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FEDERAL RESERVE'S SECOND MONETARY POLICY REPORT FOR 2017

HEARING

BEFORE THE

COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS UNITED STATES SENATE

ONE HUNDRED FIFTEENTH CONGRESS

FIRST SESSION

ON

OVERSIGHT ON THE MONETARY POLICY REPORT TO CONGRESS PURSUANT TO THE FULL EMPLOYMENT AND BALANCED GROWTH ACT OF 1978

JULY 13, 2017

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C O N T E N T S

THURSDAY, JULY 13, 2017

WITNESS

ADDITIONAL MATERIAL SUPPLIED FOR THE RECORD

FEDERAL RESERVE'S SECOND MONETARY POLICY REPORT FOR 2017

THURSDAY, JULY 13, 2017

U.S. SENATE,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
Washington, DC.

The Committee met, at 9:34 a.m., in room SD–538, Dirksen Senate Office Building, Hon. Mike Crapo, Chairman of the Committee, presiding.

OPENING STATEMENT OF CHAIRMAN MIKE CRAPO

Chairman CRAPO. Good morning, and the Committee will come to order.

Today we will receive testimony from Federal Reserve Chair Janet Yellen regarding the Fed's semiannual report to Congress on monetary policy and the state of the economy. Welcome, Chair Yellen.

Promoting economic growth remains a top priority for this Committee and for this Congress.

I have been encouraged to see Federal agencies and stakeholders carefully and thoroughly evaluating current laws and regulations.

Since the last Humphrey–Hawkins hearing in February, there have been numerous developments that will impact economic growth legislation. Senator Brown and I have solicited the public for economic growth proposals, and more than 100 submissions from individuals and stakeholders have come in. They are listed on the Committee's website for those who may be interested, and we are working together now to put together legislation dealing with it.

The Committee has held numerous hearings focused on economic growth with financial companies and regulators; Federal financial regulators issued their second EGRPRA report; and the Treasury Department issued its first report on Core Principles of Financial Regulation.

In addition, Members on both sides of the aisle have expressed interest in finding ways to help our economy improve. Support for bipartisan legislation promoting economic growth continues to build.

Particular interest has been focused on finding bipartisan solutions to tailor regulations, change the SIFI threshold, exempt certain firms from stress testing, fix the Volcker Rule, and simplify small bank capital rules. These are just a few of many issues raised to the Committee in recent months.

Imposing enhanced standards designed for the most complex systemic firms on institutions that are not systemic has real-world implications. I regularly hear from Idaho business men and women who are concerned about access to business loans that would create jobs and promote a healthy economy.

The $50 billion SIFI threshold, particularly, is an area we should address. There are different ways enhanced standards could be applied, and all too many have questioned whether the $50 billion threshold is appropriate.

Chair Yellen, Federal Reserve Governor Powell, Acting Comptroller Noreika, former Federal Reserve Governor Tarullo, and former Comptroller Curry have all expressed support for changing the $50 billion threshold.

In addition to the $50 billion threshold, Federal Reserve Governor Powell recently shared specific areas where the Fed believes some laws and regulations can be changed to alleviate burden, including the Volcker Rule, stress tests, and resolution plans, among others. I look forward to working with the Fed on these issues and welcome any additional color that you, Chair Yellen, can provide on areas where the Fed and Congress may act together to further reduce burden.

With respect to housing, reforming the housing finance system is one of my key priorities this Congress. I have repeatedly stated that the status quo is not a viable option. The current system is not in the best interest of consumers, taxpayers, investors, lenders, or the broader economy.

I was encouraged that Federal Reserve Governor Powell gave a speech last week in which he said that the status quo it unsustainable.

He also noted that "[a]s memories of the crisis fade, the next few years may present our last best chance to finish these critical reforms."

With respect to monetary policy, the Fed has now raised interest rates four times since 2008. Overall, the Fed maintains an accommodative monetary policy with a balance sheet that still stands at $4.5 trillion in assets.

Last month, the Federal Open Market Committee issued an addendum to its Policy Normalization Principles and Plans detailing how the Fed will gradually reduce its assets. I welcome more comments from Chair Yellen about the state of the economy and the path of monetary policy.

The Committee continues to work to find bipartisan fixes to address many of the issues outlined here today, and I look forward to working with Chair Yellen, the Federal Reserve, and the Members of this Committee.

Senator Brown.

STATEMENT OF SENATOR SHERROD BROWN

Senator BROWN. Thank you, Mr. Chairman, for holding this hearing. Chair Yellen, welcome back. It is wonderful to have you here and to see you again. Thank you, and thank you so much for your service.

Since your last appearance before this Committee, the Fed has increased the Federal funds rate twice, employers continue to cre-

ate jobs—although at a slightly slower pace than last year—and wages have increased modestly.

The Fed continues to lay out its plans to sell off the securities that it purchased during the crisis. The biggest banks are making record profits. Important to remember that. The biggest banks are making record profits and just passed the Fed's 2017 stress tests.

At the same time, too many Americans continue to struggle to make ends meet. They worry their children will not have the economic security that they once had. Life expectancy in many parts of the country is falling—something more or less unprecedented in recent history—and that tells us something about our economy.

So I am troubled by what I am hearing from the Administration, from some Republicans, and from some in the banking industry. Even though a fifth of homeowners with a mortgage are still seriously underwater in cities across Ohio—you and my colleagues have heard me say on this Committee that the Zip Code my wife and I live in in the city of Cleveland, Zip Code 44105, had 10 years ago more foreclosures the first half of that year than any Zip Code in the United States of America. I see the difficulty that people in my neighborhood and my Zip Code have in rebuilding their lives. Even though the wealth gap between white and black families has widened, the Administration seems to want to let Wall Street gamble with the financial futures of working families once again.

Gutting protections for working Americans is back in style in parts of Washington—from the Treasury Department's report, to the Financial CHOICE Act, to the House's financial appropriations bill. We face a slate of nominees for watchdog politicians who are, with great apology to President Lincoln, of Wall Street, by Wall Street, and for Wall Street.

Ten years ago, Chairman Bernanke sat in the seat that you occupy. After describing the economic conditions in the housing and business sectors, he told our Committee—he spoke about concerns about subprime mortgages, global economic trends, and consumption and labor data. But he concluded—this was 10 years ago—"Overall, the U.S. economy appears likely to expand at a moderate pace over the second half of 2007, with growth then strengthening a bit in 2008 . . . ".

We must not forget what actually happened next: a devastating financial crisis. Working families in Ohio and Nevada and Maryland and Arkansas and all over, working families across this country cannot forget that. They are still digging out. Nor can we forget it, collective amnesia on this panel aside.

I mention this not as a criticism of Chairman Bernanke. He had plenty of company in missing the signs of an impending crisis and an impending collapse. But when it happened, he took aggressive action, all of you did, to confront that crisis. He learned the lessons that came at such a high cost.

After the crisis, we put rules in place that strengthened the capital positions of banks, that provided more stable liquidity, and that improved protections for consumers and for taxpayers.

Lobbyists are using the success of these reforms as proof that they should now be gutted. They are arguing that the results of the Fed's stress tests prove that we can now relax the rules. Having passed the test once, they want to make the test easier.

I am sure every college student you taught in your long, distinguished academic career, Madam Chair, I am sure every college student you taught who struggled in class would have wanted the same thing. But they, unlike our Nation's biggest banks, would have been too embarrassed to ask their professor.

The financial crisis was caused in part by watchdogs who were busy focusing on bank profits instead of ensuring that banks were treating their consumers fairly and had enough capital to weather a downturn.

Everyone on this dais can agree that there are parts of Wall Street Reform that could be improved. Of course there are. But our focus should be on growing a stronger economy for everyone, in every part of the country—from Idaho to Ohio and beyond—and particularly in communities too often forgotten in this town.

That means protecting consumers. It means improving the economic security of communities of color. It means strengthening the working- and middle-class families who felt the devastation the most, the devastation of 2008's financial crisis.

It means lowering the cost of health care. It means investing in infrastructure. It means expanding educational opportunities and job training. That is how you spur long-term economic growth that lifts up all Americans.

Instead, weakening safeguards to boost bank profits and crossing our fingers that Wall Street will invest some of those profits in the real economy—we hope, we hope, we hope—instead just passing it along to their shareholders will not prevent another crisis. It will only hasten the next one.

Madam Chair, I look forward to hearing your answers to our questions. Thank you.

Chairman CRAPO. Thank you, Senator Brown.

Chair Yellen, again, welcome here. We appreciate you being here with us today. My understanding is that because today's testimony is the same as the testimony you gave yesterday at the House, you have requested to waive the reading of your testimony. Senator Brown and I have conferred, and we agree with that, and so we will proceed directly to the questions.

Ms. YELLEN. Very good.

Chairman CRAPO. And with regard to the questions, I again remind the Members of the Committee that we have 5 minutes each for questions, and we will try our very best—we have got a lot of time pressures today, and we will try our very best to help you keep on course with your 5-minute question period.

I will begin. First, Chair Yellen, in a speech that Governor Powell gave last week, he outlined a few principles for housing finance reform. As part of the discussion, he explained that it was important to do three things: to do whatever we can to make the possibility of future housing bailouts as remote as possible, to change the system to attract large amounts of private capital, and to identify and buildupon areas of bipartisan agreement.

Do you agree with these principles?

Ms. YELLEN. Yes, I do, Chair Crapo. I would support the principles that Governor Powell put forward and think it is something that I hope the Congress will move to in the near future.

Chairman CRAPO. And I know the answer to this, but I would like to have you say it. Do you agree with the urgency that he expressed and that many of us have expressed about the need for us to act?

Ms. YELLEN. Yes. I mean, it has been almost a decade since Fannie and Freddie were moved into receivership, and the role of the Government and the associated systemic risk remains. And I think it is important to move forward with reforms.

