferring to wait for further evidence of recovery before they engage in significant workforce expansion. Finally, several large District firms in the telecom, agriculture, and energy trading businesses have experienced further deterioration in their financial condition and credit ratings since our last meeting.

On the inflation front, wage and price pressures remain mostly subdued, although obviously we have seen higher steel prices and that has had some effect on a number of our metal manufacturing companies.

Turning to the national outlook, obviously recent economic releases have been mixed. Nevertheless, I do expect growth to be about 3½ percent this year and to rise to something over 4 percent next year. The Board staff's outlook is similar to my own: second-quarter growth at about 2 percent and second-half growth at about 3½ percent. I think the forces behind the

recovery are clear and have not changed all that much since our last meeting. That is, productivity appears to remain basically sound, monetary policy—with the real fed funds rate near zero—is stimulative, fiscal policy is stimulative, and the inventory adjustment is continuing. These factors are working to strengthen the economy and offset the downside risks to the economy. Still, the downside risks are significant, and I acknowledge them. One is the accounting scandal, which monetary policy really can't do much about; another is the geopolitical risk, which again we can't do a lot about. But those risks are real, and they are affecting psychology. There is also a downside risk in capital spending, which has not picked up as much as we perhaps would like to see. And that is still a risk in the future.

Let me just say in acknowledging these risks that I still feel that policy remains extremely accommodative. And I think we need to take a longer-term view of this. Every measure that the staff has presented—every measure we have—suggests that the real federal funds rate is below the natural rate by a significant margin. Let me clarify my policy position: I have not in the past and I am not suggesting now that policy should be tight in any sense. The conditions aren't at all right for that. I am suggesting only, and I think importantly, that we prepare to move to a less accommodative position. I would say that for purposes of long-run price stability we are overly accommodative, and we should begin to consider a longer-term strategy to move ourselves toward—not to, but toward—a more neutral position. And as others have indicated, we have an opportunity after this meeting through your upcoming congressional testimony, Mr. Chairman, to begin to inform the markets of this need and to develop a strategy so that we don't catch them off guard as we necessarily move toward a more neutral policy.

CHAIRMAN GREENSPAN. President Jordan.

MR. JORDAN. Thank you, Mr. Chairman. First, I want to make a comment about state and local finances, an issue that several people have mentioned. I think that is going to be a concern for some time. The census numbers for the State of Ohio indicate that during the decade of the 1990s—between the 1990 census and the 2000 census—there was a 12 percent absolute decline in the 19 to 44 age group, which doesn't seem to bode well for the future. And the projections for the next decade are that we will have the second lowest population growth and employment growth on record, which means that the tax base is eroding. A clear implication for the governor, the legislature, and many journalists is that Ohio needs to raise taxes significantly in order to address its problems. So I hope everybody else also will raise taxes because this strategy is not going to work too well otherwise.

Within the region, economic activity is generally characterized as slowly improving. While the levels of sales and production are up from their recent lows, the pace of increase is certainly slow. The recovery in trucking and shipping has been earlier and stronger than was expected at the beginning of this year; but employment, especially at the parts suppliers, has not yet started to rise. Several of the manufacturers in the region believe that they will be able to exceed prior peak levels of production with significantly fewer workers. I'm going to come back to that point in just a minute.

In the automotive sector, the combination of continued strong sales and optimism expressed by senior management is not translating into either capital spending or employment increases so far. Instead, both parts and assembly plants are reporting that considerable overtime is being paid. Reports from two specific companies are worth mentioning because they offer a hopeful indication of what would be nice to start hearing from others. Timkin reports that its efforts over the last couple of years—the company has gotten rid of some plants, downsized,

shrunk its labor force, and so on—will be reflected in much better earnings this year. The firm also says that both its domestic and its international business have been improving recently.

Pittsburgh Plate and Glass notes that demand from both the residential construction and the automotive sectors remains strong and now its chemical business is recovering after a two-year slump. Moreover, the weaker dollar is helping exports, and overall profitability is now rising.

The tourist destinations in the region are off to a strong start, and industry observers believe that traffic will easily exceed last year's levels. But group sales, mainly blocks of tickets sold to companies that use them for their employees, are down. Hiring at these tourist locales has been much easier this year. And contacts say that wages paid have remained flat for the third year in a row, but they are still able to raise ticket prices.

One large retailer headquartered in the District, Federated, continues to struggle but seems to accept that their problem may well be simply that their business model doesn't fit the current environment. Another director who sits on the Kohl's Department Stores board always provides a cheerful and optimistic report to offset the downbeat report that we get from Federated. In retail categories, furniture, appliances, electronics, and jewelry are all reported to be strong. In view of the low reported levels of inventories in these categories, retailers are reporting fewer sales promotions and markdowns than a year ago at this time.

The housing market at the lower end of the price range is reported to be doing very well throughout the region while the upper end of the housing market is characterized generally as being dead in the water. Lots and lots of million dollar houses that were built don't have owners or they have "upside down" owners. The bankruptcy of a large residential builder in the greater Cincinnati area is creating a lot of problems because it involved a very major fraud. We don't know the magnitude of it yet, but it's very large. So there are a lot of single-family and

multifamily housing projects throughout the region that are unfinished and abandoned. This has caused at least three dozen banks to incur significant losses and has left more than 200 homeowners with prior claims or construction loans against their houses. We think there is one bank whose survival is very much in doubt and two others whose capital has been severely impaired.

With respect to capital spending plans, even companies that are described as sitting on piles of cash—that's the way their bankers describe them anyway—have taken a wait-and-see attitude. And the reason given is that management is still unsure how much productivity and efficiency can be wrung out of prior investments before additional capacity can be justified. That raises an intriguing question: If at the micro level individual firms simply claim not to know their potential or their capacity, how can we be very confident about those measures at a macro level? It also says something at the micro level of the firm: There must be a shift under way in Okun's law, and where it will end up we don't know at this point.

At a recent meeting of our Community Bank Advisory Council, several bankers described their business customers as sounding more pessimistic than their actions imply. Nevertheless, it is generally asserted that business customers continue to pay down old loans and are attempting to build liquidity. The almost total absence of reports of either business or personal bankruptcies seemed to surprise even the bankers. It appeared that there was a tendency for each member to believe that his own bank's experience was the exception and that somebody else must be incurring a lot of losses. But nobody claimed that that was happening at his or her bank.

Let me turn to the national economy. Whatever the problems of various sectors, regions, or industries in this country or whatever the problems plaguing many foreign economies, there

certainly are limits as to how far highly expansionary monetary policy can go to be helpful before going too far and becoming part of the problem. At some point, and I tend to think it will be sooner rather than later, it is going to become essential for us to move to a more neutral stance of monetary policy and to find the patience to wait for other necessary adjustments to work through the system.

I want to say something about the idea of risk versus uncertainty in the classic sense. Risks, of course, are at least potentially quantifiable in some probabilistic way. The staff does a good job of sensitizing us to the various risks to the economic outlook, and that's very helpful. But uncertainties are quite different. We face an environment where the uncertainties are more important than the various risks that we can identify. There are uncertainties associated with almost certain events in the Middle East, but we cannot quantify those uncertainties in any useful way. There are uncertainties in the form of "Enronitis" associated with the legacy of the last few years. How much of that has carried into the present and how long it is going to hang over this economy and our markets is something that I don't find very easy to contemplate in a quantifiable way. The implication for me is that we are going to be event driven and we are going to be reactive for quite some time, and in my view that's the best that we can hope to do. Thank you, Mr. Chairman.

CHAIRMAN GREENSPAN. President Broaddus.

MR. BROADDUS. Thank you, Mr. Chairman. Frequently at recent meetings I've described our District's economic picture as mixed. The information we've received since the last meeting of this Committee in early May I would describe as beyond mixed. I've been looking for another word—"dual" doesn't quite do it—and maybe "schizophrenic" is as close as I can come to characterizing it.

CHAIRMAN GREENSPAN. How about “mixed up”? [Laughter]

MR. BROADDUS. Yes, “mixed up” is a good phrase. In any case, what I mean by that is that there are strong negatives and strong positives and not a lot of middle ground. The comments we’re hearing on the positive side are similar to those a number of other people around the table have mentioned. Manufacturing looks better and that has been going on now for several months. Even textile companies are continuing to provide more optimistic reports. A contact at Burlington told us that he thought the textile depression is now bottoming out. We’ve had at least a few reports at recent board meetings and on discount rate calls of some limited increases in plant capital expenditures—nothing really significant, but at least the news has been in that direction. Housing activity is still very robust in our District as elsewhere. So those two sectors especially—housing and manufacturing—look pretty solid. And picking up on what Michael Moskow said, car sales seem to us to be reasonably healthy in most localities in our region. But there has been a pronounced deceleration recently in both household and business spending for other goods and services. I would say this has been going on now over the last six to eight weeks, based on information we pick up from the monthly surveys we do on both retail and service sector revenues. And District labor markets remain relatively soft, with unemployment rates increasing in most District states.

