Meeting of the Federal Open Market Committee on April 28–29, 2020

A joint meeting of the Federal Open Market Committee and the Board of Governors was held by conference call on Tuesday, April 28, 2020, at 1:00 p.m. and continued on Wednesday, April 29, 2020, at 9:00 a.m.

PRESENT:
Jerome H. Powell, Chair
John C. Williams, Vice Chair
Michelle W. Bowman
Lael Brainard
Richard H. Clarida
Patrick Harker
Robert S. Kaplan
Neel Kashkari
Loretta J. Mester
Randal K. Quarles

Thomas I. Barkin, Raphael W. Bostic, Mary C. Daly, Charles L. Evans, and Michael Strine, Alternate Members of the Federal Open Market Committee

James Bullard, Esther L. George, and Eric Rosengren, Presidents of the Federal Reserve Banks of St. Louis, Kansas City, and Boston, respectively

James A. Clouse, Secretary
Matthew M. Luecke, Deputy Secretary
Michelle A. Smith, Assistant Secretary
Mark E. Van Der Weide, General Counsel
Michael Held, Deputy General Counsel
Thomas Laubach, Economist
Stacey Tevlin, Economist
Beth Anne Wilson, Economist

Shaghil Ahmed, Michael Dotsey, Joseph W. Gruber, David E. Lebow, Trevor A. Reeve, Ellis W. Tallman, William Wascher, and Mark L.J. Wright, Associate Economists

Lorie K. Logan, Manager, System Open Market Account

Ann E. Misback, Secretary, Office of the Secretary, Board of Governors

Matthew J. Eichner,[1] Director, Division of Reserve Bank Operations and Payment Systems, Board of Governors; Michael S. Gibson, Director, Division of Supervision and Regulation, Board of Governors; Andreas Lehnert, Director, Division of Financial Stability, Board of Governors

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[1] Attended Tuesday's session only.

Daniel M. Covitz,[1] Deputy Director, Division of Research and Statistics, Board of Governors; Rochelle M. Edge, Deputy Director, Division of Monetary Affairs, Board of Governors; Michael T. Kiley, Deputy Director, Division of Financial Stability, Board of Governors

Jon Faust, Senior Special Adviser to the Chair, Office of Board Members, Board of Governors

Joshua Gallin, Special Adviser to the Chair, Office of Board Members, Board of Governors

Antulio N. Bomfim, Wendy E. Dunn, Ellen E. Meade, Chiara Scotti, and Ivan Vidangos, Special Advisers to the Board, Office of Board Members, Board of Governors

Linda Robertson, Assistant to the Board, Office of Board Members, Board of Governors

Brian M. Doyle, Senior Associate Director, Division of International Finance, Board of Governors; John J. Stevens, Senior Associate Director, Division of Research and Statistics, Board of Governors

Edward Nelson, Senior Adviser, Division of Monetary Affairs, Board of Governors

Marnie Gillis DeBoer and Min Wei, Associate Directors, Division of Monetary Affairs, Board of Governors; Glenn Follette, Associate Director, Division of Research and Statistics, Board of Governors

Eric C. Engstrom, Deputy Associate Director, Division of Monetary Affairs, Board of Governors; Patrick E. McCabe and John M. Roberts, Deputy Associate Directors, Division of Research and Statistics, Board of Governors; Andrea Raffo, Deputy Associate Director, Division of International Finance, Board of Governors; Jeffrey D. Walker,[1] Deputy Associate Director, Division of Reserve Bank Operations and Payment Systems, Board of Governors

Brian J. Bonis and Rebecca Zarutskie, Assistant Directors, Division of Monetary Affairs, Board of Governors; Ricardo Correa, Assistant Director, Division of International Finance, Board of Governors

Penelope A. Beattie,[1] Section Chief, Office of the Secretary, Board of Governors

David H. Small, Project Manager, Division of Monetary Affairs, Board of Governors

Michele Cavallo, Edward Herbst, and Ander Perez-Orive, Principal Economists, Division of Monetary Affairs, Board of Governors

Randall A. Williams, Senior Information Manager, Division of Monetary Affairs, Board of Governors

Ron Feldman, First Vice President, Federal Reserve Bank of Minneapolis

David Altig, Kartik B. Athreya, Sylvain Leduc, Daleep Singh, and Christopher J. Waller, Executive Vice Presidents, Federal Reserve Banks of Atlanta, Richmond, San Francisco, New York, and St. Louis, respectively

Spencer Krane, Senior Vice President, Federal Reserve Bank of Chicago

Scott Frame, Anna Kovner, Giovanni Olivei, and Patricia Zobel, Vice Presidents, Federal Reserve Banks of Dallas, New York, Boston, and New York, respectively

A. Lee Smith, Research and Policy Advisor, Federal Reserve Bank of Kansas City

Transcript of the Federal Open Market Committee Meeting on April 28–29, 2020

April 28 Session

CHAIR POWELL. Good afternoon, and good morning to those of you who are still in the morning. This meeting, as usual, will be a joint meeting of the FOMC and the Board, and I need a motion from an unmuted Board member to close the meeting. Governor Clarida?

MR. CLARIDA. So moved.

CHAIR POWELL. There we go. Without objection. By the way, if it's hard to hear me, please let me know. Before we dive into our formal agenda, I'd like to thank everyone for your extraordinary efforts over the past month or so. These are challenging and unprecedented times, and our actions are making a difference. With your continued support and contributions, I'm confident we can weather this crisis and help put the economy and the lives of millions of Americans on the road to economic recovery.

As you know, the logistics for this meeting are more challenging than usual, so I'm going to urge those of you who are not "power muted"—which is to say, FOMC participants and senior staff who are presenting—please keep your phones on mute at all times unless you are speaking. When you are speaking, please do remember to unmute yourself and speak directly into the phone in order to avoid feedback.

We also have a parallel Skype session that participants and others can use to indicate when you have a question. Please don't use the Skype session to start running side debates or commentary because they will then become part of the meeting, and that would be awkward. Following each staff briefing, if you'd like to ask a question or a two-hander, please indicate that in the Skype session, which I will be monitoring. If you're having difficulty with Skype, I will also call for further questions at the end of each Q&A session. A link to a single file containing all the presentation materials was distributed earlier today. You can open the file at that link and follow along during the briefings.

On the topic of the staff briefings, I'd like to note that our international developments briefer today, Joe Gruber, will be transitioning next week from his post as deputy director of the Board's IF Division and adviser to Governor Quarles to his new role of director of research at the Kansas City Fed. Joe, the Board will miss your deep experience and your keen insight, but I trust that Esther and the Kansas City Fed will take full advantage of your abilities. We wish you well in your transition and offer you "remote" thanks and best wishes.

Before we get started, I also wanted briefly to mention the review of our monetary policy strategy tools and communications. Earlier this year, not so long ago, I was very pleased with the progress we'd made, and we seemed to be very much on track to reach and announce our conclusions around midyear, as we had guided the public to expect. We put the review aside in March, of course—and appropriately so, as we focused on the extraordinary and continuing response to the coronavirus. We will absolutely return to the review and will announce our conclusions when it becomes appropriate to do so—in all likelihood, later this year. I don't want to be any more specific than that today in terms of timing.

Even before we've reached and communicated our final conclusions, I do feel that this has been a highly useful exercise for our institution. The great staff work and the discussions we've had around the Board table have moved us forward to a better understanding of the lessons of the post-crisis era and to the inclusion of those into our policy framework, ultimately. And, of course, the *Fed Listens* events around the country brought new voices more systematically into our policy process, enlightened our discussions, and sent a strong message of our openness to the view of the people we serve—all of them.

Let's move to our agenda. First up is the Desk briefing, which will include a discussion of the annual swap line renewal. Lorie, would you like to begin, please?

MS. LOGAN.[1] Thank you, Mr. Chair. I'll be referring to the handout "Financial Developments and Open Market Operations," and will begin on slide 2 of the materials.

Today, I'll discuss the notable recovery in market conditions since your March meeting through the lens of two questions: What risks remain in focus, and how has the ongoing uncertainty shaped monetary policy expectations? I'll then turn to market functioning and short-term funding markets, including the Desk's approach to open market operations, before concluding with the effect of recent measures on the balance sheet.

The panels on slide 4 depict the partial rebound in asset prices in recent weeks. As shown in panel 1, the S&P 500 index has increased 23 percent from its low point on March 23 but remains about 12 percent lower year-to-date. In panel 2, the Bloomberg dollar index, which had increased sharply because of safe-haven demand and dollar funding pressures, has receded from its highs. Measures of realized and implied volatility across markets—shown in panel 3—have also retreated. In contrast, the 10-year Treasury yield has continued to move down, as shown at the top of panel 4, and remains near its all-time low.

Slide 5 outlines the main factors that have supported the rebound. First was the swift and forceful actions taken by the Federal Reserve, some in coordination with other authorities. Second was a series of significant fiscal policy measures. And third was slowing in the spread of the virus in major economies even as the economic costs of efforts to contain it continued to mount.

Nevertheless, as shown on slide 6, market participants report enormous uncertainty about the outlook and attach material probability to severe downside risks. Panel 5 shows the average probability distribution for 2020 real GDP growth taken from the Desk surveys. After averaging across respondents, you can see that the highest probability is placed on growth this year coming in between minus 4 and minus 6 percent. But the distribution is wide, and the perceived risks are skewed to the downside. Market participants generally associate the most severe outcomes with a premature easing of social restrictions, slow progress in the development of vaccines, or deeper and more lasting changes in the behavior of households and businesses.

Contacts also highlight an array of other risks. Andreas and Joe will talk about some of these in their briefings, but I'll discuss the three areas that our contacts have focused on, outlined in panel 6.

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[1] The materials used by Ms. Logan are appended to this transcript (appendix 1).

One is corporate credit, where, even before the virus, there were material concerns related to a weakening in underwriting standards and increased leverage. These concerns have only been amplified by the challenges that lie ahead. Ratings agencies have downgraded or put on watch a large number of issuers. In some instances, downgrades could trigger sales by certain funds and investors, leading to wider spreads in the secondary market and higher costs and reduced access to credit in the primary market.

A second risk relates to emerging market, or EM, countries. Many EM countries have weak and overburdened public health systems, fragile government finances, and tenuous access to capital markets. The falloff in trade and sharp decline in commodity prices will also weigh on some. EMs faced record portfolio outflows in March, as shown in panel 7. Though outflows have eased and the new issue market has reopened in size for those with better credit, a number of EM countries could still come under severe strain.

A third set of risks relates to the mortgage sector, in which we're seeing strains across the spectrum. In residential real estate, mortgage originators have had to wrestle with uncertainty about their mortgage pipelines and swings in prices of mortgage securities that have led to margin calls, while servicers need liquidity to cover payments for homeowners in forbearance. GSEs may ultimately need to issue debt on a large scale if they have to buy out mortgages that do not return to making regular payments. In commercial real estate, though agency CMBS spreads have tightened along with the Desk's purchases, the market for non-agency CMBS remains strained amid signs of sharply falling rent receipts in some industries. Contacts express concern that, if CRE asset values decline, this could be a challenge to banks that have invested heavily in CRE loans and curtail the flow of credit.

Now, it's not difficult to imagine a return to volatility and market dysfunction if any of these or other significant risks were to materialize. The process of deleveraging, asset sales, and overall reduction in risk continues, although in much smaller and more orderly ways. Many of our most experienced contacts think markets are not adequately pricing the existing risks and believe that a renewed tightening in conditions is likely as the economic damage becomes clearer.

So what are expectations about Committee policy in this unsettled environment? Regarding slide 7, market participants generally expect the target range for the federal fund rate to remain at the lower bound for the next couple of years. We see this in market pricing, in panel 8, which shows that the implied federal funds rate path expected over the longer term has dropped even farther since your past meeting. Probabilistic expectations and the range of modal forecasts in the Desk surveys, which are shown in panels 9 and 10, tell a similar story. What I find interesting is that even as our survey respondents see dire downside risks, they attached almost no probability to the FOMC implementing negative policy rates, as seen in panel 9. Some survey respondents indicated that they expect modifications to the Committee's forward guidance, but not at this meeting. And I'll come back to expectations regarding asset purchases in just a moment.

With that, let me turn to market functioning on slide 9. When I briefed the Committee in mid-March, functioning in the markets for Treasury and agency mortgage backed securities had deteriorated to a historically poor point, as investors fled to cash and the most cash-like investments. At your direction, the Desk began buying Treasury securities, agency MBS, and eventually, for the first time, agency CMBS, to support smooth market functioning. The memo that we distributed on open market operations covered the details of our purchase decisions.

Today, I want to highlight a few key points of that memo. First, market functioning has improved notably, underpinned by the Committee's commitment to supporting smooth functioning. As a result, we slowed purchases from a very rapid initial pace. Second, some measures are not back to their pre-March levels. And, third, should current trends continue, we expect a further modest reduction in the pace of purchases, although we think some will be needed through the June meeting. Slide 10 outlines the four broad categories of indicators that underlie the approach we've taken to assessing market functioning. Taken together, we think these provide a broad assessment of whether markets are functioning smoothly.

What are we seeing across these four broad categories? Slide 11 illustrates the notable improvement in these indicators, and some, but not all, have returned to levels that prevailed before March. As shown in panels 11 and 12, measures of market liquidity, such as bid-ask spreads, improved but remain stretched in some sectors. Other indicators have normalized, such as the Treasury cash-futures basis, shown in panel 13. This measures the relative value between Treasury futures and cash securities. And panel 14 shows that offer-to-cover ratios in our operations have been relatively stable even as we've cut back the purchase amounts.

One point I want to highlight is that some aspects of market functioning may not return to pre-March levels for some time. Adjustments to risk-taking in this uncertain environment, along with remote working arrangements for market participants, can hamper market functioning. It can be difficult to identify what the "new normal" value is for a given indicator, so we'll continue to take in this broad range of information to guide the purchase plans in the period ahead.

With respect to slide 12, as market functioning has improved, the Desk has reduced the pace of purchases, as shown in panels 15 and 16. We're now purchasing less than one-fifth of the peak daily amounts. If current trends continue, we anticipate gradually reducing purchases of Treasury securities further, to an average of $5 billion per day, or a little over $100 billion per month. On the MBS side, if mortgage prepayments come in consistent with our current forecasts, we also anticipate gradually lowering purchases to an average of around $5 billion per day, of which around $2 billion per day will likely represent reinvestments. We expect to continue gradually reducing CMBS purchases as well. However, if market functioning worsens, we may need to increase the pace again. For perspective, market participants' expectations for the near-term monthly pace are diffuse, as shown in panels 17 and 18, possibly reflecting the potential for a range of outcomes.

Many expect purchases to slow after the June meeting but continue at least through the end of the year. Whether the Committee will shift to a broader monetary policy objective for these purchases has been a frequent talking point made by our contacts, though we assess that few expect a shift at this meeting. The median expectation is that the combined monthly pace of purchases of Treasury securities and MBS, net of the MBS reinvestments, will be just under $100 billion at the end of the year, a bit larger than the monthly pace during the Committee's third round of large-scale asset purchases to address the financial crisis.

Regarding money markets, on slide 14, funding markets were also functioning poorly when I briefed you in March. Since then, conditions have improved substantially, though I'll highlight some sectors in which we still see some challenges. Term repo markets demonstrated the first signs of stress in early March as lenders sharply reduced the tenor of their lending. As reflected in panel 19, the Desk took successive actions to expand the size and tenor of repo operations. These actions eased strains in repo markets, and the availability of term financing has since improved. In broader dollar funding markets, rates on commercial paper and foreign exchange swap spreads, shown in panel 20, rose sharply in mid-March and have since retraced some. Spreads of overnight rates to the IOER rate also increased notably, as borrowers sought to obtain funding early in the day and the lenders—uncertain about their outflows—reserved their cash until later. In this environment, we saw the effective federal funds rate "print" at the top of the target range for several days, as shown by the red line in panel 21.

Over this period, foreign banking organizations and large regional banks were notable borrowers in unsecured markets at rates well above the top of the target range, as shown in panel 22. The enhancement and expansion of both discount window lending and U.S. dollar swaps with foreign central banks eventually contributed to a substantial easing in these strains. Discount window loans outstanding rose to around $50 billion, the highest level since the financial crisis, and FX swap line usage increased rapidly to about $400 billion in late March.

In addition to the swap lines, the temporary repo facility for foreign and international monetary authorities announced on March 31 has helped ease concerns about dollar funding. To date, the foreign currency subcommittee has approved 13 central banks to use the facility. One account holder, the Hong Kong Monetary Authority, has announced temporary operations to make U.S. dollars available to local banks using funds accessed through the facility. We mention this because it could be a template for others.

For slide 15, despite the success of Federal Reserve actions at easing strains, rates in some term funding market rates remain elevated. Panel 23 shows that while rates for the highest-rated issuers of commercial paper have fallen, rates for lower-rated issuers remain stretched even as issuance has gradually returned. The Money Market Mutual Fund Liquidity Facility and Commercial Paper Funding Facility have helped to stem outflows from prime money funds and provided a backstop to issuers of commercial paper, although some market participants suggest that lowering the cost of accessing these facilities might help lower financing rates further. Relatedly, many of our contacts highlight that three-month LIBOR—still an important reference rate for consumer and business borrowing and a barometer for risk sentiment—remains elevated. Nevertheless, as seen in panel 24, three-month LIBOR has been trending lower, and the forward measure suggests further improvements in coming months.

In terms of interest rate control, our focus for open market operations has now shifted as rates are back at the lower bound. This is highlighted on slide 16. In later March, after the FOMC lowered the target range and reserve levels climbed, overnight rates moved to near-zero levels, as shown in panel 25. In this environment, the Federal Reserve's administered rates proved effective at maintaining rates above zero. Even as near-dated bill yields turned negative in late March, take-up at the Federal Reserve's overnight RRP operations—as shown in light blue on the bottom half of panel 26—increased and overnight rates remained positive. The effective federal funds rate stabilized near 5 basis points, and overnight repo rates have hovered just above zero. With lower money market rates, take-up in Federal Reserve's overnight repo operations has approached zero, as shown in dark blue on panel 26. In response, we've pared back the offerings.

As we look ahead, we expect further significant increases in reserve balances, which could put additional downward pressure on overnight rates. However, on the other side, the decrease in reserves that could result from historically large Treasury bill issuance could be a countervailing force, making it difficult to predict where overnight rates will settle. In this regard, panel 27 outlines potential adjustments to our tools that may be warranted in the weeks ahead.

First, we expect to increase the minimum bid rate in repo operations to position these operations as more of a backstop. With higher reserve levels, maintaining ample reserves is no longer the primary purpose of repo operations. The draft Directive we circulated to you in advance of the meeting instead motivates the use of repo operations to support effective policy implementation and smooth functioning of dollar funding markets. Adjusting the pricing of these operations by increasing the minimum bid rate would be consistent with this transition.

Second, some flexibility to temporarily raise the per-counterparty limit for the overnight RRP facility could provide greater assurance of control over the federal funds rate at the lower end of the target range. With government money fund assets increasing by roughly $1 trillion since February, the overnight RRP facility's per-counterparty limit of $30 billion could become binding in some circumstances: this might limit its ability to maintain a firm floor. With this in mind, the draft directive that we circulated provides the Chair flexibility to raise temporarily the per-counterparty limit for this facility.

Relatedly, expectations for a technical adjustment to raise the IOER rate have grown. Most calling for a change recognize that control of the federal funds rate is not a significant concern at the bottom of the range. Institutions that lend federal funds have accounts with us, and they're unlikely to lend at a rate below what they would earn on that Federal Reserve account. However, many see the Committee as preferring to maintain the effective federal funds rate well within the target range and note that rates near zero could eventually cause market functioning concerns. These developments bear watching, but we don't see an immediate concern that would motivate a technical adjustment at this meeting.

To wrap up, slide 18 turns to the balance sheet. Panel 28, which shows the size of the balance sheet stretching back to 2007, puts the extraordinary actions taken during this period in perspective. The increase has been remarkable, much larger and more rapid than anything seen during or after the financial crisis. The balance sheet now stands at $6.4 trillion, or 24 percent of GDP. The dotted line at the end of the series indicates the expectations given in the Desk surveys regarding growth in the balance sheet. Thomas will discuss these expectations in his briefing.

Panels 29 and 30 break down the realized growth since the start of March. On the assets side, you can see that most of the growth has been from the Treasury security and agency MBS purchases, along with the dollar liquidity swaps. With respect to these swap arrangements, as discussed in the memo sent to the Committee in advance of the meeting, Beth Anne and I request that the Committee vote to maintain the System's U.S. dollar and foreign currency liquidity swap arrangements as well as the currency swap arrangements established under the North American Framework Agreement, or NAFA, with the central banks of Canada and Mexico. All of our central bank counterparts support the continuation of these arrangements.

On the liabilities side of the balance sheet, most of the increase has been in reserves. In addition, the Treasury General Account has reached a record high ahead of expected outlays for the CARES Act.

Finally, behind this substantial growth in the balance sheet, the Federal Reserve conducted an extraordinary number of open market operations—around 500—over the intermeeting period, with the full end-to-end trading process and support functions being conducted almost entirely remotely.

I just want to take the opportunity to thank the staff throughout the System for their ingenuity and unwavering commitment to make this happen so smoothly.

Thank you, Mr. Chair, that concludes my prepared remarks. Patricia and I would be happy to take questions.

CHAIR POWELL. Thank you, Lorie. Any questions for Lorie and Patricia? Please indicate, in the first instance, if you have a question on Skype.

Beginning with President Kashkari.

MR. KASHKARI. Thank you, Mr. Chair. Thank you, Lorie. Lorie, just a quick question. When you think about the Treasury securities market and the bid-ask spread as a sign of market functioning, I have two questions. One is on the Treasury securities market. In view of the unprecedented economic uncertainty that you described as indicated by your survey of dealers, I would've guessed that bid-ask spreads would be wide, just based on that uncertainty. So could you just share with me, why wide bid-ask spreads are a sign of market dysfunction rather than just a reflection of the uncertainty? And then I have a second question.

MS. LOGAN. The size of the positions and holdings that needed to adjust—taking into account the repricing of risk, and just the overall amount of liquidity that needed to be raised to rebalance portfolios—was large. And at the same time, we found that the intermediation process to facilitate the process was clogged and not that large. And I think the wide bid-ask spreads represent the cost of that intermediation process.

I think you're right, in the sense that, as volatility goes up, we normally see those bid-ask spreads widen as markets price for that risk. When we analyzed the widened bid-ask spreads, they were even wider than would normally be implied by the level of volatility we were seeing. And I think that just reflects the size of the sales that we were really seeing taking place in the market, particularly in the off-the-run sector of the curve.

Interpreting any one of these measures is challenging right now, though. That's why we're really focused on this whole broad set of metrics, just because any one of them could be a bit misleading in the current environment. And, as you said, we've also seen a number of firms change their overall trading strategies during this time.

MR. KASHKARI. Okay, thank you. And then my second question was, could you give any comments on stigma and the discount window? We took very aggressive measures, which I thought were appropriate, to try to reduce stigma and encourage firms. I know some firms have come in. Do you have any evidence of how we've done? Is there still stigma? Is there more to do? Thank you.

MS. LOGAN. Thank you. I think we saw a lot of progress on the stigma issue. During the most intense period, there was a notable increase in borrowing from the window even outside the institutions that had suggested they did so for demonstration effects. However, at the same time, we also saw a fair amount of trading taking place at rates still well above the primary credit rate, suggesting that, for some at least, there are still concerns about using the discount window. I think a lot of those trades were made by FBOs. When the swap lines were enhanced, we saw a big shift down in trades above the primary credit rate. So I think the swap lines played a really important role there.

But, even today, we're still seeing some very small volumes borrowed by banks in unsecured markets above the primary credit rate. It's unclear whether they're doing it to deal with customer flows, but I think it is a trend worth noting. And I also note that we're still seeing the pretty high LIBOR spreads that I talked about. So I think bank funding stresses, or banks still willing to borrow at high rates, suggests that there still may be some stigma there. And I think if bank funding stresses really appear again, it's really hard to know whether those banks that came and borrowed for demonstration purposes would really use the discount window in that environment. Even though we've seen some positive signs, if funding pressures did reemerge, I think we really still have to be cautious and look at the full range of our tools, if you're still concerned about the stigma that remains.

MR. KASHKARI. Thank you, Lorie. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Daly, please.

MS. DALY. Thank you, Mr. Chair, and thank you, Lorie, for the presentation. If I heard you correctly, you said that, right now, market participants are not expecting us to give any further information about our balance sheet or our asset purchases. But as the market functioning improves so dramatically, do you have a sense of when they might expect us to communicate plans for a move from—I mean, in my parlance, I think of it as plumbing versus policy?

MS. LOGAN. I think there's just a tremendous amount of uncertainty, and I think market participants recognize that too, particularly with the market-functioning objective that we have in place for the purchases today. So I don't think that markets are expecting anything at this meeting. I think their general view is that it's too soon to know either whether the Committee has achieved the market-functioning objective or whether the economic environment is such that the Committee may want to consider the asset purchases for other purposes.

I do think, as more information is known, markets will be looking for information both about potentially enhanced forward guidance or on the asset purchases. And I think this will come into focus more quickly in the case of the asset purchases, because if the market-functioning indicators do continue to improve, as we have been seeing, and the asset purchases undertaken to achieve this improvement slow, then I think you're going to get closer and closer to that time when the markets are going to look for the Committee to "pivot"—and talk about what the purchases will be used for over time.

The survey results that we received confirmed what we learned and were hearing from market participants, which is that they do expect purchases to continue for some time. And I don't think that's for market-functioning purposes. I think the survey reflects expectations for asset purchases to transition to some other form, such as large-scale asset purchases, or yield curve control, or some combination of the two.

MS. DALY. Thank you, Lorie, and thank you, Mr. Chair.

CHAIR POWELL. Thank you. Are there any other questions for Lorie or Patricia that are not on the Skype session? If so, just say your names, if you'd like. [No response] Okay. Hearing none, I am now going to ask for separate votes on the renewal of the NAFA swap arrangements and the liquidity swap arrangements. Of course, only current FOMC members may vote. Let's start with the NAFA arrangement, our standing swap lines with Canada and Mexico. Do I have a motion to approve?

MR. CLARIDA. So moved.

CHAIR POWELL. All in favor? [Chorus of ayes] Any opposed? [No response] The renewal of the NAFA swap arrangement is approved. Now for the renewal of the liquidity swap arrangements. Do I have a motion to approve?

VICE CHAIR WILLIAMS. So moved.

CHAIR POWELL. All those in favor? [Chorus of ayes] Any opposed? [No response] The renewal of the liquidity swap arrangements is approved. Now we need a vote to ratify domestic market operations conducted since the March meeting. Do I have a motion to approve?

VICE CHAIR WILLIAMS. So moved.

CHAIR POWELL. All those in favor? [Chorus of ayes] Thank you. Without objection. Next, we will turn to the review of financial and economic developments, and we will begin with Andreas. Over to you, Andreas.

MR. LEHNERT.[2] Thank you, Mr. Chair. The materials for my briefing begin on page 21 of the unified PDF file that was distributed this morning. For navigation

[2] The materials used by Mr. Lehnert are appended to this transcript (appendix 2).

purposes, I'll refer to the page number in the file, shown in black type in the bottom left of each page.

Today's financial stability briefing will, like the rest of this meeting, be somewhat different than usual. Under normal circumstances, I would walk you through the key vulnerabilities in the framework that underlies the *Financial Stability Report.* That framework, built over the past decade or so, is designed to be forward-looking, assessing the propensity of the financial system to amplify a range of shocks. Of course, we are now experiencing an extraordinary shock, and our focus is on how the financial system is performing as this upheaval unfolds.