Chairman CRAPO. Thank you.

There appears to be growing consensus that Congress should consider changing the $50 billion SIFI threshold, also changing the Volcker Rule exempting certain institutions from company-run stress-testing requirements, and reducing the burdens on community banks and credit unions.

Do you agree that it would be appropriate for Congress to act in each of those areas?

Ms. YELLEN. I do.

Chairman CRAPO. Thank you. And could you please give the Committee after this hearing—I do not want to use up my time on this right now—some additional suggestions of ideas or legislation the Committee could consider to reduce the burdens in these areas?

Ms. YELLEN. Yes, we would be happy to do so.

Chairman CRAPO. Thank you very much.

Next, at our hearing last month, Governor Powell said the Federal Reserve is reviewing the Volcker Rule. He noted that there is room for eliminating or relaxing aspects of implementation regulation that do not directly bear on the Volcker Rule's main policy goals.

Can you elaborate on the Fed's review of the Volcker Rule?

Ms. YELLEN. Well, we look forward to working with the other agencies that have a role in rule writing. It is a very complex rule, partly reflecting the legislation, but I think we could find ways to reduce the burden, and it should be a multiagency effort.

Chairman CRAPO. And many of us are aware that the multiagency effort has been slowed down simply, many of us believe, because of the complexity of getting four or five agencies——

Ms. YELLEN. I think that is true.

Chairman CRAPO. ——to all agree on the same thing.

Ms. YELLEN. Yes.

Chairman CRAPO. What do you think about the idea of having a designated lead agency on this issue?

Ms. YELLEN. Well, I think that is something that Congress could certainly consider. If one agency has a larger regulatory role with respect to those institutions, it might be natural for it to take the lead.

Chairman CRAPO. All right. Thank you. And at our last hearing, you told me, "We would like our balance sheet to again be primarily Treasury securities; whereas, we have substantial holdings of mortgage-backed securities." However, the FOMC's plans to reduce the balance sheet include initially not reinvesting $6 billion of maturing Treasury securities and $4 billion of agency securities per month, suggesting that the Fed may wind down its Treasury portfolio more quickly than its mortgage-backed securities portfolio. Is that accurate?

Ms. YELLEN. Well, ultimately when the caps are fully phased in, my guess is that they will not be binding and that we will be running down mortgage-backed securities at the rate that principal is received on them. It will be a long process, I should say, to go back to an old Treasurys portfolio. Even after we have come to the point where our balance sheet has been reduced to as low a level as we expect to take it, we will still have substantial holdings of mortgage-backed securities. So beyond that, we will be further running down mortgage-backed securities and replacing them with Treasurys. So it will be a lengthy process, but the FOMC is committed to a primary Treasury-only portfolio in the longer run.

Chairman CRAPO. All right. I appreciate that, and with that, I will yield back 18 of my seconds and go to you, Senator Brown.

Senator BROWN. Setting a high standard. Thank you, Mr. Chairman.

History teaches us that when Congress does big things, labor law reform and Social Security with Franklin Roosevelt, in 1965 Lyndon Johnson with Medicare, the Congress 2 or 3 years later goes back to those issues bipartisanly and makes modest changes to fix them, something we have been asking for several years, asking Republicans to do with the Affordable Care Act. They have not chosen to work with us bipartisanly to make minor adjustments.

The same with Dodd–Frank. Instead, we have seen particularly a House Financial Services Committee that wants wholesale destruction. Of course, we will work bipartisanly on making the kinds of changes that will do what certainly Chair Yellen has spoken about in making those reforms. So I just wanted to preface with that.

Madam Chair, you recently stated you do not expect another financial crisis in our lifetimes. Setting aside the delicate question of your and my and all of our life expectancies, is that predicated on maintaining the strength of the current regulatory structure?

Ms. YELLEN. Well, let me state what I think I should have stated originally when I made that comment. I believe we have done a great deal since the financial crisis to strengthen the financial system and to make it more resilient. I think we can never be confident that there will not be another financial crisis, but we have acted, in the aftermath of that crisis, to put in place much stronger capital and liquidity requirements for systemic banking organizations and the banking system more generally. I think our stress-testing regime is forcing banks to greatly improve their risk management and capital planning. It is giving us assurance that even if there is a very significant downturn in the economy, they will be able to function and provide for the credit needs of the economy. And we have greatly increased our monitoring of the financial system for a broader range of risks.

But let me say we can never be confident that there will not be another financial crisis, but it is important that we maintain the improvements that have been put in place that mitigate the risk and the potential——

Senator BROWN. Thank you. I just want people listening not to read your answers to the Chairman about moving on reform and moving—that there is some urgency to that, and we do want changes. We want them to be modest. But let me sort of further

paint that picture with this question. In light of your comments to me that you may not expect another financial crisis in our lifetimes, but the importance of a good regulatory structure——

Ms. YELLEN. Absolutely.

Senator BROWN. ——diminishes the chances dramatically. Well, if so, if the recommendations of the Treasury report that you are familiar with that, obviously, the way it was written you did not seem to have a lot of input in, the recommendations of the Treasury report that weaken regulations on the largest banks, including lower capital requirements and fewer consumer protections, if those were adopted, which you continue to have that same level of confidence that you just repeated and have said earlier?

Ms. YELLEN. So I would not be in favor of reducing capital for the most systemic banks.

Senator BROWN. And consumer protections?

Ms. YELLEN. I think those are important as well. There are a lot of things in the Treasury report that we agree with that mirror things that we are doing on our own to appropriately tailor regulations——

Senator BROWN. And I apologize——

Ms. YELLEN. ——but for those banks, it is critically important to maintain the capital standards——

Senator BROWN. So if we were to adopt—I am sorry to interrupt. If we were to adopt the Treasury report recommendations, it would more likely result in a potential financial crisis?

Ms. YELLEN. Well, some of them, yes.

Senator BROWN. OK, OK. The last question I wanted to ask. I want to return to a topic I discussed several weeks ago with your colleague Governor Powell. Last year, the Fed proposed adding capital surcharges into the large bank stress test. Former Governor Tarullo recently said the biggest banks' capital requirements "are still somewhat below where they should be," and that incorporating the surcharges into CCAR will protect against contagion from one of these banks spreading to the rest of the financial system.

Madam Chair, is the Fed on track to finishing these changes?

Ms. YELLEN. We are working very hard on those. We are awaiting further work by our staff. We hope to include those surcharges and make other adjustments, and to better integrate the capital requirements relating to the stress tests and toward a normal capital——

Senator BROWN. But you are assuming, then—can you give us with assurance—and, Mr. Chair, this will be the last, and this is an easy one. Can you assure us that those changes will be in place for next year's stress tests?

Ms. YELLEN. It depends on the timing. We will need to go out with the proposal, and I cannot guarantee that it will be in place that quickly.

Senator BROWN. But you do not see the Fed heading in the direction of the Treasury report recommendations instead?

Ms. YELLEN. The Treasury report is supportive of integrating a capital buffer relating to the stress tests into our regular risk-based capital requirements, but probably is not supportive of including the G–SIB surcharges.

Senator BROWN. Yeah, more than probably. Thank you, Madam Chair.

Chairman CRAPO. Thank you.

Senator Shelby.

Senator SHELBY. Thank you. Welcome again, Chairman Yellen.

In the area of inflation calculations, which you have to deal with, and price stability, which is very important to all central banks and to us, current Fed calculations show that inflation has fallen to 1.4 percent, I believe. This statistic is puzzling to some economists as interest rates were recently raised in June.

Some have suggested—you are aware of this—that the Fed should not continue the practice of gradually raising interest rates because inflation has not kept pace with some of the things that you had talked about earlier. You said in recent testimony, and I will quote, "It appears that the recent lower readings on inflation are partly the result of a few unusual reductions in certain categories of prices." Your words.

Ms. YELLEN. Yes.

Senator SHELBY. In addition to these few unusual reductions here, is it possible that certain aspects of foreign economies, such as slow growth and soft prices in China, are artificially lowering or influencing inflation in this country? Or what is it? What is going on here? Do you know? And if you know, what do you believe?

Ms. YELLEN. Well, with respect to the global economy, we have been through a period in which there has been a substantial appreciation of the dollar, and that depressed for quite some time import prices. But that trend has now come to an end, and import prices are rising at a modest rate. So I do not see the global economy as at this point mainly responsible for the low inflation readings.

You know, as I indicated in the quote that you mentioned, I do think there are some special one-time transitory factors, these unusual changes reflecting the move to unlimited data plans for cell phones, and large declines in some prescription drug prices. There may be more going on, and we are watching inflation very carefully in light of low readings.

I think it is premature to conclude that the underlying inflation trend is falling well short of 2 percent. I have not reached such a conclusion. We are watching data very carefully, and I would say I regard the risk as being two-sided with respect to inflation. On the one hand, we are seeing low inflation numbers for several months. On the other hand, we have quite a tight labor market, and it continues to strengthen. And experience suggests that ultimately, although with a lag, we are not seeing very substantial upward pressure on wages, but we may begin to see pressures on wages and prices as slack in the economy diminishes.

So I see the risk with respect to inflation as being two-sided, and with respect to how that bears on policy, most of my colleagues and I, when we looked at this matter in June, even recognizing that we have had several months of low inflation readings and that we are focused on trying to understand it, have felt that it probably remains prudent to continue on a gradual path of rate increases. But it is something we will watch very carefully, and I want to emphasize that monetary policy is not something that is set in stone. And

if our evaluation changes with respect to inflation, that will make a difference.

Senator SHELBY. This economy has been in an expansionist mood for quite some time. A lot of economists say this is a mature economy. Would you disagree with that? Do you believe this economy has got a lot more zip in it?