More broadly—and this is perhaps the most useful thing I can say about the information we’ve picked up from contacts in our District—the comments I hear, even in social situations, are more downbeat now than at any time since the early 1990s and maybe even since the early 1980s. To a large degree this probably reflects the stock market decline, and hopefully it will prove temporary. But I have to say it gets my attention and it worries me a little. And my final

point on the District economy is that our state governments have the same kinds of budgetary issues as many other states around the country.

On the national outlook, the Greenbook projection hasn't changed a lot from last time. The staff revised its second-quarter GDP projection down a bit, but I gather, given what Dave said this morning, that the latest data might offset that. So we have pretty much the same kind of forecast. One might argue, I guess, that a bigger downward revision might be merited in view of all of the pessimism that we hear around the country from a wide range of contacts. But as the Greenbook points out and as a number of people underlined this morning, there continues to be a substantial amount of policy stimulus in play. So I think the staff forecast is still a reasonable forecast. There are obviously risks to the forecast, as always. And I must say that I'm having more difficulty than usual trying to get a sense of where those risks might be balanced or in which direction they might be tilted, if they are tilted. Maybe that has a bit to do with what Jerry Jordan was just saying.

The recovery depends in large part on continued growth in consumer spending, since the resumption of business investment is probably at least still some distance away. In that regard, I think job market conditions are going to be the key because consumer confidence will hinge importantly on job and wage prospects. And as I see it, job and wage prospects in turn depend to a significant degree at this point on what I would describe as a horse race between structural productivity growth and the growth of demand in the near and intermediate term. In a balanced economic expansion, over the long run demand grows at the trend rate of productivity growth. So in that situation the horses in a sense are running at the same pace. And, of course, an increase in trend productivity growth is always a positive development from that longer-term perspective. But in the short run, if the productivity horse for a time outpaces the demand horse,

unemployment could rise, wages and unit labor costs could fall, and we could see further near-term disinflation. That could happen in coming quarters. In the worst case scenario, that sequence—if it were pronounced enough—could conceivably abort the recovery. Alternatively, if the demand horse gets ahead, labor markets could tighten, wages and unit labor costs could rise, and inflation could come back. And I think the comments by Tony, Tom, and others that we ought not to ignore that possibility are certainly valid.

Currently, as I see it, the two horses seem to be running about neck-and-neck in the sense that total hours worked are about steady. I see a little disinflation pressure in labor markets, but inflation is still broadly stable. So in my view it makes sense to maintain our current policy stance today. But as the Belmont Stakes reminded us very dramatically not too long ago, any horse can win in a horse race. So I think it's important that we watch this situation with particular care in the near term.

CHAIRMAN GREENSPAN. I hope the odds are not 70 to 1! [Laughter]

MR. BROADDUS. But my point is that we can't rule it out.

CHAIRMAN GREENSPAN. Yes, even at 70 to 1, I guess one can't rule it out. It happens once in seventy times.

MR. BROADDUS. Twice in 140 times!

CHAIRMAN GREENSPAN. President Stern.

MR. STERN. Thank you, Mr. Chairman. Beginning with the District economy, we have under way a gradual but what I think is by now a broadly based improvement in economic activity. Residential construction and sales, which have been a continuous bright spot, remain a distinct bright spot pretty much throughout the District. Consumer spending continues to hold up reasonably well. And tourism in the District seems to be enjoying a good spring and early

summer so far. Bankers report that consumer credit quality is in good shape. Their reports on business credit quality are a little more mixed, but as far as the consumer is concerned, the bankers seem fairly comfortable. We are seeing improvements in manufacturing activity and along with that some general improvement—though I don't want to make this too broad a statement—in business attitudes. I have been, if anything, a little pleasantly surprised recently by reports from business people that they are seeing some pickup in activity. I'd say that there has been no significant change in labor market conditions for at least several months now. Commercial construction remains probably the principal area of weakness in our region. There has been some improvement in mining and energy sectors in the District.

As far as the national economy is concerned, for the most part I think the economic fundamentals are positive. So I find the case for continued expansion convincing, especially, as other people have mentioned, with the policy stimulus in place and with signs of improvement in many foreign economies at least for the moment. For the near term anyway, I do believe inflation will remain subdued. And the productivity situation continues to look quite positive to me. As others have commented—and I may lean even a little further on this side—the expansion going forward is likely to be modest, which we recognize to a large extent is due to the fact that the recession was modest. We would not have been better off if we had had a deeper recession just so we could have a sharper snapback. Finally, though I don't want to overstate this, I do think that the current accounting issues are potentially a very big deal because I believe they could have an extremely adverse effect on confidence. We used to be able to take the accuracy of accounting for granted. We assumed that these kinds of problems, to the extent they existed, were characteristic of developing economies or at least of economies other than our own. That is

proving to be less and less true. And I'm afraid that there is real potential for that to adversely affect the economy, and not just in the short run.

CHAIRMAN GREENSPAN. First Vice President Barron.

MR. BARRON. Thank you, Mr. Chairman. Economic conditions in the Southeast have remained subdued since the last FOMC meeting. Although we are witnessing some improvement in manufacturing and especially in the tourism and textile sectors, consumer spending has actually slackened off somewhat. With respect to tourism, Florida seems to be rebounding strongly. Cruise ships have been fully booked without the need to resort to the heavy discounting that we had seen over the last several quarters. Single-family housing remains healthy, but multifamily construction seems to be clearly overbuilt. Conditions in the commercial construction sector, especially in Atlanta, are even worse. Office vacancy rates are at 20 percent, and we've been told that it may take until 2004 to absorb the current capacity. But even that would require a return to high levels of growth and employment. This weakness in the commercial market is showing through in lease renegotiations. One large deal was recently completed for a twelve-year office lease with two years completely rent-free. Not surprisingly, new speculative construction activity is virtually nonexistent.

In our discussions with our directors this month, we focused on profits, investment, inventories, and labor market related issues. Profits are still being maintained mainly by continued cost cutting and not by productivity-increasing investments or increased revenue. Further, the majority of our directors reported that their contacts, which consist mainly of smaller companies, were largely unaware of the changes in the tax law designed to stimulate investment. And in those few cases where firms were aware of the changes, the incentives reportedly were having no effect on decisions to invest. As for large companies, our contact at UPS indicated

that the tax changes were having virtually no effect on its investment decisions. This was due in part to the fact that most of its major investments were tied to longer-term contracts and also because the window for taking advantage of the changes was so long.

Clearly, the persistence of uncertainty and the effects it is having on inventory decisions are quite telling. Many retailers and manufacturers indicated they were in a wait-and-see mode at least until after the Fourth of July. Organizations are simply more willing to run the risk of incurring the added cost of just-in-time additions to inventory from domestic sources rather than risk placing large orders with lower cost sources abroad, based on highly uncertain sales projections.

Finally, on the hiring side, one bright note came from our contact in the growing Southeast auto industry. He indicated that auto producers had been generating 20 percent of their production output from overtime for the past four months. If production is maintained at the current pace for a couple more months—and he saw no reason why it should not be—he said that they would likely begin hiring again. We did not find much of a strategic story with regard to how temp workers are being used at this point. Temps are being hired, but only in conjunction with increased production and primarily as a hedge against the risk of further weakness.

In short, these anecdotal stories suggest that growth in economic activity over coming months is more likely to be moderate than robust and that investment spending is likely to be restrained because of the perception of high risk and uncertainty.

On the national front, we share the view of the Board staff that growth will be slightly below potential, at least through much of the rest of this year. Our reading of the data since the last meeting suggests that there has been no material change in the baseline economic outlook. As a result, the same questions we have had about the likely path for the recovery remain in

place. Inventories continue to be liquidated, and there are few signals that an upturn in inventory investment is imminent. The prospects for robust and rising corporate profits or investment activity have not improved. The factors that contribute to this mixed economic picture are also helping to keep inflation at bay. Mediocre growth rates for final demand and low rates of capacity utilization will help to moderate price pressures over the short run.

A period of extended low interest rates is not unprecedented. We experienced such a period in the 1990-91 recession and into the subsequent recovery. Interestingly, a rereading of the minutes from that period suggests that the Committee, prior to its initial move to tighten policy, had clear indications that the economy had turned the corner and was in fact expanding strongly. The Committee moved aggressively in 1994 once the decision was made to combat any signs of a rising inflation outlook. However, there were unusual factors that were restraining both inflation and the economy to a large degree—beyond those that are present today. As a result, although we may have some time to monitor the economic outlook for the signs of strength and a durable expansion, inflation risks may not remain as dormant this time around.

We would note some important differences between the economy during this slowdown and the 1990-91 period. For example, unemployment is currently much lower than it was during 1990 and 1991. The level of economic activity is clearly much higher than it was then, and the falloff in economic activity from the pre-slowdown period has not only been much less but is virtually nonexistent in either consumption or housing. Productivity growth remains much stronger and has not exhibited the usual slowdown typically associated with an economic contraction. The point of this is not to suggest that now may be the time to act but only to point out that it is not difficult to perceive a circumstance in which the economy could pick up quickly

and thus force more-aggressive policy moves. For now, though, it would simply be nice to see growth return to levels near potential. Thank you.