I will describe how the pandemic shock encountered a financial system that had, at its core, a set of extremely resilient large banks but, at the same time, had some notable vulnerabilities. As I go through those vulnerabilities and how they responded to the pandemic shock, I will also describe some of the extraordinary actions that the Federal Reserve—in cooperation with the Treasury, other agencies, and governments around the world—has taken in response. I will conclude with some speculation about the proverbial next shoe or next shoes to drop.

Page 22 of the file lays out a table of our 13(3) facilities in the order in which we published the initial term sheets. It also lists the publicly announced amount of any equity backstop provided by the Treasury, potential size of the facility, its current operational status, and, where appropriate, the current assets held by the facility.

This table is just for reference—it's easy to get lost in the welter of acronyms. And it leaves out changes to the swap lines and other measures to ease dollar funding strains and support market functioning that Lorie mentioned. I'll be discussing these facilities as I work through the financial-stability vulnerabilities. For that reason, I won't go into specifics here except to make the important point that these facilities represent the hard work of the staff throughout the entire Federal Reserve System, including all of the Reserve Banks. As you can see, several of the facilities are currently being implemented, with the staff working around the clock to get them open for business as quickly as possible.

Page 23 describes events in money markets. Maturity and liquidity mismatches are notable in these markets. In particular, our financial-stability assessments had regularly flagged prime money market funds as a vulnerability. Because fund managers have the ability—indeed, under stress, the obligation—to impose redemption fees or gates, investors have an incentive to redeem if they suspect others are doing so. Assets in prime institutional funds—the most runnable category—stood at around $310 billion on the eve of the pandemic shock.

The left panel of the slide shows daily outflows from prime money funds. These accelerated over the first half of March. As outflows increased, funds' holdings of the most liquid assets shrank, and investors reportedly became concerned about the prospect of funds imposing gates and fees, further motivating their desire to exit. The right panel illustrates the transmission of these strains to the commercial paper market. Issuance of CP with overnight maturities rose sharply as investors pulled back to only the shortest-maturity assets. The possibility that investors would be caught in a gated money market fund or that a major CP issuer would be unable to roll its paper felt quite proximate.

Under similar circumstances in 2008, the Treasury simply guaranteed that prices of money fund shares would not fall below a dollar. However, such a guarantee was no longer available. Instead, the Federal Reserve and Treasury announced an emergency facility to backstop commercial paper issuance, the Commercial Paper Funding Facility, or CPFF; a liquidity facility for primary dealers, the Primary Dealer Credit Facility, or PDCF; and a facility for money market funds, the Money Market Mutual Fund Liquidity Facility, or MMLF. The MMLF was modeled on a 2008-era facility that purchased asset-backed commercial paper from money funds. However, the current implementation ultimately purchased a wider range of assets, in order to give investors' confidence that the money market mutual funds would have sufficient liquidity to meet additional redemptions. The MMLF was able to purchase this broader set of assets because the Federal Reserve's loans made through the facility were protected by a $10 billion slice of equity provided by the Treasury. These facilities evidently gave investors' confidence to stop redeeming money fund shares and to return to longer-term commercial paper markets, greatly easing pressures in funding markets.

Your next slide, on page 24 of the file, considers open-end mutual funds that hold assets like corporate bonds or loans. Our stability assessments had regularly flagged these funds as a potential vulnerability because of the mismatch between investors' ability to redeem fund shares daily and the longer time required to sell the underlying bonds or loans. During the period of extreme stress beginning in mid-March, flows out of these funds were extremely heavy. Strains were evident, and liquidity measures at some funds dipped below regulatory expectations. Redemptions slackened in late March amid numerous Federal Reserve actions, including announcements of the corporate credit facilities, which I will describe shortly, and the general easing of tensions in financial markets.

Let's turn to asset valuations, starting on page 26 of the file. The slide shows spreads on corporate bonds and leveraged loans. Risky business debt, a vulnerability we've highlighted previously, proved to be a source of significant strains. As shown, spreads on these assets widened from historically low levels to levels previously seen in 2008 and 2009.

On March 23, the Federal Reserve and Treasury announced two facilities designed to backstop issuance and liquidity in the markets for investment-grade corporate bonds and loans: the Primary Market Corporate Credit Facility, or PMCCF, and the Secondary Market Corporate Credit Facility, or SMCCF.

Since late March, spreads have declined amid a number of additional policy developments, including fiscal stimulus. On net, spreads have retraced about half of their widening, leaving them at the very upper ends of their post-crisis ranges.

Your next slide, on page 27, considers equity valuations. The left panel shows equity price volatility, which reached record levels on some days this spring, boosting the March monthly average to levels not seen since the most extreme days in 2008. Amid all this volatility, stock prices are down roughly 12 percent from their year-end levels, although price-to-earnings ratios remain somewhat high. With so many imponderables affecting share prices, perhaps it's best to say, borrowing a piece of medical jargon, that equity prices may be labile—that is, more prone than usual to a sudden drop should investor confidence suffer another shock.

Page 28 provides information on commercial real estate, another sector for which we had flagged stretched valuations. In the period ahead, the fundamental problem is obvious. Shuttered businesses have no revenue and can't pay their rent. Property owners then have trouble servicing their debt. We don't yet have hard data on the scale of the problem. However, suggestive evidence abounds. For example, New York City, one of the hardest-hit areas of the United States, is a very large CRE market that will likely remain depressed for a significant period.

Indeed, credit markets tied to commercial properties have shown notable strains. As shown to the left, agency CMBS spreads blew out in March and narrowed some following the FOMC announcement regarding the agency CMBS purchases. The April SLOOS results, displayed in the middle panel, show a sharp tightening in standards on loans backed by CRE, and in the right panel, a drop in demand for CRE loans. Separately, a recent survey of commercial mortgage lenders indicated that CMBS pipelines remain inactive and that insurance companies and banks have also pulled back on new originations over the past several weeks.

All told, asset prices have swung rapidly since March. But, looking through the ups and downs, at this moment, corporate bond spreads are only moderately above the range that prevailed over the long expansion, and equity prices haven't declined tremendously since the start of the year. Further bad news or an increase in investor risk aversion could prompt further price declines. Whether these will, in turn, have outsized effects on the economy depends in part on the financial strength of businesses and households—the subject of your next slides.

Page 30 considers evidence on residential mortgages. The left panel shows that, at least through the end of last year, delinquencies were low. As we've highlighted for some time, household balance sheets had generally looked strong for a number of years, with income outpacing debt for almost a decade and debt growth concentrated among households with high credit scores. The current shock is likely to shift that picture notably.

The recently passed CARES Act gave homeowners affected by the pandemic access to a fairly generous forbearance program. Such forbearance programs are common for a few months in a geographically limited area following a natural disaster, such as a hurricane. The scope and duration of the current program are unprecedented. We are monitoring the fraction of borrowers requesting forbearance, and, as shown to the right, they have increased notably.

Let's turn to page 31. Over the past six weeks, as shown in the left panel, C&I loans grew over $500 billion, the bulk of which most likely represents businesses drawing on bank credit lines. The table to the right highlights which industries are increasing their use of credit lines the most. The middle column of numbers shows the percent of credit lines utilized as of the end of last year. The rightmost column of numbers shows an estimate of the percent utilized currently. Businesses across the board increased their utilization rates, but the largest jumps are among sectors acutely affected by the pandemic, such as leisure and hospitality.

Page 32 shows the near-term results of this combination of high and rising debt and falling business revenues: a sharp decline in business credit quality. The left panel shows bond downgrades that take issuers out of investment grade and into high yield: so-called "fallen angels." The rate at which angels fell in March was extremely high, and the so-called triple-B cliff suggests that more may be coming. The right panel shows that downgrades in the leveraged loan market were also extremely heavy.

Even with measures in place to support the finances of businesses, the sector seems headed for a large increase in bankruptcies and workouts, with the potential for higher-than-normal deadweight losses. Business debt was high relative to fundamentals even before the pandemic. At the same time, the economic effects of social-distancing measures suggest that many businesses need loans to maintain their capacity to restart operations through the shutdown. This combination may both support the recovery by supporting business activity and ultimately leave the sector more fragile—potential developments that we will be monitoring carefully.

On page 33, I show a measure of stress in the municipal debt market. The pandemic has meant increased expenses and decreased revenues for state and local governments. At the same time, investor aversion to risk and preference for liquidity has strained the market. As shown in the figure, the spread of short-term general obligation notes to Treasury yields is normally negative because the income from these notes is tax-exempt. As the pandemic hit the United States in March, though, this spread spiked sharply to levels surpassing those seen in 2008. Actions taken since then, including the funding for state and local governments provided in the CARES Act, the expansion of the MMLF to include tax-exempt assets on March 20, and the announcement of the Municipal Liquidity Facility on April 9, have generally kept spreads from widening further, but the market remains under extreme pressure.

Bank capital ratios are discussed on page 35. Our financial-stability assessments have always highlighted the resilience of the banking system, particularly the largest banks. And it's worth noting that—so far, at least—we have not had a major financial institution face distress.

As we look ahead, though, the salient question is the extent to which the financial system will help finance the survival of businesses as we fight our way through the economic shutdowns and then support economic activity when the recovery begins. Banks are important lenders to affected sectors and, what's more, are key components of several of our facilities. The set of facilities known collectively as Main Street, for example, rely on banks' willingness to make new, or expand existing, loans to businesses while retaining between 5 and 15 percent of the credit risk on those loans.

No doubt, as borrowers experience the effects of the pandemic, the banking system will experience mounting credit losses. The left panel on the slide shows that capital ratios at the largest banks dropped about 75 basis points from December 2019 to March 2020. Much of this decline reflects increases in bank assets; as discussed earlier, the banking system has accommodated business and households' needs.

There will be additional pressure associated with losses. The right panel provides two rough estimates of the scale of losses associated with pandemic. The leftmost bar shows aggregate bank holding company capital as of the end of 2019 at around 12 percent of risk-weighted assets. The next two bars are designed to give a rough sense of the level of aggregate bank capital when the pandemic and economic contraction are behind us. The middle bar simulates the level of bank capital after simply tacking on the realized losses from the 2007–09 recession and financial crisis. The rightmost bar simulates the level of capital after we feed the Blue Chip's downside tail forecast into our rough, top-down loss models. In both cases, capital drops about 5 percentage points.

Were these drops to be realized, banks would remain solidly above regulatory minimums. However, several would likely have fallen into their buffers and faced increasing restrictions on payouts and compensation designed to put them on a path to return to their pre-crisis capital levels without having to sharply limit credit availability. I should note that the staff is in the midst of running the actual stress test models using a range of alternative scenarios. And the results of those exercises, when available, will offer a great deal more precise insight into the dynamics of the banking industry.

Let's move to page 36. Despite the near-certainty of substantial credit losses down the road, market participants still view the largest banks as able to withstand the shock. The top panel shows the CDS spreads of G-SIBs over the past 15 years. Current levels are well below those seen in the 2007–09 crisis. This suggests that investors don't see a serious increase in credit risk at major banks. However, price-to-book ratios, the bottom panel, have recently dropped below unity. This suggests that, though investors don't expect banks to experience distress, they do expect depressed earnings in coming years.

Page 38 considers shoes that might drop—I should add that these are early thoughts that a team of staff members across the System have come up with. We have been through a period of financial strain as intense as that seen in 2008—and compressed into a few weeks. It is simply tempting fate to hypothesize that the most fragile elements of the system have been shaken out. Looking down the road, there are a few specific problems that we are keeping a particularly close eye on.

First, as many of you are fully aware, mortgage servicers are responsible for making payments even if the underlying borrower is delinquent or in a forbearance program. Strains among nonbank servicers are already evident and may increase in coming weeks. Several agencies share responsibility for the U.S. housing finance system, and we continue to work with them to monitor the situation.

Second, insurance companies are some of the largest holders of U.S. corporate credit risk, have significant investments in commercial real estate assets, and are responsible for paying out in the event of loss of life or damage to business or property. With the wave of downgrades and distress to come, they will likely see their capital ratios fall. Although some insurers have been relying on less stable funding sources, we haven't yet seen signs that they are coming under funding pressure, such as a widespread pullback by counterparties or an increase in policy surrenders.

Third, while the burst of financial volatility and funding market stresses was intense, it wasn't particularly long lived. This raises the possibility that a significant, large leveraged intermediary made it through the recent episode but will be unable to survive a second bout, should it come.

In summary: We survived a financial panic brought on by a truly severe and unexpected development completely outside the financial system. As the economic consequences of the pandemic unfold, the financial system will no doubt be stressed further, but there is also some hope that it can be a source of strength to the economy. With that, I'll turn to John Roberts to continue our briefing.

MR. ROBERTS.[3] Thanks, Andreas. My materials begin on page 39 of your packet. Over the past eight weeks, we've been looking at information on the spread of the disease and ways to slow it. We've also developed a host of high-frequency indicators to help us track the effect of these measures on the economy. Despite these efforts, the uncertainty remains enormous. There is uncertainty about the course of the disease and society's reaction to it, and there is uncertainty about how the economy will respond, given the course of the disease.

In my remarks today, I will review some of what we currently know about the disease and the economy's response so far. I will then review how the staff has interpreted that information in terms of our forecast and then discuss some of the risks both about the disease and its progression and about how the economy will respond.

The figure on your next slide—page 41—shows the evolution of new cases in several countries. Specifically, the figure shows new cases per capita, normalized so that the first period is when each country reaches 30 new cases per day. One key lesson is that the course of the disease has varied greatly across countries. As the experience of China, Italy, and Spain, among others, illustrates, it appears that strict

[3] The materials used by Mr. Roberts are appended to this transcript (appendix 3).

social-distancing measures, such as stay-at-home orders, can slow the spread of the disease. But, of course, such measures come with a very high economic cost.

Some countries appear to have found less costly ways to contain the disease. Korea, for example, has managed to keep the disease under control without widespread strict social-distancing measures. And China, after an initial period of lockdown, has, more recently, managed to reopen its economy in large part while, so far, keeping the disease in check. Public health experts believe that one key way in which these countries have controlled the spread of the virus without needing costly social distancing is through contact tracing, facilitated by readily available testing.

Your next slide describes the staff's baseline assumptions about the disease and measures to address it. In developing our baseline scenario, we consulted a recent study issued by the American Enterprise Institute and written by Scott Gottlieb and others. The study lays out several criteria for relaxing strict social-distancing measures while keeping the disease under control. As shown in the column to the left, those criteria include a sustained 14-day drop in new cases, a level of hospital utilization that allows hospitals to safely treat all patients, and a thorough program of testing and contact tracing that allows public health officials to track down all the "chains of infection."

As shown in the column on the right, in the staff baseline, we assume that stay-at-home orders remain in place essentially throughout the country until the end of May, after which they are gradually lifted. Many epidemiologists believe that a peak in new cases in this country may already have been reached or will soon be reached in much of the country. Thus, it seems likely that the first of the Gottlieb and others criteria will be met in much of the country by the end of May. It is also likely that hospitals in most of the country will not be overtaxed by then.

The third criterion is a higher hurdle, as it requires hiring large numbers of contact tracers; one study suggested 100,000 would need to be hired. In the staff forecast, states and localities would need to meet this criterion between June and September. Though ambitious, we nonetheless believe this assumption is feasible. For example, the states of Massachusetts and Michigan have announced specific plans to engage, collectively, thousands of contact checkers; other states, such as California, have announced similar—although, so far, less specific—intentions. We acknowledge, however, that this assumption may be optimistic. If that proves to be the case, social distancing may be required for more extended periods than we have assumed, with adverse consequences for the economy. I will turn to alternatives later in my presentation.

Social distancing, both mandated and voluntary, has had a devastating effect on the labor market. As can be seen in the top-left panel of your next slide, page 43, initial claims for unemployment insurance have risen to unprecedented levels and have totaled around 25 million in recent weeks. To the right, our translation of the ADP "paid employment" data also suggests more than 20 million jobs losses in April.

As seen in the bottom panel, the staff is currently assuming that 22 million workers will lose their jobs this month, and that the unemployment rate will rise to 16 percent. We expect further large job losses in May, with the unemployment rate reaching 18 percent. We estimate that job losses would have been even larger in coming months were it not for the Paycheck Protection Program that was part of the CARES Act. On our current assumptions, the economy will start gradually reopening in June, so we're expecting a rebound in employment and a drop in the unemployment rate to begin then.

Consumer confidence, shown in the top panel of your next exhibit, has plummeted. The black line shows the monthly index of consumer confidence, as provided in the Michigan surveys, through April. The red line shows a daily indicator of consumer confidence maintained by the Rasmussen polling company. As can be seen to the right, after dropping sharply through early this month, the Rasumussen index has stabilized over the past couple of weeks. An indicator of retail spending produced by the NPD market research group is shown on the bottom left. It similarly indicates a sharp drop in spending in March and some stabilization, at a low level, more recently. Finally, as shown in the bottom right, various business surveys taken in April also suggest a sharp drop in activity.

Your next slide shows some recent information about prices. The effects of COVID-19 on prices of goods and services directly affected by social distancing were already evident in the March CPI. The top-left-hand figure shows sharp drops in airfares, hotel rates, and apparel prices last month. Reflecting the global drop in demand, oil prices, in the bottom panel, have plummeted.

As noted to the right, there are also some potential upside pressures on prices. There is high demand at some retailers, such as grocery stores and online outlets. As well, social-distancing efforts may lead to production bottlenecks. COVID-19 could also raise firms' costs through other channels, such as measures to keep workers safe or the need to offer premium pay for taking the risk of coming to work.

Your next slide briefly outlines government support for the economy. Federal government support, both fiscal and monetary, has been both substantial and considerably more timely than in previous recessions. The CARES Act by itself provided an unprecedented $2 trillion in fiscal support that has been augmented in subsequent legislation. In addition to direct stimulus, the CARES Act also bolstered the Treasury backstop for Federal Reserve lending programs. The Federal Reserve has also acted aggressively, as, of course, you all know, and as was detailed by Lorie and Andreas.

Your next slide, on page 47, illustrates how the staff has pulled together these various elements through the lens of our real GDP forecast. The black line in the chart shows the staff forecast of the level of GDP, indexed so that it is equal to 100 in 2019:Q4. The colored lines show estimates of the effects of various factors related to COVID-19 on the level of GDP. Note that, in the absence of these factors, we would have expected real GDP to increase gradually over this period—as was projected, for example, in the January Tealbook.

The green line shows our estimate of the effect of social-distancing measures, which leave a profound effect on the economy, especially in the near term. We think that the effects will be less adverse in the third quarter and relax gradually further thereafter. The dark blue line shows the staff's estimated effects of fiscal stimulus. Fiscal stimulus has an important effect already this quarter and one that grows through the year. On current assumptions, the effect fades over 2021, reflecting the near-term focus of legislation so far.

The orange line shows our estimate of the effects of standard macroeconomic dynamics, such as "multiplier" effects, that we would expect, given the initial shock to the economy. The gold line shows further "recessionary dynamics," reflecting factors such as business closures, permanent layoffs, and financial disruptions, which typically occur during recessions and which magnify the effect of shocks.

The effects of monetary policy and other Federal Reserve actions are not shown separately. Instead, these are captured in the standard macro dynamics and recessionary dynamics lines. Importantly, the adverse effects reflected in these lines would have been much larger had it not been for aggressive monetary and fiscal actions.

Your next slide summarizes the staff inflation outlook. As noted previously, social distancing, both voluntary and mandatory, has unleashed an unprecedented mix of supply and demand forces on the economy. On net, the staff believes that the adverse demand effects will dominate. Thus, we are currently expecting core inflation of only 1.4 percent this year. Because of the collapse in oil prices, we see overall inflation of only 0.6 percent. As the economy recovers in 2021 and 2022, we project inflation to move up gradually.

On page 49, I turn to risks to the outlook. Overall, we view the risks as tilted to the downside, and here I explore one such risk scenario that we consider about as likely as the baseline.

In our baseline, local public health officials are able to keep the disease in check, perhaps through an aggressive program of testing and contact tracing. Such a program would be unprecedented, however, and state and local government efforts may prove inadequate. In this scenario, the efforts are adequate through the summer, perhaps aided by some seasonality in the course of the disease.

In the fall, however, a second wave of the disease overwhelms the contact-tracing capacity of state and local governments. The rising caseload and burden on hospitals elicits another round of social distancing, both voluntary and mandated. As seen in the panel to the right, the unemployment rate rises again—not quite as high as in the first wave, perhaps reflecting better preparations and more efficient distancing strategies. In this scenario, the ultimate recovery is more protracted than in the baseline, in part because strains to the financial system impair firms' and households' access to financing to a greater extent.

With the high degree of uncertainty, it's also possible that things could turn out better than we are assuming. My final slide illustrates one such possibility. In this scenario, positive developments, such as novel treatments for COVID-19 or a lower fatality rate than currently estimated, allow social-distancing measures to be relaxed more quickly. As well, spending may rise more rapidly than in the baseline—for example, if households and firms spend a greater portion of the fiscal stimulus than we have assumed. In this scenario, the unemployment rate declines more rapidly than in our baseline: It is 2 percentage points below the baseline by the end of this year and reaches 5 percent by the end of next year. Joe Gruber will now discuss international developments.

MR. GRUBER.[4] Thank you, John. My presentation starts on page 52 of the overall packet. The COVID-19 outbreak and the restrictions imposed to contain it are devastating economies across the globe. Flash composite PMIs for April, on the left, confirm an unprecedented decline in activity across a number of economies, with services falling more sharply than manufacturing, not shown. Shutdowns and disruptions abroad are an additional drag on the United States economy, with March exports, as reported this morning, falling 9 percent relative to last year, and with still further export declines expected in the months ahead.

In China, where virus-related disruptions hit early, first-quarter GDP dropped 36 percent at an annual rate. Late in the quarter, China's March data, coincident with some easing of restrictions there, support two key themes of our overall foreign outlook. First, as restrictions are lifted, production, the blue line on the right, will rebound. Second, even with this rebound, activity will remain depressed, in part as consumers—the black line—react cautiously to new health and economic risks.

However, as discussed on slide 53, with restrictions yet to ease in most countries and still likely to be tightened in some, a rebound in overall foreign activity is still a forecast rather than a reality. The color-coded table outlines our projected timeline for mandatory restrictions in the foreign economies, with red indicating full lockdown. A few things to note: First, we expect the euro area, in line with recent announcements, to begin easing some of its most onerous restrictions in May. Second, there is some variation in timing across regions, with Latin America maintaining relatively harsh restrictions for longer, in part as a consequence of its relatively late start. Third, we expect some degree of restrictions to persist across the foreign economies through next year, in line with our assumption for the United States.

As shown on the left in slide 54, we project that as restrictions ease, overall foreign real GDP will begin to recover next quarter, but only to a level that remains well below our previous baseline, in red. Of course, this forecast is highly uncertain,

[4] The materials used by Mr. Gruber are appended to this transcript (appendix 4).

importantly because the course of the outbreak remains unknown. To give an idea of the range of possible outcomes, the chart on the right plots the foreign counterparts to the alternative scenarios discussed in John's briefing.

Notably, the recovery that we have penciled in, incomplete as it is, would be even weaker without the extraordinary policy response of foreign central banks and governments. As shown on slide 55, those central banks in the advanced foreign economies, the red bars, that had the space cut policy rates, often to the effective lower bound, with many central banks also engaging in sizable interventions to maintain market liquidity and credit availability. Emerging-market central banks have also lowered policy rates—though generally to levels well above zero, as they have to balance stimulus against concerns over capital outflows.

Similarly, as shown on the right, the fiscal response in the advanced foreign economies has generally compared in size with that of the United States, while some emerging markets, particularly in Latin America, are constrained by a lack of fiscal space arising from their existing vulnerabilities.

Overall, given the severity of the downturn, the aggressive efforts of policymakers, while providing some relief during the crisis and some support for the subsequent recovery, will obviously be unable to prevent sharp contractions. The crisis is likely to leave a lasting imprint on global activity even after social-distancing restrictions are eased. In the remainder of my briefing, I will discuss some of the headwinds and recessionary dynamics that are likely to drag out the recovery.

Focusing on the euro area in slide 56, we expect sharp increases in unemployment rates, particularly in hard-hit Spain, the yellow line, and Italy, the purple line. Historically, euro-area labor markets have shown considerable hysteresis, and we expect unemployment to remain well above pre-crisis levels in most of the euro area through the end of next year. One exception is Germany, where the short-term wage subsidy Kurzarbeit program is expected to help keep the unemployment rate, the green line in the middle, relatively low. While other European countries are experimenting with similar programs, given its size and generosity, we expect Germany's to be the most effective.

The euro-area recovery is also likely to be impeded by considerable disruption to businesses. As shown on the right, small and medium-size enterprises account for a larger fraction of employment in the euro area than in the United States, and, to the degree that these businesses operate with less of a financial cushion or are harder to reach with government assistance, the euro-area economy is more likely to suffer.

Regarding slide 57, the crisis also runs the risk of reinvigorating preexisting financial stresses and political tensions in the euro area. The projected rise in debt-to-GDP ratios, on the left, raises sustainability concerns, particularly in Italy, where sovereign spreads are now under pressure, on the right. The announcement of the ECB's €750 billion PEPP, the Pandemic Emergency Purchase Program, narrowed spreads, in part on the expectation of increased purchases of peripheral debt;

however, spreads have subsequently widened, as the economic outlook worsened and European leaders could agree on only a limited common fiscal rescue package.

More broadly, on slide 58, as the outbreak and associated restrictions roll across countries, we are likely to see further stress on global supply chains. Emerging Asia, emerging Europe, and Mexico rely on intermediate imports to a far greater degree than the United States and other advanced economies, increasing their exposure to global trade disruptions in the near term and a possible retrenchment of globalization in the long term.

The collapse of oil prices, shown on slide 59, is likely to result in additional pressure on select EMEs as well as some advanced economies, including Canada and parts of the United States. Spot prices have fallen two-thirds since the beginning of the year, as oil demand—in the middle—has collapsed by close to 25 million barrels per day this quarter, about one-fourth of total demand. With production slow to adjust, oil inventories are filling fast, on the right, putting additional downward pressure on near-term prices, with the WTI contract for May delivery notably turning negative just prior to its expiration.

The fall in oil prices and other commodity prices is an additional stress for EMEs already under considerable strain, as discussed on slide 60. With depreciating currencies, not shown, rapid capital outflows, the red and blue bars on the left, and rising credit spreads, the green line, tight financial conditions make it even more difficult for EMEs to address the challenges posed by the coronavirus. Although financial conditions in the EMEs have eased somewhat since the middle of March, as markets reacted favorably to global policy actions, including those by the Federal Reserve, the reaction was more muted than in the advanced economies.

As income losses mount, the likelihood of an EME or group of EMEs moving into full-blown crisis is increasing. To monitor these risks, the staff of the International Finance Division and the Federal Reserve Bank of New York are collaborating on a project to track EME financial conditions. The project has resulted in a mechanism to systematically monitor and aggregate a tremendous amount of EME data into five main conceptual buckets: financial market stress, market access, sovereign risk, stresses in banks, and stresses in nonfinancial corporations. As a preliminary output of this project, the table on the right presents a summary assessment of EMEs' recent financial stresses. Unsurprisingly, Argentina, currently in selective default, and Turkey, a perpetual poor performer on most risk metrics, are facing the most acute financial strains. More worrying, several other EMEs, notably Mexico, Indonesia, and India—with Chile and Brazil not far behind—are displaying significant financial stresses. We will continue to monitor these economies closely.

Thank you. That completes my presentation.

CHAIR POWELL. Thank you, Andreas, John, and Joe. Any questions for our briefers? You can notify me on Skype. [No response] Give it a second. [No response] Any questions not on Skype? [No response] I'm not seeing any questions or hearing any. [No response] Okay. If there are no questions, let's now move to the opportunity for comment on financial stability, beginning with President Rosengren.