Ms. YELLEN. Well, we have had a long expansion, and the unemployment rate is now at really quite low levels in the historic sense. But I do not believe that expansions die of old age. There are shocks that impact the economy, and a negative shock could end the expansion. But I do not see anything inherent in the nature of the expansion that suggests that it will come to an end anytime soon.

Senator SHELBY. My time is about gone. What significance is the continuing lower price of oil and gas in our economy? I know you exclude some of this from your basic monthly calculations. But it does have something to say and do about our economy because so many things go into oil and gas.

Ms. YELLEN. Well, the low prices of oil and gas have translated into gains to households. It has boosted their ability to buy other goods and services.

Senator SHELBY. Very positive, is it not?

Ms. YELLEN. Excuse me?

Senator SHELBY. Overall, very positive in the country?

Ms. YELLEN. I think on balance it is a positive.

Senator SHELBY. Sure.

Ms. YELLEN. Now, oil prices have rebounded off their very lows, and that has meant that drilling activity has picked back up again, and that is something that is supporting investment spending and demand in the economy.

Senator SHELBY. Thank you, Mr. Chairman.

Chairman CRAPO. Thank you.

Senator Menendez.

Senator MENENDEZ. Thank you, Mr. Chairman. And, Madam Chair, thank you for your service.

When you were here last in February, we discussed the economic impact of loss of access to health insurance. You said then that large-scale loss of access to health insurance could have a significant impact on household spending for goods and services that could also impact job mobility, making it more difficult for people to leave jobs for new positions or to start a new business because they would be risking their access to health insurance.

Is that a view you still hold today? And if so, could you explain why?

Ms. YELLEN. So I really cannot quantify any of those effects, but, clearly, spending on health care is an important aspect of household budgets, and changes there could have an effect on spending on a wide range of goods and services in the economy. And access to health care is important. I think research suggests that a certain amount of so-called job lock reflects a desire of workers to hang onto employer-provided health care. I cannot tell you quantitatively, however, how important that is.

Senator MENENDEZ. In your testimony you mentioned that possible changes in fiscal policy and other governmental policies in the United States represent a source of economic uncertainty.

Ms. YELLEN. Right.

Senator MENENDEZ. Would you include potential changes to our health care system as one of the factors causing uncertainty in the economic outlook?

Ms. YELLEN. Yes, I think fiscal policy, policies generally, are associated. The level of policy uncertainty is quite high at the moment.

Senator MENENDEZ. So I certainly believe that if a potential 22 million more Americans are uninsured by 2026 and cause premiums to skyrocket for middle-class families and those nearing retirement, that is going to have an impact on the economy. New Jersey alone would see 1 million more uninsured under the Republican proposals, a 47-percent increase in uncompensated care, $8.5 billion lost in Federal funding, the elimination of nearly 100,000 jobs. I think that has an impact in the economy.

Let me move to a different topic. What would be the consequences of weakening or eliminating, as some have suggested, the Federal Reserve's full-employment mandate, particularly for those workers, many of them minorities, that have been left behind in the recovery and continue to face barriers in the job market?

Ms. YELLEN. Well, I believe that the strengthening of the job market that we have seen over the last several years has been particularly beneficial to minorities. Our Monetary Policy Report points out—and this is not the first time we have done this—that even in a so-called full-employment economy, unfortunately African Americans and Hispanics typically have higher unemployment rates, substantially so, than other groups.

Senator MENENDEZ. If I may, my specific question is: What would the elimination or weakening of your full-employment mandate mean to those communities? If the Federal Reserve either by some suggestion eliminates the full-employment mandate that the Fed has or weakens that as one of your core missions, what would be the consequences of that?

Ms. YELLEN. Well, I do believe it is an important mandate that keeps us focused on the labor market and wanting to ensure strong performance, and we have been very focused on it.

Of course, we also have a price stability mandate. Now, inflation has been running below our 2-percent objective now for many years, and so there has not been a conflict between our price stability and employment mandates that we have——

Senator MENENDEZ. And I am not suggesting that. But I am simply suggesting that if you were to eliminate or weaken that, wouldn't that have negative consequences?

Ms. YELLEN. It most likely would.

Senator MENENDEZ. OK. Then let me ask you finally, how does—we see high, rising levels of household debt, widening inequality, a neutral interest rate at historically low levels, and to me it is critical that the Fed have the ability to respond in the event of another economic decline. How does below-target inflation impact household debt? And what signs do you see of inflation coming

close to the Fed's 2-percent target let alone exceeding it by dangerous amounts?

Ms. YELLEN. So as I said, I think the risks with respect to inflation are two-sided, but we are very aware of the fact that inflation has been running below our 2-percent objective now for many years, and we are very focused on trying to bring inflation up to our 2-percent objective. That is a symmetric objective and not a ceiling.

We know from periods in which we have had deflation, which, of course, we do not have in this country, but that is something that has a very adverse effect on debtors and can leave debtors drowned in debt.

Now, we do not have a situation nearly that serious, but it is important when we have a 2-percent inflation objective to make sure that we achieve it, and we are focused on doing that.

Senator MENENDEZ. Thank you, Mr. Chairman.

Chairman CRAPO. Senator Scott.

Senator SCOTT. Thank you, Mr. Chairman. Thank you, Chair Yellen, for being here this morning. Good to see you again. Thank you for your accessibility as well. We have had a number of conversations. We are not always on the same page, but your accessibility is much appreciated.

Ms. YELLEN. Thank you.

Senator SCOTT. You know, the last time we chatted, we talked a lot about the unwinding of the Fed portfolio, which I think today is about $4.5 trillion or so. I think at the beginning of the crisis it was under $1 trillion. Can you just talk for a few minutes on the timing of the unwinding? And if you have a target number at the end, when would you see us getting there?

I think my question is germane to the impact that your objective will have on South Carolinians who are looking for ways to improve their quality of life, and that coupled with the interest rate environment may have a negative impact on first-time homebuyers as well as those retirees that have much if not all of their money in the market.

So your comments I would like to apply to those two specific groups as you discuss this for a few minutes.

Ms. YELLEN. OK. So let me see if I can be responsive to that. Our intention is to shrink our balance sheet and the quantity of reserves in the banking system in a slow, gradual, predictable way. And we have set out a concrete and detailed plan for how to do that, and it involves reducing the extent to which we reinvest principal payments that we receive on our holdings of Treasury and mortgage-backed securities.

So when we set the plan into effect, we will set caps on the amount of reinvestment that we allow to occur. The caps will gradually rise over time, and our balance sheet will gradually run off as a consequence of reduced reinvestment.

We want to make sure that we manage this in a way that is not disruptive to financial markets, and in part for that reason, we have tried to set out increasingly clearly and in great detail how we intend to proceed. So once we trigger this process, I expect it to run in the background, not something that we will be talking

about a lot from meeting to meeting. It will be a predictable process.

Now, we think that our purchases of assets did have some positive effect in depressing longer-term interest rates, and so over many years, as our balance sheet shrinks, we would expect to see some increase in longer-term interest rates relative to short-term interest rates. But, of course, we will take that into effect, namely, a steepening of the yield curve, in how we set the Federal funds rate, which will become, is now, and I hope will remain our primary tool for adjusting the stance of monetary policy. And we will set that, as always, with a view toward trying to achieve maximum employment and price stability.

Now, finally, you mentioned that our balance sheet was around $1 trillion prior to the crisis, and that is true. But it is important to recognize that although our balance sheet will shrink appreciably during this process, as will the quantity of reserves, I have no expectation of going back to a balance sheet that small.

One of the factors influencing the size of our balance sheet——

Senator SCOTT. I have about a minute left, so I am going to—I hate to cut you off, but I want to go to insurance.

Ms. YELLEN. OK.

Senator SCOTT. But let me just say this: As we talked about the depressing of interest rates, which can be very positive for first-time homebuyers, it is very negative for those retirees who are depending on the return on their investments to produce their livable income, so to speak.

On the insurance side, we talked as well on the importance of having insurance expertise on the FSOC. As we have all mentioned, I think Mr. Woodall's term expires September 21st or thereabout. Today the way that we have it structured, we could be absent of any insurance expertise on the FSOC. Would you support legislation to—I know that you do not necessarily get involved in politics, but would you support legislation that would head in the direction of making sure that the insurance expertise stays on FSOC?

Ms. YELLEN. So I do think it is important for FSOC to have insurance expertise, and exactly how you go about accomplishing that, I do not have a specific recommendation.

Senator SCOTT. Thank you, ma'am. My time is about up. I do want to encourage our Chairman Crapo and Ranking Member Brown to continue their work on making sure that the FSOC has that continuous insurance representation. Thank you.

Chairman CRAPO. Senator Warner.

Senator WARNER. Thank you, Mr. Chairman. Chair Yellen, it is great to see you again, and let me just say at the outset it is great to be asking somebody a question that does not have to deal with Russia.

You know, Chair Yellen, recently I know the Fed moved proactively to scale back the qualitative portion of the CCAR test, and I know former Member Tarullo before he left also discussed potential further reforms on CCAR, and many of those I support in terms of maybe folding CCAR into the annual—more of the traditional annual review so it is not dual-hatted.

I do think, though, that CCAR for the largest institutions is important, and in a sense not broadcasting the methodology you are going to use before you do the test is important. I would like to get your views on that and how you see either that continuing reform, which I know you have already gone ahead and moved proactively for banks under $250 billion. Do you see more reform? And is there some value for continuing to keep CCAR in place for the largest institutions?

Ms. YELLEN. So I do believe our stress tests and CCAR have very substantially strengthened especially the largest banking firms, and I think we have in the process gained assurance that these firms have enough capital to be able to survive a very adverse, stressful scenario while continuing to provide for the credit needs of American households and businesses.