CHAIRMAN GREENSPAN. President McTeer.

MR. MCTEER. Since our last meeting, we have more evidence that the Eleventh District is still in recovery mode, but data and anecdotes to date point to a disappointingly weak and lackluster rebound. Job growth from February through May has been close to zero, and the Texas unemployment rate has inched up to just over 6 percent. Initial jobless claims were up again in May and, given robust labor force growth in the state so far this year, I expect that the Texas unemployment rate will continue to rise over the next few months. AI's productivity horse is outrunning the demand horse. This has not been a typical business cycle for Texas in that the region's performance has tracked the nation's so closely. As you know, in the past Texas typically experienced bigger booms and bigger busts than the nation as a whole. That is not the case this time. This is likely the outcome of greater diversification, with reduced dependence on energy and the fact that this most recent recession was not oil-price driven or at least not exclusively oil-price driven.

Currently, our older-economy cities like Houston have overtaken our newer-economy metros, such as Austin and Dallas/Fort Worth, in what is likely a temporary but nevertheless striking reversal of our experience over the past decade. Houston has been particularly buoyant in the last two months as a result of a stronger energy picture, particularly in natural gas. Although gas prices have come down somewhat in recent weeks, futures prices still imply prices closer to \$4 by the end of the year. Another positive development for us has been the beginning of recovery in Mexico. We've done quite a bit of work to adjust the Mexican data for this year's early Easter. So in contrast to the official Mexican statistics, our numbers suggest that Mexico

was out of recession in the first quarter, with GDP growth of positive 1.4 percent and with Mexican exports, imports, and industrial production all increasing steadily since the beginning of the year.

The big question marks in our District are the high-tech and telecom industries. We've had some positive developments outside of telecom, such as increased exports of computers and electronics to Asia. In the telecom sector, however, it seems that bad news is followed by more bad news. As a result we've had no job growth and rising unemployment in both Austin and Dallas. Commercial real estate markets in these cities have deteriorated quickly—another consequence of the high-tech bust.

As I look at the national economy, I don't see much in the monthly numbers to suggest an acceleration in demand. But the continued positive results may have boosted business confidence in the sustainability of the recovery. The weakness of the recovery is only partly due to the mildness of the recession that preceded it. The declines in industrial production and capacity utilization that we saw during 2000 and 2001 were not small at all by historical standards, yet the rebound we've seen in these series since December has been exceptionally modest. Consumers have certainly been doing their part, but it still seems that, going forward, they can't continue to carry the whole load. If we're to avoid a 1991-style jobless recovery, firms are going to have to resume their capital spending. Fortunately, the preconditions for that to occur seem to be falling into place. And we are seeing increases in capacity utilization, however weak. Corporate cash flow has begun to improve, and the stunning productivity gains of recent quarters are holding down unit labor costs relative to prices.

All in all, I think we're more likely to see a replay of 1971 than of 1991. Instead of an unemployment rate that rises a full percentage point after the recovery begins, as happened a

decade ago, the unemployment rate may waffle between 5½ and 6 percent for an extended period of time. If that is the case, then we're not likely to see any acceleration in inflation worth worrying about anytime soon.

Tightening at this juncture would, in my opinion, be premature. We have met some of the preconditions for a pickup in capital investment, but we have no hard evidence yet that the pickup has begun. Job growth has only just turned positive, and increases in jobs keep getting revised away. The recovery is still very weak and very tentative. As confidence that the economy is on a healthy growth path increases, rates will have to rise, but that time has not come yet.

CHAIRMAN GREENSPAN. President Poole.

MR. POOLE. Thank you, Mr. Chairman. The contacts that I talk to emphasize over and over again that the picture has not changed very much from the time of our last meeting. In fact, as I reflect on the situation, I can't remember an intermeeting period in which less has changed in terms of the overall outlook for the real economy, though obviously there have been developments in the financial world that really are newsworthy. To reinforce a point that some others have made, we, too, hear frequent comments about the weak condition of state and local budgets. I think that probably will be a factor depressing spending by state and local governments for quite some time.

My contacts at UPS, FedEx, and Wal-Mart all stressed a noticeable change in the labor market in terms of a lower turnover rate or increased retention rate. Full-time employees are not leaving as frequently as they were in the past, and as a consequence, these companies are reducing the use of part-time help because they have more full-time employees. All of these contacts pointed to that as being a marked change in the situation over the last year. My UPS

and FedEx contacts both said that they see some real signs of recovery in Asia and Europe, with outbound traffic from those areas clearly picking up. The volume of shipments from the United States to Europe and Asia, however, is not picking up. My Wal-Mart contact had an interesting observation about Argentina. He said that Wal-Mart has about eighteen stores in Argentina, and with the banking system closed, they have problems paying employees. They are sending armored trucks directly to the stores and paying wages in cash.

So, my Wal-Mart contact said that things were going fairly well in Argentina except for the financial and banking sides. The level of activity, measured in terms of the volume in their stores, looked okay.

I think that's about all I want to say in the way of a review of current conditions. I would like to offer the observation that clearly the economy is working through a number of adjustments, especially on the financial side, in light of all the uncertainties about the accounting problems. We continue to get distressing stories along that line

There has been a significant decline in longer-term interest rates. There is a self-equilibrating process going on. That decline in long rates is certainly going to help to bolster housing and probably consumption through the traditional channels—or what have become the traditional channels of refinancing and other means of extracting cash from increased home values. That will no doubt provide some support for business fixed investment; it will encourage that to come along. When the environment improves and becomes more buoyant, we will start to see rates on longer maturity instruments go in the other direction. That will be part of a self-stabilizing or self-equilibrating process as well. And it's exactly that process that makes it, I

think, easy and fully appropriate for us just to sit here and let the market do as much of that as possible. I believe there's no compelling reason for us to change policy until the underlying situation changes quite a bit. Thank you.

CHAIRMAN GREENSPAN. Governor Bies.

MS. BIES. The discussion that we've been hearing today is consistent with the Beige Book summary that characterizes economic growth as modest and uneven—or schizophrenic, as we said earlier. From late 2001 until the last FOMC meeting, most forecasters had been revising growth estimates upward. Since the last meeting, we're seeing more forecasts for the remainder of 2002 being revised down. Consumers have slowed their pace of spending. Business fixed investment still does not show signs of sustained recovery. Employment and average weekly hours worked have stabilized. But I echo the concerns that have been expressed many times already today that issues about the integrity of corporate earnings are continuing to overhang markets and consumer expectations. On the positive side, I look at the increase in labor force participation and the continued inventory liquidation and sustained final sales of businesses, which have brought inventory-sales ratios to historic low levels. Production has grown for five months but at a pace below that necessary to maintain even the low current level of inventories. Housing continues to be a bright spot in economic activity, and fiscal policy continues to be stimulative.

Inflation remains at extremely low levels, and CEOs continue to lament their limited ability to increase prices. The slow pace of employment activity and the pressure on profits continue to drive productivity to strong levels. The sustained lower value of the dollar, however, will increase inflation pressures to some degree. Thus, the modest pace of economic activity and the low level of inflation warrant no change in economic policy today.

CHAIRMAN GREENSPAN. Vice Chair.

VICE CHAIRMAN MCDONOUGH. Thank you, Mr. Chairman. The Second District's economic performance has been mixed, as we've been hearing is the case in most parts of the country. There are some signs of increased price pressures in manufacturing and real estate; but aside from shelter costs, finished goods inflation has remained stable and low. Retail sales bounced back in June after a weak performance in May. Consumer confidence has been rather mixed, and labor market conditions are as well, but overall both are fairly steady. The housing markets in the District have been restrained, with prices continuing to rise but modestly. Office markets in and around New York City remain weak but have stabilized, and the hotels have reported further increases in occupancy and room rates. Our surveys of manufacturers and purchasing managers suggest a mixed performance in the manufacturing sector in May. And bankers in the District report some softening in consumer loan demand but a pickup in demand from commercial borrowers, tighter lending standards, and steady to lower delinquency rates.

On the national level, our quibbles with the staff forecast are so minor as to not require any discussion. I'd like to comment on some of the views around the table that somehow we have to prepare the market for what seems like an inevitable tightening of monetary policy. I'm not sure who it is that we think we need to convince of what. If the world outside really questioned the inflation-fighting skills and the willingness of this Committee to combat inflation, then I guess we'd have to go out and try to convince the world of that. But with the exception of a few loonies who write rather silly columns—such as one in the *Wall Street Journal* today—in order to make a living, nobody questions the ability and the willingness of this Committee to fight inflation when it needs to be fought. It's rather like Babe Ruth running around and saying,

“I’m a great hitter,” or Lefty Grove saying “I’m a great pitcher.” Nobody questioned their abilities.

CHAIRMAN GREENSPAN. I’m not sure everybody around here would know who Lefty Grove is! [Laughter]

VICE CHAIRMAN MCDONOUGH. He’s the greatest left-handed pitcher in baseball history. Thirty-one wins and six losses in his best year, with a lifetime earned-run average of about 2.53?