MR. ROSENGREN. Thank you very much, Mr. Chair. It is likely, in my view, that the unemployment rate is going to peak above 20 percent. And as I will argue in the economic go-round, my base case features a trajectory for the unemployment rate that is closer to the Tealbook's "Second Waves" alternative scenario. In view of the severe nature of the downturn and the extraordinary actions being taken, I would hold banks to the same standard as other businesses benefiting directly from our 13(3) facilities, by imposing limits on executive compensation, share buybacks, and dividends.

If, unlike many other countries, we allow banks to continue to pay dividends and the economy does not recover quickly, it creates the risk of both having to bail out banks again and having to deal with the optics of perceived favoritism being shown to Wall Street over Main Street—a reputational risk that we need not and should not embrace. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Mester.

MS. MESTER. Thank you, Mr. Chair. Federal Reserve actions have played a crucial role in providing liquidity to financial markets, thereby improving their orderly function. Although volatility and risk spreads have not returned to prepandemic levels, there has been a significant lessening of stress in most markets.

To support the flow of credit to households and businesses during the pandemic, the Fed has encouraged banks to work with their borrowers and has temporarily relaxed some of the regulatory requirements and supervisory oversight of banks. Banks entered the period with what many regarded as sizable capital and liquidity cushions, but nonfinancial business debt levels, which are already high, will rise further, and some households will take on additional debt in the face of a 20 percent unemployment rate.

Recent provisioning under the new Current Expected Credit Loss standard indicates increases in loan losses will potentially eat significantly into bank capital cushions. The upcoming stress test will help quantify potential capital deficits of the banks subject to the test. We may learn that because banks did not build up sufficiently large capital cushions in advance, they are now in the less desirable position of having to raise capital during a downturn, which itself may pose some systemic risk.

Of course, it's difficult to plan for something unprecedented. The negative shock the economy is currently experiencing is larger and deeper than many of us ever contemplated, and it shines a bright light on the economy's dependency on a resilient banking system. The temporary relaxation of regulations and supervisory oversight, borrower forbearance, and the increase in bank lending in these difficult times all lend support to the real economy at a time when it is crucially needed. But these measures could also increase risks to financial stability.

In light of this, the Financial Stability Subcommittee of the Conference of Presidents has reprioritized its work this year and is sponsoring research on the resiliency of the financial system to ensure that banks can continue to lend in a safe and sound manner through economic downturns that are deeper and characterized by greater uncertainty than once contemplated.

The staff are undertaking several work streams. One work stream will use four of the Federal Reserve System's existing banking models to evaluate bank resiliency under several economic scenarios—including the CCAR 2020, severely adverse, scenario, a *V*-shaped scenario derived from the Blue Chip consensus forecast, an *L*-shaped scenario based on the Blue Chip tail forecast, and a *U*-shaped scenario, designed to fall between the Blue Chip consensus and tail scenarios. The analysis will quantify the effects on bank capital buffers and balance sheet capacity for borrower forbearance and measures taken to relax regulatory burdens. Another work stream will focus on the appropriate way to exit from the borrower and regulatory forbearance measures and to rebuild banking system resiliency.

After the most recent financial crisis, the Federal Reserve worked to improve the resiliency of the financial system to better position it for the next crisis. A similar evaluation should be undertaken after this crisis, and it's our hope that projects being sponsored by the COP's Financial Stability Subcommittee will help inform a reevaluation of what levels of capital and liquidity are appropriate for banks to hold across the business cycle and how best to use our macroprudential tools, including the countercyclical capital buffer and stress tests, so that buffers are built up in good economic times in preparation for downturns. I plan to report on the results of the research sponsored by the Financial Stability Subcommittee at a future meeting of this Committee. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Barkin, please.

MR. BARKIN. Thank you, Mr. Chair. Dysfunction in the markets has forced us to do a lot of heavy lifting over the past several weeks, but the world's premier market for safe assets shouldn't be misfiring, and certainly not for this length of time. We aren't solely responsible for these markets, but I believe we should be pressing—now that, I hope, the dysfunction in these markets has passed—to understand better the underlying dynamics that drove this dysfunction and to push for alternatives that reduce the risk of this problem recurring in the future. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Mr. Chair. I want to start by expressing my admiration and appreciation for the staff across the System who have mounted an extraordinary emergency response to the COVID-19 shock. The staff have been working around the clock to see that wholesale and retail financial transactions are processed seamlessly; to ensure our technology infrastructure is scaled to meet surge demand securely; to implement market operations on a massive scale; to meet elevated demand for cash at depositories around the country; to adjust regulatory dials to enable our banks to support credit; to produce forecasts in response to historically unprecedented developments; to provide households with rapid access to CARES Act payments through direct deposit; to process Paycheck Protection Program lifelines to small businesses; to stand up and, in some cases, invent emergency facilities; and to ensure strong governance and transparency for all of these efforts. For the most part, they have been doing all of this working from home while also caring for at-risk parents and neighbors and homeschooling their children. Very, very admirable.

These forceful early interventions have been effective at restoring smooth market functioning and addressing liquidity stresses in a variety of markets. Volatility has fallen from historical peaks, liquidity has improved, and we have seen a restoration of market access for higher-grade borrowers and a reduction in spreads more generally.

As we think about financial stability, it’s important to assess how these stresses have tracked against our assessments of vulnerabilities. In several areas, the improvements in resilience put in place since the financial crisis have proven to be vitally important. The banking sector, in particular, as a result of the strong measures put in place under Dodd-Frank—with strong emphasis on the G-SIBs at the core of the system—came into the current crisis with strong capital and liquidity buffers and operational capacity. Supervisors and market participants had improved sightlines into how those buffers would hold up under stress. As a result, supervisors have had the confidence to encourage banks to put those buffers to use. In sharp contrast to the Great Financial Crisis, this has allowed banks to be important intermediaries and credit providers in the early phase of the COVID-19 crisis. Banks have been able to meet the surging demand for draws on credit lines while also building loan loss reserves.

Another area to highlight is operations, which have been remarkably resilient so far. It's noteworthy that financial institutions and market intermediaries have been operating based on their business continuity plans for much longer than anticipated, while intermediating outsized transactions volumes in conditions of elevated volatility. This speaks to the important benefit of developing and actively testing those plans in advance.

Central Counter Parties, or CCPs, have also been able to handle tremendous volumes and volatility with only minor incidents so far. A tremendous share of clearing activity has migrated onto these core financial platforms since the previous crisis. Amid the extraordinary volatility and stress in markets last month, margin calls increased sharply. Despite this, clearing members and end users were able to meet collateral and margin calls with very few glitches, and the CCP risk-management frameworks seem to have functioned well.

Household balance sheets were also much stronger coming into this crisis than they were at the outset of the GFC. On the other hand, as we know from our analysis of the Distributional Financial Accounts and Survey on Household Economics Decisionmaking, a very large share of households entered this crisis with very low liquid buffers. Even with the unprecedented direct cash transfers and expanded unemployment compensation in the CARES Act, many of these liquidity-constrained households are also in occupations likely to be disproportionately affected by the crisis.

As we turn from resilience to vulnerabilities, several areas in which we've seen the greatest stress so far correspond to the vulnerabilities that have been flagged in our previous financial stability assessments. We've repeatedly called attention to the surge in indebtedness among risky corporate borrowers and the potential for this to amplify any shock. Like many others, we flagged that about half of investment-grade corporate debt outstanding was rated in the lowest tranche of the range and cautioned about the potential knock-on effects of a wave of "fallen angels"—which we are beginning to see now.

In the high-yield corporate bond market, spreads remain elevated, and secondary-market liquidity conditions remain in the upper end of their typical ranges. The leveraged loan market also shows signs of fragility. Elevated valuations in CRE markets have also been flashing red for some time, and the COVID-19 shock has only exacerbated this risk in important sectors, such as non-grocery retail and hotels, as well as co-working space providers.

The Financial Stability Report and the Financial Stability Board have highlighted the gap in the robustness of regulatory reforms between supervised depositories, on the one hand, and nonbank financial intermediaries, on the other. And several of the highlighted nonbank sectors have exhibited stress. A wave of redemptions at bond funds and muni funds raises questions of whether liquidity management frameworks are sufficiently robust. Prime money market funds are once again under the spotlight, after a wave of redemptions led to stresses that required emergency interventions. The need to exit crowded positions among hedge funds with relative-value strategies contributed to the massive distortions in Treasury securities markets. And the capital- and liquidity-light business model of many nonbank mortgage servicers has come under stress, as a result of the forbearance provided by the CARES Act.

As we look ahead, the outlook remains entirely hostage to the course of the pandemic, and a wave of insolvencies is possible. A second wave of infections could once again trigger financial market turbulence at a time when vulnerabilities will have grown. Scarring could be prolonged, particularly for commercial property, small and medium enterprises, or SMEs, and swaths of consumer services. In some sectors, business delivery and processes could change permanently, endangering incumbents that cannot adapt. Even with unprecedented interventions in credit markets, insolvencies will be elevated, especially in sectors hit hard by social distancing that came into the crisis with high levels of debt. And, of course, the oil price shock is making this worse. Downgrades, deleveraging, and defaults will have implications for asset managers, insurance companies, and banks.

The nonperforming loans and insolvencies that lie ahead, as well as declines in asset valuations, could weigh on bank balance sheets, so we must be vigilant that the banks at the core of the system remain resilient. My own strong preference would be to ask banks to put on hold any distributions of dividends and share buybacks, in order to preserve capital and support economic activity. By asking for an across-the-board pause in this activity, regulators can help level the playing field—removing competitive pressure that banks may feel to make payouts that they may regret later.

And, finally, we need to take a thoughtful approach to stress testing this year to maintain confidence and credibility. In many respects, this year's stress test is more akin to the initial Supervisory Capital Assessment Program stress test in 2009, with the important function of assessing the resilience of bank capital with regard to a shock of unknown severity and duration taking place in real time. Comparing the severely adverse stress-test scenario released earlier this year with the Tealbook baseline and "Second Waves" scenarios, it appears that financial market effects are in the ballpark, while the possible near-term drop in employment and activity could outstrip the maximum-employment effect in our severely adverse scenario. We need to anticipate how bank balance sheets could deteriorate as the crisis deepens, depending on the severity of solvency challenges.

But these challenges lie ahead. For now, again, I want to just highlight the extraordinary efforts undertaken by the staff. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President George.

MS. GEORGE. Thank you, Mr. Chairman. The economy's sharp contraction seems likely to be followed by an extended period of recovery, and banks will almost certainly experience significant credit losses. Steps they take now to conserve capital and to maintain and extend credit through the recession and beyond will influence the long-term health of the U.S. economy.

At the end of the first quarter, G-SIB payout ratios were two and a half times their net income available to common shareholders. Since then, share buybacks have been suspended. But dividends have not been. Continuing to distribute earnings to shareholders in the face of a broad-based recession seems ill advised. The experience of past recessions and crises suggests that bank managers tend to be too optimistic about potential losses. During the previous crisis, for example, as conditions deteriorated, bank managers announced loan loss provisions of several billions of dollars, expecting that they would cover any future losses. After such announcements, the five largest U.S. banks continued to distribute more than $75 billion in dividends and billions more through stock buybacks. Losses, however, continued to mount at these banks.

Today the role of the banking system has never been more important to the provision of credit to households and businesses. And although the largest banks hold more capital than they did the last time, that capacity will be needed to make loans. As insolvencies associated with this recession begin to produce losses, borrowers that escape default will still need credit support. History suggests that such support will come from banks that have higher capital levels. Such banks consistently maintained stronger lending patterns during the previous crisis than less well-capitalized banks, which sharply reduced their lending. This history strongly argues for bank managers to conserve capital resources sooner rather than later. Thank you, Mr. Chairman.

CHAIR POWELL. Thank you. Governor Quarles.

MR. QUARLES. Thank you, Mr. Chairman. For more than a decade, we have overseen banking organizations with the goal that they could be a source of strength during, rather than the cause of, the next downturn. And, thus far, I think that that plan has been borne out in this event. Banks have met demands for massive drawdowns by businesses since the crisis intensified in early March.

According to the numbers on the weekly H.8 reports, Commercial and Industrial, or C&I, loans have increased by $535 billion since the end of February. For struggling households, banks have agreed to forbear billions of dollars in loan payments. At the large universal banks, more than four million accounts across auto and home lending and credit cards have received payment deferrals. Domestic banks have absorbed more than $800 billion of central bank reserves, and they've received more than $1 trillion of core deposits.

Now, as supervisors, we recognize that all of those actions have strained the balance sheet capacity of the banks, so we've taken a number of steps to allow them to continue to support their customers in this situation. A lot of those steps, such as encouraging them to work with their customers to continue to provide credit, are consistent with what we do whenever there's a natural disaster. But an important difference is that this disaster has affected the entire country, rather than specific geographies. Actually, it's affected the entire world, requiring a set of extraordinary actions.

As Andreas noted, to ensure that banks are able to continue to support businesses and households, we've reintroduced and we've added numerous funding facilities. The Paycheck Protection Program Liquidity Facility and the Main Street program specifically support lending to small and middle-market businesses, which has become acutely necessary, given the widespread tightening of lending conditions that we saw in the April Senior Loan Officer Opinion Survey on Bank Lending Practices, or SLOOS. And, to ensure that balance sheets don't become constrained by unprecedented amounts of low-risk assets being created to support market functioning, we've also temporarily changed the supplemental leverage ratio to exempt reserves and Treasuries.

Banks are stepping up now at a time when other creditors and financial market participants are clamping down, and the banks are using the capital and liquidity that they've shored up since the previous crisis. Thus far, U.S. banks remain financially healthy, but we'll want to be sure that they remain a source of strength and support for the economy beyond this first phase of the response. Stress testing served a critical role in the previous crisis by giving valuable information about the financial health of the largest U.S. banks, both to the public and to the market. And, for the past decade, robust stress testing has been at the core of our strategy for ensuring that our banks have sufficient capital to weather an extreme downturn and continue to lend. And I think that stress testing is going to serve an important role during this crisis, as it did in the last.

Of course, everyone on this call recognizes that the stress-test scenario that we put out in early February has been overtaken by events. And though we'll want to make sure that the supervision and regulation of banks doesn't exacerbate this most extreme swing in economic conditions, we do want to guard the credibility of our stress test jealously. So the staff is planning a robust set of additional analyses of this year's results. Those will include evaluating a hypothetical scenario in which it is assumed that there is a delayed easing of social-distancing restrictions, followed by a shallow and protracted recovery.

We're already seeing evidence that we're going to need to be vigilant in our assessment of banks' resilience in coming months. First-quarter earnings reports showed core profitability under strain, with banks already preparing for mounting loan losses. Common equity tier 1 capital ratios at the largest banks dipped notably—up to a full percentage point, as was demonstrated in Andreas's slide—because of unplanned balance sheet growth and provisioning for outsized losses. Banks' earnings are going to be further strained in the near future as a result of likely compressions in interest margins and higher provisions. So we've likely gone from worrying about "lower for longer" to living with "even lower for even longer." And, in coming quarters, significant fractions of banks' investments will reprice lower, while large fractions of banks' liabilities are already priced close to zero.

According to the FR Y-14 data, about 90 percent of C&I loans and 70 percent of commercial real estate loans are adjustable rate. Many residential mortgages will be refinanced in coming months. And the high level of corporate debt and elevated valuations that were prevailing going into this crisis, combined with prolonged uncertainties, could lead to very high losses on C&I loans and CRE loans. Consumer lending and residential mortgages also need to be watched closely in light of the forbearance that we have encouraged as policymakers. But going into this crisis, household debt was of generally high credit quality, and that, combined with the strong fiscal support for unemployed workers, offers some hope that this sector, while certainly hurting terribly, may avoid the worst-case outcomes of the previous crisis.

So we'll want to be continuously assessing the status of our banks in the coming weeks, with the goal that they remain well capitalized and continue to perform their role as credit intermediaries. And, to that end, I'm looking forward to the results of our enhanced stress-test analysis, because I think it's vitally important that we be deliberate and data driven in making decisions.

Let me add just a few words supporting something that Governor Brainard noted, and it's relevant to the international financial stability considerations of the Financial Stability Board. I do think that this event has thrown into relief some vulnerabilities in the nonbank financial sector that we have talked about for some time but that had not been addressed in the wake of the previous crisis or not addressed completely, perhaps because of response fatigue or just the more difficult nature of the response. But I do think that it will be incumbent on the Financial Stability Board to pick up some of these questions about nonbank finance and to look at them much more intently. And we have created a steering group on nonbank finance, the early returns of which are that it should be much more effective than the previous methodology of the Financial Stability Board in actually being able to address some of those issues. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Mr. Chair. I've got two points, one on the short run and one on long run. In my point on the short run, I want to echo what President Rosengren said. I think the staff's "Second-waves" scenario is much closer to my baseline than what the staff is calling its baseline. The staff's baseline forecast, for me, is an upside scenario. If everything goes right, we could have that kind of an economic recovery. I hope that's true. I don't think it's likely, and so that's why I think we should be planning for a more severe downturn.

And that leads me to be concerned about the health of the banking system. We've already seen it. People don't pay their mortgage. They're not paying their credit cards or auto loan payments. If this downturn continues, these losses end up rolling up into the banking sector, and how big are the losses going to be? We don't know. I mean, Andreas showed in his presentation that the Blue Chip model losses end up looking like the 2008–10 losses—basically, on average, bank holding companies getting their capital cut in half. Of course, that average masks heterogeneity beneath it. It's that heterogeneity that causes market participants to pull back from the banking sector as a whole, because they don't know which banks are ultimately going to be most exposed.

The 2008 crisis is just burned into me, and April 2020 reminds me of April 2008. In March of '08, Bear Stearns was rescued, thanks to the Federal Reserve's actions. Markets started breathing a sigh of relief. In April, people thought, "Maybe we're through it." The banks said, "Oh, we're fine. We've got enough capital." They continued paying dividends. They refused to raise capital. And, of course, the much bigger shoe was yet to drop in the fall. I obviously hope that doesn't happen here, but I think we should be urging banks both to stop paying dividends and to be raising capital just as a precautionary measure.

I think the fact that this is happening 12 years after 2008 is just shocking to me and probably shocking to all of us. Over the longer term, I think it is going to raise many more fundamental questions about our regulatory system, not just for banks, but for nonbanks. I mean, the basic theory of our regulatory reforms coming after '08 is that institutions should be self-insuring. And yet we've already demonstrated that that's failed.

The Federal Reserve has taken extraordinary actions in the past month, and I support those actions. It was the right thing to do to stand up all of these facilities to support financial markets. And now everybody knows that we're there. And we were there in '08, we are there now, and we're going to be there in the future. And so, even after we officially deactivate these facilities when the COVID-19 crisis passes, in a sense, these facilities are always on in the background now.

And so, to me, I think we have to ask, over the long term, much more fundamental questions about the structure of our financial markets. Think about overnight funding markets. Is there any social value to allowing institutions—banks or nonbanks—to fund themselves overnight? The only social value that occurs to me is that they can maximize their profits in the short run, knowing that the Federal Reserve is going to be there in the long run when things get scary.

And so I know we're not going to answer these questions today, this week, or this month, but I'm beginning to think about, if we have this very robust Federal Reserve–provided safety net behind the financial system—and I agree that we should, I'm not questioning that—I think it should lead to much more profound questions about the regulatory system that we have in the future so that taxpayers aren't "on the hook," with the private sector getting the benefits. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. Vice Chair Williams, please.

VICE CHAIR WILLIAMS. Thank you, Mr. Chair. As others have indicated during this go-round, there are numerous reasons to be concerned about vulnerabilities to the financial system stemming from the coronavirus epidemic. I'd like to emphasize one of those on the list, and that is that consumer business and market sentiment and behavior may be predicated on an overly confident assumption that the crisis will soon be behind us, and that a swift return to normal will ensue.

In particular, there's a very real risk that restrictions may be lifted too soon, and that testing will be inadequate, leading to a potentially devastating second wave of the coronavirus. Such a situation, as described in the Tealbook's "Second Waves" alternative scenario, has been mentioned by a few people already. I should note that the Board staff views this scenario as equally likely as the baseline one, and I agree. In addition, the southern hemisphere is only starting to see the full effects of the spread of the virus, which poses risks to the global economy, supply chains, and financial markets.

My research staff has been studying the highly nonlinear nature of the epidemiological models, in which relatively modest changes in assumptions or policies can lead to divergent paths of the virus and the economy. This sensitivity is closely related to the knife edge, between a stationary process and a nonstationary one, that we study in economics. Their analysis highlights the point that, although a short-run tradeoff between economic activity and the spread of the virus exists in theory, many policies and paths are far from this frontier, with worse outcomes on both dimensions. And this prediction is borne out by evidence on the 1918 flu pandemic uncovered by New York Fed and Board economists.

They found that regions that had less aggressive public health interventions were associated not just with worse health outcomes, but also with weaker subsequent economic recoveries. My staff developed an epidemiological model that allows for various degrees of testing in shutdowns and used it to simulate possible exit strategies from the current "pause" phase. And the analysis indicates considerable risks arising from fully reopening the economy in May or even in June in the absence of widespread testing of individuals.

There is a significant probability of a second wave of infections even larger than the first one, and this possibility arises because a decline in infections is not enough to warrant lifting social-distancing policies. It's the level of infections that's of paramount importance in the timing to ensure that cases do not rise quickly afterward. A premature relaxation of restrictions can lead to the transmission rate of infections returning above 1, which, coupled with a still-high number of outstanding cases, could cause an explosive rise in new cases as early as this summer.

Now, if such a second wave were to occur, I would expect a much more severe contraction, with output down around 10 percent for this year as a whole. And such a scenario would bring with it much greater risks of household and business defaults and pervasive financial market instability, which in turn could feed back on the economy. Analysis by my staff finds that the lower 5 percent quantile of 2020 growth would be about minus 20 percent if there were this feedback loop of greater financial instability.

Now, beyond the tragedy of human suffering and loss, my concern is, if such a scenario should play out, our lending and monetary policy tools would fall well short of what's needed to restore the economy to full health in the foreseeable future. And the resilience of the banking system, which we have been counting on, would be severely compromised.

I sincerely hope that this dire scenario will be avoided. But we do need to prepare, in case it is not. Thank you.

CHAIR POWELL. Thank you. That concludes our financial-stability comments. We're going to take a short break now, and we'll come back at 3:00 sharp. Jim Clouse informs me that it's appropriate to just leave your phones on mute and connected during this period, if you like. And then when you're back, just send a Skype message saying "Back." So thanks, everybody. Talk to you at 3:00. Thanks.

[Recess]

CHAIR POWELL. We're now going to turn to the economic go-round, beginning with Governor Clarida.

MR. CLARIDA. Thank you, Chair Powell. The U.S. economic outlook has deteriorated markedly since we met on March 15 and, if anything, is even more uncertain today than it was six weeks ago. But, notwithstanding this uncertainty, it is evident that government policies to require households to shelter in place and nonessential businesses to close, though necessary to "bend the curve" on the virus contagion, also pushed the economy into recession in March. This downturn will almost certainly feature the steepest decline in U.S. real economic activity since World War II. Since the March FOMC meeting, more than 25 million Americans have filed for unemployment benefits. The unemployment rate will soon soar to double-digit levels last seen during the Great Depression.

But although the economic news has been unremittingly awful since our March meeting, financial conditions have eased, and considerably so in many markets. I believe, and most outside observers agree, that this easing of financial conditions is the direct consequence of the actions that the Federal Reserve has taken since the March 15 FOMC meeting and the subsequent announcements of nine new credit facilities to support the flow of credit to households and companies. This easing of financial conditions is, of course, welcome. But it may not prove to be durable, depending on the course of COVID-19 and the duration of the recession that it causes. At minimum, the easing of financial conditions is buying some time until the economy can begin to recover, but we should not lose sight of the reality that what today is a problem of illiquidity, which Federal Reserve policies can address, may at some point morph into a problem of insolvency, which monetary policy is not well suited to solve under our existing statutory structure and price-stability mandate.

Each of us today faces the challenge of pulling together a baseline outlook and forming a judgment about the balance of risks. As much as I wanted to convince myself that the staff's baseline is too pessimistic, I confess that I found their analysis and the marshaling of evidence, both economic and epidemiological, to be persuasive. To review: That baseline sees real GDP declining by 4½ percent this year, compared with the 2.2 percent growth rate that we projected as recently as January. Sequentially, our forecast is for real GDP to decline 1½ percent in Q1 and 9½ percent in Q2 and then to rebound by 7½ percent in Q3 and 2.1 percent in Q4. To be clear: These are actual—not annualized—growth rates, which are too depressing to quote—minus 38 percent in Q2, for example. We project the unemployment rate to peak at 18 percent in May, a full 8 percentage points higher than any U.S. unemployment rate recorded since the Great Depression. And, as sobering as the staff's baseline is, it is by no means an outlier, as the Tealbook comparison table confirms.

I do note that while our baseline view is for a staggeringly steep collapse in economic activity, the baseline also projects a relatively brief two-quarter decline in economic activity, with recovery commencing in the third quarter of this year. But, in terms of the alphabet, neither we nor most outside forecasters foresee a *V*-shaped recovery. In our baseline, real GDP does not reach its previous peak until the end of 2021, and the unemployment rate does not return to 4 percent until 2023. And, unfortunately, as some others pointed out a moment ago, there are other far worse scenarios that are not only possible, but very plausible, depending on how the course of the contagion evolves. In particular, the staff baseline does not factor in a significant second wave of infections next winter. Were a widespread second wave of infections to emerge, the damage to the economy would be much more severe and long lasting.

Yes, I do realize that probability distributions have a right tail as well as a left tail, but I do agree with the analysis that the risks to the outlook, unfortunately, are skewed to the downside. And I also fully agree with the assessment that, on net, the COVID-19 contagion shock is disinflationary, not inflationary. In other words, while both aggregate demand and supply are being disrupted, the net effect will be on aggregate demand to decline relative to supply. And, if anything, I think the projected core PCE inflation path in the Tealbook may be too optimistic.

Let me close with some observations on U.S. fiscal policy. As the staff analysis points out, the recession would be projected to be much, much deeper in the absence of a fiscal policy response that is not only massive, but, by U.S. standards, timely. In several pieces of legislation passed in just a matter of weeks, the Congress has voted for more than $2.5 trillion in COVID-19 relief, or more than 10 percent of GDP. And this includes more than $600 billion in the Paycheck Protection Program and $450 billion to the Treasury to provide first-loss equity funding for Federal Reserve facilities. The scale of this package is such that the staff projects that disposable household income, notwithstanding the elevated unemployment rate, may actually increase this year, despite the steep recession. But the stimulus forthcoming from fiscal support to households is damped by a projected spike in household saving and a collapse in business profits and investment.

In sum, notwithstanding robust and timely monetary and fiscal policy support, the plausible best-case scenario we confront features an output gap of at least 4 percent of GDP persisting into 2022 and significant slack in the labor market lasting even longer. We entered this recession with core PCE inflation running below our 2 percent objective and are likely to see it running below that this year and next year as well. I shall have more to say on this, and the implications for monetary policy, tomorrow. Thank you, Chair Powell.

CHAIR POWELL. Thank you. President Rosengren.

MR. ROSENGREN. Thank you, Mr. Chair. Massachusetts continues to require shelter at home, with one of the largest outbreaks outside of the New York metropolitan area—now exceeding 50,000 confirmed cases. Some hospitals in downtown Boston are nearing full capacity in intensive care units, and some new patients are being directed to other hospitals.

The Institute for Health Metrics and Evaluation, or IHME, forecast for the appropriate timing to reduce social distancing in Massachusetts is after June 8. Consistent with this forecast, schools have been canceled for the remainder of the school year. Massachusetts is also planning a robust contact-tracing program once community spread has been reduced significantly. Unfortunately, medical officials and epidemiologists in the area place a high probability that Massachusetts and the nation as a whole will face additional waves of infection either in the short run, because of mobility of individuals coming from areas that have had less strict social distancing, or in the long run, because of a resurgence of the disease in the fall or winter.