We have looked carefully at CCAR and how we conduct the stress tests, and we are continuing to do so, are open to making changes, but let me say that conducting these stress tests in a rigorous way and making sure that firms have the capacity to be able to meet our capital planning expectations which CCAR has facilitated is critically important to having a sound financial system.

I cannot really see our putting the models into the public domain. We have been making public the results of the stress tests. I think that is an important part of transparency that has strengthened market participants' understanding of the strengths and weaknesses of particular banking organizations. And I think it is something that has helped to provide market discipline.

We have tried to make it less burdensome, as you noted, for the under $250 billion institutions. It is conceivable that 1 day if the largest institutions were to show on a regular basis that they have in place very strong capital planning standards that meet our expectations, that perhaps we could change the qualitative portion of the review for some of them, as long as we had that assurance. But that remains an open question, and this is a core part of our supervision that is essential.

Senator WARNER. And I commend in terms of moving up to 250, and I even say there may be regional banks that would be even slightly higher that might be afforded some relief. And I would argue that it is less about kind of annual basis and would be more triggered by on the qualitative piece if they change their line of business or they introduce a series of new products.

Obviously, the SIFIs I think need this, and I agree with you that broadcasting the methodology on the front end might not be the best way to go.

Can you speak for a minute—you know, one of the ways we saw in the crisis was, as a lot of financial transactions moved into the shadow banking system, in a sense—and I think we managed to try to scoop a lot of those back in back in 2008.

Ms. YELLEN. Yes, we did.

Senator WARNER. But capital moves fairly quickly. Where do you see in kind of the shadow banking system in 2017 where there may be vulnerabilities or areas that we ought to reexamine?

Ms. YELLEN. Well, so we are constantly looking for vulnerabilities and recognize that risk can move outside the regulatory perimeter. I do not have something specifically to highlight.

I would note that, with respect to shadow banking, the changes that we have made with respect to money market mutual funds have reduced what was a very important and destabilizing risk. We have made a number of changes with respect to the tri-party repo market that have reduced risks there.

So I do see changes that have been made with respect to shadow banking that have diminished risks, but we are on the lookout for areas where new risks may be emerging.

Senator WARNER. Thank you, Mr. Chairman.

Senator SHELBY [presiding]. Senator Cotton.

Senator COTTON. Thank you. Welcome back, Madam Chair.

Ms. YELLEN. Thank you.

Senator COTTON. Much has been made about the slow pace of the recovery over the last 8 years. One aspect of the recovery that does not get quite as much coverage is the geographically distributed nature of the recovery. It has been concentrated primarily in larger metropolitan areas. In fact, if you look at small business creation, just 20 counties in this country accounted for over half of all small business creation. This is in contrast to 25 years ago. In metropolitan counties with more than 1 million people, growth in new businesses was only 3.9 percent. In counties with fewer than 100,000 residents, it was 8.4 percent. Whereas, in this recovery small business creation in metropolitan counties of more than 1 million is 4.8 percent. Unfortunately, in small counties of fewer than 100, it is negative 1.2 percent. In Arkansas, we call counties with fewer than 100,000 people "counties" because there is only about—there are only 7 out of 75 that have 100,000 counties—or 100,000 people.

On page 19 of the most recent report, the Fed states that measures of small business credit demand have remained weak amid stable supply. I understand that banks' small business lending is weak and it has never really recovered to pre-crisis levels. In your testimony you also attribute the outcome to weak small business demand for credit, and you say that the supply of small business credit is stable. But how do we know that the weak lending demand is the cause of this weakness in small business lending and that at least to a degree a contributing factor is not the supply of small business loans being caused by the decline in the number of community banks in places like rural Arkansas?

Ms. YELLEN. So we have a number of surveys, including our regular survey on lending standards in banking organizations that helps us try to distinguish between demand factors that may be affecting the growth of credit and supply factors. And the statement that demand is weak is partially based on that information.

We do have surveys like the National Federation of Independent Business that regularly queries smaller businesses and asks them about the problems that they face. And a very small number cite inability to gain access to credit as a significant factor that is affecting their businesses. But community banks are important sources of supply of credit, especially in rural areas, to small business, and we are very committed to working to reduce the burdens that these firms face from regulations so that they can thrive and they can meet the needs of consumers and small businesses in their communities.

Senator COTTON. Does your study and analysis show what small businesses do in places like Cleveland County and Dallas County, Arkansas, when their small community banks close or maybe are acquired and then their presence is reduced to an ATM location? So if you are a small business there and used to rely on your small bank in Cleveland or Dallas County, that bank is no longer there, what is the most common avenue for them to try to seek financing?

Ms. YELLEN. I am not aware of data that bears on that. There may be something. If there is, I will get back to you on that.

Senator COTTON. OK. Thank you very much for your testimony. Thank you, Mr. Chairman.

Senator SHELBY. Senator Van Hollen.

Senator VAN HOLLEN. Thank you. Thank you, Senator Shelby. And, Madam Chair, thank you for your leadership. It is great to have you here.

The last time you were here, we talked about some of the economic—you know, the situation in the country specifically as it related to wage growth. And even as we have seen fairly steady job growth, we continue to see very sticky, stagnant wage growth. And you indicated that that is partly a result of low productivity, even though over decades, even when we had higher productivity, we saw very unevenly distributed wage growth.

And you mentioned that we need to do more in the way of investing in education, job training, whether it is things like apprenticeships, 2-year community colleges, 4 years. And I know you have made comments about that recently, and I hope as we look at the budget here in the U.S. Senate, we keep that in mind. And, additionally, the need to focus on modernizing our national infrastructure, which is another area of productivity growth where I think we could make some progress. And I wish, in fact, we had started here in the Congress working with the White House on that kind of bipartisan initiative. So I may follow up with you on that.

My questions do relate to some of the comments made by the Ranking Member. Senator Brown reminded us that on the eve of the financial crisis, most people were predicting sunny skies and clear sailing, did not see the storm clouds ahead. And that is why we put in place some of these safeguards, these guardrails to try to make sure the economy could grow but without undue risk in the system.

Ms. YELLEN. Yes.

Senator VAN HOLLEN. And that obviously is the subject of ongoing debate now. So I just have a couple questions relating to the guardrails, the safety procedures we put in place.

Orderly liquidation authority that was part of Dodd–Frank, do you believe it is important to maintain and preserve that provision?

Ms. YELLEN. I believe it is essential to maintain orderly liquidation. We saw during the crisis the absence of a way to resolve a nondepository institution, a systemic financial institution in an orderly way led to a massive intensification of the crisis.

Now, I agree that bankruptcy should be the preferred route for resolving a firm that is in difficulty, and Congress in Dodd–Frank mandated living wills, and that we should work on the ability to resolve these firms under the Bankruptcy Code. I believe we have made a great deal of progress in getting firms not only to file these

living wills, but also to think systematically in the course of their regular business how they need to be organized to make them resolvable in the event of distress.

We have put in place rules to ensure the most systemic firms have sufficient gone-concern loss absorbency that they could be recapitalized by bailing in debt holders in a situation where they encounter substantial losses. But while bankruptcy should be the preferred route to resolve such a firm, Title II is a very important safeguard. We cannot know exactly what the circumstances would be at the time that a firm encounters distress, and that is a very workable approach that I believe we absolutely need.

Senator VAN HOLLEN. Thank you. One other question relating to some of the safeguards that were put in place, because some have proposed eliminating either the leverage ratio or the capital buffer. Former Governor Tarullo said not that long ago that applying a simple leverage ratio to banks in exchange for allowing them to escape Dodd–Frank's capital standards would allow banks to ditch safe assets in favor of riskier ones to boost profits. In other words, he and many others have said it is important to maintain both of these measures in order to prevent undue risk in the system. What is your view?

Ms. YELLEN. So I agree with that. A simple leverage ratio basically imposes a capital charge on a junk bond that is identical to the charge that is imposed on holding a Treasury bill, and that type of system can result in banks taking on a great deal of risk. So I believe risk-based capital should be the most important form of capital regulation, that that is what should be binding. And I see a leverage ratio as a back-up catch-all that is there in a belt-and-suspenders approach. But it should not be what drives decision-making in firms.

So we have strong risk-based capital. We now have an enhanced supplementary leverage ratio that applies to the most systemic banks. These two things do need to be calibrated appropriately so that the risk-based capital is what is binding. And we are looking at the calibration of that supplementary leverage ratio because it may be that it is high, for example, it affects the custody banks and maybe having some unintended adverse consequences. But both need to be in place, and they need to be appropriately calibrated.

Senator VAN HOLLEN. Thank you.

Senator SHELBY. Senator Perdue.

Senator PERDUE. Madam Chair, good to see you again. Thank you for being here and for your service.

I just have two quick questions, but the first one, I am very concerned about global debt. The Institute of International Finance recently reported that their estimate of total global debt is $217 trillion or more than 300 percent of global GDP. Do you agree with that directionally?

Ms. YELLEN. So I have not heard that number. That could be. I do not have that number at my——

Senator PERDUE. Well, of that, $60 trillion is estimated to be sovereign debt. We have about $20 trillion of the $60 trillion. With that as background, the four large central banks also have their largest historic balance sheets, as you have said before. Japan,

China, EU, and U.S. have collectively close to, approaching $20 trillion now of balance sheet size.

As you talk about reducing the size of the Fed's balance sheet, are you coordinating with these other central banks and looking at emerging market debt, particularly the $300 billion that is coming due by the end of 2018, relative to the size of your balance sheet here in the United States?