CHAIRMAN GREENSPAN. Is that a question mark at the end of that statement?
[Laughter]

VICE CHAIRMAN MCDONOUGH. He was a very good pitcher. The point I wish to make is that we would be ill advised now to be preparing the market for something that I don’t think the market needs to be prepared for. Our balance of risks statement says that we think the risks are balanced. If we were to say that we think there is a greater risk of inflation, people would wonder on which planet we had taken up residence! We certainly don’t need to posture ourselves as virtuous inflation fighters; that would seem to place in doubt whether we consider ourselves to be good inflation fighters when necessary. Otherwise, why would we be talking about that?

I have a position in the world’s financial center that provides me with about a zillion international contacts. If anybody were seriously worried about our willingness to take on inflation, I would surely be inundated by such comments. I don’t get any. So I would suggest that we not get involved in a fight that nobody thinks we need to engage in. There are some very, very serious problems out there, and we don’t need to contribute to them by placing our own skills in question.

The markets continue to be pounded by what appears to be an expanding scandal in corporate America, leading a growing number of our fellow citizens—and even more foreign investors—to fear equity investments in this market. A month ago I think one could have said that the corporate scandals were relatively isolated and that there weren't too many Enrons. Just too many are coming to light for people to be able to say that now. And the willingness, despite all these developments, of the final four accounting firms to spend their considerable skills on the Hill trying to ensure that no legislation is passed that calls for oversight of them—no oversight at all—indicates a lack of common sense that is really quite dangerous.

The probability of an international financial crisis would be difficult to exaggerate, I think. Argentina is as we have described it in recent meetings. Brazil, in my view, is an ever-growing danger. The question is not whether Lula da Silva would be elected President of Brazil. Rather, it is whether the financial markets in the country, and especially the citizens of the country, are going to sit around and wait to see what happens. If his lead in the polls continues, I think we have to stand by for a very high probability of massive capital flight as we get closer to the election. There is nothing the IMF or anybody else can do about that. If the Brazilian people decide that they're going to vote with their money, the rest of the world will have to watch. But if that happens, the likelihood of a very serious contagion effect on the world economy is great indeed. For a while we could say that there was almost no contagion effect coming out of Argentina. That is no longer true. It may not be coming out of Argentina, but there is a fear in the emerging-market area that is getting considerably greater.

If we have an international financial crisis, we are not in very good shape to deal with it. We, the people of the United States, are very solidly in support of our President in the war against terrorism. But if you were to spend as much time as I do dealing with the international

community, you would know that the support of our traditional allies for our position is weak at best. Their attitude that the United States is being unilateral, which I think is a bum rap, is spreading, and it takes on a reality of its own. If we have an international financial crisis, the world is going to say that the present economic leadership team in the United States has never been through such a crisis. Anytime that a group has not been through the handling of a crisis, there will be questions about how good it will be at it. I hope and expect that this team would handle such a crisis very well indeed. But I think the world would expect the central bank of the United States to take on the leadership role if needed, as we did in the fall of 1998 particularly. And because of what I see as a very murky and rather dangerous international environment—and it could get quite bad indeed—I think it is particularly important for us to conduct ourselves in a way that indicates our self-confidence. We need to show that we are sure of ourselves and confident in our own abilities to manage domestic monetary policy well and to manage our role in promoting financial stability as brilliantly—a word well selected, I think—as we have in recent years. It is not the time to go around preparing the market for something for which it doesn't need to be prepared and in the process to place in doubt our confidence in ourselves. Thank you.

CHAIRMAN GREENSPAN. Governor Gramlich.

MR. GRAMLICH. Thank you, Mr. Chairman. The latest J.P. Morgan newsletter starts off: “Global equity markets continue to slide this week, government bond yields are falling, and the spread on emerging-market debt is widening. Such changes often signal that an economic slowdown lies ahead. However, economic indicators still point upward. A wave of recent reports suggests that housing activity, along with retail spending and manufacturing output, is re-accelerating as midyear approaches. This news is accompanied by continued strength globally in

trade flows and manufacturing output.” This quote captures what others have called the schizophrenic situation facing the economy. Many indicators suggest that we are on track for a gradual recovery. We are slowly working off excess inventories and fixed investment is gradually coming back. Consumption and housing remain strong. Both the Greenbook and Blue Chip forecasters look for a gradual recovery. And gradual is good because it reduces the expected amplitude of future investment accelerator cycles.

Looking further into the future, the so-called “perfect foresight” path for the funds rate in the Bluebook is not far from the scenario that I imagine most of us poor souls without perfect foresight would have in mind. And this path does lead to very low levels of inflation and unemployment. There are imbalances, but even these are not too alarming, at least in the central Greenbook forecast. Both the dollar and the stock market had been overvalued according to conventional notions of equilibrium, but both are readjusting. Given all this—the gradual recovery of the real economy, stable prices without much inflation threat, and the readjustment of financial prices that are out of line—what’s the problem? Why don’t we feel better about the outlook?

There are several sources of concern, which is bad enough. What is worse is that, compared with the good news, these disconcerting factors could be fundamental, are often unprecedented, and are very hard to analyze. I have five items on my list. One, of course, is future terrorism risk. We’ve talked enough about that here.

Second is the risk that gradual price movements will become rapid price movements. The stock market may not be too far out of equilibrium now. Forward earnings-price ratios have returned to a decent margin over real interest rates. And the household wealth-income ratio is now much closer to its historical average. But the market could well overshoot, as it often has in

the past. The dollar, on the other hand, is miles away from its equilibrium value—the one that equates imports with exports. A rapid change there could have quite dramatic implications, largely along the lines of those just mentioned by Bill McDonough.

Third is a long-run erosion of national saving. The budget situation is bad and getting awful. The deficit is rising rapidly; political discipline is gone; nobody will make a vote in the public interest. As long-run national saving declines, either investment will decline, or our foreign financing needs will increase. And both are bad for quite different reasons.

Fourth is what the Greenbook has euphemistically called accounting irregularities, which other people are calling scandals. If these irregularities were in fact irregular or abnormal, that would one thing. But they are looking rather pervasive to a lot of us.

The fifth is interactions. All of these risks involve potential interactions. If accounting firms are successful in enabling businesses and households to avoid taxes, won't this further erode the budget and national savings? Will the accounting irregularities lead to further and sharper falls in the stock market, the dollar, investment and/or consumption? Will declines in investment demand, if any, reduce a capital-deepening productivity change—still our best piece of economic news—and then further affect the dollar or the stock market or both? Will the threat of terrorism interact with any of these or all of these?

So while we have an economy that is in some sense well positioned for a gradual recovery and while we could be on track for an outcome with lower unemployment and low inflation, there are mysterious forces out there. And those forces are difficult to analyze and could be quite ominous and quite powerful. Schizophrenia rules!

CHAIRMAN GREENSPAN. Governor Ferguson.

MR. FERGUSON. Thank you, Mr. Chairman. My view of the near-term indicators is that they do indeed, as others have already indicated, paint an economy that is stable—certainly not contracting—but not yet growing at trend. For example, the initial claims data have come down from their recent artificially elevated level, but they remain historically high—at around the 400,000 level that has prevailed since early 2001. Certainly the most recent retail sales data were weaker than expected—flat in May—and are pointing to a possible slowing in the pace of increase in personal consumption expenditures. And finally, the data for orders and shipments, as we've just seen this morning, are clearly stabilizing and perhaps turning up some but certainly are not returning to the pace of the late 1990s.

This picture is frustrating, I think, for those who had hoped for or bet on a sharp turnaround. But this Committee should be mindful, as many have already said, that the gradual growth of the current quarter was anticipated in our earlier meetings. Two of the three previous Greenbooks this year forecast growth in this quarter within a range of 2 to 2½ percent, and growth at such a pace still seems to be the case. While expected, however, this slow growth does leave one wondering what will be the impetus for an upturn or return to trend. If the second half of 2002 is going to be stronger than the second quarter and lead to a stronger 2003, as forecast by both the staff and the consensus of external forecasters, we must soon start to see a pattern of more rapidly improving incoming data. While that pattern of data is not yet in hand, both housing and autos are continuing to play the important stabilizing roles that they've played thus far for the cyclical episode.

Additionally, as other have said, impetus will most assuredly come from monetary policy, which is accommodative; fiscal policy, which is likely to continue to provide a positive impulse; and a weaker dollar, which will allow foreign demand to take up some of the slack not

provided by domestic demand. On the other hand, eroding equity prices, declining consumer and investor confidence due to a range of factors that Governor Gramlich has identified, and an uncertain profit outlook in the business community are admittedly creating and likely to continue to create some drag on both household and business expenditures.

All of these forces taken together lead me to believe that the risks to the baseline forecast are, if you will, uncomfortably balanced. Now, if contrary to most expectations the negative forces weighing on the economy grow stronger, become more persistent, and undermine recovery, then obviously we'll have to react to that. Similarly, on the other hand, if the turnaround proves stronger than forecast, we'll need to move rates upward more quickly than currently built into the assumptions underlying the Greenbook or the perfect foresight outlook in the Bluebook. Whether such moves will surprise the market is really uncertain. Just as the markets have adjusted in the intermeeting period to the incoming data by modifying their expectations with respect to policy in a downward direction, presumably incoming data would get the markets to adjust their policy expectations up if indeed that were the appropriate response.