While preparing my forecast for the FOMC cycle, I told President Bostic that I had Georgia on my mind. Comparing the experience across states is difficult, given the different testing rates, but Massachusetts appears to be having a tougher time than Georgia. Yet the IHME suggests that Georgia, like Massachusetts, should wait until after June 8 to relax its social-distancing policies. Unlike Massachusetts, Georgia is already beginning to ease the social-distancing policies in the state. In light of the mobility across states, such significant policy differences make medical projections of repeat waves of infection in both the short and long runs seem even more likely.

As a result, my forecast is an average of the baseline outlook and the "Second Waves" alternative scenario in the current Tealbook. My approach of forecast averaging, given the current circumstances and the downplaying of the modal forecast, is quite similar to the FOMC's approach during the second Gulf War, when the high degree of uncertainty resulted in a forecast that was an amalgam of scenarios. Given the current health status, economic uncertainty, and the very disparate actions taken across states to combat the pandemic, an average of these two forecasts is probably our best bet at this time. A simple averaging of the Tealbook baseline and the "Second Waves" alternative scenario results in an outlook that is much grimmer than the Tealbook's modal forecast, and maybe I'm being too optimistic at that.

One important issue with a forecast conditioned on additional COVID-19 flare-ups is that second waves are bound to be a significant challenge to any industry in which social interaction is a critical component of economic value. Unfortunately, these industries also tend to be labor intensive and rely heavily on workers making hourly wages. With unemployment insurance claims for the nation already likely consistent with an unemployment rate greater than 15 percent, many states still not well past the pandemic peak, and subsequent waves of infection potentially on the horizon, we risk experiencing a sustained period of high unemployment.

Indeed, my staff's analysis on the potential for job losses across disaggregated sectors of the economy, which pays particular attention to those sectors that importantly rely on social interactions, suggests the potential for the unemployment rate peaking above 20 percent. Higher peak unemployment, along with a secondary wave infection, suggests a potentially worse trajectory for the unemployment rate than a simple average of the Tealbook's baseline and "Second Waves" scenario.

One of the important features of the economic effects of the pandemic is how quickly production plummeted as a result of widespread government-mandated shutdowns. However, my forecast takes into account the possibility that the recovery will not only be hindered by periodic infection flare-ups, but also by changed consumer and firm behavior, changes that could prove difficult to offset with monetary policy. In the Tealbook baseline, the decline in most of the private components of demand this year is offset by recoveries of roughly similar magnitudes in 2021. One area in which there may be more of a structural break in demand as a result of the pandemic is in spending categories that may be more permanently affected because of social-distancing concerns.

Given that COVID-19 is most lethal for older individuals, older households may have a more permanent aversion to activities that place them at a greater risk for infection, thus influencing their spending behavior. When one looks at consumption of food outside the home, entertainment, and travel expenses in the consumer expenditure survey, households aged 50 through 79 account for between 45 and 55 percent of spending in each category. Therefore, if older households alter their spending behavior in a more permanent manner, there will be longer-lasting effects on consumption in these categories. Households in general may also choose to save more for fear of increased future medical and other expenses should COVID-19 affect them or their families.

On the investment side, firms in the aforementioned industries, whose revenues require close contact and social interaction, are likely to be disproportionately affected, resulting in bankruptcies, layoffs, and a reluctance for new firms to enter the sectors. Because of these potential structural shifts in consumer and firm behavior, I am carefully watching whether more-permanent changes in demand may alter the medium- and long-term outlooks. It is still early in the pandemic. However, as we think about appropriate monetary policy, we need to remain extremely open and flexible, given that both the short- and long-run effects of this crisis are unusually uncertain. I will return to this topic tomorrow. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Harker.

MR. HARKER. Thank you, Mr. Chair. The staff forecast seems reasonable and is consistent with the discussions I've had with contacts in the Third District and around the country. That said, I am less sanguine that the bounceback will be quite so rapid, as others have said, but I don't think we gain much from debating between really bad forecasts and really, really bad forecasts. I'd rather spend my time this afternoon relaying information my team members have obtained from a couple of novel surveys they've undertaken and from a new and extensive data set on credit and debit card usage.

Regarding the latter, relative to a year ago, we have seen credit card charges fall more than 30 percent this month, with declines of nearly 90 percent in travel and 60 percent in both fuel and entertainment. The only category showing any increase was food and drugs, which grew slightly less than 15 percent. However, in the week ending April 22, there was noticeable improvement in spending on general retail goods. With respect to debit cards, the picture is strikingly different, with card purchases actually increasing 6 percent in the latest week. There was dramatic growth in the categories of home improvement—73 percent—and general retail services—68 percent—and significant growth in the food and drug and automotive categories. We hope that strength will carry over into some other categories and into some other forms of transactions and represents a harbinger of pent-up consumption demand.

These data, by the way, come from one of the largest U.S. payment card networks and represent about one-fifth of all consumer spending in the United States. And on a personal note, I can attest to the large increase in home-improvement expenditures, having fixed literally every annoying thing in my house over the past month, including honing my plumbing skills and installing a fence. So just FYI for the members of the FOMC, I am available for hire.

Turning to some of the surveys we've done, the members of our team in the Consumer Finance Institute conducted a survey during the week spanning April 3 through 10 and will continue to do so each month. The survey had around 3,500 respondents and asked a detailed set of questions. The survey is nationally representative, so let me relay some of what the team has uncovered. Regarding work arrangements, about 40 percent of employees continue to work on site, while 32 percent have switched to working remotely. This is consistent with estimates of the national workforce that can work remotely—so anyone who can work remotely appears to be doing so.

Roughly one-fifth of the workforce has been furloughed or laid off. About 4 percent of workers were affected by COVID-19, meaning either they themselves had symptoms or were caring for a family member that had symptoms. Unemployment was concentrated among those earning less than $40,000 before the crisis, with 28 percent of that group being furloughed. That compares with only 8 percent of those earning more than $125,000 being furloughed.

Regarding income, roughly one-half of respondents reported no change, and nearly one-fifth reported little change. But 10 percent of respondents reported losing more than one-half of their income, and one-tenth reported a total loss of income. While 10 percent of respondents reported they needed resources immediately, another 24 percent indicated they would need additional resources by early May. However, when broken out by income, again, those earning less than $40,000 are feeling the most financial pressure. Thus, we are experiencing both a health crisis and an income inequality crisis.

The pandemic is also affecting expected spending patterns, and the survey is, for the most part, consistent with what is reported in the credit card data I just cited. A small portion of respondents reported they expected their spending over the next 90 days to increase. But the majority expect their spending to decrease, with 13 percent expecting their spending to fall by more than one-half. Almost one-fifth of respondents have requested deferrals on rent, mortgages, utilities, or credit card payments, with roughly 40 percent of those requests being granted and about one-fourth being rejected.

My regional staff is also conducting a survey on an ongoing weekly basis, which mostly involves small businesses. And the sample for this survey has gradually grown to almost 600 respondents, with about 250 responding in recent weeks. Of those surveyed, 75 percent have seen a decline in sales of more than 5 percent, and 16 percent of firms have shut down at least temporarily. The percentages have been remarkably consistent from week to week.

Almost one-half of the firms have ceased hiring, and about 30 percent have cut average weekly work hours. Between 25 to 35 percent of firms have furloughed workers, and, as of the latest survey, 15 percent have laid off workers. That percentage is consistently trending up across the weeks. And 70 percent have adopted telecommuting for at least some portion of their workforce. As of April 12, an astounding 87 percent have applied for a Paycheck Protection Program loan, with 32 percent getting approved so far. Many firms seem to be trying to retain workers as long as possible, although, with unemployment insurance becoming more widely available, that may change. The sentiment was really aptly expressed by one of our contacts: “We should be cutting employment more, but my heart is interfering with my business sense.”

Regarding the Board's staff projection of a rapid bounceback in economic activity, discussions with Third District manufacturers are consistent, actually, with that scenario. A diversified manufacturer mentioned that orders in the transportation industry were down 80 percent in April, but—and this is an important "but"—this is not due to cancellations, but the result of people pushing back delivery dates. Rumors are that the orders will pick up by mid-May. In fact, the biggest "takeaway" from the conversation with the owner of this business is that the current decline in activity, although historically unprecedented, does not resemble the decline in activity that took place in 2001 or 2008. In those recessions, orders were just simply canceled, his order book dried up, and the backlog disappeared for the foreseeable future.

Currently, firms are actively managing liquidity and don't want to accumulate inventory until they can use it. They are pushing out orders week by week, and, eventually, it looks like there will be a race for product. This business owner's biggest worry is that, in this event, he will be unable to supply everyone at once. In addition, this business owner reported his backlog of orders has been recovering after hitting a trough in mid-January. So what he is seeing appears consistent with the staff's optimistic recovery scenario, at least when it comes to the manufacturing sector in our District.

There are, however, some concerning signs in the economy beyond the actual numbers pertaining to activity and employment. About one-fourth of firms report that they have saved up about 13 days' worth of normal operating expenses. Now, that can, of course, be extended through access to credit and decreased expenses during the lockdown, but it does paint a picture of an economy that is dangerously close to the precipice. Thus, the measures taken by this institution and fiscal authorities to buttress our economic infrastructure take on overwhelming significance, as they buy us time to open up the economy safely. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Mester.

MS. MESTER. Thank you, Mr. Chair. The Cleveland Fed has been engaging in ample outreach to business, labor, community development, and consumer contacts in the region to assess economic conditions, but the result of the outreach paints a very pained picture. The spread of COVID-19 and the social-distancing measures taken to slow the pandemic have had a material adverse effect on the regional economy since mid-March. The region's economy has evolved from one that was growing at its trend rate, with tight labor markets, to one that has experienced declines in spending across the broad array of industry segments, with high and rising unemployment rates.

Firms report that the year started on a solid note, but that ended abruptly in March when Ohio, Pennsylvania, and Kentucky imposed stay-at-home orders. Consumer spending is down across almost every sector. The only firms that have fared well are those manufacturing goods related to health care, food, and household products, and grocery stores. One local grocery chain reported that same-store sales were up 150 to 200 percent year-over-year. Most manufacturers are seeing substantial declines in their orders.

In mid-March, automakers temporarily suspended light vehicle production to protect worker safety. Suspensions at the six auto assembly plants in the Fourth District remain in place. Together, these plants contribute more than 10 percent of the country's light vehicle production and support more than 100,000 jobs in motor vehicle and parts production. Reports suggest that these plants may resume production in May, but the UAW has opposed an early May opening, so there is considerable uncertainty about the timing.

There has been a sharp drop-off in confidence among businesses and households, as the negative effects of the virus have risen from week to week. Regional firms are taking defensive positions, pulling back from risk-taking, conserving cash, putting capital expenditures on hold, and drawing on their credit lines. More than half of District contacts reported they have delayed or canceled planned capital projects. One of the country's largest developers of apartment buildings, headquartered in Cleveland, has halted all of its new market-rate projects for the foreseeable future.

Now, at the beginning, firms told us they intended to keep employees on their payrolls, but over time, an increasing number have laid off or furloughed workers. District job losses appear to be deeper than the national average, reflecting the importance of manufacturing autos in our region. Payroll employment fell 0.6 percent year-over-year in Ohio in March, about 40,000 jobs. In contrast, employment fell 701,000 jobs in March for the nation as a whole, but the level of employment was still 1 percent above its year-ago level.

In addition, Ohio saw a larger jump in unemployment in March than the nation did. The national unemployment rate rose 0.9 percentage point to 4.4 percent in March. In Ohio, the unemployment rate rose 1.4 percentage points to 5.5 percent in March. In 2008, it took three months to see such a rise in Ohio's unemployment rate. New filings for unemployment claims have surged, overwhelming the system. West Virginia has literally called in the troops—the National Guard—to assist with its claims backlog.

Business contacts expect economic stress to continue over the summer. Less than one-third of District contacts expect conditions to improve fairly quickly. Many expect that it will take at least a year for output to return to pre-pandemic levels. Many businesses also expect consumer behavior to be affected for quite some time, and that this change in behavior will weigh on the recovery.

Now, this is somewhat different from what we're learning from a new daily online national survey of households that the Cleveland Fed has been running since early March. The survey features a number of questions that are directly focused on the coronavirus outbreak, and some of the results of the survey are now published on the Cleveland Fed's website. Similar to those of District contacts, the attitudes of household respondents to our nationwide survey have deteriorated over time. Most respondents had initially thought the outbreak would last less than six months; more now believe it will last a year, and a growing number think it could last two years. As a result, many households are increasing savings. One-half say they fear losing their jobs, and about two-thirds say they are storing more food. And that's a larger percentage than those storing more medical supplies.

The households we surveyed expect the virus to push inflation higher. Now, although that's at odds with a Phillips-curve view of inflation, it is consistent with other research findings that households tend to associate bad news on the economy with higher inflation. But it's interesting that many respondents say that once the coronavirus crisis has ended, they expect to go to restaurants, bars, and malls, and attend crowded venues—such as concerts and sporting events—roughly as much as they did before the crisis, with a sizable number reporting they plan to increase usage.

I view the shutdown of economic activity and practice of social distancing as an investment in public health, intended to buy time so that the health-care system can increase its capacity to care for the sick so that more can be learned about the virus's spread and who is most at risk, and so that better testing, monitoring, and treatments can be developed. The good news is that evidence suggests that this investment in public health has yielded benefits in terms of flattening the curve of new cases.

I serve on the Board of Trustees of the Cleveland Clinic, so I've had the opportunity to observe the efforts that institution is undertaking as a result of the virus. The clinic was proactive in preparing for the surge, converting its newly opened, state-of-the-art teaching facility into a 1,000-bed "surge hospital." New hospitalizations have stabilized in Ohio over the past two weeks, so the hope is that Hope Hospital, as it's being called, won't be needed now, although it stands ready for the increase in cases that epidemiologists tell us to expect in the fall.

Another positive is that new data suggest that more people may have already been exposed, and mortality rates are lower than previously thought. And, at least in Ohio, there has been some increase in test capacity, although it's still far from the goal of being able to test everyone or even everyone who has symptoms. While the shutdown has yielded important public health benefits, it's also led to extensive economic hardships. Much of the sacrifice being made in the interest of public health is being borne by the most vulnerable in our economy: lower-income workers and communities, those who don't have the opportunity to work from home, those who don't live in areas that have reliable telecommunications and internet services or access to adequate health care, and smaller businesses.

The policy actions taken by the federal government and the Federal Reserve are intended to help ensure that the shutdown does not cause lasting damage, that the temporary disruption in activity doesn't become much more persistent, and that the economy is in the best position to recover as it can be, given this difficult situation. I've likened these relief efforts to building a bridge to get us from the generally good economy we had in February to the other side of the pandemic shutdown period. Now, the duration of the shutdown has lengthened over time, so that bridge has to be longer than first assumed, and it also has to be wider, as more households and firms are in need of some kind of help. The nature of the recovery will depend on how successful the country is at controlling the disease and how successful policy actions are in preventing more persistent damage to the economy.

My view of the first half of the year is consistent with that of the Tealbook, with real GDP down about 5 percent in the first quarter and about 30 percent in the second quarter and the unemployment rate moving up to around 20 percent in the second quarter as a result of the stay-at-home policies. I expect inflation to remain low for some time to come. In looking further out, because this type of shock is very different from the type that drives the typical recession, because the underlying fundamentals, going into the pandemic period, were very solid, and because there has been a sizable policy response with more expected to come, there is some chance we can build a solid enough bridge to avoid or significantly mitigate the typical recession dynamics. This time may indeed be different.

The Tealbook's baseline of a pickup in economic activity starting in the third quarter and a gradual return to more normal growth rates over the forecast horizon is a possibility. But I am getting concerned that this outcome is too optimistic. The length of the shutdown has grown over time, given the course of the virus, so the economic needs are greater than first assessed. In addition, there have been some implementation challenges in making sure that the relief gets to those who need it, and it appears that the Treasury's risk tolerance is low, to judge from the discussions surrounding some of the terms of the lending programs.

The Tealbook's baseline assessment of the effects of the government relief policies may be too optimistic. There's a possibility that the collateral damage will be large, borne by those least in a position to bear it, and this will create more lasting damage to households, businesses, and the future productive capacity of the economy. We've already seen actions in some sectors, such as higher education, that will affect 2021 and beyond. If temporary layoffs become permanent and we experience a large number of business closures, we may see persistent negative effects on potential growth and the usual recession dynamics, which will make for a shallow and prolonged recovery.

The more-positive news about the course of the virus, coupled with the increasingly negative news about the effects of the shutdown on the economy, has led some states to begin planning for the return to work even though widespread testing and monitoring and a vaccine will not be available for some time. As the head of the Cleveland Clinic puts it, “We cannot hold our breath forever. The virus is something we will need to learn to live with.” On May 1, the governor of Ohio will begin relaxing some of the restrictions on businesses and households. This will be a slow and staged process, with significant general and industry-specific protocols that will need to be met. These protocols will preclude many firms from reopening at an early date. For example, schools, restaurants, salons, and gyms, among others, will remain closed.

If all goes well, the Ohio plan will offer a path for other regions. However, an approach based on science, including the careful monitoring of the disease, will be critical to ensuring that we don’t find ourselves needing to shut down all activity once again. In our current situation, it’s crucially important that we *do* go gently in order to avoid going into that good night that Dylan Thomas wrote about so eloquently. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Bostic.

MR. BOSTIC. Thank you Mr. Chair. Given the unprecedented nature of this emergency, which makes the usual macroeconomic data decidedly uninformative for thinking about policy today, the Federal Reserve’s staff has gone into what I’d call “hyper mode.” In the Sixth District, regional executives collected information from three to four times more contacts than we typically do during a normal policy cycle. We similarly activated our extensive survey apparatus by adding special questions to several of our April surveys. These efforts have helped provide a more complete picture of the rapid changes that have taken place over the past month, and I'd like to commend and thank everyone across the Federal Reserve System for their efforts. They have made a difference.

The experience among businesses in the Sixth District largely mirrors what President Mester just reported. Most businesses are in distress and trying desperately to hold on, with a smaller number of firms benefiting from a shift in focus to household basics and an increased reliance on home delivery. Sentiment was trending negatively across the board. One of the best overall descriptions of our current situation that I have heard was given by a director, who adroitly observed that because this downturn is rooted in biology, the solutions to this emergency lie outside the influence of the Fed and other policymakers and will rely instead on many individual actors. This fact leaves open many possible paths, a degree of uncertainty that will likely contribute to significant volatility.

On that note, I would like to speak to the topic of the reopening the economy, as many Sixth District states, as well as neighboring states, are beginning to take initial steps in that direction. While I certainly acknowledge that—on the evidence of video calls that I've been on recently—many of my friends, family, and colleagues are in dire need of a haircut, that reality should not color how we balance the desire to get back to a functioning economy against the risk of potentially impairing public health by returning to business as usual too quickly.

On this point, today staff members noted an assumption in their modeling that stay-at-home orders would remain in place through May. Experience and signaling by policymakers in many states suggest this might be too optimistic. In Georgia, for example, the beginning of easing is occurring at a time when the coronavirus caseload is still increasing. This concerns me and makes me worry that a second wave would come and even sooner than in the "Second Waves" model presented by the staff this afternoon. I take President Rosengren's state of mind to heart: I assure everyone, I wish Georgia *wasn't* on everyone's mind.

That reality notwithstanding, my conversations with both local public officials and businesses have revealed a thoughtfulness that bodes well for how we will transition to a "business open" phase and gives me some degree of optimism. In addition, while it is still too early to determine what the behavioral response to Governor Kemp's reopening orders will look like, at least two data sources indicate that distances traveled last Friday and Saturday in Georgia were similar to behavior during the formal lockdown. We will continue to watch a variety of novel mobility data series to see if this pattern persists.

A frequent theme that has arisen from our outreach during this period has been that this public health shock is catalyzing structural sectoral adjustments that have been delayed by the long expansion period. The excess capacity in the restaurant industry that many have decried may soon be a thing of the past, as some of our contacts are expecting this crisis to result in a 15 to 20 percent reduction in the number of restaurant establishments. Many institutions of higher education that have long held precarious financial positions, including smaller liberal arts colleges, may soon be facing their day of reckoning. And I would be remiss if I didn't express my concern for the viability of many nonprofit organizations, particularly those that serve low- to moderate-income communities. These organizations, which are reporting large increases in demand for their services, are among the least well prepared to weather this type of shock.

In coming months, I will be closely monitoring the resilience of these industries as well as the economy more broadly. I am concerned that if households and businesses do not have the resources to bridge this health shock and the related social-distancing measures, we will be facing a more traditional business cycle shock in the second half of the year, with plans for capital expenditures and durable goods spending being set aside and prospects for a bounceback in employment fading significantly.

Along these lines, one of the dynamics that I am watching most closely is the distinction between temporary layoffs and permanent layoffs. I was encouraged by the recent analysis by the Board's staff using ADP data, showing that the decline in active workers, those who continue to show up on payrolls of firms even if not being paid, was significantly smaller than the decline in paid workers in total. Obviously, we hope that this gap is resolved by the return of those unpaid workers to their firms, and we also hope efforts like the SBA's Paycheck Protection Program will facilitate this among small businesses. More generally, it will be very helpful to be able to assess the effect of the wide range of programs being implemented so we have better sightlines into the industries, regions, and communities in which they are assisting. I'm hopeful that we can develop and share Fed facility dashboards that offer the Committee insights that help us better assess economic conditions as they evolve.

At our recent Atlanta and Branch Board meetings, we asked all directors to comment on the current recovery path that they see for their businesses. While we offered them the set of letters that we have all been discussing—*V*, *U*, *W*, and *L*—many directors called out the "Nike swoosh" as the best descriptor of their expectation for the shape of the recovery. Many said there is a distinction between having the store open and doing good volumes.

Directors from a range of industries commented that it will likely be 6 to 12 months before they see activity returning to normal. And for the tourism and hospitality sectors, that timeline is closer to two years. My initial hope, going into this, was for a *V*-shaped recovery.

But, unfortunately, the broad sentiment in the Sixth District suggests that one of the other patterns is going to be the eventual outcome. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. We're getting a lot of distortion from some of the phones, so just hold on one second while we see if we can address that. Hang on one sec.

[Brief pause]

CHAIR POWELL. Okay. We think that it's people who are, in effect, using an internet phone by speaking through their computers. We're getting distortion when hearing from two of the five speakers we've had so far. So if you are reaching us through your computer, perhaps you could dial in through a nearby landline, if that's okay. I'm afraid we're going to have a lot of distortion with these internet phones. You can hear, but it's very hard to follow part of the time. Does that make sense to people?

MR. BARKIN. Yes.

CHAIR POWELL. We're going to take a four-minute break, until quarter of 4. If you are using your computer, we want you to just get the line number handy and then dial into the conference bridge from a landline. Jim Clouse, is that going to work?

MR. CLOUSE. Yes, we think so.

CHAIR POWELL. Sorry about the trouble. We'll be back on in four minutes with President Bullard.

[Brief pause]

CHAIR POWELL. Okay.

MR. CLOUSE. Thank you, all. Sorry for the break. I just wanted to call attendance to make sure everyone is back, if I may.

Chair Powell	Here
Governor Quarles	Here

Governor Bowman	Here
Governor Brainard	Yes
Governor Clarida	Yes
President Rosengren	Here
Vice Chair Williams	Here
President Harker	Yes
President Mester	Here
President Barkin	Here
President Bostic	Here
President Evans	Present
President Bullard	Here
President Kashkari	Here
President George	Here
President Kaplan	Here
President Daly	Here

All are back.

CHAIR POWELL. Okay. Sorry about that, folks. Modern technology. Let's go. Please go ahead, President Bullard.

MR. BULLARD. Okay. Thank you, Mr. Chair. I have some remarks on how I see the current state of the crisis. First, I agree with President Mester that it's important to stress that the nature of this shock is very different and largely unprecedented, so appealing to past data is probably inappropriate in this environment. We are experimenting with a temporary shutdown to invest in public health that we hope is followed by a phased reopening of the economy. This is something that has not been tried in U.S. macroeconomic history. The surprise shutdown policy is a blunt instrument but was perhaps necessary in this particular case. The nation was not as ready as we would've liked for a pandemic event of this magnitude. I do think we can take some solace that most other countries weren't ready either, so it wasn't just us.

In my view, the response of macroeconomic policy has been appropriate. We've seen a rapid adjustment of both the fiscal and the monetary policy stances in just a matter of weeks. I also think that the insurance aspect of what's being done is appropriate—the idea that we want to keep firms and households "whole" as best we can during the pandemic adjustment period. It's no fault of theirs that this policy suddenly came into place and disrupted their businesses and their livelihoods. So we'd like to provide insurance to them, and I think that's what we're doing.

I also like Chair Powell's rhetoric about building a bridge to the other side of this crisis. I think that's appropriate and does describe what we're trying to do here. However, I think that this type of insurance or pandemic relief of this magnitude can be provided only temporarily. My estimate is on the order of 90 days. It's being delivered very unevenly across the economy, as you'd expect in a crisis environment. If we try to provide insurance at this level for a longer time, I think new problems will arise, and we'll have many new issues that come up.

My second point is, I think we have to keep in mind also that the magnitude of the shock is far outside the U.S. postwar macroeconomic experience. We have unemployment already rising close to or beyond Great Depression levels. Most estimates are in the range of 15 to 20 percent right now, so this is certainly well beyond even what happened during the 2007–09 period.

But I also think we should keep the nature of the shock in mind when we're looking at that unemployment rate. This is, in fact, the means of providing pandemic relief insurance to disrupted households. We've asked them to stay at home to invest in public health, and we've used the unemployment insurance channel as a way to provide that relief. So, in some ways, it's good news, because it means that we're getting relief to the people that need it during the pandemic adjustment period, and this unemployment rate may not mean exactly what unemployment rates have meant in response to other types of shocks that we've seen in U.S. macroeconomic history.

As for the effect on real output, the health authorities are really requesting that nearly all interaction in the economy be shut down. I think when we're talking with health authorities, they really have in mind almost nothing being produced—only police, fire, electricity, water, and other essential services of that nature plus whatever can be produced as a work-from-home workaround. To me, that suggests that if we were doing the health policy appropriately, we would see less than 50 percent of normal output being produced and, therefore, less than 50 percent of household income for some period. I think that most of the disruption will occur in the second quarter. So if the shutdown lasted the whole second quarter, you'd be talking about 50 percent of a quarter's output, something on the order of $2½ trillion.

Now, to the extent we're not shutting down nearly all interaction in the economy, it suggests that we're really not doing what the health authorities would like.. I also recognize that the shutdown will not exist in such a draconian fashion for the entire second quarter, so that could change numbers quite a bit, and certainly the Tealbook reflects this uncertainty. But my main point is that Wall Street and other forecasters, including the staff that developed the Tealbook forecast, may be understating the severity of the second-quarter decline because, basically, they have second-quarter production and income at about 90 percent of first-quarter production and income. That's still an annualized decline of 40 percent, but to get these magnitudes in your head, it's just astonishing.

If you're going to minimize output in pursuit of public health objectives instead of pursuing the normal goal to maximize output, you're really talking about pressing output down toward zero. And I think the macroeconomics community has had a hard time coming to grips with this reality—that, combined with wanting to take the movements in the macro variables and then extrapolate based on past data and past shocks, what's going to happen could lead us astray in the current environment. So I am concerned that there may be further downward surprises in, let's say, the next two or three months ahead as reports come in that the downturn was even more draconian than what we had previously thought. Markets might possibly react negatively to such a development.