Ms. YELLEN. Well, I would not say "coordinate." We certainly consult with one another and try to make sure we meet regularly and discuss our policy approaches, make sure that other central banks understand how we are looking at our economies and policy options. So I think the major central banks understand the approach that others are taking, but trying to ask in an aggregate sense how much debt is outstanding is something that we are not doing. Our economies are in rather different situations. While we all encountered weaknesses that were sufficiently severe that Japan, the ECB, the Bank of England, the United States, we all resorted to purchases of longer-term assets to support growth, I would say the United States is further along in the process of normalizing monetary policy—well, at least in the Bank of Japan and the ECB.

Senator PERDUE. Are you concerned about the emerging market debt with so much of that denominated in dollars today?

Ms. YELLEN. Well, it is a risk. A significant amount of that is in China, but that is not the only country where there is substantial corporate dollar-denominated debts. And certainly that is a risk that we have considered that affects the global economy.

Senator PERDUE. With regard to the Fed's balance sheet, it is currently about $4.5 trillion. Senator Scott just asked earlier and I did not quite get the answer: Is there a directional limit or a target that you have set at this point for the size of that balance sheet? You did say that you did not see a $1 trillion balance sheet again. But is there a target and a time period that you could discuss publicly about the size of that balance sheet?

Ms. YELLEN. So we do not have a target for the ultimate size of our balance sheet. What we have said is that we expect the quantity of reserves in the banking system, which is now a little bit over $2 trillion, to shrink considerably. How small reserve balances will become when we are done this process is something we do not know.

A lot has happened over the last decade to affect the demand for reserves, and as this process occurs, we expect to learn more about how the demand by banking organizations for reserves has changed. But I do want to point out that the overall size of our balance sheet depends not only on the quantity of reserves but on other non-reserve liabilities, importantly including currency.

Back in 2007, the stock of currency outstanding was around $700 billion, and it now stands at closer to $1.5 trillion. And so even if reserves were to shrink to zero, our balance sheet would not go below $1.5 trillion.

Senator PERDUE. I am almost out of time. I have one last question. This is a long recovery. It has been very weak, but it has been very long, almost 9 years, and the typical recovery in U.S. history is about 58 months, about 5 years. So the question I have is: With

consumer confidence right now being at a 13-year high and yet consumer debt, as you just mentioned, has risen again in the last couple of years back to approaching 100 percent of household income, what are your concerns relative to the strength of this market and the fiscal policy that is coming out of Washington over the last couple years, and even this year, relative to a potential correction in this longstanding recovery, the weak recovery? And does the economy have energy to pop and recover from this extended period of weak economic growth?

Ms. YELLEN. So I do have a reasonable level of confidence that the expansion can continue, and we are trying to put in place a monetary policy that will facilitate that. Often previous downturns following expansions have reflected inflation rising to levels that are unacceptable, forcing a tightening in monetary policy. And we have a very different situation now with inflation running below our target rather than above it.

Of course, as I said, we are attentive not only to downside but also to upside inflationary risks, and we are focused on that.

With respect to consumer debt, I think households are generally in a stronger position. Mortgage debt has declined significantly relative to household income. Student debt has risen enormously. But a lot of the expansion of debt is among higher-income households with strong creditworthiness, and the burden of debt payments relative to household income is low. So, of course, there are risks in some areas there, but overall I would not point to household debt as something that is flashing red on a financial stability concern.

Senator PERDUE. Thank you.

Thank you, Chair.

Chairman CRAPO [presiding]. Thank you.

Senator Warren.

Senator WARREN. Thank you, Mr. Chair. It is good to see you again, Chair Yellen.

I want to follow up on the letter I sent you last month urging the Fed to remove the Wells Fargo board members who served during the bank's fake accounts scandal. And I appreciate the response you sent me earlier this week, which acknowledges that you have legal authority to remove these board members and that confirms that you are willing to use that authority if it is warranted. And that is a question I want to get at today.

How could removal of these board members not be warranted given the facts that we already know? You know, the 2008 financial crisis showed that the big banks had completely inadequate risk management systems, and after the crash, the Fed established tough new rules for risk management. Those rules imposed higher risk management standards on bigger and more complex institutions, which means that Wells Fargo by law had to meet a very high standard.

So let us lay this out. The Wells Fargo board of directors is ultimately responsible for risk management at the bank. Is that right, Chair Yellen?

Ms. YELLEN. That is a responsibility.

Senator WARREN. Good. So the board is responsible, and here is what they are responsible for under the Fed's own regulations: making sure that there are "processes and systems to integrate

risk management with management goals and its compensation structure," and making sure there are "processes and systems for ensuring effective and timely implementation of actions to address emerging risks."

Now, Wells Fargo did not come close to meeting those requirements. They established impossible cross-selling goals and set up a compensation structure that put enormous pressure on employees to open new accounts for existing customers. And despite a mountain of evidence that these incentives were leading to the creation of fake accounts, the board did nothing for years. The result was thousands of employees opening more than 2 million fake accounts.

So can you explain to me how the Wells board can possibly have satisfied its obligations under the Fed's risk management regulations?

Ms. YELLEN. So I am not prepared to discuss in detail what is a confidential supervisory matter. I will say that the behavior that we saw was egregious and unacceptable, and it is our job to understand what the root causes were of those failures. And as I have agreed, we do have the power, if it proves appropriate, to remove directors. A number of actions have already been taken, and we need to conduct a thorough investigation to look at the full record to understand the root causes of the problems, and we are certainly prepared to take enforcement actions if those prove to be appropriate.

Senator WARREN. Well, I appreciate that, Chair Yellen, because we already know a lot that is just in the public record and that Wells itself has already admitted to, and that, in fact, Wells Fargo's own board commissioned an investigation by the law firm Shearman & Sterling and found that the board was far too deferential to Wells' executives on risk management issues and ignored several red flags about the scope of the fake accounts scandal. So there is already a lot out there in public.

And here is what worries me: Time after time, big banks cheat their customers, and no actual human beings are held accountable. Instead, there is a fine, which ultimately is paid for by shareholders, not by executives, and certainly not by directors of the board. And nothing is going to change at these big banks if that does not change.

You know how I know that for a fact? It is because in 2011 the Fed fined Wells Fargo $85 million for illegally steering mortgage borrowers into costlier loans, and the Fed specifically said those illegal practices were caused by "incentive compensation and sales quota programs, and the lack of adequate controls to manage the risks resulting from these programs." So the Fed fined Wells in 2011 for failing to manage the risks resulting from bad incentive compensation practices. And what did Wells do? For the next 4 years, immediately after that fine, the board signed off on incentive compensation practices that led to the creation of 2 million fake accounts. Fines are not working with these giant financial institutions.

If bank directors who preside over the firing of thousands of employees for creating millions of fake accounts can keep their jobs, then I think every bank director in this country knows that they

are bulletproof. And that poses a danger to the rest of us every single day.

You have the power to change the culture on Wall Street. I know you care about this issue. I hope you will use that power.

Thank you, Mr. Chairman.

Chairman CRAPO. Thank you.

Senator Rounds—oh, excuse me. Senator Sasse.

Senator SASSE. Thank you. Madam Chair, thanks for being here.

I am very concerned about the most recently available data on job openings and job hires. As you probably know, there are 6 million open jobs in America right now, and yet job hire numbers are falling. I hear about this from Nebraska businesses every week when I am home, the difficulty they have in finding and retaining talent.

What do you think the most prominent causes are of the mismatch between job openings and job seekers right now?

Ms. YELLEN. So it is commonly the case that with an unemployment rate as low as we have now that many employers would have vacancies and regard them and report that they are hard to fill. In fact, the fraction of firms reporting that jobs are hard to fill is in a way an alternative to the unemployment rate as a measure of labor market slack. So with a 4.4 percent unemployment rate, you should expect that there would be many firms that would find this.

That said, I agree that there is job mismatch, that there are kinds of jobs that firms have had a good deal of difficulty in filling. I often, when I am asked about productivity growth and problems in the labor market, talk about the importance of worker training programs, education. We routinely hear that there are jobs, for example, in manufacturing, but ones that require skills that those who are losing jobs do not have. And I often, when I travel, look at programs that have been devised in different parts of the country to try to enable workers who are having a tough time finding jobs fill the jobs that are available. And I have seen examples of nonprofits partnering with State and local government and with local businesses, community colleges, to put in place programs that are linked to job opportunities that fill that gap. With a tight labor market, I hear many more firms telling me that they are doing their own training, putting in place and expanding training programs to try to fill these vacancies.

Senator SASSE. Thank you for that. I am trying to get my hands around, though, whether or not we think this is a new normal and somehow economic growth is going to solve this problem, or whether or not we have a set of cultural issues or institutional issues around mid-career job retraining in particular.

Nick Eberstadt at American Enterprise Institute has data that shows that prime-age male labor force participation rates have been declining for over 40 years. We have gone from 25- to 55-year-old males nonparticipating in a seemingly quasi-voluntary way from about 4 percent 40 years to pushing 15 percent today, I believe. Do you think this is a new normal?

Ms. YELLEN. Well, we have had many decades of declining labor force participation by prime-age men, and I think this reflects a whole variety of adverse trends related particularly to technological change that has eliminated many middle-income jobs, those that

can be replaced by technology, combined with global outsourcing and production. And the individuals that have lost those jobs have found it difficult to acquire the skills necessary to be reintegrated into the labor market. And many individuals with less education are finding it difficult to be placed in jobs that are middle-income jobs. And so this perhaps intensified during the recession, but it is a much longer-lasting trend, and, you know, we have seen now, unfortunately, this is likely tied to the opioid crisis. It is tied to the problems that many communities have. You know, we have even seen an increase in death rates due to deaths of despair, suicide, drugs——

Senator SASSE. Pardon me jumping in——

Ms. YELLEN. ——among these communities, and so this is a very serious matter.