Let me comment briefly on the issue that Vice Chairman McDonough discussed and perhaps take a slightly different tack. I think the issue of preparing the markets is one that is rather challenging for this Committee. We have the benefit of having the confidence of the markets that we will attempt to avoid surprising them if we can. That may not always be possible, but we will try not to surprise them. We don't want to lose that unwritten but rather well understood pact between this Committee and the markets. On the other hand, we don't want a desire to prepare the markets to lead inadvertently to instability in the markets, which perhaps was what Vice Chairman McDonough was suggesting. That does leave us in a bit of a

challenging position here. But for now I'd say it's better just to have a steady hand on the tiller. These are indeed uncertain times, and we don't want to add to that uncertainty. Thank you very much, Mr. Chairman.

CHAIRMAN GREENSPAN. Governor Olson.

MR. OLSON. We've had a couple of comments regarding the impact of public policy, and I think Governor Gramlich summarized it pretty well. In the course of this past year we have had a stimulative tax and spending policy offset—and significantly, I think—by a loss of fiscal discipline, which was an issue we discussed at the last FOMC meeting. President Jordan described monetary policy as likely to be event-driven and reactive. I would say that, from a public policy perspective, the efforts for the rest of the year will be targeted and cautious.

The election year in America really begins after Labor Day. In Washington, D.C., which is different from America, [laughter] it begins in midspring. The control of the Senate is now perceived to be in the hands of five states, three of which are agriculture states—South Dakota, Minnesota, and Iowa. And it's not surprising that we have in the Congress a farm policy bill that is targeted toward those states and, in turn, to achieving control of the Senate. It seems to me that the one public policy decision that has been made—and this addresses what Vice Chairman McDonough said regarding the corporate governance issue—is that the accounting industry has lost its right to self-governance. There will be an oversight board, in one form or another, that is largely out of their control. And that I would consider a cautious decision because it reflects what I believe is a consensus position.

I think the best example of public policy action in this time frame is the inability of the legislature to pass a debt-ceiling bill. The government is going to run out of money this Friday. The Senate has passed the bill. The Republicans in the House are looking very hard at ways to

avoid addressing the issue directly. To me what that suggests is that, in the area of public policy, the decisions will not contribute to the solution but will no longer be part of the problem. So perhaps that, too, reflects where we are now, that a policy of no change or a steady-as-you-go course ought to be the one we follow.

CHAIRMAN GREENSPAN. Thank you very much. I think we can break for coffee now.

[Coffee break]

CHAIRMAN GREENSPAN. Mr. Kohn.

MR. KOHN. Thank you, Mr. Chairman. The Committee has noted in its last few announcements that the current stance of policy is accommodative, in large part to signal that it appreciated that the current level of the federal funds rate is likely to be inconsistent over time with its long-term goals for price stability and maximum sustainable growth. This policy stance was adopted to counteract the effects of some very powerful restraints on aggregate demand—most notably the collapse of capital spending and the decline in equity prices associated with a re-evaluation of the demand for, and profitability of, capital goods. Working through the imbalances that built up in the second half of the 1990s has depressed output and resource utilization enough to put downward pressure on an already fairly modest core inflation rate. As the economy began to stabilize late last year and to expand in recent months, the key policy question has been whether the adjustment in the capital goods sector and in expected profits has proceeded sufficiently, or other countervailing stimulative forces have come into play, so that monetary policy should begin to move toward a more neutral setting to forestall an eventual rise in inflation.

In many respects, the news since your last meeting has supported an assessment that the adjustment process has been progressing largely as expected. The staff anticipated a slowdown in GDP growth along the lines experienced, as the boost from the slower runoff in inventory waned and as growth in final sales moderated after a surge in consumption and government spending in the fourth and first quarters. Economic activity has continued to advance, with industrial output increasing and labor markets stabilizing. Importantly, as highlighted by the data this morning, investment spending does look as if it has begun to recover, suggesting that the correction of imbalances in the capital goods sector is well along. Core inflation has continued to moderate this year, though by a little less than anticipated by the staff in the last Greenbook. And longer-term inflation expectations remain relatively low; indeed, over the intermeeting period, the spread between nominal and indexed debt reversed a considerable part of its previous run-up.

More unexpected in recent weeks have been developments in financial markets. Through the close of business yesterday, the dollar had fallen around 4 percent against other major currencies over the intermeeting period, the broadest stock price index was down more than 7 percent, and most long-term interest rates had fallen around $\frac{1}{4}$ percentage point. To a considerable extent, these asset price adjustments have reflected a response to economic news in line with the staff's outlook for activity and earnings, but short of the outsized expectations of market participants. It is important to emphasize that, taken together, the net changes in asset prices over the intermeeting period should have very little overall effect on the path of economic activity and inflation going forward, at least when viewed from the perspective of the staff model. This results because the restraint on aggregate demand from the drop in stock market wealth is projected to be about offset over time by the boost to spending and production from the lower dollar and interest rates.

But it seems evident that financial markets are reacting as well to perceptions of heightened risk and uncertainty that have the potential to damp spending in ways that had not been anticipated or built into the model. To some extent, these perceptions reflect the persistence and possible intensification of foreign conflicts and of turmoil in key Latin America economies, which are seen as posing a greater risk of spilling over to the domestic economy. The added uncertainty also represents another lingering hangover from the late 1990s boom. The exposure of questionable practices at an increasing number of U.S. corporations has raised questions about governance and transparency at firms more generally, reducing the confidence with which investors can interpret recent history and anticipate the future. Greater uncertainty and skittishness have been manifest in a marked increase in actual and expected volatility in a number of financial markets. Moreover, credit risk premiums have jumped in certain market segments and for the lower-rated borrowers who are perceived to be most prone to corporate irregularities and most vulnerable to more-worried lenders. Clearly, such market responses would tend to damp spending by the businesses that now find the financial markets less hospitable. But heightened anxiety about the future and about the cost and availability of finance could have much broader effects by making both households and businesses more cautious, less confident, and less willing to take risks in spending and investing.

So long as the increase in uncertainty does not feed upon itself, the fundamentals remain in place for a strengthening of demand over coming quarters for the reasons presented in the chart show yesterday. With inventory-sales ratios quite low, inventory investment should continue to contribute to increases in production—though not by as much as in the first quarter. Growth in final demand should be bolstered by expansive monetary policy, which is keeping real short-term and long-term interest rates low—at least for more creditworthy borrowers—supporting household spending on homes and durable goods and enabling corporations to strengthen balance sheets, leaving them better positioned to pursue profitable investment opportunities. Stimulus to final demand from fiscal policy is reflected in boosts to disposable income from tax cuts, in large increases in government spending, and in greater incentives to purchase capital equipment that should begin to have

significant effects over the next several quarters. As depreciation of the existing capital stock and expanding sales continue to eat into any remaining capital overhang, the normal accelerator process will begin to boost business spending, reinforcing the special incentives to deepen capital given by tax law and the opportunities from technological innovation. The resulting productivity gains will continue to bolster labor income and spending over time.

In the staff forecast, nonetheless, the forces restraining spending lift only gradually. Not until next year does the economy expand at a rate fast enough to begin to make significant inroads into excess resources. In effect, high margins of excess production capacity, lower equity prices, cautious lenders and spenders, and moderate expansion in our trading partners mute the economy's response to stimulative monetary and fiscal policy. As a consequence, in both the staff forecast and the perfect foresight exercise in the Bluebook, holding the current accommodative stance of policy for a time and raising the federal funds rate gradually thereafter is consistent with maintaining inflation near its current relatively low level. Keeping policy unchanged might have particular appeal when there is so little historical precedent to judge the likely path for spending as the economy works through the effects of the previous imbalances in capital goods and equity markets. With financial markets skittish, core inflation still edging lower, and inflation expectations well anchored, the Committee might see little to be lost by waiting to get a better fix on how demand is likely to evolve.

The Committee's perception of the balance of risks to the outlook at an unchanged policy stance might depend on how you weighed the various types of information you received over the intermeeting period. The passage of time, together with the economic data consistent with expectations that investment was turning around, could imply that the odds on economic expansion falling short had declined and that inflation risks had drawn closer—perhaps to the point where the latter now were the more important threat to meeting your longer-term objectives. The belief that the foreign exchange value of the dollar was likely to be trending substantially lower over a considerable period would reinforce such a judgment.

In contrast, should concerns continue to mount about global political and economic developments and about the true state of finances of U.S. corporations, the resulting caution could cut into spending. Indeed, a few observers have read recent financial market developments as raising the odds that your next action is more likely to be an easing than a tightening, suggesting the possibility that the balance of risks had tilted toward economic weakness. And in fact, financial markets this morning have built in some odds of an easing in the October-November time frame.