Third, I would want to rally people around the idea that we should not call what we're doing—right now, anyway—"stimulus." In my view, we're trying to cooperate with health authorities who are trying to restrict economic activity greatly. And so we're trying to help them, and we're trying to keep economic activity low during the second quarter to invest in national health. So keeping economic activity low is completely the opposite of what we're trying to do in normal times.

Attempts to pull production into the second quarter can be counterproductive with respect to the health policy. To the extent you encourage people to consume more today or consume through channels that would otherwise be restricted by the health policy, you're doing something at cross-purposes with the spirit of the times. Instead, we're trying to produce and consume less during the current quarter, and we're trying to provide relief to those most disrupted, but we're not sending them back to work or encouraging them to return to previous consumption patterns. I think it is, again, very hard to think in normal macroeconomic terms for this very unprecedented situation and this unprecedented shock.

Fourth, I would characterize what macroeconomic fiscal and monetary policies are trying to do as a "large project," which, like all large projects, requires project management expertise and carries substantial risks. The project is to put the production process in the economy on pause for something on the order of 90 days and then restart it at that point, taking appropriate precautions against virus transmission. There are many risks associated with this policy, and there are many ways that this project could fail. In particular, we're facing a very serious risk of global depression, and we should not lose sight of that fact. Nevertheless, one country has arguably executed this project successfully—China—and so there is some hope. There has been no second wave there so far. Maybe it's still coming. Also, I think Wall Street seemed optimistic for now, so there may be some optimism out there that this project can be executed.

Fifth, Federal Reserve policy so far has been, in my view, appropriate in keeping financial markets liquid, as discussed earlier by Lorie Logan. My judgment is that, at least in the first phase of the crisis, liquidity policies have been sufficient to prevent an accompanying financial crisis from developing, which is, again, one of the key risks that exists for us out there. However, I do not think that the shutdown can go on indefinitely, and so it will be imperative to end the shutdown policy with appropriate precautions in place. I do not see the current situation as one in which interest rate policy plays a key role. I think rates are low. They're expected to remain low. I don't think anyone is really expecting that to do much here. I think that this is all about the virus and about the appropriate response to virus containment.

Sixth, on reopening and the questions around reopening, I'm more optimistic than the Tealbook and possibly than many of you on the Committee. I see the shutdown policy as a very blunt tool, which is not appropriately risk-based. I see a more risk-based, granular strategy regarding virus containment as evolving now and in the days ahead, as many different firms, households, governments, and nonprofit entities make judgments about how they want to manage the risks that they face. I do not see this as something that is orchestrated at high levels, although there are different roles to play, but at different levels of government. I see this more as the economy itself, and the entities in the economy, deciding how they want to react.

I would stress also that the U.S. economy faces many mortality risks every day and has systems in place to mitigate those risks. I see similar risk-mitigation systems developing now very quickly as the economy continues to adjust to the existence of the disease. Many other deadly and contagious diseases have existed throughout U.S. history, but that did not prevent the United States from becoming a global economic power. In my view, we should look for ways to end the crisis without counting on future scientific advances, like vaccines or therapeutics, which may never arrive.

Testing technology exists today and could be widely deployed to end the crisis. Demand for testing is quite high not just on the part of the health authorities, but also firms and households. To give one example, Amazon wants to test all employees. A market-oriented prediction suggests that tests will become ubiquitous in the months ahead in response to the very high demand. It also suggests that fiscal policy will focus increasingly on this avenue to end the crisis. Ubiquitous testing will mean that the location of the virus will be known at all times, and that people can interact with confidence that they are unlikely to be exposed to the virus in the workplace or in consumption activities.

I also think that fiscal policy should encourage this process even further by creating a "pop-up" industry in test production, designed to saturate the economy with testing technology. This could be done by paying costs of production for test producers but allowing them to sell their product on an open market and collecting the resulting profit. Such an approach would be very cheap compared with the trillions of dollars currently being spent on relief efforts, and it would use a known technology and not rely on the uncertain future of scientific developments.

In summary, while I agree with all of you that there are substantial downside risks in the current environment, I see our role in the weeks ahead as trying to point the way to an end to the crisis and avoid the potential global depression that could otherwise develop. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Kaplan.

MR. KAPLAN. Thank you, Mr. Chairman. Let me say a few words about energy. It goes without saying—and it's been well publicized—that excess output is now overwhelming available global storage. And we expect that we're going to reach the end of the road on global storage some time by the end of the second quarter, at which point it's our estimate at the Dallas Fed that 11 million barrels a day of production will be forcibly shut in, and there will be no space to store excess crude. Much of that production will ultimately come back, but some portion of it will stay permanently shut in—we think about 1.2 million barrels.

It's our estimate that there will be about 1.2 billion of accumulated excess supply in global storage at the end of the first half of 2020. And just to give you an idea how we got into this situation, oil inventories will grow by about 6.7 million barrels per day for the first 180 days of this year on average. Multiply that by 180, and you get to 1.2 billion.

The good news is, by the third quarter, we believe we will start to have consumption exceed production, and we will start working off that excess supply. The timing for working off excess oil inventories will be largely dependent on when global consumption returns to near-normal levels.

In a scenario in which consumption gradually normalizes and returns to near-normal levels by late 2021, we expect the excess inventory to be worked off by the second quarter of 2021. However, if consumption only recovers to 90 percent of normal, we think it will likely take until the end of 2022 for excess inventory to be worked off. The upshot of all of this for U.S. production is that we reached a peak of U.S. oil production of 12.8 million barrels a day in

December of 2019. We think we will end this year at 10.8 million barrels a day. In the interim, though, production on a daily basis will drop below 10.8 million, because as much as two million barrels a day will be shut-in and the decline curve for shale simply won't be replaced.

We think the activity level in shale basins is likely to fall by 50 percent this year, as most operators cannot profitably drill new wells, obviously, at these prices. We expect that production in the Permian Basin will shrink from approximately 4.7 million barrels a day in December 2019 to about 3.9 million barrels a day at the end of 2020.

It goes without saying, as a result of all of this, we're going to see a number of bankruptcies, restructurings, and failures among oil producers, oil field service firms, and even the midstream firms. The pipelines are going to struggle, because we have overbuilt pipeline capacity.

The average credit spread for high-yield energy companies now is about double the overall high-yield index, about 1,600 basis points. Things are going to get even harder as we go into the year, because the banks are going to reevaluate to whom they will lend, and it's going to be harder for energy companies to raise funds through bank borrowing. And, again, we're already seeing, in the process, the beginning of failures and restructurings throughout the industry. We expect that there will be a smaller number of players. It will be a much more consolidated industry—much less fragmented than the industry we've known up to now.

More broadly, for the 11th District, preliminary data obtained from our Texas outlook surveys show, like all the rest of you mentioned, steep declines in all indicators: historic declines, with headline indexes, and manufacturing and services setting record lows. As we dig into some of the special survey questions, though, what we find is approximately 48 percent of firms we surveyed said that this situation is negatively affecting the number of employees they employ. Of those, 42 percent said they expect to rehire all furloughed workers, while the remainder expect a reduced headcount. When asked about measures firms have taken to cover revenue shortfalls, 69 percent noted applying for a loan through the Paycheck Protection Program, by far the most common response. Other responses were drawing down cash reserves, reducing salaries, laying off employees, and drawing down credit lines.

Our Dallas forecast for the United States is broadly similar to the Tealbook. We continue to worry, as many of you do, about a second wave. Texas is already beginning steps to reopen, and it does not appear to us that testing, as President Bullard talked about, is as widely available as it needs to be to do this properly, but we'll see how this unfolds.

A key question we wonder about is, to what extent will this crisis damage the economy's growth potential? We think it is very likely to lead to lower investment over a long period of time as well as a reduction in the labor force growth rate, which was already sluggish to begin with. And so we worry about, actually, as we normalize, what the potential output in the United States will be. But we think it will be diminished.

Another key point that a number of you raised—Presidents Barkin and Kashkari and others—is that this shutdown may be different in that it's self-induced, but it has exposed a number of vulnerabilities in the financial system, particularly embedded leverage in the financial system, and I think it would be good in the aftermath of this to revisit what lessons we've learned. Thank you, Mr. Chairman.

CHAIR POWELL. Thank you. President Barkin.

MR. BARKIN. Thank you, Mr. Chair. The efforts to control this public health crisis through social distancing are having staggering effects on our economy. And, like the rest of you, we are seeing unprecedented declines in our manufacturing and service industry surveys and hearing dire concerns from our contacts.

When we last met, retail restaurants, travel, and entertainment had just been shut down. But over the past few weeks, the rest of the economy has been hit hard as well. Automotive demand has plunged, and airline struggles have affected aerospace. As President Kaplan just said, energy price declines are decimating the drilling and exploration sector. Business closures are damaging landlords. The meat supply chain is being disrupted. And even hospitals face a revenue crunch as they forgo elective surgery. Payment deferrals by struggling businesses and individuals are threatening liquidity. The unemployment numbers are unimaginable, and recent work by my staff, some of which is with colleagues at St. Louis and Kansas City, demonstrates that the dislocation is hitting the most vulnerable and the neediest communities the hardest.

One could try to take comfort from the historic levels of fiscal and monetary support in play and the tendency of our economy to bounce back. As the Tealbook says, transfer payments will increase disposable income this quarter despite all of the labor market dislocation. And, in general, service-sector declines have less persistent effects than those in construction or durables, as recent joint Richmond and San Francisco Federal Reserve research points out. All that said, I'm quite worried that our fiscal strategy and many businesses still have an outlook reflecting *V*-shaped recovery. But I believe absent a vaccine or credible treatment, our recovery will be much slower and somewhat weaker. Maybe rather than the "Nike swoosh," I'll call it a "reverse *J*."

Why do I think it will be slower? The evidence in China and from our essential industries does support the notion that businesses will be able to bring their operations back for the most part. The bigger challenge will be in bringing customers back. Industries like sports and entertainment that depend on large gatherings will suffer, but even industries like travel, retail, and restaurants will struggle with convincing consumers, now highly sensitive to the risks as infections continue, to resume their historic patterns.

In China and in South Korea, for example, shopper track data suggest store traffic is still 40 percent below its year-ago levels three months after their peak level of infection. Consumer confidence matters—business confidence, too—and let's accept both have been badly shaken by these health concerns. I also want to echo President Kaplan on why I think our recovery will be weaker, because I worry about longer-term damage that has already been done to the growth potential of our economy. Workforce growth is at risk. I've seen firsthand our own dual-career employees as they try to navigate work without reliable daycare, and I fear many will rethink their labor force participation.

Single parents or elder caregivers have the same issue. Perhaps vulnerable populations, like baby boomers, will retreat from the workforce to protect their health. Those dislocated may well struggle to be redeployed, and pandemic control efforts are already making immigration even more difficult.

I also worry about productivity. A new set of health-distancing protocols in restaurants, retail, and manufacturing operations will reduce throughput. Diminished confidence and additional debt burdens will constrain investment. Businesses are redesigning previously optimized supply chains in the spirit of resiliency more than efficiency. Assets are being stranded.

With a slower and weaker recovery, I fear a different sort of second wave from that outlined in the Tealbook. Seven weeks from now, the Paycheck Protection Program will run out of money to lend, and a whole swath of businesses will face demand inadequate to support their workforces. Perhaps international concerns will crystallize, too. Each successive round of fiscal stimulus will get politically more challenging. Emotions will be high.

That said, I do believe in the ability of our scientists to develop a treatment and a vaccine in good time. I recognize it's hardest to be optimistic when you're at the trough. I just worry about the length of the bridge required to get to the other side and the damage done to the economy in the interim. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Evans.

MR. EVANS. Thank you, Mr. Chair. The speed and severity of the collapse in activity over the past several weeks has been shocking. My contact reports, received from a wide range of businesses and nonprofits, paint a bleak picture. These entities face a broad array of immediate challenges and express deep concerns over what lies ahead.

Scattered among those dismal reports were a few descriptions of how firms are adapting their workplaces to operate in today's demanding environment. The responses to the public health challenge on the factory floor gave me hope that others would be able to scale up production as well when the time comes. Still, those reports only improved my mood from gloomy to pessimistic. Despite the efforts and heroic work by many throughout the country, the nationally directed policy response to the pandemic crisis in the United States has been poor.

John Roberts mentioned that Massachusetts and Michigan are contemplating working on contact tracing, and President Rosengren mentioned that, too. Uneven regional approaches will challenge a key assumption that could give life to the Tealbook's baseline outlook—namely, a relatively smooth transition from stay-at-home to back-to-work. So I worry that the likelihood that the United States avoids the truly awful second-wave and depression scenarios described in the Tealbook relies crucially on improvements on the national front.

My contacts are in broad agreement that adequate testing, tracing, and the development of effective therapeutic treatments are critical for bringing us to something closer to normal operations. An actual vaccine is probably necessary for a return to full capacity. This means the likelihood of various Tealbook scenarios depends importantly on the degree of national leadership support for these public health efforts. In the meantime, firms will largely be left to fend for themselves, some going as far as to produce their own personal protective equipment.

Several of my manufacturing contacts described their substantial and largely successful efforts to operate safely. This success and their success in making workers feel safe on the job is an important element of the roadmap to recovery once stay-at-home orders are relaxed. I spoke with a heavy equipment manufacturer who, as an essential business, has been in continuous operation in the United States. The company produces agricultural, construction, and turf maintenance machinery. Their factories are running at about 75 percent capacity globally, with production in China coming back strongly. Workers wear facemasks and safety glasses. They are separated by plexiglass if they must work in close proximity, and areas with close personal contact undergo intense disinfection. This firm also has a health center in which workers can be screened and tested and in which contact tracing and quarantining are coordinated. All told, the CEO indicated that their investments in health and safety have already reached upward of $100 million. I heard of similar efforts from a major steelmaker, two of Detroit's Big Three automakers that I spoke with, and another heavy equipment manufacturer.

These reports are encouraging, as they show that businesses will go to great lengths to do what is clearly necessary for production to continue or resume. And greater public awareness of these investments in worker safety could help people feel more confident about going back to work. These successful models need to be emulated and highlighted in the hopes of expunging the intensely negative headlines about dangerous working conditions elsewhere—in food processing plants, for example.

During these extraordinary times, such investments in worker safety are clearly necessary, but they're also costly and will reduce productivity. All of this adds to the financial pressures firms are experiencing. Indeed, many firms and nonprofit institutions are already strapped for cash or are making large efforts to conserve it. Several of my directors reported business customers asking to delay payments for 3 to 12 months. One who leads a major auto and consumer data and analytics firm said that delays at the top end of this range would leave them with significant liquidity issues. This firm had enjoyed healthy finances before the pandemic.

Numerous businesses and institutions have been drawing on lines of credit, seeking new loans, and requesting forbearance. These liquidity draws are essential for them to stay in business. Still, most will be saddled with considerable debt if they survive. Many households will be in similar situations. Clearly, debt overhang, depleted wealth, and thinner capital cushions would weaken economic fundamentals and have a notable effect on the trajectory of the recovery.

My contacts are considering a wide range of scenarios and what these scenarios might mean for a return to more normal operations. A common theme is that this contingency planning is useful but the paths of both the virus and the economy are too unclear to make confident predictions. That said, many think the most likely scenario is that the recovery will be a hard slog. The Tealbook baseline and its "Second Waves" alternative capture this thinking well.

One of my directors who runs a major manufacturing conglomerate remarked that he saw investment being scarred for a long time. His firm has a lot of business-to-business and cap-ex exposure, so he has a lot at stake here. A large automaker said it would be years before vehicle sales returned to pre-crisis levels. Another director who is on the leadership team of a global airline noted that bookings are dismal, and she does not see a quick return to anything like typical travel patterns.

We've been in regular contact over the past several weeks with the CEO of a large global temporary help agency. He has provided us with a worldwide perspective on the progression of virus-related business developments. He has consistently described the United States as about two weeks behind Europe. He also noted the important role of effective national leadership for the path forward, pointing to Angela Merkel in Germany as an example. He expects a shallow recovery in the United States, anticipating that businesses will be in cost-cutting mode for some time. For now, many of his client firms are trying to hold onto skilled workers with wages holding steady. I heard similar reports from some of my directors. They are taking a wait-and-see approach and maintaining workforces as best they can. But everyone is making plans for layoffs if conditions do not improve in coming months.

In terms of the national outlook, let me take a moment to congratulate Stacey, Beth Anne, and everyone on their teams for doing an outstanding job in providing us with benchmarks to gauge the potential paths that the recovery might take. I've had the great privilege to read and argue over many Greenbooks, Bluebooks, and Tealbooks over the years. This Tealbook is clearly one of the best. The staff has given the Committee several plausible scenarios to consider, along with a thorough description of what might put us into one case or another.

As a baseline outlook, it's reasonable to assume a legitimate rebound in the second half of 2020 and into 2021. With sufficient progress on testing and tracing, we should see a slow but steady decline in social distancing that will allow businesses to reopen and consumers to go about their daily lives with some semblance of normalcy. You could go to a restaurant. You could wait at the bar with others for a table and enjoy the experience.

But I agree with the Tealbook that a darker, "Second Waves" scenario is probably about as likely as the baseline. This is a maddening place to be. The list of potential negatives is long, and they're largely not amenable to pure monetary policy support. The staff's analysis highlights the complex factors we face and how these factors influence which scenario is likely to prevail. First, there is the progression of the virus, our public health policy response, and the public's willingness to comply with limitations on their behavior over an extended period of time. Then there is the degree to which voluntary social distancing, risk aversion, supply chain difficulties, and the destruction of businesses and human capital will weigh on the economy. And, of course, there are the mountains of debt that firms, households, and governments will have incurred to cushion the blow from the shutdown.

The risks are large, and the downside risks seem highly nonlinear. If the baseline scenario gives way to rolling regional "Second Waves" scenario, the deterioration in economic activity will likely feel less like a gradual deceleration and more like a steep descent into something much worse.

Where does that leave us as policymakers? So far, the Fed's response has been rapid, large, and broad. The federal funds rate target range is at the effective lower bound, and we have provided a great deal of support for market functioning and credit intermediation through asset purchases and the tremendous breadth of the 13(3) programs. This is essential. I think that monetary policy is in a good place for now. In coming months, we will gain information about the path forward and the appropriate monetary policy response. But in any case, we must be prepared to do more. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. Governor Brainard.

MS. BRAINARD. Thank you. The COVID-19 shock is of historic proportions. I fear that we will be referring to pre-COVID-19 and post-COVID-19 for years to come. In the labor market, close to 25 million filed an initial claim for unemployment between mid-March and mid-April, and unemployment is expected to reach double-digit levels not seen since the Great Depression.

Consumer sentiment plunged by the largest one-month drop in the history of the Michigan surveys. Total retail, trade, and food services sales plunged 8.7 percent in March, by far the largest monthly decline on record. Spending is down nearly 100 percent over the previous year at restaurants and movie theaters, transit ridership is down nearly 95 percent in cities such as D.C., New York, and San Francisco, and passengers departing from U.S. airports are down by 100 percent. Factory output fell more than 6 percent in March, the largest one-month decline since the end of World War II. And oil futures prices saw a record-breaking decline into negative territory. This got so much attention that my middle daughter took a break from online school to tell me to take the car down to the gas station because she thought they would pay us to fill up our tank.

COVID-19 is sparing no one. World trade is projected to decline more than 11 percent for the year. And since January, the IMF has revised down its 2020 growth forecast for emerging markets, including China, by 5½ percentage points and for our North American trade partners by nearly 8 percent. Emerging markets are facing a perfect storm. There is a risk the shock could tip some countries over the edge, with spillovers back into the United States. With growth revised downward by 8.7 percentage points, the capacity of the euro area to cushion vulnerable members with the least fiscal space will once again be put to the test.

In looking ahead, the biggest factor in my forecast is uncertainty—uncertainty about the course of the pandemic, about foreign spillovers, about the depth and duration of the downturn, and the scarring and insolvencies that could accompany it. In trying to put bands around the uncertainty, an unusually wide range seems plausible. If, as in the Tealbook baseline, containment of the virus allowed individuals and enterprises to be confident enough to relax social distancing over the next few months, it is conceivable that the rebound in activity could be relatively rapid, comparable with a recovery from a typical recession.

The economy and banking sector entered the crisis on a strong footing, and the shock didn't emanate from within the economy or a financial system. Moreover, the policy response has been substantially more rapid and larger than in previous recessions. The $2.3 trillion fiscal package enacted in late March has included unprecedented steps, including lump-sum payments to households, substantial increases to and extensions of unemployment benefits, a program of forgivable loans to small businesses, and more than $450 billion in backstop funding for emergency financing.

In a rapid-recovery scenario, the policy actions taken by the Federal Reserve and those authorized by the Congress would be enough to contain the damage to the productive capacity of the economy, put a floor under demand, and enable a relatively quick rebound. But there are fragilities associated with that baseline scenario, and more negative outcomes seem equally plausible. Sentiment has been negatively affected by the slow ramp-up on testing, ventilators, and personal protective equipment, or PPE. As with other emergencies, confidence and leadership could matter greatly for behavioral responses and the tone of the recovery.

Unfortunately, a "Second Waves" scenario cannot be ruled out—as was seen with the Spanish flu—with the potential for terrible human and economic consequences. It's only natural that many businesses and individuals facing a devastating loss of income are impatient to get back to work. But, if social distancing is abandoned too early or the virus spread rises again, confidence would be shaken, strict social distancing would again be necessary, and we would see another substantial contraction late this year or next.

In such a scenario, the current illiquidity strains could easily evolve into a full-on insolvency crisis. And these insolvencies among formerly creditworthy households and businesses would create deadweight losses. It would destroy more employment attachments and human capital, and, like Presidents Barkin and Kaplan, I worry about the substantial damage to the productive capacity of the economy.

Behavioral changes due to heightened uncertainty and lingering concerns about infection could depress demand for a prolonged period, possibly until a vaccine becomes widely available. And there is also the likelihood that some sectors could change permanently, such as retail, higher education, or cruise lines, to name a few. Furthermore, any of these domestic scenarios could be exacerbated by a crisis abroad.

With that as a backdrop, let me just turn briefly to monetary policy. This meeting, like the previous one, is appropriately focused on market functioning and stabilization. We moved early and decisively to lower the policy rate to its lower bound and pledged to keep it there until the economy is on track to achieve our goals. After gathering more data and observing economic developments a little longer, we'll want to consider how monetary policy should evolve further. A few elements might be helpful in the evolution of policy.

First, bringing to fruition the emerging consensus on key changes to the Statement on Longer-Run Goals and Monetary Policy Strategy could help anchor a very strong commitment framework. It's a tribute to all of the groundwork that was laid by the Chair and Governor

Clarida that the proposed changes to the statement speak directly to today's circumstances. In particular, it would be helpful to move to a flexible inflation-averaging framework, as contemplated in the Committee's previous discussion. It appears the crisis is likely to complicate our challenges on inflation, with the disinflationary effects of lower energy prices, increased slack, and a stronger dollar likely dominating any inflationary pressures arising from disruptions to production. In this regard, it will be essential to clarify, as was proposed earlier, that actual inflation averaging 2 percent over time is most consistent with our statutory mandate. Relatedly, our review discussed various forms of makeup strategies. Because of the greater likelihood that inflation will continue to fall well short of 2 percent, I support a flexible inflation-averaging approach that would, following periods when inflation has been running persistently below 2 percent, have the aim of achieving, for some time, inflation moderately above 2 percent.

Second, the clarification of our commitment to achieving maximum employment is also critical. It was heartening to see so many marginalized workers returning to the labor market over the past few years, and it's heartbreaking to see this progress put in jeopardy today. Together, the changes to the inflation target and the clarification of "maximum employment" would enable us to put in place a much stronger form of forward guidance than has been used previously. In particular, we could consider a strong form of forward guidance whereby the Committee would condition liftoff on the achievement of full employment and 2 percent average inflation over a sustained period. Research based on simulations has shown that this strong form of forward guidance will likely be vital to ensure we can be confident in achieving our goals in a reasonable amount of time.

Third, the draft statement we discussed included a commitment to use the full range of tools, and, indeed, we're leading with that commitment in today's statement. In that regard, we'll need to contemplate what kind of balance sheet commitment will provide the most effective means of reinforcing our forward guidance. I've been interested in an approach that would target interest rates on the segment of the yield curve that would best reinforce the Committee's outcome-based forward guidance, and some other members have as well. Specifically, we could commit, after making an assessment of how long it might take to get back to full employment and target inflation, to capping rates out the yield curve for a period consistent with that expectation. By augmenting the credibility of those caps, setting the horizon on the interest rate caps to reinforce forward guidance would diminish concerns about an open-ended balance sheet commitment. Once target inflation and maximum employment are achieved and the caps expire, any Treasury securities that were acquired under the program would roll off organically, unwinding the policy smoothly and predictably.

Last month, the Reserve Bank of Australia put in place precisely such a framework, and we've been closely observing their experience. This type of approach could have benefits, in terms of anchoring market expectations, reducing volatility, and potentially limiting the expansion of the balance sheet. But I recognize that there are important risks, and quantitative approaches have the benefit of being familiar and previously tested.

In light of the relatively higher bar for adoption, I'd like to request staff analysis in the intermeeting period of what an effective yield curve control approach would look like and the specifics regarding operationalizing such an approach, perhaps drawing on experience in other countries but tailored to the specifics of our current circumstances. That analysis would be very helpful in assessing the relative benefits and risks of targeting interest rates compared with quantities as part of a comprehensive policy framework in support of strong, outcome-based forward guidance. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. Governor Bowman.

MS. BOWMAN. Thank you, Mr. Chair. Since our March FOMC meeting—which now seems like it was a century ago—it's become clear that this devastating global health crisis and our efforts to contain it will leave an extremely painful and lasting imprint on the U.S. economy. To me, the most troubling development has been the rapid and overwhelmingly massive declines in employment, evidenced by the weekly data on unemployment insurance claims. The Board staff now anticipates that the unemployment rate will rise to around 20 percent over the next few months, and some outside analysts are forecasting even worse outcomes.

It is difficult to comprehend the gravity of these numbers fully, because they are so far outside our past experience. Making matters worse, employees in the most heavy-hit sectors also tend to be individuals who are least able to carry through the period financially. Results provided in the Survey of Household Economics Decisionmaking survey, taken in early April, found that workers from households with annual incomes less than $40,000 were three times more likely to have lost a job in March than workers from households with incomes over $100,000—39 percent and 13 percent, respectively.

Although households' financial positions were generally sound when we entered into this crisis, the extensive job losses have already altered that picture for the worse. Even with the substantial and, fortunately, timely support from both fiscal and monetary policies, I expect that many households will have a limited ability to pay their mortgages, rents, car payments, credit cards, and other everyday expenses.

Given the relative ease with which mortgage holders can request forbearance, it's a bit of a relief to see that only 7 percent of outstanding mortgages are in forbearance at this point. While that's good news today, May and June could bring a far different perspective on that. In the macroeconomic data, we've observed these financial pressures manifest in the pullback in spending and in various survey readings on consumer and business confidence. But these numbers cannot begin to account for the emotional toll this crisis is having, and will likely continue to have, on our population. In conversations with bankers, business owners, and community leaders across the country, I can hear the extreme sense of worry that many are feeling for themselves, their families, and their communities.

The tremendous breadth of the effects on business activity is another aspect of the crisis that is likely to be vastly different from our previous experience. With stay-at-home orders in effect across more than 90 percent of the country's landscape, business revenues are being harmed in all areas. Industries in which the business disruptions are most readily apparent include travel, restaurants, and leisure. And it is in these sectors that the initial extraordinary employment losses have been concentrated. Adding to the list of challenges, many leisure-centered businesses will be entering into what is traditionally their most profitable season during spring and summer.

I see a significant risk that the prolonged period of inactivity will lead to the failure of enormous numbers of U.S. businesses, especially small businesses and those that have high fixed operating costs and low cash buffers. In the Small Business Credit Survey conducted in 2019, 86 percent of small businesses reported they would not be able to withstand a financial shock of two months' lost revenue.