Senator SASSE. I think there are social maladies all around this that will be valuable to unpack with your input. If we had longer rounds, I would also ask you some questions about the new multi-career economy that we are inevitably headed toward and the fact that this institution is not at all nimble or prepared to think about what mid-career job retraining institutionalization looks like. But before I am out of time, I want to ask you just one question on trade.

Corn exports from the U.S. to Mexico have fallen 7 percent just in the last 5 months. Obviously, Mexico has been exploring other trading partners. There is an attempt on Mexico's part to turn from the U.S. toward Brazil for certain grains and other commodities.

Do you think that the U.S. rhetoric around increasingly protectionist tone is having a direct effect now on people trying to prenegotiate other trading partners? And do you have historical examples of moments like this where we are not yet in a trade war but we seem to be speaking in a way that implies we might go there and we are already seeing effects on certain agricultural commodities and exports?

Ms. YELLEN. I am going to pass, if you do not mind, on this question. I think this is——

Senator SASSE. I mind a little bit.

[Laughter.]

Ms. YELLEN. You know, this is a matter that is well outside the domain of monetary policy and really is a matter for Congress and the Administration.

Chairman CRAPO. Well, I was going to ask you to keep your response short, anyway.

[Laughter.]

Chairman CRAPO. Thank you, Chair Yellen.

Senator Donnelly.

Senator DONNELLY. Thank you, Mr. Chairman. And, Madam Chair, thank you for your service to the country. We greatly appreciate it.

Ms. YELLEN. Thank you, Senator.

Senator DONNELLY. This is a subject that my colleague Senator Sasse touched on a little bit and then you mentioned, and that is, my State, like many others, is in the midst of a severe opioid abuse epidemic. Hoosiers of all ages and backgrounds have been impacted—families, friends, personal addictions. And it not only im-

pacts health outcomes but has a real consequence on economic and employment opportunities.

The national unemployment rate is at 4.4 percent, but the labor participation rate has gone down. People talk about the aging population, this and that. How much of a factor do you think the opioid abuse situation has been?

Ms. YELLEN. So I do think it is related to the decline in labor force participation among prime-age workers. I do not know if it is causal or it is a symptom of long-running economic maladies that have affected these communities and particularly affected workers who have seen their job opportunities decline. This is something that has been going on for many decades. Surveys suggest that many prime-age men who are not actively participating in the labor market are involved in prescription drug use, not always opioids. But, you know, we are seeing, as I mentioned, an increase in death rates which is extremely unusual. I think the United States is the only advanced nation that I know of where in these communities we are actually seeing, especially among less educated men, an increase in death rates partly reflecting opioid use. And it is obviously a very serious and heartbreaking problem.

Senator DONNELLY. I have felt for a long time that, you know, if we—the job opportunities are there if we could have somehow trained these individuals and gotten them to avoid this. And I am not asking you to be a social scientist, but I think you already mentioned this. There seems to be a clear indication or a clear connection between this and the opportunity to go to a job, to get employed, to have success, and to, in effect, have hope and dignity and purpose, it would seem to me.

Ms. YELLEN. I would agree with you, and I feel that all of those things are bound up in this opioid crisis and are interacting in ways that are really quite devastating for these individuals and their communities.

Senator DONNELLY. A little bit different topic but one that I think is going to become more and more in the front of our windshield, because I think that, you know, if we look and interest rates start to go up, one of my top concerns is the national debt. I think the debt already has an impact on future generations as the cost of borrowing is increasing. I think it is going to get more expensive very soon. It is $260 billion plus a year. And you look at that, and we have discussions here about how do we fund the National Institutes for Health which is going to cure cancer, cure diabetes, cure multiple sclerosis, and all those funds that we sit and try to figure out how do we get enough of, we are spending $260 billion a year just paying interest on our debt.

Is there a tipping point coming up or is there a point that you look at and you go this is really—as the interest rates go up and the amount of it goes up, that you look and you go this is going to have a very, very significant impact?

Ms. YELLEN. So fiscal policy, we have long known, under current policy is on an unsustainable course. And as the population continues to age, especially if health care costs rise, as they have historically, more rapidly than the general price level, we are going to see the debt-to-GDP ratio rise from its current level of about 75 percent, which is not frightening but also not low, to unsustainable

levels. And the increase in interest on the debt will be a factor contributing to its unsustainability. You routinely see projections by the Congressional Budget Office. They make assumptions about the path of short- and long-term interest rates. They project—I do not have the exact numbers, but short-term interest rates rising.

My colleagues publish our estimates of longer-run normal short-term interest rates, which we see is about 3 percent. Now, that estimate might change, but CBO also sees short-term interest rates rising toward something like that level with long-term interest rates moving up. And so that is going to be increasingly a factor driving debt dynamics.

Senator DONNELLY. Thank you. And thank you for your service, and 1 week from today, on July 20th, 330 workers, those Carrier workers that we have talked about so many times, start to lose their jobs. So, please, keep them in mind about how we make sure that their chances for success are ahead and that we have trade laws that stand up for all our workers.

Thank you very much.

Chairman CRAPO. Thank you.

Senator Rounds.

Senator ROUNDS. Thank you, Mr. Chairman. Madam Chair, welcome once again. We always appreciate the opportunity to visit with you.

I was very pleased to hear your expression of concern regarding the enhanced SLRs and, in particular, the impact it would have on a series of not a lot of banks but on some banks that are the custody banks.

Ms. YELLEN. Yes.

Senator ROUNDS. I am interested because for mutual fund holders the costs for those banks is passed on directly to the mutual funds. I am just curious. I think it is an issue that should be addressed, and I am just wondering if you have got a timeframe or a concept in terms of how to address the increased costs that they have, even though they are holding, as you have indicated, one of the safest assets out there or instruments out there in terms of their use of central bank instruments. Can you talk a little bit about what your thoughts are?

Ms. YELLEN. So I would agree with you. We have been in touch and are aware of the issues faced by the custody banks. It is one of the reasons that we are looking at the issue of the appropriate calibration of the enhanced supplementary leverage ratio for those banks. Perhaps it is too high relative to risk-based capital requirements. I am comfortable with the level of risk-based capital requirements, but this is something that needs to be looked into. Different countries have taken different approaches. One approach is to exempt certain items like central bank reserves from the ratio. Another alternative is to recalibrate the ratio.

I cannot give you a definite timetable for our reconsideration of this, but it is something where perhaps our regulations had an unintended consequence, and we are looking at that carefully.

Senator ROUNDS. Do you feel you have the resources or the capabilities to handle this? Or will it require legislation?

Ms. YELLEN. My guess is that we would not need legislation. I will get back to you if that is not the case.

Senator ROUNDS. That is fine. I would appreciate——

Ms. YELLEN. We believe it is something that we could change by the banking regulators.

Senator ROUNDS. I think it does two things. Number one, I think it makes our banks within the United States less competitive with some other competitors elsewhere that do not have the higher rate or the higher requirement. And, second of all, I think that cost is ultimately passed on to mutual fund holders, and I think that just simply means one more fee that takes away from their net return. And in either event, I think we should at least examine it, and I think there is room to be able to reduce some of that cost which is passed on to mutual fund holders.

Ms. YELLEN. OK. We are going to have a careful look.

Senator ROUNDS. Thank you.

Second of all, I am just curious. There has been considerable debate in the Banking Committee this year about reforming Dodd–Frank and the right-sizing of some of the regulations and thresholds that Dodd–Frank established. I have heard a number of concerns from financial institutions that arbitrary thresholds set in Dodd–Frank make it difficult for them to do business. The Chairperson also mentioned concerns in his opening statement.

Congressman Barney Frank himself admitted the pitfalls of these thresholds. In a radio interview last November, the former Congressman said, and I am going to quote him verbatim: "We put in there that banks got the extra supervision if they were $50 billion in assets. That was a mistake. We should have made it much higher, $125 billion or more, and we should have indexed it."

I am thinking perhaps even looked at other alternatives as opposed to a dollar threshold, perhaps the business model and what the business activities are of the individual institution.

With this in mind, and even the fact that one of the architects of Dodd–Frank openly admitted that the current supervisory threshold are inappropriate, could you state here and now that the thresholds either should be raised or we should be looking at perhaps even changing to a business model approach? We did the TAILOR Act or we provided the TAILOR Act as an alternative for smaller banks, and that would model the types of regulations based upon the business activity. Could you give us your thoughts? And is it time now to start taking a hard look at changing that?

Ms. YELLEN. So we have already said that we would favor some increase, if Congress sticks with a dollar threshold, that we would support some increase in the threshold. An approach based on a business model or factors is also a workable approach from our point of view. Conceivably, some of the enhanced standards should apply to more firms with lower levels of assets and others with higher levels. So I think either type of approach is something that we could work with and would be supportive of.

Senator ROUNDS. Madam Chair, first of all, thanks for being here. We appreciate it, and I appreciate the information that you have provided.

Thank you, Mr. Chairman.

Chairman CRAPO. Thank you.

Senator Cortez Masto.

Senator CORTEZ MASTO. Thank you, Mr. Chairman. Welcome, Chairwoman Yellen. It is always good to see you, and thank you for your service.

Ms. YELLEN. Thank you.

Senator CORTEZ MASTO. I appreciate your comments with respect to the opioid epidemic, because in Nevada that is having an impact. We see it. And every time I go home, we are having difficulty in hiring, but there is so much going on with respect to our economy because of it.

There is another area I would like to have discussion with you, and that is housing. In both northern and southern Nevada, I also frequently hear concerns about the housing market from my constituents.

In northern Nevada, home prices have been rising sharply, and there is a lack of available inventory, particularly for people seeking to become first-time homebuyers, and the rental vacancy rates are extremely low.