In the staff forecast, these greater uncertainties have not undermined the judgment that fundamental forces will be strengthening the expansion and that policy will need to tighten at some point, but they have pushed off the date at which inflation risks will require firming to begin. If the Committee shares the assessment of the staff that heightened inflation pressures are no closer now than they were in May, presumably

it would retain its assessment that the risks to its objectives are balanced. This is what the markets expect, and the announcement of an unchanged policy along with balanced risks should have little effect on asset prices. The heightened degree of unsettlement in financial markets most recently, including this morning, might strengthen the argument for not surprising market participants at this meeting unless the Committee saw policy expectations now embedded in asset prices as seriously misguided and potentially destabilizing. Thank you, Mr. Chairman.

CHAIRMAN GREENSPAN. Thank you. Questions for Don? President Parry.

MR. PARRY. First of all, I think the perfect foresight exercises, both in the Bluebook and also in the memo by Bob Tetlow were very helpful. I have a couple of questions with regard to those exercises. Page 7 of the Bluebook, about the seventh or eighth line down, talks about the objective function as minimizing the squared deviations of output from its potential. Is that correct? I ask because I think Tetlow minimizes squared deviations of the unemployment rate from the NAIRU and that makes a difference. In this latest recession, of course, the deviation of output from its potential really didn't become very great, but the deviation of the unemployment rate relative to the NAIRU was quite large. So, is there a difference?

MR. KOHN. I think they were about the same, but maybe Vince can give you a more detailed explanation.

MR. REINHART. You are right; Bob's memo highlighted that it was unemployment relative to the natural rate.

MR. PARRY. So did you run a different model simulation?

MR. REINHART. No, actually we ran the same one.

MR. PARRY. Oh, okay.

MR. REINHART. However, going forward in the forecast, Okun's law relates the two, so it doesn't make a difference.

MR. PARRY. But the relationship—I think we ought to talk about that. In other words, you didn't put it in the right terms. This should be—

MR. REINHART. Unemployment relative to the natural rate.

MR. PARRY. That's what I thought the answer was. Thank you.

MR. KOHN. I do think that in the staff's assessment there isn't much difference going forward because in the staff forecast the NAIRU is 5¼ percent.

MR. PARRY. Right, but in the most recent period it's different. My second point is that you talk about the small penalty associated with changes in the funds rate. In Tetlow's work I thought it had almost an equal weight. And that's pretty important in terms of the objective function. Unless you used a different penalty, I don't see how you could characterize it as a small penalty.

MR. REINHART. No, the Bluebook simulation is exactly the same as the one Bob presented.

MR. PARRY. So it gives a heavy weight to smoothing changes in the funds rate; that's the way he characterized it.

MR. REINHART. The penalty is our dirty little secret.

MR. PARRY. You got it!

MR. REINHART. It isn't obvious why in a perfect foresight simulation we would necessarily impose that the Committee cared about gradualism in setting rates.

MR. PARRY. Right.

MR. REINHART. We do it for a couple of reasons. One is the characterization of uncertainty. Second, the model has a property that it gives us a small contemporaneous effect of monetary policy. That is, if you change the funds rate this quarter, it will actually influence

output in this quarter. That doesn't seem credible. So gradualism has the effect of taking that out. Whether that is small, medium, or large, it was chosen so that we would get the historical funds rate volatility.

MR. PARRY. It's all relative to the other.

MR. REINHART. Right.

MR. PARRY. One final question. You referred to the growth rate of potential as 3¼ percent after 2003. Tetlow used 3½ percent, and in fact it builds to above 3½ percent after that. Did you use a different simulation there?

MR. REINHART. We were using the same simulations. Now, Bob's memo was written a week before the Greenbook was finalized. So, it must reflect either a change between the times the two exercises were done or a different rounding convention.

MR. PARRY. Okay, thanks.

MR. STOCKTON. I don't think there were any changes in the model itself.

CHAIRMAN GREENSPAN. President Poole.

MR. POOLE. I have a comment on page 14 of the Bluebook—the box that discusses the market reaction to policy surprises. I think there's a lot more that could be done in that exercise. In particular, I think there's a better way of doing table 1 versus table 2. Instead of partitioning the data by date, I'd use the size of the policy surprise as measured by the change in the federal funds futures market. A change of 5 basis points or less really is no surprise, but a change of 5 basis points or more would be. That would be a better way of presenting this analysis.

MR. REINHART. In fact, I think we did something similar to that with a different range. This analysis is basically a work in progress. I would say that we were influenced by the reaction to the January 3, 2001, action, which was certainly not in the 5 basis points or less cell.

MR. POOLE. That's absolutely right. That's why I'm suggesting that you partition these observations. I used 5 basis points because our research indicates that that's about the ambient noise in the federal funds futures market.

MR. REINHART. We have ongoing research that involves looking at the different measures of expectations. And it does turn out, whether you use the federal funds futures, the Eurodollar, or a term structure that you can tweak these numbers a little bit.

CHAIRMAN GREENSPAN. Further questions? If not, let me get started. I've been particularly impressed, and others have as well, by how this economy has withstood the extraordinary impact of the dual shocks of a major collapse in equity asset values and the tragic events of September 11. I think it's important, however, not to perceive the economy's resilience as an either/or issue. In other words, the economy either deflects these shocks, or it doesn't. If a person has a flu bug that puts him or her to bed for a week, that person is seriously ill. The alternative as it applies to the economy in the current context is that it is suffering, but it is not in bed. And I think it is going to take a while, maybe many months, before the lingering effects of what the economy has essentially deflected actually wear off. As I see it, a goodly part of the restraint on economic activity that we see pretty much across the board is the after-effect of these shocks. They have been very substantial shocks. In this context, the big rise in GDP in the first quarter as a consequence of the sharp slowing in inventory liquidation is merely an arithmetical inevitability; it is not something that gives us any really great insight into ongoing economic processes.

What characterizes this period in my view is that globalization is beginning to have a general effect on the competitive structure of the world's economies. It essentially has opened up the world market to a lot of local areas with excess capacity. When there are local areas that

cannot trade with one another, a higher level of aggregate capacity is needed to accommodate rising demand. The consequence of homogenizing the world economy, which is effectively what globalization does, has very clearly been to exert a marked deflationary force on the pricing structure of the world. Merely looking at the rate of inflation as it gradually came down through the 1990s is telling us that we are seeing a very broad force that is exerting its economic effects relatively slowly. I'd like to think that in some way the monetary authorities of the world were extraordinarily clever and that we calibrated this process precisely in the way it happened. I don't believe that for five seconds. I think we have been very fortunate in having essentially recognized the process as it was occurring and having calibrated our actions to profoundly important events. And the reason they are profoundly important, even today, is that this is a different kind of recovery from those we have seen before. To a very large extent, it's characterized by the loss of pricing power. What that essentially means is that we are not seeing the recovery characteristics that we have observed in the past in which inflation got down to a low rate of, say, 3 percent and then started to move back up. This recovery is different. It's different largely because the business community deals with nominal values. Business firms are facing consolidated corporate revenues that are basically flat in nominal terms, and even if the price level is falling or the rate of inflation is coming down, business executives who are in charge of capital investments remain skeptical about indications of an emerging upturn. We clearly are getting a very different pattern of real GDP as a consequence.

The fact is that we have gotten some firming in the orders series despite the pervasive gloom in the business community. Cathy Minehan reflected on the extent to which her business contacts talk about this gloomy sentiment. We are all seeing it, and given its pervasiveness, it is difficult to imagine why any investment is taking place. But business firms are in fact investing.

If the chart in front of us covered more years, we would find that the current orders figures are higher than they were in any recent period except for the years 1997 through 2000. They have come down very sharply, but we have to remember how far they had gone up, so the current level relative to where they were in the past is really quite high. The question is how that squares with the gloom that permeates much of the business community. The reason they are spending is that they perceive they need to. The only people who are making any capital investments, if you listen to what business executives are saying, are those who have no choice. It appears from the data that there's an awful lot of nonchoice out there! There is no doubt that the numbers on investment outlays look better than what business executives are saying, and I think that's important.

I think it's also important to reflect on why this period differs from, say, the 1950s and 1960s, which also was a period of low price inflation. Back then, the population was growing at about twice the rate it is today, and nominal values also were growing faster than they are today. We usually don't consider population growth to be an issue, but it's relevant in this case. I recall that capital investment was doing reasonably well in the 1950s and 1960s. Profits were doing reasonably well. Sales were doing reasonably well. With the population and the labor force growing much faster than they are now, housing starts began a long-term uptrend from the beginning of the post-World War II period. The impetus for rising housing activity usually focuses on household formation, and that's not what we're getting today. I'll come back to that shortly because it has considerable relevance to what is going on currently.

There is no question that the issue of corporate governance and accounting practices has eroded the level of confidence, and more so than I expected it would. One cannot escape the conclusion that some of what has gone on within a number of large corporations probably has

involved some felonies and that inevitably somebody is going to jail. Even so, it's hard to say that corporate efficiency, which is really the ultimate measure of the effectiveness of corporate governance, is weakened. On the contrary, all the evidence we have from the productivity data indicates precisely the opposite. What it also is saying is that the fear in the marketplace about the quality of earnings is a short-term fear. The reason is that there are certain fundamental numbers in our system that, if we believe them and I think that we do, mean that underlying productivity is indeed rising. One cannot spin the productivity data that we are working with. Indeed, David Stockton provided alternate and independent estimates of what is happening, and they all show the same thing—that it is very difficult to deny that output per hour has accelerated. It's also very difficult to deny that unit labor costs have either leveled out or fallen.