Smaller firms, especially those serving struggling communities, are especially vulnerable, because they lack the financing options of larger businesses. Even if they are able to take on debt, they often lack access to networks or technical expertise to navigate loan processes. Many report that the process of applying for government financing is overwhelming. That said, it was encouraging to see reports suggesting that the Paycheck Protection Program, or PPP, funds are reaching small businesses across a broad set of industries and geographic areas. The Small Business Association reported that more than 1.6 million businesses were approved for PPP loans before the initial round of $350 billion in funding was exhausted.

Moreover, a recent survey conducted by the Independent Community Bankers Association, or ICBA, showed that the average PPP loan approved by surveyed banks was between $50,000 and $100,000. It also appears that community banks have been at the forefront in providing these PPP loans quickly to businesses that need them. In the ICBA survey, the responding community banks had each made an average of 166 loans, with loans from banks under $1 billion in assets accounting for about 30 percent of the number of all first-round PPP loans. I believe that this attests to the flexibility and responsiveness that community banks offer to their customers in times of need.

Using detailed data on business failures that occurred during the previous financial crisis, the Board staff has made dire predictions regarding the pattern of business failures in the period ahead. In particular, the staff currently estimates that around 600,000 establishments will close permanently by the end of the second quarter, accounting for more than 4 million of the 26 million jobs they forecast will be lost in that time frame. Incredibly, their forecast of pandemic-related business failures would have been even higher—roughly 800,000—were it not for the financial support that many businesses are receiving from the two rounds of the SBA's Paycheck Protection Program.

A sector that I continue to monitor closely, because of its close ties to rural economies and the loan portfolios of many community banks, is agriculture. What I am hearing from my contacts is that the agriculture sector is also suffering, and these difficulties are coming at a time when the balance sheets of many agricultural producers are already fragile. The challenge in the energy sector is flowing through to agricultural production via weaker ethanol demand, which puts downward pressure on corn prices. We are also seeing effects on food production amid virus-related shutdowns in several large meat processing plants.

In looking ahead, the timeline for a reduction in the number of new COVID-19 cases and the easing in stay-at-home orders is still extremely uncertain. It will probably vary greatly across all areas of the country. Some states appear set to ease restrictions partially, while others remain mostly shuttered. The national economy will begin to grow again, but the recovery in economic activity is likely to be prolonged and uneven. Financial markets have calmed, but there is still a real risk that financial pressures will reemerge and reignite the sense of panic that prevailed in March.

Though I am confident that our policies have helped to stabilize markets and helped us avoid more catastrophic economic outcomes, critical downside risks have remained. Therefore, it's important that we continue to monitor developments carefully and respond promptly and flexibly to events that threaten the stable functioning of financial markets and the economy. We also need to remain observant with regard to the changing conditions that financial institutions of all sizes are facing and remain open to adjusting their supervisory schedules and expectations as needed, consistent with our recent guidance. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President George.

MS. GEORGE. Thank you, Mr. Chairman. Our District surveys are beginning to confirm what I've been hearing in numerous daily calls from contacts in nearly every sector across the region: a broad-based and sharp contraction with a negative near-term outlook. Leisure and hospitality, health services, retail, and durable goods manufacturing report the largest declines to date, and a significant number of these contacts are desperately trying to stay afloat, either by accessing government funding, using cash reserves, or drawing on bank credit lines.

We are also hearing from state and local governments that are beginning to brace for large budget shortfalls. Several of the District's larger cities have announced immediate furloughs and budget cuts, with larger adjustments expected over the next couple of years as revenues decline and funding from the CARES Act runs out.

Our first-quarter energy survey shows that activity fell at a steep pace, and expectations for future activity dropped further. Not surprisingly, no energy company in our survey is profitable at current prices, and only one-third of contacts report being profitable when oil is under $40 a barrel.

Finally, prospects for our agricultural sector turned decidedly more negative since the March meeting. Agricultural commodity prices declined sharply as significant reductions in ethanol production weighed heavily on the price of corn. In addition, confirmed COVID-19 cases at our meat processing facilities have led to reduced demand for cattle and hogs because of temporary plant closures in Colorado, Kansas, and Missouri, with several other District locations under watch. These disruptions are expected to worsen farm financial conditions in the coming months, notwithstanding the prospect of government payments to provide some temporary support.

Regarding the national outlook, the U.S. economy appears to be facing a recession like no other, as government-led pandemic shutdowns roll across the United States and the rest of the world, leading to a very rapid decline in global economic activity. Even as the lifting of stay-at-home orders is being contemplated in the coming weeks, I expect the return to a new normal of social and economic activity will be gradual and subdued. In the absence of clear containment of the virus through effective vaccines or treatments, both the magnitude and duration of the downturn are highly uncertain and present considerable further downside risk.

Evidence of a protracted downturn is becoming clearer. Initial claims for unemployment insurance indicate that more than 26 million Americans lost their jobs over the past five weeks, unwinding a decade of job gains since the end of the Great Recession and resulting in a sharp drop in consumption and confidence. The New York Fed's Survey of Consumer Expectations suggests many households are now more pessimistic about their future financial conditions. This suggests that consumer spending may remain depressed in the near and medium term.

Aggregate statistics on employment and household spending are clearly concerning, but some segments of the population will suffer disproportionately, as others have already noted. Analysis by my staff shows that women, for example, especially those lacking a college degree, held more jobs in the hardest-hit industries, accounting for roughly 60 percent of all job losses in the March employment report. This segment of the workforce faces damage to job prospects and labor market attachment in the medium term, as was the case during the very slow recovery in their labor force participation after the Great Recession. Likewise, other analysis by my staff shows that communities with the highest financial distress and least able to weather economic losses tend to rely more heavily on employment in industries deeply affected by the pandemic as well as have a greater risk of contracting the illness.

The outlook for business investment also looks bleak. My business contacts initially expected a rebound. They now have grown far more pessimistic over the past few weeks in the face of weak domestic demand, a lack of global growth, and supply chain disruptions that are causing severe declines in business activity and investment. I also expect a large drag on investment this year to come from the energy sector, as it significantly reduces activity in the face of a historic decline in oil prices.

Finally, the combination of global and domestic disinflationary factors is likely to keep headline and core inflation persistently low over the medium term. Risks to my outlook for real activity and inflation remains to the downside. Until a vaccination or an effective treatment is developed, virus recurrences will remain an ongoing concern. Thank you.

CHAIR POWELL. Thank you. Governor Quarles.

MR. QUARLES. Thank you, Chair. Containment measures that have been taken in response to the COVID-19 concerns are leading to unprecedented declines in economic activity both in the United States and around the world. As everyone has noted, there's a great deal of uncertainty about how those containment measures will evolve. And with so much uncertainty, rather than speculate on the near term, I'll discuss, just very briefly, some of the longer-term implications of the pandemic.

This is going to shape the economic and political discussion for years to come. We've been talking about the Global Financial Crisis for over a decade. The fallout of the COVID-19 event is likely to dominate our conversation for at least as long, with a steeper decline in output, a larger fiscal response, and further expansion of the central bank playbook. The ramifications of the past two months will manifest in the shape of the policy discussion for years to come.

Initial hopes for a *V*-shaped recovery, I think, have faded for most, and it's true that this crisis is different, with the economy being hit by an outside shock rather than suffering some internal imbalance that has to be unwound before recovery. Unlike the 2008 crisis, banks are well capitalized. The financial system is healthy and performing well. But the hit to income has been so large—trillions of dollars—that it seems inevitable that the effects will persist for some time. And how the economy performs over the next few years will depend importantly on how that loss of income is distributed across the economy—that is, how the burden is split across workers, businesses, creditors, and the government.

Purely from an economic policy perspective, having the government fill as much of the hole in income as possible is likely to be the least disruptive to the near-term health of the economy, and the swiftness of the fiscal response is consistent with that. But even with the forceful action of policymakers, it's unlikely that the negative effects of the tremendous loss of income that we've experienced as an economy are going to be fully ameliorated. And the loss of income will likely affect the economy in myriad ways. Let me focus on three broad channels.

First, regardless of the effectiveness of fiscal transfers in replacing lost income, consumers and firms are likely to pull back and exhibit increasing caution. Even before this event, a persistent feature of the post–financial crisis economy was the caution of both consumers, with relatively elevated savings rates, and firms, with the stubborn weakness of capital investment. The current shock is likely to only make things worse—higher saving, less investment, and an even lower r^*.

Second, the enormous increase in government debt could weigh on growth either as concerns in the Congress provoke consolidation and create considerable fiscal drag or, perhaps more unlikely except in theory, as citizens react to the threat of higher taxes by cutting their spending.

Third, even with tremendous government support, workers and firms are unlikely to be made whole. As a consequence, they'll react to their loss in income by cutting spending either now or, if they have access to credit, in the future. Alternatively, some of the burden will likely be shared with their creditors, either through missed payments or bankruptcy. And, as I discussed during the financial stability go-round, while banks entered the crisis well positioned to absorb some of the burden, we will remain vigilant in our assessment of stresses in the banking sector. Thank you, Mr. Chairman.

CHAIR POWELL. Thank you. President Daly.

MS. DALY. Thank you, Mr. Chair. As in other parts of the country, the coronavirus and the social-distancing actions required to contain it have taken a severe toll on economies and communities in the 12th District. Although some District states are beginning to relax the most restrictive guidance, none is planning an immediate restart to activity. Many large businesses with the potential for telework in fact have already announced that they will keep workers home at least through September and most likely through the end of the year. And businesses that require onsite staff are already planning for cohort work teams and staggered scheduling, bringing one group in for a week and then letting them off for two weeks for quarantining purposes. So it is not surprising that none of my contacts expect a *V*-shaped recovery. Whether they call it a *U*, an *L*, a hockey stick, or a swoosh, they all agree on three words: tentative, choppy, and slow.

The consistent underlying theme, if you will, is that nationally and across the globe, everyone will be cautious, working to replenish cash flows and savings and positioning for a resurgence of the virus and additional potential lockdowns. Indeed, the modal expectation for businesses in the 12th District, including large national retailers and global tech companies, is that 2020 will be a series of fits and starts. And, it's not surprising this is starting to affect their planning. Many businesses are thinking about cutting costs to match projected lower revenues. For some, this is about rebalancing salaries: for now, asking mostly senior staff to take pay cuts. For others, it's been about scaling back operations, reducing headcount, and shuttering some locations altogether. And this means that, even when economic activity resumes, large numbers of laid-off and furloughed workers are likely to find themselves persistently unemployed.

If we put these comments of my contacts into our economic language or models, it really says that without a vaccine or some kind of confidence that the virus is behind us, pervasive uncertainty will be an ongoing and significant drag on aggregate demand both here and abroad. And, here, I want to just second something that Governor Clarida said earlier about the supply effects and demand effects. I'm hearing from my contacts that aggregate demand effects are completely swamping any concerns about aggregate supply or the supply chain disruption.

So all of this suggests that the outbreak will likely have a lasting effect on the economy. This assessment is in line with recent research around the System, including at the San Francisco Fed and the New York Fed, on the economic effects of previous epidemics. And this research consistently finds that substantial knock-on effects are present in pandemics, and they persist long after the health risk has been addressed. In other words, I think, as many have said, there's a lasting imprint.

Of course, one fundamental that will either aid or further depress the recovery is the health of the financial system. Our quick and forceful responses have clearly encouraged financial market functioning and compressed risk in term premiums. However, corporate default risk remains elevated. The collapse in oil prices will pressure the highly leveraged oil sector, and the commercial real estate sector remains at risk.

Though banks are well capitalized or came into this period well capitalized and can absorb some losses, a drawn-out downturn could quickly deplete their capital. And in light of the downside risks and the vital role that banks play in lending through a recovery, working to ensure that they remain well capitalized is an important part of our support for the economy. So

I second the remarks of many during the financial stability go-round that we proactively require banks to conserve their capital by suspending dividend payments, extending the suspension of share buybacks, and limiting executive compensation.

Let me conclude by saying that even if we get the baseline Tealbook virus evolution and keep the banking and broader financial sector from more lasting damage, the potential for a longer-lasting imprint on the economy is really outsized, in my judgment. First, the dislocations due to the virus have already severed many relationships between workers and firms, firms and customers, and firms and financing. And this "severing," if you will, has been disproportionately concentrated in those least prepared to weather it, least able to rebound quickly from it. This is, frankly, heart-wrenching to watch and to observe. But it's also, as others have noted, challenging for the economy's potential output growth, which depends critically on having everyone possibly involved in the recovery.

Second, history tells us that large shocks and persistent uncertainty leave a mark on psychology. They materially alter the perspective of consumers and businesses for some time. And this seems especially relevant now, when the shock of the global pandemic and individual health and lives are at risk.

So all of this suggests that the economy will need ongoing support once we're past the emergency efforts to ensure that this once-in-a-century event does not then turn into a decade of below-par performance. I will return to our role in this support tomorrow. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Mr. Chair. The Ninth District economy is reacting the same way the other Districts are—with activity declining significantly since our previous meeting. More than 40 percent of firms in a Districtwide poll reported revenue being down more than 50 percent, with, for obvious reasons, higher losses in the entertainment, retail, food, and lodging industries. There have been large layoffs in the health-care sector because of all of the deferred elective procedures. There have also been large layoffs in mining, and in meatpacking plants, as President George said—that's also affecting our District here. Also, layoffs have been higher at smaller firms. And, in those cases of firms that have not laid off people, we're also seeing widespread pay cuts. The only places we're really seeing pay increases are in some national consumer-facing chains—supermarket stores and so forth—that are giving some people some premium pay.

Fuel prices are down, freight rates are down, and there have been large declines in livestock and dairy prices. Construction here is still ongoing, but there are some project delays, and the pipelines are weakening quite dramatically. Housing is weak, but the market is still functioning. President Kaplan already talked about energy. We've got the Bakken here, so that's severely affecting North Dakota. And iron ore and steel demand is down because of the U.S. automakers.

We're focusing a lot of our attention just on trying to look at the virus dynamics and learn as much as we can, like all of you are, from epidemiologists. Early on, I was hoping for a short but sharp contraction, but the more we talk to epidemiologists and other health experts, the more we think we're looking at a 12-to-18-month time frame before we can get back to a normal economy.

First of all, the share of the population to date that has been infected is still very low. And whether or not having been infected in fact confers immunity is unclear, but assuming that it does, the share of the population that has been infected is still very low. The good news is, the shutdown is slowing the infection, but it also means there's a lot of the population that potentially could be infected in the future as we relax the shutdown. And so the risk of flare-ups appears to be very high. We're seeing examples around the world of countries that thought they were past it now having flare-ups again, with potentially new rolling shutdowns coming.

So how does this end? The experts tell us that there are a number of different destinations. One destination is, we develop a vaccine, and they say that's at least 18 months away—if it is going to happen. I mean, the flu vaccine they've been working on—they create a flu vaccine every year—is only marginally effective. So we're all hoping that, in 18 months, we're going to have a perfectly effective vaccine. The experts say that's unclear. We shouldn't count on it.

The second destination is massive testing capability, the way President Bullard and others—publicly, Paul Romer—have been talking about. Again, health experts that I talk to say that that's like hoping for a vaccine in a few months, that there's no evidence that we are on the verge of some type of mass testing breakthrough. It would be great if it were to happen, but there's no evidence that we're building up toward that or some miracle therapy that we could all have confidence would provide effective treatment. Again, we can't preclude the possibility of any of these—we should hope for a breakthrough on any of these—but I don't think we can plan for it.

Some people have said, "Well, we need a moonshot." And I say, "Well, yeah, the moon landing took 10 years." And in the moon landing, we were racing against the Russians—here, we're racing against trying to beat herd immunity. And if we achieve herd immunity in 18 months or two years, that itself could be very costly in terms of human life and in terms of economic activity. But that's why I'm more skeptical that we're going to have some type of technology breakthrough, just because the virus is going to reach its natural destination with herd immunity, which could be very, very costly.

So what does this translate into for the economy? The Tealbook paints a pretty bleak picture in the near term, with contractions in employment, output, consumption, and investment. I agree with the Tealbook's near-term outlook, but I'm more and more doubtful that we're going to see a strong bounceback in Q3 and Q4. I expect activity to remain significantly depressed as partial shutdowns continue—either partial shutdowns imposed by government officials or just simply self-isolation.

I'll give you an example. When the governor of Minnesota issued a stay-at-home order for the state of Minnesota, he designated some businesses and some workers as essential. Well, if you added it all up, 78 percent of Minnesota workers were deemed essential. So my reaction was, that doesn't seem like a very draconian shutdown. Well, it turned out the shutdown was much more stark than 22 percent, because many businesses that were deemed essential nonetheless shut down dramatically. So, for example, banks were deemed essential, but almost all banks that I've spoken with in our District have shut most of their branches. And you can only see a human if you make an appointment in advance. So banks didn't need to shut down, but they shut down. Or hardware stores were deemed essential, but Home Depot and other hardware chains here dramatically scaled back their hours.

And so, to me, it's not simply when the government is going to give you the "all clear," it's when businesses and workers and customers are going to feel confident enough to return to normal economic activity. And I would ask all of us on this call: When are you going to feel comfortable to take your family back to a restaurant or to go to a movie theater, or to get on an airplane that's crowded with a bunch of people you don't know? So, unfortunately, I think for that confidence to return, I think we need to see dramatic progress on the health-care front, and I'm just cautioned by the damping of expectations that the health-care experts who we've consulted with have provided us.

I'll turn now to employment. We've obviously seen the massive unemployment claims. The difference between nonparticipation and unemployment is going to get really murky right now, so we're focused on employment-to-population ratio. We saw a study by some economists—Alex Bick and Adam Blandin—who said that the employment rate for 18-to-64-year-olds has declined by 18 percentage points from February to April 12, which is obviously extraordinary. It looks like employment is going to be depressed for a while. But, again, as President Bullard said, that's part of the strategy to slow the spread of the virus.

The real challenge, again, for bounceback is how many small firms end up failing. I'm really hopeful that the Paycheck Protection Program is going to provide a bridge. But, again, if this bridge needs to go on for more than just a few months—if it needs to go on for 6 months, 9 months, 12 months—it's likely that we're going to see waves of small-firm failures. And then it's just such a long process. If you think about that coffee shop that goes out of business in a strip mall, then you're going to have the out-of-business sign on it for a number of months, and then eventually somebody else will move in there—that just leads to a much slower recovery and a much slower rebuilding of the labor market.

I'll turn now to inflation. The financial market indicates that inflation expectations have fallen. The five-year, five-year-forward rate is down about 50 basis points since earlier in the year. A lot of factors are pushing inflation further below target, whether it's declining oil prices, the strong dollar, wage cuts, or slumping demand in many sectors. It's really difficult to identify factors that are likely to lift inflation. I understand the supply side of this, but as others have said, the demand side seems to be swamping the supply side. And this is, of course, a global crisis. Even if we manage to get through this with relatively less damage than others, it's likely going to hit emerging markets much harder. They have less capacity to endure this and respond to it, and that global recession will affect us as well.

So, unfortunately, I'm pretty pessimistic on the outlook. I view the Tealbook baseline as corresponding to a scenario in which a lot of things go right. And I certainly hope they go right. But I think that we need to prepare for a harsher downturn, unfortunately. And we should be thinking about monetary policy with that in mind. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. Vice Chair Williams.

VICE CHAIR WILLIAMS. Thank you, Mr. Chair. Recent data show that the economy contracted sharply in March. And early indications are for April to be far worse, as many people have already reported.

Despite the unprecedented decline in economic activity both here and abroad, equity markets have rallied, and conditions in funding and credit markets have improved markedly. And the recent recovery in financial markets reflects, in large part, the combination of fiscal policy and the rapid and decisive actions by the Federal Reserve and other central banks to provide massive liquidity and support market functioning. These measures have addressed the immediate liquidity needs, which was a critical and necessary step to avoid a broad breakdown in the flow of credit. However, this success should not breed a sense of complacency or a belief that the worst is behind us.

I was at a couple of meetings—Bank for International Settements and Financial Stability Board committee meetings—last week, and it was really striking that a chorus of voices from around the world pointed out that what was first a liquidity problem is now becoming a solvency problem for households and businesses and, ultimately, for banks and other financial institutions. As others have indicated, we entered the year with sky-high business debt, and now the hardest-hit sectors, such as energy and retail, are in dire straits, and numerous large-scale defaults and bankruptcies are sure to ensue.

So today's relative calm in financial markets may prove short lived as investors recognize the full extent of the damage from the pandemic. Because traditional economic data lag developments in this rapidly moving environment, I, like many others who have already spoken, have turned my attention to high-frequency measures of the economy's performance. In particular, my staff, in collaboration with colleagues at the Dallas Fed and at Harvard University, now regularly publish the Weekly Economic Index, or WEI. This measure uses 10 weekly indicators—such as unemployment claims, electricity consumption, tax withholding, rail traffic, and retail sales—to track national economic activity. And the WEI is designed to mimic the four-quarter change in real GDP.

If you look back to mid-March—which, like some others, I feel like was a year ago—the WEI indicated that output was actually up about 1 percent over the preceding year. If you look at the most recent reading of this index, it is now down minus 12 percent, meaning that GDP is at a level 12 percent below that of a year ago. So if you assume the WEI stays at its current level through June, this implies an annualized real GDP growth rate in the first half of this year of a staggering minus 23½ percent—which happens to be almost exactly the Board staff forecast for that period.

Survey data paint a similarly gloomy picture. Like others, our surveys of firms in the Second District showed unprecedented declines in regional business activity. The headline indexes in both the Empire State Manufacturing Survey and our Business Leaders Survey plunged to minus 78.2 and minus 76.5, respectively, in early April. Just to provide a point of comparison, the lowest level these indexes reached before this month was in the range of minus 40 to minus 50 during the Great Recession.

Our national Survey of Consumer Expectations also turned sharply negative this month, with a substantial jump in those worried about being financially worse off a year from now—which was at about 10 percent in February and is now at over 30 percent in April—or losing their job over the next year, which has moved from 14 percent to 22 percent. Likewise, the index of consumer sentiment from the Michigan surveys dropped sharply over the past two months, declining by about 30 points from February and returning to levels last seen in 2011.

These survey results are echoed in what we hear from contacts throughout the Second District who tell of widespread declines in business activity, concerns about being able to stay afloat, and frustration over access to loans made through the Small Business Administration's Paycheck Protection Program loans. And I'd like to pick up on, I think, some of the themes that President Kashkari mentioned. Obviously, in the New York City region, we're the center of the coronavirus outbreak in the United States, and it's affected us more than anyone. In my conversations with business leaders, labor unions, and nonprofits, especially in the New York City region— there is a very negative sense of how long it's going to take for people to come back into the theaters on Broadway, to come to concerts, and to come to sports events. And, most importantly for our economy, which is based so much on tourism, people are very negative about how quickly tourists will come back to the New York area. The return of tourists is, of course, really important for hospitality, travel, hotels, restaurants, and everything. So that's a pretty consistent theme.

One particular example I'll share, because I thought it showed how the dynamics of this kind of evolve in a very specific way, concerns plays and theater. There's a natural cycle to this industry, and, obviously, all of the theaters are shut down now. But if you want to start a new play or show for next season, you have to have the funding for it, obviously. You have to do the planning for it. And investors are just not, in any way, in the mood to be funding what are already risky ventures, given the uncertainties about how soon people will be coming back to theaters. And so the view is that sector, as an example, will come back very slowly, because investors themselves are not going to be wanting to put money up, given the uncertainty.

Going back to the national situation: The economy is in an unprecedented, sharp decline. Like the Tealbook, I expect the recovery to be painfully slow, with us missing both dual-mandate goals at least well into 2022. And, finally, as I discussed in my earlier remarks, and consistent with what was said by a number of you who have already spoken, I do think that the Tealbook's "Second Waves" alternative scenario is a very real risk, and that that would obviously have disastrous effects on lives and the economy. Thank you.

CHAIR POWELL. Thank you. And thanks, everyone, for your comments. The picture is indeed a challenging one. We are living through a world historical event. It will actually, in hindsight, look like a series of world historical events, maybe. It's the largest global pandemic of modern times, with the simultaneous shutdown of big parts of the economy around the world.

We have a global health crisis. And we are working hard to try to prevent it from becoming a global financial and economic crisis— taking unprecedented measures, as are other governments and multilateral bodies around the world. Yet there's no sense that we've done enough yet. Do what we may, the very nature of the crisis leaves us without a decisive response in the near term. So tremendous uncertainty remains about what lies ahead.

I want to join others, too, in thanking the staff for a very insightful analysis of the state of the economy and the financial system here and around the world, and for the thoughtful assessment of the range of reasonably likely ways in which the situation could unfold. I am grateful, and I am proud of the way you have stepped up. I would just say, in my eight years here, this is perhaps the biggest challenge that we've faced, and it's been very well met. There's no template here, no cookie cutter, no paint-by-the-numbers for this cycle or for this episode. And you've produced what amounts to a really excellent rendering of a perfectly awful forecast. So, again, thank you.

I do find the staff framework of breaking down the economic effects into several phases quite helpful. In the current phase, big parts of the economy are shut down to slow the spread of the virus, to "flatten the curve." As a result, and almost in direct proportion to the success of those measures, we see economic data that are, in many cases, beyond historical experience and beyond anything we thought we might ever see. The role of monetary policy in this phase is to provide some stability to financial markets and some relief to households and businesses, not to stimulate demand at a time when governments are asking people to stay home and nonessential businesses to close. Of course, the future phases are so shrouded in uncertainty as to defy forecasting.

I think that the measures that we've taken so far have done a lot of good. We moved proactively, decisively, aggressively. Our actions have calmed markets, and they've supported sentiment. We bought some time: time for health authorities to fight the battle, time for companies to finance their operations and raise big amounts of liquidity, time for people to stay home and stay healthy without living in fear that the financial system is collapsing or that their life savings are lost, and time for the Congress to act.

Of course, as many of you noted, we are a long way from the end. It is, perhaps, "the end of the beginning," as Winston Churchill famously said in 1942. And it's likely to get harder and require more from us, and especially from the Congress, as problems of illiquidity become, with the mere passage of time and not even that much time, problems of insolvency.

I don't think I really need to add much on the current economic situation or the forecast. The second quarter will break many records for terribleness. As our national conversation already reflects, in the next couple of months, the formal social-distancing measures will begin to be gradually rolled back. Economic activity is likely to move back up, perhaps even quite sharply, but will fall far short of a full recovery. That's because people will likely be slow to change their behavior. Governments can allow restaurant owners and theaters to reopen, but people are likely to take their time to return to old habits and spending patterns, and they will need to feel confident that it's safe to do so. That could ultimately mean waiting for a vaccine, and we don't know—if it does come—when it will come.

So a reasonable baseline expectation is a partial but incomplete recovery and a gradual return to full employment that could drag on for a couple of years, and even that painful baseline assumes that there will not be a second outbreak following the lapse of the social-distancing measures or perhaps a rolling series of outbreaks, maybe in the fall when the schools reopen—that is, if they do reopen.

So I'll join others just in saying, we need to hope for the best, but we need to be ready to face the worst, plan for the worst. I'll also say that in the longer term, the broad government policy reactions to this crisis will be judged by their success in limiting lasting damage to the productive capacity of the economy. That damage will come to the extent that temporary unemployment and furloughs turn into permanent job losses that for many will damage or even end their career prospects. It will also come if we allow mass bankruptcies—and I'm thinking here of avoidable bankruptcies—among both households and thousands of businesses that have been built over long years and that are worth more than the sum of their physical parts to the economy.