In southern Nevada, we still have the worst rates of homeowners being underwater on their mortgages, and that is even nearly a decade after the recession. And recent data suggests that Las Vegas has the worst rental affordability crisis for lower-income households of any major city in the country.

Can you opine or just discuss the role that housing affordability plays in the overall health of the U.S. economy? And can we count on home ownership to be the primary source of wealth building for our younger generation like it used to be at one point in time?

Ms. YELLEN. Well, housing plays an important role in the economy. Although housing construction, residential construction, is not an enormous sector, housing has very important influence on economic performance and on the health of consumers. For such a large share of Americans, a house is their most important asset, and housing prices affect well-being, their wealth, and availability of credit and access to ability to borrow. So the health of the housing market is extremely important.

Senator CORTEZ MASTO. So talk about it when it comes to the younger generation, because the younger generation that I talk to grew up through the housing crisis, and at one point in time owning a home was the best investment that you could make. I do not know if they think that anymore. And do you think that is something that is going to be of concern for our future and for the younger generation when it comes to owning a home?

Ms. YELLEN. So there has always been a big debate about whether or not it is correct that housing is the best investment that one can possibly make. And I agree with you that in the aftermath of the crisis, views on that are changing. I am not going to opine on a personal view as to whether or not that is true. But, you know, for all but those individuals with very strong credit, it is extremely difficult now to gain access to mortgage credit. And we do have overall, I would say, a shortage of housing, whether it is owner-occupied housing or rental housing, relative to what you would think would be a normal pace of household formation in this country. As you have said, inventories are low. We have seen a significant pick-up, though, in production of rental housing.

Senator CORTEZ MASTO. Thank you.

Let me jump back to another issue that I hear from my constituents. As you well know, the FOMC has raised interest rates four times since 2015. This generally, my understanding, helps banks' revenue since they can charge more to lend money. But what I hear from constituents, particularly savers, is they do not see any benefit or interest rate increases that help them when they want to save their money. And so when do you anticipate that the impact of the Fed's rate hikes will be felt by savers in this country?

Ms. YELLEN. So, unfortunately, there is a lag in terms of when retail depositors see an increase in their rates. We are beginning to see for those who hold large CDs, for example, that it is possible to obtain somewhat higher rates. But especially with rates having been so low for so long, I think it will take some time before competition among banking organizations begins to drive up the rates that smaller retail depositors see. I think that will occur, but it will take a while to show up.

Senator CORTEZ MASTO. OK. Thank you so much. I appreciate your service.

Ms. YELLEN. Thank you.

Chairman CRAPO. Senator Corker.

Senator CORKER. Thank you, Mr. Chairman. Madam Chairman, thank you for being here. I am glad to see some of the moves that you are making and contemplating at the Fed.

I know there has been a lot of discussion about productivity, and that has been going on for some time. And for many, many years, the only game in town as it related to dealing with the economy was the Federal Reserve. Congress was in a place where likely no actions were going to be taken, and so everybody really, with your predecessor and even much of your term, has relied upon the Fed to be doing things to hopefully stimulate the economy and move things ahead, which is too much of a burden for the Fed. I mean, we should be taking actions ourselves. We are finally in a place where maybe—it is not for sure, of course—we will be dealing with some things as Congress, to deal with fiscal issues, other issues that relate to the economy. One of those coming up could be tax reform itself.

So we have been in a situation with low inflation, really below where you would like for it to be, low productivity, below where you would like for it to be. And these are not questions to, you know, lead in a particular direction, but is tax reform one of those things that, should Congress pursue it in a productive manner, could be really helpful as collateral to move the economy ahead in a much more rapid way?

Ms. YELLEN. Well, I would certainly agree that appropriately designed tax reform could have a favorable effect on productivity. Of course, it obviously depends on the details of what you do.

Senator CORKER. Got it.

Ms. YELLEN. And I do not have numbers to give you, but certainly there are distortions in the Tax Code that I believe are negatively impacting productivity. And so I think there is scope there to have a favorable impact on long-term economic growth.

Senator CORKER. So one of the things that we are going to be debating on both sides of the aisle, we have got, you know, huge fiscal issues as a Nation. Obviously, constraining spending is one of the

ways we all, I am sure in appropriate manners, want to look at to keep our deficits down. But growth is really the easiest way to move away from the issues that we have.

Mr. Mulvaney was in my office this week. You know, tax reform is beginning to be something of a discussion, and I know that the current Administration wants to see growth get into the 3-percent range to move beyond where we have been for some time. And is tax reform from your perspective something that, again, if done properly, has the ability to move us into a much higher growth rate here in the United States?

Ms. YELLEN. So as I said, I think it is something that could have a favorable impact if appropriately done. You know, productivity growth is something—it is very hard to move, and if you put in place a policy that predictably raises productivity growth a few tenths, you would probably regard that as a very good payoff. So the numbers typically that studies show when you do have a positive impact on productivity, they are not a percent, they are not a percent-and-a-half. It is hard to raise productivity growth. So I think it moves in the right direction, but it is challenging given the last 5 years' productivity growth has averaged a half percent; the last decade, something like 1.1 percent. So overall growth for the economy is productivity growth plus growth of the labor force. Labor force growth is declining. It is quite low.

It is challenging to move productivity growth up that much, but I hope that Congress and the Administration will focus on changes that will succeed in accomplishing that.

Senator CORKER. And how much would productivity growth need to be to achieve, you know, a stable economic growth of 3 percent, GDP growth?

Ms. YELLEN. So I do not have the precise number for you, but it would probably have to rise to something over 2.

Senator CORKER. Productivity over 2 to get economic growth to 3.

Ms. YELLEN. Right, given the labor force——

Senator CORKER. And just based on—again, these are not leading questions, because we are going to have a significant debate about that, about this soon. Do you think it is achievable for us based on all the things that you see right now to even achieve 3 percent growth in the near term, in the next 5-year period?

Ms. YELLEN. So I think it is something that would be wonderful if you can accomplish it. I would love to see it. I think it is challenging.

Senator CORKER. You think that would be very difficult?

Ms. YELLEN. I think it would be quite challenging.

Senator CORKER. Thank you, Mr. Chairman.

Chairman CRAPO. Thank you.

Senator Heitkamp.

Senator HEITKAMP. Thank you. And Senator Corker gave you—welcome.

Ms. YELLEN. Thank you.

Senator HEITKAMP. I will start there. He gave you a 5-year window. How likely is it that we are going to see 3 percent growth in the next 2 years?

Ms. YELLEN. Well, I think that would be——

Senator HEITKAMP. Quite challenging.

Ms. YELLEN. ——difficult.

Senator HEITKAMP. Yeah, we heard that. So, I mean, I think there are strategies we should all pursue because I think it has got to be one of the goals in fiscal and monetary policy to look at what we can do to get out of the flat growth rate of 2 percent. And I think there are a lot of people now basically saying we are in a perpetual 2 percent growth, too mature, the economy is too mature, the economy is too sluggish to ever get there. And so I think it is critically important that we examine strategies together, very real strategies, not make-believe, which just—you know, asking for productivity so you could mask a political agenda. So I will just leave it there.

What percent of export growth in the last 2 years do you think has been related to commodities and agriculture?

Ms. YELLEN. I am sorry. I do not have that number in front of me. I can get back to you on it, but I do not——

Senator HEITKAMP. That would be great, because I think what you are going to find is that when you look at export growth, one of the great stories has really been an increase in exports of oil, an increase in exports of energy, and certainly agricultural exports are always a great story when we are talking about balance of trade.

Unfortunately, right now, as you know, commodities are getting particularly hard hit. North Dakota is a commodity-dependent State in a lot of ways, and the dollar values being high never help us, in my opinion. But we are challenged with bad weather, but we are also challenged with a lot of uncertainty in the trade sector. Are we going to continue to have the trade regime that we currently have in NAFTA? Are we going to be able to do things within a bilateral context in the Asia Pacific Rim that will replace, in fact, the promise of TPP? These are all great challenges.

How do you see the trade disruption, trade policy disruption having an impact on agricultural exports and commodity prices?

Ms. YELLEN. So I really do not want to wade in in detail into trade policy, which is the responsibility of Congress and the Administration.

Senator HEITKAMP. But you would agree that it is part of—trade policy is part of our opportunity for economic growth, part of our overall economic—a critical component to our economic growth, you would agree?

Ms. YELLEN. It certainly has been.

Senator HEITKAMP. OK. I think we all understand the benefit of low commodity prices in terms of bringing down cost of production for companies, and it has increased the disposable income for consumers. But at the same time, we have not seen the type of boost to the economic growth in GDP that you would suggest, you know, just even taking a look at what has happened with gasoline prices, what has happened with natural gas prices, as either an input in the chemical industry or as a major component of manufacturing costs.

How are you weighing this tension as you consider further reduction in the Fed's balance sheet along with possible hikes to interest rates?

Ms. YELLEN. So we are considering the overall economic outlook relative to our objectives of maximum employment and price stability. And commodity prices, energy and oil prices certainly feed into our view of the outlook. For example, the huge decline we saw in oil prices is certainly something that substantially depressed investment spending in the United States, although it was a plus for consumers. We are now seeing a pickup in drilling activity which is supporting spending on plant and equipment. But we need to look overall at all sectors of the economy, and I guess I would summarize that by saying although there are varied trends in different sectors, this year we have had 180,000 jobs a month; last year, slightly more, about 190,000. This has been going on for a long time. It has been—you know, we cannot really control the distribution of jobs across sectors that are created, but it has been driving a stronger and stronger labor market with unemployment rates that are now at, you know, close to historically low levels.

Senator HEITKAMP. Just to lay down a marker, I would suggest that the reduction in commodity prices, the challenges of the commodity industry, whether it is agriculture or whether it is energy, when you look at job growth in those very difficult times after 2008, a large percentage of that job growth was equated to energy job growth. And so it is critically important that we not just look at one side of the equation.