One may argue that prices are going down in the corporate sector, and in part that may be correct, but severe deflation is evident in none of the data. As a consequence, profit margins, as reflected in the NIPA, have been recovering. It's important to keep in mind that the NIPA profits numbers are not capable of being spun under GAAP and they are not capable of being misrepresented by off-balance-sheet analysis. When I ask myself whether there is any way in which one can spin the national income and product account profit figures, the answer is “yes”—in part. The “in part” relates to the fact that the underlying source data used by the BEA may very well be questionable to a degree. But there are quite significant limits to how far that can go. At the end of the day, the NIPA profits figures are based on the tax returns that corporations put out. There is no evidence of which I'm aware that corporate tax return reporting is deficient or suspect. There is no evidence that I'm aware of that the IRS has found huge accounting misreporting for tax evasion and tax avoidance purposes. The truth of the matter is that the amount of avoidance that a business firm can engage in is limited. That means that the NIPA

data in general are probably quite reflective of what is going on, and those data show a lot higher profits growth than do the recent shareholder reports. Part of the reason for that, as I have argued in the past, is that the non-expensing of stock options, which was a major factor in the widened spread between shareholder S&P 500 earnings and the NIPA earnings from 1997 through 2000, is now reversing. And it's reversing in the sense that, with the fall in the stock market, the willingness of employees to take stock option grants in lieu of cash has gone into very significant retrenchment. That means that cash, which is expensed, is taking the place of stock option grants, and that's depressing S&P 500 earnings relative to those in the NIPA data. The latter, of course, already have a form of expensing in them as is required under the tax code.

My suspicion is that if the numbers we're looking at are reasonable and if the GDP data that David Stockton was talking about this morning are going to be revised as he suggests, we are looking at a productivity number of around 2¾ percent at an annual rate for the second quarter. By itself, that is not hugely remarkable, but it is hugely remarkable in the sense that it would follow annual rates of 7 percent averaged over the two previous quarters. One would have expected a negative second quarter merely because it's just not credible that those 7 percent numbers can be representative of the trend in the real world. The fact of the matter is that there appears to be something very real going on. And if it is and if compensation of employees is not picking up all of the gains in productivity, as clearly it is not, then of necessity the productivity gains have to flow over into profit margins unless we see serious evidence of accelerated deflation or actual price declines in the corporate sector. There is little of that because the reasonably good data that we have for manufacturing prices do not show very much deflation, except for the high-tech sector. The latter, of course, has been characterized by persistently

falling prices. Indeed, that's one of the reasons why in the present environment we have very slowly moving nominal GDP that is associated with reasonably good real GDP.

In my view, the problem with profits is going to cure itself. I nonetheless think that a lot more shoes probably will fall in the disclosure area. The WorldCom episode is bizarre, including the huge loan that the company made to Bernie Ebbers. I served on a lot of boards of directors before I arrived here. The notion that we directors would authorize huge loans to the chief executive officer is so far from anything that I even remotely encountered at that time as to indicate that something in the area of corporate governance clearly has broken apart. It's not that human greed has somehow inexplicably and suddenly escalated after standing at a fairly pronounced positive but measurable level for millennia. What has happened is that the exploitable opportunities for greed have gone up very substantially with the huge bonanza in market capitalization sitting out there as a potential free lunch with no apparent offsetting liabilities. Some of the practices that business firms are engaged in are utterly bizarre. So there are bound to be further revelations relating to such practices, and I don't know how long this problem will last.

I see evidence that the capital goods markets are reflecting slightly improved profitability. I'm a little dubious about the reports that the legislation providing for accelerated depreciation is having no effect. It is true that if one surveys corporate executives, many will say that they never heard of it in terms of their firms' investment decisions. But that's not where the investment decision is made. It's made at the plant level. If a plant manager has a potential project to be presented to the capital facilities planning committee of the company, that depreciation change will be included in the calculation of the projected rate of return. It will influence the total amount of the capital expenditure even if the chief executive officer thinks it

has zero effect. He just doesn't know, and the reason he doesn't know is that it seldom surfaces at the executive committee level or at the board level. That's not the way depreciation changes and replacement demand get generated within a corporation. To be sure, company executives and the boards of directors do vote on the overall capital appropriations, but they do not and cannot know what is in the detail in any meaningful respect. As I see it, the outlook for capital goods spending is probably okay. The depression among business executives is so great that capital spending presumably can only go higher from what is currently a relatively elevated level "gloom-adjusted," if I may put it that way.

Personal consumption expenditures were weak in May. Obviously, the data we have through June are mixed, but the month as a whole still looks to be reasonably positive. Chain store sales, of course, have been quite impressive. The only problem I have with such sales information is that, even though we have the reports on a weekly basis, their actual usefulness in forecasting total personal consumption expenditures is dubious. We clearly are getting some increase, as Mike Moskow mentioned, in motor vehicle sales in June. The Redbook chain store estimates and forecasts are less grim than those of the Bank of Tokyo-Mitsubishi, but neither one of them is as useful as the motor vehicles data. The latter include all car sales and are almost exactly what shows up in the PCE and the PDE for these key sectors. These motor vehicle statistics are therefore of crucial importance in gauging overall consumer spending. To be sure, the growth of consumer spending will be a good deal weaker in the second quarter than it was in the first quarter.

I believe that equity extractions from homes will continue to be a source of positive growth in personal consumption expenditures. If we disaggregate the model that we use, we find that little more than 80 percent of personal consumption expenditures is financed out of income

in the short run. The implication is that a big chunk, nearly 20 percent of outlays, is driven by the stock of overall wealth, of which housing is a very important part. In this regard, I think we are all aware of the fact that, despite the weakness in the economy, homebuilding has been remarkably well maintained. A clear reason for that in my view is immigration, which currently accounts for a third of U.S. population growth and a third of the rise in household formations. The demand for housing is pressing up against land shortages and the like, and we are getting fairly dramatic increases in a lot of areas in the market value of homes and hence in the total housing equity, from which there has been a consistent degree of extractions. One source of the extractions is the very high level of existing home sales. The sellers pay off significantly less mortgage debt than the buyers take on, and the net change in those two mortgage numbers equals the extraction of equity from the sale of existing homes. The funds made available from home sales plus the funds obtained from the very large increase in home equity lending, which stems from “unrealized gains” that are not the consequence of a sale of a home, are being employed to a significant extent for consumer expenditures. Of course, a further source of such funds comes from cash-outs from home refinancings, which as I recall are an increasing proportion of the aggregate amounts being refinanced. The impact of the very substantial extraction of home equity funds is to lower the level of measured personal savings. But that is not the true measure of the saving rate because we are dealing with a structural difference in personal consumption expenditures as a consequence of a secular rise in home equity values. I don’t know where I saw the recent chart showing changes in the real value of homes over the past couple of decades—was that in your presentation?

MR. OLINER. We had a panel on that.

CHAIRMAN GREENSPAN. It's fairly evident that there is a secular increase in the value of homes relative to the value of other assets. The consequence is that the extraction of funds from home equity values is a much more important source of consumption expenditures than earlier. Previously, consumers were not able to extract cash easily out of the rising value of their homes, but they can now, and that source of funds has been a strong sustaining force for spending through the recession. Unless immigration slows down as a consequence of September 11, it's hard to imagine that anything really major is going to change in this regard. And unless we get a significant decline in home prices, and that's a very questionable prospect at this stage, it's hard to imagine that there will not be very considerable ongoing support for consumption expenditures coming out of the housing equity markets.

A real concern lurking in the background, which we have great difficulty evaluating, is the potential implication of changes in the foreign exchange rate. I know that everyone has a firm belief regarding exactly which way the dollar is going to go. All I can tell you is that the history of exchange rate forecasts indicates a greater degree of confidence in forecasting such rates than there has been success. [Laughter] Exchange rate traders will tell you that they make money only in marketmaking—in their bid-asked spreads. I remember that month after month when I was on the J.P. Morgan board I would see a line in their report indicating foreign exchange capital gains. And I kept asking myself how in the world they managed to do that. I knew how difficult it was. Finally, they all “fessed up.” They admitted that they forecasted badly. They hadn't a clue. But they were marketmakers, and their spreads were very effective in producing what was in essence service income for facilitating foreign exchange transactions. In fact, the vast majority of commercial transactions involve a loss largely because of transaction costs. Stock prices tend to trend higher over time because of inflation plus the capital gains that

result from the accumulation of undistributed profits; but that trend does not exist for the exchange rate, which is trendless by definition.