We are using our powers here to their fullest, and we need to keep at it until we are confident that the economy is well on the road to recovery. But our tools cannot do the whole job. If the recovery is slower than we might hope, the burden will increasingly fall to fiscal policy, which can address those solvency problems that we can't. So far, the Congress has stepped up. Although the cash benefits from the Paycheck Protection Program and enhanced unemployment insurance have been slowed by technical hurdles, they are very substantial—historically so. And it will be costly to maintain measures like these. But in the long run, it may be more costly to stop them before the job is done. To do so would risk leaving us with a badly damaged economy that may struggle for many years to recover, and that could prove to be shortsighted.

I'll turn briefly to monetary policy. I believe that our current policy stance is appropriate. Markets and surveys show an appropriate expectation that we will patiently await recovery before considering lifting off again. As I mentioned earlier, we're not trying to stimulate demand now, not when people have been asked to stay home and businesses to remain closed. The time is coming when it will be appropriate for us to adjust and clarify our policy stance, when the path ahead is clearer. And, as we have discussed, that time could come fairly soon.

In the meantime, our focus appropriately remains on other dimensions of Federal Reserve policy, particularly the pace of our asset purchases and the implementation of the credit facilities we have announced. On both, I feel that we are right where we need to be. On asset purchases, the ramping-up and the gradual tapering-down have been impressively executed. Kudos on that. On our facilities, I expect that all of them will be working within a few weeks, and here, too, staff efforts undertaken across the System have been remarkable under very, very difficult deadlines. But there will be plenty to do to improve our facilities and perhaps roll out additional ones. We do expect that we will be making adjustments to a number of them just as we learn how they work.

I'll stop there. Thank you. And I'll turn it over now to Thomas for his briefing. Thomas, over to you.

MR. LAUBACH.[5] Thank you, Mr. Chair. I will be referring to the exhibit on page 62 of your briefing materials packet. Since your previous meeting, the Federal Reserve has taken numerous policy actions to support key financial markets and foster the effective transmission of monetary policy. Financial markets have stabilized since then, but the economic outlook remains extraordinarily grim and uncertain. With the federal funds rate at the effective lower bound, forward guidance regarding the funds rate in place, and substantial ongoing asset purchases, you may judge that the current setting and communication of monetary policy remain appropriate for the time being. Against this backdrop, you may see the primary purposes of this meeting as being to make an assessment of how the coronavirus outbreak is affecting economic activity and an evaluation of the deployment, performance, and efficacy of the various lending facilities, while setting aside for now decisions on any further adjustments to your policy stance or communications. Consequently, only a single draft policy statement for the April FOMC meeting is presented.

As the Chair indicated, however, before long you will need to turn to a discussion of refining your monetary policy stance or communications. Instead of going in detail through this meeting's draft statement, I thought it might be more helpful for your future deliberations to provide a summary of market participants' current policy expectations and to compare them with what the staff wrote down as placeholders in the Tealbook. Of course, both market participants and the staff are confronted with enormous uncertainty about the economy and, hence, the path of policy. In view of these uncertainties, my objective is modest, which is to summarize current thinking of market participants, as best as we can ascertain it, and look for indications of potential emerging communications challenges.

Beginning with expectations for the path of the federal funds rate, the blue triangles in the top-left panel show that the median respondent to the Desk surveys

[5] The materials used by Mr. Laubach are appended to this transcript (appendix 5).

views the funds rate as most likely to remain at the effective lower bound, or ELB, through at least the end of 2022, the horizon that respondents were asked about. A straight read of the OIS path, the pink line, suggests that investors expect the federal funds rate to first rise above 25 basis points sometime around the middle of 2023. This interpretation is quite sensitive to whether one assumes a term premium of zero—as in the straight read—or accounts for the large negative term premium that the staff model sees as embedded in the quotes, the blue line. However, our term-premium estimate may be less reliable now that the federal funds rate is back at the ELB. As noted in the left column of the table at the center of your exhibit, in the Tealbook projection, the staff assumed that the federal funds rate remains at the ELB until the unemployment rate reaches 4.3 percent and thereafter follows the conditional attenuated rule. As shown by the green line in the upper-left panel, this assumption implies a liftoff date of early 2023, which happens to align well with the market-based path.

This close alignment does not, in itself, imply a similar understanding of the reaction function, because the liftoff date depends on the economic outlook as well as the reaction function. While our insight into the economic outlook associated with market pricing is always limited, the panel to the upper right presents one facet that may be useful in current circumstances. The blue dots show individual Desk survey respondents' projections regarding the timing and level at which they expect the U.S. unemployment rate will peak. The majority of respondents consider the peak most likely to occur by midyear, with the survey median pointing to a peak level of 17 percent. Although there is a substantial dispersion of views among survey respondents, the median respondent's views seem to be close to the staff's forecast of the unemployment rate peaking at 18 percent in May, shown by the yellow triangle. In addition, as discussed in the Tealbook, the staff's view of economic conditions likely to prevail at the end of 2021 is near the middle of 16 outside forecasters' predictions. Our views on conditions prevailing at the end of this ELB episode may therefore not be too far from market views, either. Regarding FOMC communications, as noted in the left column of the table, only about half of survey respondents expressed any view on the issue, but about two-thirds of those expect no change to the Committee's forward guidance at this meeting.

I will turn now to balance sheet policy. The right two columns of the table summarize expectations expressed in the Desk surveys and staff assumptions about asset purchases and usage of lending facilities. Much of the market commentary discusses the outlook for Treasury security and MBS purchases separately from the likely take-up at the facilities. In thinking about the evolution of the Federal Reserve's balance sheet, the distinction between the two is useful because the persistence of these two components of the balance sheet may well be quite different. As noted in the middle column, the median respondent to the Desk surveys sees the pace of asset purchases slowing gradually after May but remaining significant, being around $100 billion per month by year-end. The median response implies that securities holdings—which do not include loans made under either the discount window or 13(3) authority—will reach about $6.5 trillion in September and rise further to around $7 trillion by the end of 2021. By contrast, in the projections shown in Tealbook B, we did not assume any net asset purchases beyond the end of June, as such decisions have not yet been made. After June, we assume that maturing Treasury securities and principal payments on agency MBS would be fully reinvested until the funds rate reaches 1¼ percent in about May 2024. Under these assumptions, securities holdings are projected to peak at around $6 trillion in September and remain near that level until 2024.

The Desk surveys also asked respondents about their expectations for Federal Reserve facilities. As shown in the right column of the table, the median respondent forecasts a total take-up of $2 trillion at the end of September that declines to about $1.6 trillion by the end of 2021. By comparison, the staff assumes that facilities that were operational at the end of March will stay at their March-end levels for six months before gradually tapering off, while facilities that became operational in April or later will have a peak total take-up of $2.1 trillion in September 2020 before tapering to zero through 2024. Under these assumptions, the staff projects that total take-up will peak at around $2.7 trillion in September before tapering off to about $1.9 trillion at the end of 2021.

To put these various projections into perspective, the bottom-left panel plots the staff projections for the Federal Reserve's balance sheet as a percentage of nominal GDP. Total assets are projected to jump from under 20 percent of nominal GDP at the end of March 2020 to 45 percent in September 2020, an all-time high. Subsequently, total assets are expected to decline relative to nominal GDP over the next several years as take-up at the facilities declines and Treasury securities and MBS roll off the balance sheet. The hatched region shows how the evolution of the balance sheet would change if we replaced our assumption of no net asset purchases beyond June with a path informed by the median survey respondent's forecasts. Under this survey-informed projection, the balance sheet peaks at a slightly higher level of almost 50 percent of nominal GDP in September 2020 and thereafter follows a contour broadly similar to the staff's baseline projections.

Needless to say, these projections are at this point no more than informed guesswork. For one thing, it is difficult to forecast how much usage the lending facilities will receive and for how long. It might therefore be instructive to look back at how the Federal Reserve's balance sheet evolved during and after the financial crisis, shown in the panel to the right. As shown by the gray portion, usage of lending facilities diminished quite rapidly during 2009. If history is a good guide, the gray portion in the chart to the left may turn out to show less persistence than we currently assume.

Thank you, Chair Powell. That completes my prepared remarks. Pages 63 to 68 of the briefing materials packet present the March 15 and 23 statements and the draft statement and draft implementation note. I will be happy to take any questions.

CHAIR POWELL. Thank you very much, Thomas. Let's go back to Skype, and I'll ask for any questions people may have on Thomas's presentation. [No response] I'm not seeing any questions or comments on Thomas's presentation. Does anyone who is not a Skyper want to offer any questions or comments over the phone line? Hello? If someone is trying to speak, I can't hear you. [No response] Okay, sounds like "no."

Great. So thanks again for really excellent briefings and rounds of comments. I'm very sorry we will not be able to gather for dinner in the elegant West Court Café. I am hopeful we can resume that tradition later this year. If there's nothing else, I'm going to go ahead and adjourn, and we'll resume tomorrow morning for the policy go-round. Everyone be safe tonight, and we'll pick it up again tomorrow morning at 9:00 a.m. Thanks, everyone.

[Meeting recessed]

April 29 Session

CHAIR POWELL. Good morning, everyone. We'll go ahead now. Everyone's on the line. So before we begin the policy go-round, I'd like to ask Stacey for a brief update on this morning's data. Over to you, Stacey.

MS. TEVLIN. Good morning. Real GDP declined 4.8 percent in the first quarter. Both consumption and investment spending fell sharply—a 7.6 percent decline in consumption and an 8.6 percent decline in business fixed investment. These are all at annual rates. In contrast, residential investment jumped 21 percent.

Compared with our expectations as of yesterday morning, the top-line number came in pretty much exactly as we expected, but the categories were surprising. Consumption growth was 2¾ percentage points more negative than we'd expected. That's an extremely large miss, and it was concentrated in the services category. We had written down large negative numbers for leisure and travel and other services in March and those came in about as expected, but there was also a large negative contribution in the health-care category, which by itself trimmed 2 percentage points off real GDP growth. Now, we had written down a pretty sizable negative contribution as coming from that category. But the negative contribution was more than double what we had expected. On the other hand, both net exports and inventory investment were much less negative last quarter than we'd expected. Looking at the mix of categories, this is, I would say, a worse report than we'd expected, and, of course, an almost 5 percent decline in real GDP is always a terrible reading. But given what's coming this quarter, the surprise isn't probably too big a deal.

One thing I would note that's sort of interesting is that the BEA, because of the big shift in spending in March and because they didn't have all of their March data, their assumptions about the March data were based on a whole variety of different sources. In particular, they used private high-frequency credit card transactions, they used the claims data to identify late-period declines in business production and compensation, and they used information on the timing of school closures to estimate government spending. So those ways of gathering data are a little different from those they normally use.

That's about it. I guess I should also say, prices appear to have come in pretty close to expectations. That's all I'll say on that. Thanks.

CHAIR POWELL. Any questions for Stacey? [No response] Stacey, I'll ask: It sounds like the chances of real-time mismeasurement, which are always high on initial reports of GDP, are quite elevated, given the current situation. Is that a fair statement?

MS. TEVLIN. Yes, I think that's right. Again, the BEA often doesn't have some of their March data when they publish the initial report on first quarter GDP. They used different methods than usual to estimate that data. And then we had reports also that the normal underlying source data for February and March may not have been as good this time because of changes in the way they could collect things, with states shut down. So I would say, there is probably a higher-than-usual chance of big revisions.

CHAIR POWELL. Joe, do you have anything to add on that on the trade data? It sounds like net exports surprised.

MR. GRUBER. Yes. So I think that the net export contribution to real GDP growth was actually considerably more positive than we thought it was going to be, at 1¼ percentage points. But that's really just that imports actually fell a lot steeper than we thought they were going to. And services, both exports and imports, were down, close to 30 percent. So that was quite a bit weaker—and that's travel for the most part, probably.

CHAIR POWELL. Thank you. Any other questions, either on Skype—I don't see any on Skype—are there any questions anyone would like to raise? [No response] Okay. In that case, let's go to our go-round, beginning with Governor Clarida, please.

MR. CLARIDA. Thank you, Mr. Chair. At our March 15 meeting, we agreed on a muscular policy response to the virus pandemic, which, of course, included lowering the target range for the federal funds rate by 100 basis points to its effective lower bound. In our statement, we said that we expect to maintain this range until we're confident "the economy has weathered recent events" and is on track to achieve our maximum employment and price stability goals. In the week following our March 15 meeting, there were severe disruptions in financial markets, including the Treasury and agency mortgage-backed securities markets, and the scale of open market operations needed to address this disruption prompted us to issue a statement on March 23 that we would continue to purchase Treasury and agency mortgage-backed securities "in the amounts needed to support smooth market functioning" and the transmission of our policy.

So, coming into today's meeting, the markets are not expecting the Committee to change our guidance on either rates or the balance sheet. I believe our policy and communication today are in a good place coming into and going out of this meeting, and I fully support our decision, our statement, and the directive that we will issue today. Now, as our announcement today is in line with consensus, it should not generate much reaction. The focus, I suspect, at the Chair's press conference will be on the nine new credit facilities that the Federal Reserve has announced since March 17. However, once these facilities are up and running, I suspect that, at some point in the future, we may be pressed for or choose to provide additional clarity on our balance sheet plans and perhaps also our rate guidance. So here are some thoughts on that, looking ahead.

With regard to future purchase programs for Treasury and agency mortgage-backed securities, I would argue that the range of viable options we might consider will depend critically on the level of yields prevailing at such time that we would determine our current language is no longer serving us well. For example, in a scenario in which bond yields move sharply higher to entice investors to take down a huge supply of Treasury securities, we might consider a more conventional quantitative easing, or QE, program aimed at limiting an unwelcome rise in the term premium. By contrast, in a scenario in which inflation and inflation expectations decline in response to a contraction in activity associated with a second wave of the pandemic, we might consider a version of yield curve control, as Governor Brainard mentioned yesterday, as a complement to calendar-based forward guidance. Finally, we may rather soon find ourselves in a position in which Treasury and agency mortgage-backed securities markets are functioning sufficiently well that it might be difficult to justify the pace of purchases expected by markets on market-functioning grounds alone.

With regard to rate guidance specifically, our statement now indicates that rates are on hold until we are confident "the economy has weathered recent events." Now, this is so-called "big tent" language, which I fully support and embrace—but, as such, it is open to a range of interpretations that, over time, we may choose to address. For example, would the economy have "weathered recent events" when the recession ends, when real GDP has achieved its previous peak, or when the unemployment rate falls, say, below 4 percent? In the latter example, this could be well into 2023, according to the staff. Right now, our language is not being tested, and markets are certainly not pressing us on the rate path. But the economy is in a deep recession, and the data are and will be abysmal for some time. The recession will end, the data will eventually get better, and at that time, we may choose or need to refine what "weathered recent events" means.

The second piece of our guidance—that rates are on hold until we're "on track" to achieve our goals—may also at some point need to be refined. "On track," to me—and, I suspect, many Fed watchers—suggests a forecast-based threshold, which, if crossed, would trigger rate hikes even if core inflation at the time of liftoff were below 2 percent, for example, as was the case in 2015. Now, in my academic research and as a professional Fed watcher, I've historically been very favorably disposed toward forecast-based, forward-looking policy evaluation. But in light of the empirical record of PCE inflation consistently falling below our objective, there's a risk, especially if the recession is deeper than we expect, that inflation expectations could move uncomfortably lower. And in such circumstance, we might choose to offer guidance that rates are on hold until we actually achieve our 2 percent inflation objective.

In closing, let me be clear that I do believe our policy and communication are in a good place coming into and going out of this meeting. The shelf life of our existing guidance for rates and open market purchases may serve us well for some time to come, so these remarks are offered solely to provide some context for thinking about a possible evolution at some future date. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Rosengren, please.

MR. ROSENGREN. Thank you, Mr. Chair. I support today's decision. In the near term, monetary policy is being conducted through liquidity facilities. Reducing financial spillovers of the pandemic is probably the most effective way of limiting, as much as we can, deviations from our dual-mandate objectives. And if the pandemic ends quickly, the facilities will help produce something closer to the *V*-shaped recovery in the modal Tealbook forecast.

However, we are still in the process of implementing our liquidity facilities, and these facilities may need to change significantly as we learn more about how the COVID-19 virus will affect public health and the economy, both in the short run and in the long run.

Because my outlook is more pessimistic than the Tealbook baseline, I believe we will need to consider other potential appropriate actions to help mitigate an event that could be the most economically severe in the postwar period. Both asset purchases and forward guidance will help. I also think we should be asking for broader authority to directly purchase a wider set of assets now so we will be able to react quickly should the time come when such actions are needed. Liquidity facilities are not as flexible as direct purchases. I think it is possible that our asset purchases could be quite significant, and acquiring a wider set of assets may allow us to be more targeted and efficient in our approach and allow for a faster return to full employment. I am mindful that such purchases have significant risks, but purchasing Treasury and agency mortgage-backed securities may not be enough if the economic challenge is deeper and more prolonged than the modal Tealbook forecast. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Bostic.

MR. BOSTIC. Thank you, Mr. Chair. I support the actions and language proposed in the draft statement. In the current condition of the economy, it pretty much goes without saying that we should not be raising rates at this meeting. Judging from the sentiment of my directors and contacts over the past few weeks, I would not expect that we will be contemplating raising rates anytime soon.

In addition, I'm supportive of the directive to the Open Market Desk as well as the flexibilities introduced therein. We are in an emergency period, and it is important that we position ourselves to be as nimble as possible so that we can respond to whatever arises in a timely and decisive fashion.

I was going to stop there and keep it quite brief, as I think the decision today is quite straightforward. Reflecting on the mood of yesterday's meeting—in particular, the negative and almost despairing tone it took at times—like everyone else, I recognize that things are tough now and likely to get tougher. And, as I noted yesterday, the hard reality is that realizing a more positive outcome will rely on the decisions and actions of many, many people, almost all of whom are not on this call.

But in spite of the growing odds against a more positive outcome, when I reflect on the past eight weeks, what the Federal Reserve has done, and how those actions have been received, I see a heightened belief and faith in the Fed. I see a public that views the Fed both as an honest broker that is deeply committed to supporting the U.S. economy and as one of the few institutions that can be trusted to speak the unvarnished truth. Many have told me that they are grateful for all that we have done thus far and are looking to us for guidance and vision. Because of this, I believe there's a role we can play to influence those who need to do the right thing if we are to avoid a deep second wave of the pandemic and see recovery come sooner and stronger rather than later and weaker.

Yesterday's commentaries made clear to me that we have a broad consensus on what needs to be done: Follow the advice of public health officials and respect social distancing; continue to monitor all sectors of the economy, and stand ready to act to offer policy support and relief; reopen incrementally, with an appropriate level of caution; and enhance testing and distancing protocols so the public has confidence and will reengage with the economy. It's the policy stance that needs to be heard at this time and one that I hope each of us considers and embraces in the weeks ahead. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Harker.

MR. HARKER. Thank you, Mr. Chair. I can, of course, support the statement as written. As others stated, we have time between now and our next meeting to consider changes to our statement language to signal our intentions. Now, I think this discussion is best had by the circulation of staff memos and by iterating through the drafts of such language before the next meeting, and I look forward to that work ahead.

Thus, in lieu of a policy statement today, I'd just like to thank everybody who has worked and continues to work on the myriad of facilities that have prevented the economy from entering depression so far. And we don't know where it's going, but the work so far is critically important to the economy. The challenges that we faced were complex and unprecedented, and a market meltdown was averted. The standing up of additional facilities is an ongoing endeavor, and we will need to monitor closely the effectiveness of each facility as funds are disbursed.

I'm simply going to add to what President Bostic said, just in conclusion. I've heard from a lot of people not only my professional contacts, but also, like all of us, walking around our neighborhoods and meeting our neighbors, in some cases for the first time. And all I hear back, when they find out what I do, is "Thank you." I really want to pass that along to all of the staff who've worked so hard to get these facilities up and all of the work that you've done. What I get the sense from all of my contacts the American people are very grateful, as President Bostic said, for what we've done, and they just want to say "Thank you." Thanks, Mr. Chair.

CHAIR POWELL. Thank you. President Bullard, please.

MR. BULLARD. Thank you, Mr. Chair. I think our current policy stance and liquidity programs are appropriate for the given situation.

In light of yesterday's very pessimistic discussion, I thought I would use a few minutes here to give my review of some U.S. macroeconomic history with respect to pandemics. The main point of my review is twofold. One, pandemics on the scale we are observing today have not, by themselves, historically caused major disturbances to the U.S. economy. And, two, the draconian shutdown policy, a one-size-fits-all policy that is not appropriately adjusted for actual health risks, does have the potential to lead to a depression outcome in the United States and globally. This health policy, with which this Committee is currently cooperating, needs to become better tailored to actual risks and become more granular very soon in order to prevent long-lasting damage to the U.S. economy and, ultimately and ironically, to actual health-care outcomes in the United States.

Let me turn to this review. Current estimates for this pandemic suggest that the total number of fatalities will be less than 100,000. You could argue about that. The fatalities will be concentrated and are concentrated in the older population with preexisting conditions. In the postwar era of macroeconomics, we have seen other pandemics of this sort. The 1957–58 pandemic also had, estimates suggest, approximately 100,000 fatalities in the United States on a population base of about 175 million. So in some ways, that pandemic was more severe than this one. Fatalities there were concentrated among older cohorts with preexisting health conditions, as is the case here. But if you look at macroeconomic characterizations of this period in time-series macroeconomics or in quantitative theoretic macroeconomics, the discussions do not make special mention of the pandemic. It is, in effect, pushed into the noise term, like many other events that occur in the economy.

It's true that 1958:Q1 was the single worst quarter for annualized economic growth in the United States in the postwar era up until the current quarter, which is likely to be worse. But subsequent growth was some of the most rapid in the postwar era, and, certainly, factors other than the pandemic are thought to have driven the recession during this period. Subsequent growth in the 1960s was excellent, and we didn't see anything like a long-lasting depression or *L*-shaped recovery during that period. So this would be a counterexample with regard to the pessimistic discussion that we had yesterday.

There was also a pandemic in 1968—also about 100,000 fatalities but on a population base of about 200 million. So it was also arguably more severe than the pandemic that we're seeing today. There was no recession around this period, nor in macroeconomic characterizations of this period is there really mention of the pandemic being an important factor. It was again pushed into the noise term, along with many other factors that get pushed into the noise term in typical macroeconomic analysis. Fatalities in 1968 were again concentrated among the elderly with preexisting conditions. If we look at our current pandemic in 2020, we're looking at probably, again, less than 100,000 fatalities but on a population of about 330 million—so, less severe than either the 1957–58 case or the 1968 case.

We do have the case of the 1918 pandemic, which has been mentioned at this meeting. Estimated deaths there—imprecise, of course, but maybe 675,000 deaths on a population base of about 100 million. So this is a much bigger event than the 1957–58 or the 1968 case or the current case. Still, a recession in the United States did not occur until later—1920 and 1921. Friedman and Schwartz, in their monumental *Monetary History of the United States,* did not mention the pandemic and instead attributed that recession to restrictive monetary policy designed to keep inflation under control. The subsequent 1920s, often described as the Roaring

Twenties, was one of the best periods of economic growth in U.S. macroeconomic history. So, again, even the very severe pandemic at that time is not associated with the kinds of long-lasting, depression-like outcomes that we talked about yesterday.

So the current projections for less than 100,000 fatalities in the United States on a population of 330 million are not as severe as any of these past pandemics. And it looks like, according to this set of evidence, that the pandemic by itself is unlikely to cause a depression-like outcome in the United States.

What may cause a depression, however, is a continuation of the shutdown policy if it does not soon become more granular and tailored to the situation. The shutdown policy may have been necessary initially, and we're certainly cooperating with our health officials, as I think is appropriate in this situation. But once the initial policy has had some success, the risk-mitigation strategy should adjust to become more tailored, more granular, and more focused on the actual health risks at hand. A one-size-fits-all policy is rarely optimal, and I think the economy will likely adjust to something that is more appropriate.

The U.S. economy handles mortality risks with appropriate risk-mitigation strategies every day. Examples include auto accident risk and terrorism risk. These are not met with policies that say that we can't drive on the highways, nor are they met with policies that say we can't go out of our houses because we might be shot by a terrorist.

So once we get through the initial phase, I think an appropriate risk-mitigation strategy will take hold, and the economy will be able to recover appropriately. But we need to encourage this outcome and not allow the very negative global "Depression scenario" to take hold, which will be disastrous not only for the U.S. economy, but also for health care in the United States and around the world.

On the statement itself, I have two comments. One would be that now may not be a good time to emphasize the dual mandate quite as aggressively as we have done in the past decade. In my opinion, as I described yesterday, we're using the unemployment insurance program appropriately in the current circumstance to provide pandemic relief during the second quarter. Accordingly and in cooperation with our fellow policymakers in the health-care sphere, we're trying to cooperate with the health policy, which is to confine many workers to their homes. These workers have to be compensated for their loss of employment, so the high unemployment rate right now probably does not mean what it has meant historically in macroeconomics.

I see the use of the unemployment insurance program as the convenient channel to provide this relief, but it could have been provided in some other way that didn't show up in the unemployment rate, such as direct payments to individuals that needed pandemic relief. But we're putting it through the unemployment insurance program, and that's making it look like unemployment is quite high when, really, we're offering pandemic relief for the several months here.

Later, in paragraph 3 in the statement, we have a sentence that essentially describes the apocalypse, and then the next sentence is to say that we're keeping rates where they are. I think that this is a little bit jarring. I don't think we should try to do anything about it today, but it does bring to mind the idea that we may have to try to provide a better description of why our current policy is correct for the situation in later periods. You can't, for long, maintain the posture that the sky is falling, but we're doing nothing. So we have to give a better description of why we think the current policy is the right one. I do think it is the right one for the current situation, but we're going to have to describe it better in future statements. Thank you, Mr. Chair.

CHAIR POWELL. President Kaplan, please.

MR. KAPLAN. Thank you, Mr. Chair. I agree with the statement as written and, obviously, the actions that we've taken, and I agree with many of the comments made by other presidents talking about the excellence of the work that the Fed has done and the reaction of the public.

I go back, in thinking about all of this, to the situation that predated the COVID-19 crisis, and we've talked about the fact that we had a strong economy going into this crisis. But I would highlight that there were several vulnerabilities at that time that we were concerned about: weak global trade; deglobalization; a high level of corporate leverage; weak, sluggish business fixed investment; muted inflation, probably due to the trend, partially, of technology-enabled disruption; and slow workforce growth.

It strikes me that, in the future, none of these issues are going away. And, in fact, some of them will likely be made worse by this crisis, and we're going to have to go back to addressing some of these. However, many of them need to be addressed away from the Fed with structural reforms and policies that grow the workforce, improve skills training, improve productivity, and probably deemphasize financial engineering in place of business fixed investment.

I overlay on that situation the implications of a very large Federal Reserve balance sheet, but more concerning to me are extremely large fiscal deficits that we're going to now be living with for the rest of our lives and probably for the rest of our children's lives. And I wonder, what will be the effect of those policies on squeezing out private capital and maybe even impeding business fixed investment, which already was an issue. How do we pay for all of this government debt? What are the implications for taxes and other policies? What implications do those have for growth? What's the effect of all of this on potential growth? It's clear, as we've talked about, that we face disinflation and even deflationary risks in the short run, but in the longer run, as we get to full capacity in the next few years, what are the risks of inflation pressures, which we haven't dealt with for several years?

These are some of the questions and things we'll be watching here, and I'll be watching, as we deal with this current situation as the dust settles and we begin to reopen—and as we debate what type of policy is appropriate and what type of forward guidance is appropriate. Thank you, Mr. Chairman.

CHAIR POWELL. Thank you. President Barkin.

MR. BARKIN. Thank you, Mr. Chair. At every FOMC meeting, we share our perspectives on future monetary policy. But I actually want to use most of my time today to look backward and, like Presidents Bostic, Harker, and Kaplan, offer my appreciation to the Board of Governors and the New York Open Market Desk for a job well done.

The Fed moved quickly and moved aggressively. We got our facilities into the markets without operational hiccups. We had real effect on a number of malfunctioning markets that, absent our intervention, could have made this situation much worse. We navigated the legislative process with commitment but also humility and, by doing so, reinforced the trust we have with both the Congress and the Treasury. We sent sensible and timely messages to markets, banks, and the public.

Speaking for my team in Richmond, I want to say that we're proud to have been part of what the Fed has done. And, speaking for contacts in my District, I would like to say that they credit us with stepping up to help in their time of need. Thank you for what I know has been a brutal two months.

I'm tempted to close there and probably should. But if I can add just one more thought—we will buy ourselves additional credibility by moving to suspend facilities with the same kind of speed with which we initiated them when their purpose has been addressed. Our "footprint" has expanded greatly and will draw growing attention over time. Our newer facilities will inevitably generate criticism from those not served. We know that public opinion can shift quickly.

It would be good to continue to stay a step ahead by signaling through our actions that our interventions are targeted and time limited. The first candidate might be our repo interventions now that the federal funds rate has stabilized. But we might also look at our Treasury securities purchases as that market returns to normal functioning and at facilities for which the need has passed, like those aimed at money markets. I would welcome further discussion of the relationship between our market-functioning indicators and our criteria for facility suspension. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Mester.

MS. MESTER. Thank you, Mr. Chair. I support no change in our policy stance today, including the target range for the federal funds rate, our forward guidance, and balance sheet actions, and I support the statement as written.

The Fed continues to take an all-hands-on-deck approach in setting up the remaining facilities we've already announced. Some of these facilities involve our moving into new asset classes, including municipal debt and corporate bonds, and lending to businesses that we've not been involved with before. While we do not want to lend to businesses that are not viable, we're facing a huge, unprecedented negative shock, and I believe it's appropriate for us to take on more credit risk than we may have felt comfortable with before this situation. We should be open to amending our programs as appropriate to make them as effective as possible and considering additional programs as needed.

As the statement says, the Federal Reserve needs to be "committed to using its full range of tools." We are taking unprecedented action in unprecedented times. In doing so, we need to steel ourselves not only against criticism, but also against praise, and be guided by our principles and goals of promoting maximum employment and price stability.

The virus and shutdown of the economy to help control its spread have led to sharp declines in activity and employment. Even after some of the restrictions have eased, it will take some time for economic activity and job growth to return to more normal levels. How long it takes for us to be confident that the economy is on track to achieve our dual-mandate goals will depend on the success of measures taken to control the spread of the disease and the success of policy actions taken to provide economic relief during the pandemic shutdown period. Over the next month or two, we will get a better read on the state of the economy and whether policy actions are having the desired effect in limiting more permanent damage to the productive capacity of the economy. I agree with Governor Clarida that our guidance on the interest rate path will need some thought as we get more information on the expected evolution of the economy.

Now, with the high level of uncertainty, I think the best approach is to look at several models and various assumptions to better understand the range of possible outcomes. And I appreciate the Tealbook's providing several alternatives this time. The Cleveland Fed staff also ran several forecasting models with various conditioning assumptions. What is clear from these models is that a wide range of outcomes is possible, depending on what one assumes about the length of the pandemic shutdown and the success of policy actions in helping avoid the usual recession dynamics.

What is also clear is that the standard models are not equipped to deal with a self-imposed deep recession and unprecedented policy actions. The nature of the shock, combined with the aggressive policy actions, provides a reasonable chance the economy can avoid much of the usual recession dynamics that are built into the models based on historical data. There is some chance that the Tealbook's baseline scenario will be how things evolve. But there's also some chance that this outlook will turn out to be too optimistic, and we will see something more like what the Tealbook calls its "Second Waves" scenario or even something worse. This possibility becomes more likely if the relief actions taken—and those still expected to come—have less of an effect than projected and we see temporary layoffs turn into persistent unemployment and a significant number of business closures.

We need to be prepared for both possible outcomes. It could be that, after staged reopenings in enough regions, economic activity will pick up, as in the Tealbook baseline. Even in this case, if we want to maintain our current policy stance, we may soon need to clarify our plans for asset purchases. We've been careful to characterize purchases of Treasury and agency mortgage-backed securities as steps taken to improve market functioning. And I want to compliment the Desk staff on implementing these purchases in a timely and effective manner, and I appreciate their memos describing the actions' effects on markets and the Fed's balance sheet.

As market functioning has improved, the Desk has slowed the pace of these purchases. At some point, without further guidance, market participants may become concerned that these purchases will slow so much that this will result in a tightening of financial conditions more broadly. To avoid this, some further guidance on planned purchases may be called for.

We also need to prepare for the possibility that the recovery will be a tepid and drawn-out affair, and that more accommodation will be needed to support the recovery. Forward guidance and quantitative easing are tools the Committee has used before. As Governor Brainard discussed yesterday, yield curve control, perhaps at shorter maturities to support forward guidance, should also be contemplated. Although both Japan and Australia are using this tool, neither has exited from it, and thinking through how exit would be accomplished would be worthwhile to do as part of the design work before using this tool.

The appropriate timing of when to add additional accommodation also has to be considered. Standard theory would suggest that once you’ve determined that the outlook necessitates a more accommodative stance, you should move to that stance without delay. Doing so shifts future activity to the present, thereby helping the economy. And in the current situation, a large portion of the economy is shut down. Less activity can be brought forward.

If there were no constraints on our tools, there would be no cost in taking the action now so that the accommodation is in place whenever the economy reopens. But it could be that you’re better off delaying the action until the economy begins to reopen if some of the effect comes through the announcement of a change in policy and its effect on expectations. You could also be better off delaying the action if there are some constraints on our tools so that an action today makes it more difficult to take an action tomorrow. Of course, many states have begun slowly reopening. And by the time of our June meeting, the economy beginning to reopen could have already occurred—which makes the timing consideration more of an academic one.

Communication about additional accommodation will matter. If additional asset purchases are called for, we need to transition from explaining our purchases as supportive of market functioning to explaining them as supportive of a more general easing of financial conditions. In addition, outcome-based forward guidance will be more effective when we offer an economic forecast to go with it. In the environment that we are in, outcomes depend not only on economic factors and fiscal and monetary policy actions, but also on epidemiology, which is outside our realm of expertise. In this situation, it may be helpful to communicate a couple of scenarios. Even if the modal forecast is the Tealbook baseline, the discussion of an alternative, more drawn-out recovery scenario could help explain a risk-management rationale for taking accommodative action. It would also help limit excessively negative signals being taken from our actions.

I would suggest that we once again submit projections in June but incorporate the possibility of a couple of scenarios and place more emphasis on the uncertainty-and-risk questions that are already part of the submissions. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Evans.

MR. EVANS. Thank you, Mr. Chair. I think monetary policy is in the right place for now. The setting and forward guidance for the target for the federal funds rate are clearly correct, and I think our balance sheet is appropriately deployed, given what we know about the current financial environment.

I support the new language in the Committee's policy statement. It is important that we display a realistic assessment of the challenges faced by the nation today. Paragraphs 2 and 3 do that well, and I'm also fine with the new Desk directive.

The strong actions we've taken to date should mitigate some of the hardships that households and businesses are facing. For now, it is appropriate for us to wait and see how the pandemic and its effect on the economy play out and how well the monetary and fiscal policy actions taken to date cushion the blow.

The economic path forward is highly uncertain, and I would love to be optimistic. Certainly, the comments about the cost of shut-in have to make us all very concerned. But, as I think about the strengths of the U.S. economy coming into this, we all pointed to the consumer as an enormous part of the strength of the economy.

And the composition of our economy right now is just so different than in many earlier eras. We have a large service sector. People are accustomed to going out, eating, and socializing. Travel is just such a very large part of the economy—investment in the travel industry and capital expenditures in airlines, hotels, leisure, and retiree activities. It's hard to imagine that loss of confidence in these areas wouldn't have a big effect on the economy. Consumer confidence is going to be key. Things like "When will Disney World reopen?" are going to be really important.

And I just think that to educate people throughout the United States, it really comes down to a relatively small number of people at the highest levels generating the right messages to provide comfort to everyone on this. Large amounts of economic activity take place in very dense metropolitan areas, so returning to work is feasible in some areas, but it'll be much more challenging in others.

As we move through the year, we will learn more about the challenges that we face, and we can tailor our responses as warranted. As the first line in our policy statement says, the guiding principle for this Committee is that we will use all of our tools as necessary to support the economy through this crisis. We undoubtedly will be putting that toolbox to the test as we work our way through these extraordinarily difficult times. Thank you, Mr. Chairman.

CHAIR POWELL. Thank you. President George.

MS. GEORGE. Thank you, Mr. Chairman. Today's policy decision seems straightforward to me. Although it's perhaps too soon to judge the full extent of damage to the economy, the actions we've taken since early March to support market functioning and the flow of credit have been a necessary central bank response to an unfolding and unprecedented global crisis.

And I, too, want to thank so many in the Federal Reserve. This has been an impressive response from leadership and staff to an enormous challenge, whether it's our cash operations, the technology support for a remote workforce, or the New York Desk and staff who support this Committee.

But in the weeks ahead, I hope the focus will shift from our triage response to the role that monetary policy will play in supporting the economy's recovery. The effects of a historically large economic contraction and the prospect of an only gradual return to something like normal social and economic activity will challenge our policies that support a return of employment and inflation to more normal levels.

We generally know the countercyclical tools at our immediate disposal—namely, balance sheet policy and forward guidance. While asset purchases aimed at restoring market functioning of the sorts we've done in recent months are certainly necessary in times of stress, I'm more skeptical of continuing to expand our balance sheet as a tool to stimulate aggregate demand. I would prefer to orient future easing measures on our communication for the future path of the funds rate. Research by my staff shows that forward guidance can drive the very reductions in term premiums that asset purchases aim to achieve. For example, the introduction of date-based forward guidance in August 2011 significantly lowered term premiums. And this research finds that event studies often fail to account for this channel of forward guidance and, therefore, tend to exaggerate the effects that large-scale asset purchases have had on longer-term yields.

Our June meeting would not be too soon, in my opinion, to consider how forward guidance might help us achieve our objectives for the damaged economy. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. We need to check again to make sure everyone is on mute. It seems that someone is not on mute. We can hear typing. We can hear talking. So please check again to make sure that you're on mute. Governor Bowman, please.

MS. BOWMAN. Thank you, Mr. Chair. I support the policy statement as written. The current stance of monetary policy is appropriate for the current unprecedented economic circumstances. In anticipation of these conditions, following our previous meeting, we signaled that we would maintain that stance until we became confident that the economy had weathered the storm and was on the way to recovery. We are still very much in the middle of the storm, with little visibility on the timing and the shape of the eventual recovery. So at this point, I see no reason to change our policy stance, consistent with the draft policy statement.

With the policy stance more on the back burner at this point, I believe we should remain focused on ensuring the flow of credit to businesses and households. Access to credit is a lifeline for businesses and families, especially during these incredibly disruptive times. In addition, a well-functioning credit market is essential for the transmission of monetary policy. When credit seizes, our monetary policy decisions can't really reach the economy, and, as a result, we can't effectively pursue our dual mandate. Low interest rates provide value only if businesses and consumers can access loans when they need funds.

The creation and implementation of the 13(3) emergency facilities enabled us to support credit markets that were distressed to the point of breaking. As others have noted, these facilities should function as a temporary bridge to help the economy get to the other side of this pandemic and related credit market disruptions. And I'm encouraged by the recent signs of improved market functioning.

In addition to supporting the economy, a further normalization of market functioning will enhance the effectiveness of our recent and future monetary policy actions. And, speaking of future monetary policy actions, I'd like to note briefly a few topics that will likely warrant further discussion in coming meetings as credit markets continue to normalize further and as we get a little more clarity on the extent of the pandemic-induced damage to the economy. We will have to consider our purchases of Treasury and agency mortgage-backed securities—whether to phase them out carefully or repurpose them as a tool to provide further monetary policy accommodation, as opposed to a tool to support market functioning. At the appropriate time, we will also likely want to consider the use of more explicit forward guidance. Right now, the market doesn't appear to expect a change in the target range for the federal funds rate anytime soon, but that could change in ways that may not be consistent with our intentions.

Let me conclude by recognizing the staff's work here at the Board and throughout the System—addressing the many operational, logistical, and supervisory issues, in addition to bringing to life the multitude of facilities and programs we announced in recent weeks, while juggling work from home, family, and other responsibilities and challenges. You've worked many weekends and nights. You've answered so many questions and worked tirelessly to accomplish an enormous amount in a very short timespan with incredible dedication and insight.

I’d also like to thank our leadership for their vision in this historic time—and also the leadership of our Reserve Bank presidents, who have taken on the implementation responsibility for the various facilities.

And, finally, I’d like to thank Joe Gruber for his excellent work here at the Board. I wish you all the best in your new role at the Kansas City Fed. Thank you, Chair Powell.

CHAIR POWELL. Thank you. Governor Quarles.

MR. QUARLES. Thank you. Thanks, Chair. I support the proposed statement. And, in addition, I want to reiterate my support for all of the actions that we’ve taken. We’ve been confronted with an unprecedented shock due to the government closures of the economy. Although I share many of the questions that President Bullard raised as to whether those closures have been well calibrated, the Fed has had to play the hand that we’ve been dealt, and we responded with speed and forcefulness. I want to underscore the admiration that I think everyone has expressed for the staff’s response, which has really been admirable and in the highest traditions of the Fed and of American public service—very, very much so.

I do want to go on record as noting how much we as an institution really owe to the Chair’s leadership. I mean, Jay has noted that he began realizing that we would need a forceful response at the G-20 and G-7 meetings in Saudi Arabia. I was at those same meetings, and I have to say, I would not have begun to see what was coming. I was principally focused on the fact that the Saudi Arabians have an annual contest for the most beautiful camel, which they had on display for us at dinner, while Jay was calculating this sort of world historical response. And, as a result, as an institution, we have shown competence, seriousness, and flexibility in confronting this crisis.

So, obviously, I usually try to stay away from those sorts of personal panegyrics, because it sounds a little too much like Trump's first cabinet meeting or the opening session of the North Korean Supreme People's Assembly. And I do have a "but," which is that although I fully support our aggressive policy response, that's not to say that I don't have some concerns, as I think we all might. Primarily, we have broken the glass, committing to buy assets that we have heretofore avoided. And, as the metaphor suggests, once the glass is broken, it's hard to go back. It is indicative that, coming into this crisis, our first actions were to redeploy the full arsenal of tools that had been used during the crisis of 2008. And going into the next crisis—and there will be one—we'll be pulled in the direction of recreating this playbook used in this crisis. There's a path dependence in monetary policy that will be hard to avoid.

Even if we wanted to, it will be difficult to tie up our new facilities into a specific pandemic response kit. Some of our foreign central bank colleagues have tried to construct linguistic cordons around their new programs, such as the ECB's pandemic emergency response program or the Bank of England's Covid Corporate Financing Facility, which I think primarily ensures that they will have to use different acronyms during the next crisis even though the facilities are likely to be familiar.

And a word on moral hazard. Clearly, the economy entered this crisis through no fault of its own, to speak anthropomorphically, and hence the strong policy response we've undertaken can't be viewed as bailing out or supporting bad behavior. But, that said, we shouldn't simply shrug off the effect that our actions might have on future behavior. And just as worrying is the possibility that the perception of new avenues of moral hazard results in calls for stronger and more intrusive regulation.

Finally, a word on the public response. I, too, as many have noted, have been on the receiving end of many thanks, even out here in "black-helicopter land." But through that, I have been thinking of one of my favorite movies—*The Queen,* with Helen Mirren, which, you all remember, describes the period when Tony Blair, the new prime minister, is instructing her, the experienced sovereign, on how to deal with the public's response to Princess Diana's death. Tony Blair is a great success and is on the top of public opinion, while Queen Elizabeth is at the bottom. But, in their last interview, she suggests that he, too, should learn a lesson from the episode "for when they turn on you, Mr. Blair—and they will—quite suddenly and without warning."

So I think it should be a high priority for us to be giving thought now to our exit from this extraordinary stance, along the lines that President Barkin noted, as well as how to cabin and direct that next policy path. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Kashkari.

MR. KASHKARI. Thank you, Mr. Chair. I support our current policy stance and the statement. I think that we've been very aggressive with our tools, and I think that that's been the right thing to do. As we've all noted, we're not the first responders in this crisis. It is the health-care experts—the doctors, nurses, and scientists—who are going to ultimately determine the course of the virus and then the course of the economy. But we are doing our part, and I'm proud that we are.

In looking forward, I want to endorse some comments made by Governor Brainard yesterday about adopting strong forward guidance. Even before the COVID-19 crisis, I was arguing we should adopt state-based guidance saying that we were not going to raise rates until we get inflation back to our target on a sustained basis. I think she, if I understood her yesterday, took it even further, tying it also to our employment mandate. I think that that's a stronger version, and I think that's worth considering. But I do think we should soon be adopting a firmer commitment not to raise rates and preemptively cut off the recovery. So I'm in favor of strong forward guidance.

The last comment I'll make—I'm not sure that you're seeking this opinion, but I would be in favor of not having an SEP in June. I think the range of outcomes is profound, and I'm not looking forward to penciling in a deep, extended recession. I don't think that that's going to serve our policy objectives. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. President Daly.

MS. DALY. Thank you, Mr. Chair. I support the statement as written and our actions and policies more generally. And let me add to the sincere appreciation for all of the staff across the System who have really allowed us to execute well and quickly on all of the actions that we have decided on. In San Francisco, we use the hashtag "#PublicServiceProud" to reference who we are and what we do. And at this moment, this saying truly applies to everyone in the System, as it always does. But I think it was definitely a #PublicServiceProud moment. So, my appreciation.

Now, the emergency actions—and I think of them as emergency actions to support the economy that we have taken—are providing critical support to the economy as it tries to weather the ongoing public health crisis. These actions have been essential for easing financial market conditions and resolving dislocations and strains in credit provision. And they're important for minimizing the current damage, but they're also mandatory starting points for an economic rebound.

The speed and the strength of the rebound remain profoundly uncertain. I think we heard that yesterday and saw it in the Tealbook. But no matter what scenario you have, except for the very most optimistic, the likelihood of a prolonged shortfall in economic activity in coming years suggests that we will need to be ready to stimulate the economy once our emergency support has been completed. And here our framework review and the revised Statement on Longer-Run Goals and Monetary Policy Strategy we were working on before the crisis will be crucial. With the funds rate at the effective lower bound, we will likely need to rely on aggressive forward guidance as well as QE and other tools, like yield curve control, to stimulate economic activity and ensure that we are able to achieve our dual-mandate goals.

But, as we've discussed many times as part of our framework review, to be fully effective, we will need to convince market participants, businesses, and households that we are committed to achieving 2 percent inflation on a sustained basis. Making clear in our own mind and in the Statement on Longer-Run Goals and Monetary Policy Strategy that we are not comfortable with inflation persistently below our target and that we'll use some sort of average inflation targeting to ensure we achieve our goals would be an important step in that direction. And here I second many of the things that Governor Brainard said yesterday.

With our emergency actions well in train, I would welcome returning to the framework review discussion sooner rather than later, perhaps even at our next meeting. I see releasing our revised Statement on Longer-Run Goals and Monetary Policy Strategy and effectively communicating our principles and objectives to be an important element in putting households, businesses, and investors in a good place to understand fully whatever specific policy actions become required of us.

And let me conclude by agreeing with President Bostic and so many that our actions are valued by the American people. It's really clear that they're appreciated. But I would say that we cannot stop here. The future path out of the recession will also demand bold action on our part, and we should not be timid about taking it. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. Governor Brainard.

MS. BRAINARD. Thank you, Mr. Chair. The COVID-19 shock is of historic proportions, and, in turn, we have acted with unprecedented force and flexibility. In just a few weeks, we cut the target range for the federal funds rate to its lower bound and pledged to keep it there until we're confidently on track to reach full employment and 2 percent inflation. We implemented significant liquidity-easing measures, including nearly $1.8 trillion of Treasury and agency mortgage-backed securities purchases, swap lines that are now nearly $½ trillion, and a temporary repurchase agreement facility for foreign and international monetary authorities, or FIMA, account holders. And we stood up nine emergency facilities, five designed from scratch, with more than $2 trillion capacity to support the flow of credit to businesses and households.

These actions have helped restore confidence. The goal of the credit facilities is to mitigate damage to U.S. productive capacity by avoiding, where possible, damaging destruction of human capital and employment relationships and insolvencies of normally creditworthy households and businesses and to support the return to economic activity when public health conditions permit.

It is appropriate today to remain focused on stabilization. The statement conveys credibility in its description of current conditions and commitment to using the full range of tools to support the economy. Over future months, I agree with Governor Clarida—as well as Governor Bowman, Presidents Rosengren, Mester, George, Kashkari, and Daly; and others—that it will be important to consider further adjusting monetary policy. If developments point to a protracted downturn, with both employment and inflation moving away from our goals, our response could evolve in the direction of committing to strong outcome-based forward guidance that conditions liftoff on sustained achievement of full employment and 2 percent average inflation. Our response could include transitioning to quantitative-easing purchases or yield curve control to reinforce the forward guidance in providing accommodation, and committing to an average inflation target that would imply inflation rising moderately above 2 percent to make up for the current shortfall. But those considerations are not for today.

I support the proposed approach on the Overnight Reverse Repurchase Facility, or ON RRP. The effective funds rate has settled at 5 basis points in recent weeks and edged down to 4 basis points at the end of last week. Although there are no indications at this point of market-functioning problems and the low level of the federal funds rate might be due to the very high level of reserves, it is important to demonstrate that we have effective control of the policy rate. For this reason, many market participants are expecting us to raise the IOER rate by 5 basis points at this meeting, and some also expect us to raise the ON RRP rate. For now, I prefer the proposed approach of leaving these rates unchanged but providing the Chair discretion in the directive to raise the ON RRP per-counterparty limit. I wouldn't want to take any risk that an adjustment of either administered rate for technical reasons be misinterpreted. The large issuance of Treasury bills that's forthcoming could end up taking care of this problem. That said, we should continue to monitor conditions, and, if rates were to settle at lower levels than we're comfortable with, we could consider making a technical adjustment at the next meeting.

Finally, I support the statement language on continued purchases. The purchases since mid-March have contributed to significant improvements in market functioning. The Desk has been able to slow the pace of Treasury securities purchases gradually, from a peak last month of $75 billion per day to $15 billion per day last week and, in the case of agency MBS, from $50 billion per day at the peak to $10 billion per day last week. The current plan to reduce gradually the pace of purchases, of both Treasury securities and agency MBS, to $5 billion per day is appropriate. I support this plan. But it will be very important to remain vigilant for new signs of deterioration in market functioning. Retaining the open-ended commitment to purchase in the amounts needed to support smooth market functioning sends a critical message that we stand ready to increase the pace, if necessary.

Finally, I want to join others in again expressing admiration for the staff for their tireless efforts as well as thanking Joe Gruber for his outstanding service at the Board and wishing him well at the Kansas City Fed. I want to express my appreciation to the Chair for his leadership. This is indeed a moment to be #PublicServiceProud. Thank you.

CHAIR POWELL. Thank you. Vice Chair Williams, please.

VICE CHAIR WILLIAMS. Thank you, Mr. Chair. I support alternative B. Oh, sorry, old habits die hard. I meant to say, I support the statement as written.

It's already been said 1,000 times—and I think a few dozen times in the past two days—but, nonetheless, it's worth repeating: We are in an unprecedented situation. And, as I indicated yesterday, the full recovery will be measured in years, not months or quarters, and the risks are overwhelmingly to the downside. Our decisive actions in March—cutting the target range for the federal funds rate by 150 basis points and instituting massive asset purchases—have dramatically lowered short- and longer-term interest rates. Our actions and statements have been heard loud and clear. Market expectations for the path for the federal funds rate have it staying near zero through 2022. And the two-year Treasury yield, currently at around 20 basis points, is at the level seen during the period of explicit forward guidance starting in August 2011, and the 10-year Treasury yield, at 60 basis points, is near historical lows.

Given our bold actions, the immediate issue is not risk-free rates that are too high, but rather ensuring the effective transmission of monetary policy to broader financial conditions and an adequate supply of credit. These are, of course, the purposes of the enormous asset purchases that the FOMC has undertaken and the many facilities that the Fed has introduced. This is where we are appropriately focused in both our actions and our communications.

Looking ahead, we will need to decide how to best use our monetary policy tools to quickly return the economy to maximum employment and 2 percent inflation once the health crisis subsides. Our future actions and communications will be most effective once we have greater clarity on the depth of the downturn and a better sense of which of the possible paths that the economy may be on. An action that may seem well calibrated today may quickly become out of sync with economic reality in a month or two, in light of the still rapidly changing and highly uncertain environment.

In addition, we'll have a unique opportunity to reconfigure our policy strategy and communications in the context of the new policy framework, which we should be able to finalize soon. The announcement of the new framework, alongside strong policy actions aligned with that framework, will be a powerful combination as we navigate the extremely challenging policy environment of the next few years. And in thinking ahead to that day, we will need to make clear that our monetary policy actions and our communications do not represent emergency measures, as our lending facilities have, but are really part of our long-term strategy to best achieve our dual-mandate goals.

Finally, I'd like to add my thanks and appreciation to all of the staff at the New York Fed and around the Federal Reserve System who, as many have already said, have stepped up amazingly to accomplish so much in so little time. The ingenuity, creativity, and dedication of people who are working from home and working from all across the country together to get the facilities set up and take the policy actions—everything that's going on. But I'm thanking them also for all of the work we still need to do—obviously, finishing the work we started, building on that in the future, and planning and executing our monetary policy strategy over the next few years. There are still quite a few challenges ahead of us, and, again, this is an opportunity for the Fed to show truly who it is and what we're capable of. And, again, I want to thank everybody for what they've accomplished. Thank you, Mr. Chair.

CHAIR POWELL. Thank you. And thanks, everyone, for your comments—obviously, a strong consensus supporting the statement as written. So with that, let me now ask Jim Clouse to make clear what the FOMC will vote on and to read the roll.

MR. CLOUSE. Thank you, Mr. Chair. The vote will be on the monetary policy statement and directive to the Desk as they appear in Thomas's briefing materials. I'll call the roll.

Chair Powell	Yes
Vice Chair Williams	Yes
Governor Bowman	Yes
Governor Brainard	Yes
Governor Clarida	Yes
President Harker	Yes
President Kaplan	Yes
President Kashkari	Yes
President Mester	Yes
Governor Quarles	Yes

CHAIR POWELL. Now we have two sets of related matters under the Board's jurisdiction: corresponding interest rates on reserves and discount rates. May I have a motion from a Board member to take the proposed actions with respect to the interest rates on reserves as set forth in the implementation note included in Thomas's briefing materials?

MR. CLARIDA. So moved.

CHAIR POWELL. May I have a second?

MS. BRAINARD. Second.

CHAIR POWELL. Without objection. So ordered. Next up, we need to approve the corresponding actions for discount rates. May I have a motion from a Board member to approve establishment of the primary credit rate at 0.25 percent and establishment of the rates for secondary and seasonal credit under the existing formulas specified in the staff's April 24, 2020, memo to the Board?

MR. CLARIDA. So moved.

CHAIR POWELL. May I have a second?

MS. BRAINARD. Second.

CHAIR POWELL. Thanks again. To conclude, our final agenda item is to confirm that, with luck, our next meeting will be on Tuesday and Wednesday, June 9 and 10, 2020. That concludes this meeting. The meeting is adjourned. Thank you, everybody. Stay well, stay healthy, and I look forward to speaking to each of you soon. Thanks again.

PARTICIPANTS. [Chorus of thanks]

END OF MEETING