The general view that everybody knows exactly where the exchange rate is going, I think, is an illusion. I don't deny, as Ned Gramlich says, that the dollar is very severely out of sync with the international trade accounts. But it's the portfolio accounts that are crucial, and the issue here is whether we really know that the dollar is out of sync. I don't think so. Are we going to forecast that it is going to depreciate? Yes. Why are we going to do that? Because the current account deficit is very large and the recent trend has been a depreciation! And I can tell you that you will get very strong agreement on that outlook. If one goes back historically and reviews exchange rate forecasts, one will find that the forecasting of exchange rates is as close to a random process as forecasting any economic variable that I know. So I'm not of the school here that is bemoaning what may happen to the dollar because I really know that I don't know. It's very hard for me to hold that conviction, but I'm working on it! [Laughter]

I do think that the problems in Latin America, which Bill McDonough mentioned, are a sleeper here. It's not only Argentina and Brazil that are in serious shape; clearly Venezuela is as well. Their difficulties all involve political problems. They have nothing to do with economics. I would add Colombia for the same reason. These are big countries in South America. Now the question is whether there will be contagion. I'm not sure. In fact, I don't know what contagion basically means in this particular situation. Does political contagion spread? It may, but I'm not sure in which direction. For example, I don't know what will happen if people see that Brazil is brought to its knees because of a populist campaign. Fortunately, I gather—especially after listening to Bob McTeer—that Mexico seems to be doing well. If that is indeed the case, that is good. But Mexico is still a third world country. It may belong to the OECD or whatever, but

they still have political problems. The latter are not as severe as they used to be, and their severity appears to be diminishing. Hopefully, their economy won't get pulled down by developments in the rest of Latin America. But I gather, Bob, that there are no signs of that at this stage. Is that right?

MR. MCTEER. Right.

CHAIRMAN GREENSPAN. In sum, there are serious problems out there. We don't know how to evaluate them. We're still waiting for the next terrorist attack, which at some point is inevitable. We have no idea where it will come or what the consequences will be, but that something will happen somehow has to be factored into our forecasts. It's an operational risk, as we like to say in banking. But we don't have a clue what it is. It has to be having some effect on the economy, and indeed I'm sure it does. In any event, I think we're going through a very extraordinary period. Precedents help, but not a great deal. I think we are fortunately positioned so far as monetary policy is concerned at the moment. I don't envisage a need for us to make a significant move either way for the period immediately ahead. And since we can call an FOMC meeting with twenty minutes of lead time, we really don't have to commit very far in advance to doing things.

On the issue of trying to alert the financial markets that we may be firming, I don't think that's necessary, if for no other reason than that they'll be well ahead of us in that regard. If we begin to get the type of data that would incline us to move, it's already going to be reflected in the federal funds futures markets. That's the way these markets work. They are very sophisticated. There have been exceptions. Obviously back in January we tried to persuade the markets, which had us moving up the funds rate very rapidly, to take another look. That was a rare event. I don't think that's going to be happening this time. If anything, we may again find

that the very low level of the nominal funds rate is going to trigger another increase in the forward markets as soon as the economy turns around. I don't think there's going to be very much of a job for us in any effort to convince them that we're going to move. And indeed we will move because clearly the pall that's still hanging over the economy from the stock market decline will dissipate at some point. At this point it is not over. At least it doesn't quite look like it's over, although the economy displays many of the characteristics of a climax bottom. The trouble is there are more climax bottoms than there are bottoms!

So it's a very unusual outlook. I guess one can say that they all are, but I would say we are fortunate in that we are positioned, plus and minus, for it. Certainly at this meeting I think we can afford to stay where we've been. And I would say the risks are balanced, and I would recommend that we stay there. I do not deny that events can change quite quickly. That includes a likelihood that the economy may weaken further, but there's also a likelihood that we may be surprised by a lot faster recovery than we are forecasting. I think we have to be prepared for either case. My own impression is that it will take a lot to make us move the funds rate still lower. It won't take a huge amount to make us move in the other direction. Vice Chair.

VICE CHAIRMAN MCDONOUGH. Thank you, Mr. Chairman. I concur with your recommendation fully.

CHAIRMAN GREENSPAN. Governor Ferguson.

MR. FERGUSON. I also concur with your recommendation.

CHAIRMAN GREENSPAN. President Poole.

MR. POOLE. I support the recommendation.

CHAIRMAN GREENSPAN. President Moskow.

MR. MOSKOW. I support the recommendation, Mr. Chairman.

CHAIRMAN GREENSPAN. President Stern.

MR. STERN. I also support the recommendation.

CHAIRMAN GREENSPAN. President Parry.

MR. PARRY. I support it as well.

MR. MCTEER. I do, too.

CHAIRMAN GREENSPAN. Governor Bies.

MS. BIES. I support it.

CHAIRMAN GREENSPAN. I don't want to inhibit anybody from talking. We have plenty of time. President Minehan.

MS. MINEHAN. I support the recommendation as well. I must say I was drawn to the way Roger Ferguson described the situation—as an “uncomfortable balance of risks.” I feel very much that way also.

CHAIRMAN GREENSPAN. I think that's an accurate way to characterize it, clearly. President Broaddus.

MR. BROADDUS. I support your recommendation.

CHAIRMAN GREENSPAN. President Santomero.

MR. SANTOMERO. I support the recommendation.

CHAIRMAN GREENSPAN. President Hoenig.

MR. HOENIG. I support your recommendation. I do want to make one comment. I agree with you that we have a lot of credibility in the market. But I think a good part of that credibility has been achieved because we have been open with the market. And what you're saying today is that we would have a balanced risk statement but we're not quite sure the risks are as balanced as the statement is going to say.

CHAIRMAN GREENSPAN. Well, I think they are balanced at a 1¾ percent federal funds rate.

MR. HOENIG. My concern is, given where we are, that we're sending the message that the economy is going to grow and yet we're holding the funds rate down at a very low level. I think that deserves some explanation. That's my point going forward.

CHAIRMAN GREENSPAN. I would just say that I think globalization has altered the situation to an extent. It does not eliminate the fact that we will have to move. If protectionism really starts to become a problem here, it could turn the globalization issue to our disadvantage. My point is that we don't have to be anxiously moving ahead of the curve because I think the markets will be right along with us—at least they have been to a great extent. First Vice President Barron.

MR. BARRON. I support the recommendation.

CHAIRMAN GREENSPAN. President Jordan.

MR. JORDAN. I support the recommendation. I don't have any trouble saying that the risks are balanced, but I won't say that the uncertainties are balanced because that would be an oxymoron. And in my view we do have to think about that.

CHAIRMAN GREENSPAN. Good point. Governor Gramlich.

MR. GRAMLICH. I support the recommendation. I'd like to clarify one point. I was not bucking for a job on the Fed's foreign exchange trading desk. Perhaps I was speaking as a converted sinner, at least in the Jimmy Carter sense. [Laughter] I actually went through a phase over the intermeeting period where I was questioning our conventional notion of what is equilibrium in the international accounts, and Karen and others have persuaded me that their notion is correct. By that standard the dollar is, as I said, miles away from equilibrium. When

any price is that far from equilibrium, I would have to say that there is more risk to the situation than would otherwise be the case.

CHAIRMAN GREENSPAN. I would agree with that. We've heard from everybody?

MR. BERNARD. Yes.

CHAIRMAN GREENSPAN. Okay, would you read the directive?

MR. BERNARD. The directive wording is on page 15 of the Bluebook: "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 maintaining the federal funds rate at an average of around 1¾ percent." For the press statement: "Against the background of its long-run goals of price stability and sustainable economic growth and of the information currently available, the Committee believes that the risks continue to be balanced with respect to prospects for both goals in the foreseeable future."

CHAIRMAN GREENSPAN. Call the roll.

MR. BERNARD.

Chairman Greenspan	Yes
Vice Chairman McDonough	Yes
Governor Bies	Yes
Governor Ferguson	Yes
Governor Gramlich	Yes
President Jordan	Yes
President McTeer	Yes
Governor Olson	Yes
President Santomero	Yes
President Stern	Yes

CHAIRMAN GREENSPAN. I'd like to confirm that the date of the next meeting is August 13. And unless there is further business, we are adjourned.

SEVERAL. The statement?

CHAIRMAN GREENSPAN. What's wrong with me!

MR. PARRY. Aha! Trying to pull a fast one! [Laughter]

VICE CHAIRMAN MCDONOUGH. While the statement is being distributed, I will make this correction regarding my observation on Lefty Grove's lifetime ERA. I was right on his record in his best season. His lifetime ERA was 3.06. He won 300 games while losing 141.

CHAIRMAN GREENSPAN. That's not bad. Did you see him pitch?

VICE CHAIRMAN MCDONOUGH. No.

CHAIRMAN GREENSPAN. I did! [Laughter]

VICE CHAIRMAN MCDONOUGH. That's the advantage of the eight years you have on me.

CHAIRMAN GREENSPAN. I will grant you I was rather young at the time. Let me say on the statement that we tried to make minimal changes on the grounds that the less we say that is new, the better off we will be.

MR. FERGUSON. It looks good.

VICE CHAIRMAN MCDONOUGH. Silence means consent.

MR. FERGUSON. I agree.

CHAIRMAN GREENSPAN. Does anyone have any concerns at all on this? If not, then we will publish it as is. Now we can go to lunch.

END OF MEETING