Ms. YELLEN. Sure, absolutely.

Senator HEITKAMP. That is the point that I want to make, and any analysis on commodity prices in the context of the greater national economy and productivity, and maybe any little statement you can make on trade, we will follow up with questions.

Thank you so much, Chairwoman.

Ms. YELLEN. Thank you, Senator.

Chairman CRAPO. Senator Tillis.

Senator TILLIS. Thank you, Mr. Chair. And I want to thank Senator Cortez Masto for consistently and in the right committees bringing up the concern of affordable housing, both home ownership and affordable rental housing. I share virtually all the sentiment I have heard in every committee that she has spoken on it.

I want to get back to—I was not planning on it, but Senator Corker brought up something that I am very interested in, because we do have to increase productivity. And at least in North Carolina, when we were in a financial crisis, and a fourth quartile State performer, we figured out a way to do that which had to do with the Tax Code and regulations.

Now, I want to go back to regulations first. I think probably since Dodd–Frank, when I met with Chair Greenspan a year-and-a-half or so ago, he mentioned that up to that point since Dodd–Frank, some 350,000 jobs had been created that are called "regulatory compliance," in the category of "regulatory compliance." In your judgment, is that a job that improves productivity?

Ms. YELLEN. Well, look, we put in place regulations to serve important economic——

Senator TILLIS. I understand that, but I am just saying, in your professional judgment, does a job that relates to regulatory compliance contribute to productivity?

Ms. YELLEN. Well, it is a cost of doing business.

Senator TILLIS. OK. So——

Ms. YELLEN. And it is imposed, but for reasons that produce presumably benefits.

Senator TILLIS. I understand. If we take a look at—there are various ways that we are going to stimulate growth. One of them will be—and I want to get on the Tax Code. One of them will be by incenting capital investment, improving productivity, the things that you can do by maybe clearing up or eliminating some of the distortions in the Tax Code.

But we also have to be mindful, to the extent that the regulatory burden exceeds what we think is minimally necessary to ensure compliance with areas that represent risk, then that is also capital—or that is potential capital that could be deployed to productivity rather than to maybe overly burdensome regulations. Would you agree with that?

Ms. YELLEN. Yeah, I think all regulators should be attentive to burdens and seek ways to minimize them.

Senator TILLIS. And if I have time, I am going to go back to some—you have been very generous with your time, by the way. I should thank you for taking the time to meet with my office and responding to questions that we have submitted after Committee meetings. I appreciate it. I have enjoyed the discussions very much.

But could you drill—tax reform is something that we spent a lot of time on, not in our first 2 years in North Carolina, because we sought to relieve regulatory burdens first to produce economic activity that would ultimately fund real tax reform. But here we are going to move to tax reform, I hope fairly soon.

You mentioned that there are certain distortions in the Tax Code, if they were dealt with properly, would probably have a positive impact on productivity or economic activity. At a high level—I am not asking you to do our job by creating an agenda for tax reform, but at a high level, could you give me some insights into the areas that you think are probably worthy of the most scrutiny as we go forward with tax reform?

Ms. YELLEN. So, again, this is an area I really want to be careful not to wade into and give you any type of detailed advice. But I would say that there is general agreement that there are distortions in the corporate Tax Code and opportunities for improvement.

Senator TILLIS. Now, I want to go back in my remaining time. This is something that Senator Rounds touched on and I think probably other Members did before I came here. I had two competing committees, so I am sorry I was not here for your full testimony. But if you imagine that, you know, all the tools that you currently enjoy post-Dodd–Frank, so stress tests, enhanced prudential standards, living wills for banks, for the largest banks, if they had been in place before the crisis, do you think that the crisis that we have experienced would have been substantially—that the scale of the crisis would have been substantially reduced?

Ms. YELLEN. So that is a difficult judgment to render, but I do think we have much stronger capital, much stronger liquidity. I think it is important to recognize prior to the crisis we had many significant, large, stand-alone investment banks that were very highly leveraged. Now they are part of——

Senator TILLIS. Yeah, and now, because I try to develop a reputation for being close to on time, I want to close because I got a great response in the meeting, in our personal meeting, so I will not ask you to repeat it. But what I would like to see are right-sized applications of these regulations. I would like to see rational thought placed in how these regimes are applied to institutions, not based on some arbitrary number of, say, $50 billion today or $250 billion, whatever the number. It seems to me that that should only be a data point, and the nature of the businesses and the risks that they represent should be the driving factor in going forward and right-sizing these regulations, some of which I think are absolutely essential. Do you agree?

Ms. YELLEN. I do agree with that, and as I said in response to an earlier question, one way that Congress could approach this is to increase these dollar cutoffs——

Senator TILLIS. Yeah, but——

Ms. YELLEN. An alternative is to look at individual organizations and the factors that determine their riskiness——

Senator TILLIS. I would like to get——

Ms. YELLEN. ——and to take a different——

Senator TILLIS. I think one of the things we will do is probably maybe put more meaning to that, because I think everybody agrees in the abstract, but we really need to get to a point to where you regulate based on the risk of the specifics of a targeted business, instead of us feeling like we index—let us say we raise the number from $50 billion to whatever, and then index it over time, we could pretend that we are done. But I think we are missing the opportunity to make sure your resources are focused on the areas that represent the most risk and away from the businesses that do not.

Thank you, Mr. Chair. Sorry I went over.

Chairman CRAPO. Thank you.

Senator Kennedy.

Senator KENNEDY. Thank you for your service, Madam Chair.

Ms. YELLEN. Thank you.

Senator KENNEDY. I think I read the last couple of days that first-quarter growth had been readjusted to 1.4 percent. Does that sound right?

Ms. YELLEN. Yes.

Senator KENNEDY. If you had unfettered discretion, what would you do to improve on that?

Ms. YELLEN. Well, growth is variable from quarter to quarter, and we expect significantly stronger growth in the second quarter. So I would certainly, in looking at the performance of the economy, smooth through the volatility. But doing that, we have an economy that has grown over the last number of years by about 2 percent per year, and 2 percent has been sufficient to create a very large number of jobs and a tighter labor market.

Of course, it is good to have more jobs and a tighter labor market, but the fact that that could be accomplished with 2 percent economic growth points to what is very disappointing, namely, the potential of the U.S. economy to grow is very low. I believe CBO and our committee estimates that the economy's longer-run potential to grow is currently under 2 percent, and——

Senator KENNEDY. OK. But my question, Madam Chair—I apologize for interrupting. My question is: If you had unfettered discretion and were averaging 2 percent growth, and you wanted to get as close to 3 percent as you could, which would be considered normal before 2008, if you had unfettered discretion, what would you do?

Ms. YELLEN. Well, this is really not a job for the Federal Reserve. It is a job for Congress and the Administration.

Senator KENNEDY. I am asking for your advice.

Ms. YELLEN. My advice would be to focus on all of those factors that determine productivity growth, and that pertains to tax reform and the efficiency with which the economy operates. I would focus on training, on education, the quality of human capital in this economy. I would focus on investment, both public and private. I would focus on policies that impact the pace of technological change and research and development. And there are a wide range of policies that bear on everything in my list. And so it is that set of channels that I think is important in boosting the economy's potential to grow.

Senator KENNEDY. OK. Did we make a mistake moving away from Glass–Steagall?

Ms. YELLEN. I do not believe that Glass–Steagall was responsible for the financial crisis, so I do not see that as a major issue that was responsible for the financial difficulties.

Senator KENNEDY. Did our move away from it contribute at all, or was it just irrelevant, in your judgment?

Ms. YELLEN. Well, look, the largest distress was suffered at stand-alone investment banks like Bear Stearns and Lehman. You know, it was a product of Glass–Steagall. The fact that those investment banks are now—all major investment banks are part of bank holding companies and subject to stronger capital regulation is an important safeguard.

Senator KENNEDY. OK. Has the Volcker Rule worked?

Ms. YELLEN. The Volcker Rule was designed to stop proprietary trading in banking organizations. That is a goal with which I agree, and it was intended to permit market making. The implementation of it has been very complex and burdensome. We have suggested that community banks be exempt from it entirely, and——

Senator KENNEDY. Should we get rid of it?

Ms. YELLEN. I would not get rid of it, and I believe the Treasury report suggests maintaining the restriction on proprietary trading in depository institutions. So I would not get rid of it, but I would look for ways to simplify it.

Senator KENNEDY. OK. Last question, quickly. Would you accept a reappointment?

Ms. YELLEN. Excuse me?

Senator KENNEDY. Would you accept a reappointment as Chair?

Ms. YELLEN. So it is something that I really do not have anything to say about at this time. I am really focused on carrying out the responsibilities that Congress has assigned to us and have not really decided that issue.

Senator KENNEDY. Thank you for your service, Madam Chair.

Ms. YELLEN. Thank you.

Senator KENNEDY. Thank you, Mr. Chairman.

Chairman CRAPO. Thank you. And, Chair Yellen, we are approaching 11:30, which was the stop time I had hoped we would be able to meet. Senator Brown has asked for one more question.

Ms. YELLEN. OK.

Chairman CRAPO. And he certainly is welcome to do so.

Senator BROWN. Thank you. And while this was not my intent, the first part, if you are reappointed, I would be happy to join Senator Kennedy in supporting your reappointment.

Ms. YELLEN. Thank you, Senator.

Senator BROWN. I am not sure that he said that, but I think he did. Thank you. And I am very mindful of the Chairman's 11:30 meeting that the Republican conference has, and I am grateful for his giving me this one series of last questions, which will not take the whole 5 minutes.

Dodd–Frank required the CFPB to study forced arbitration, as you know, and to make a rule protecting consumers from the practice of doing so would be in the public interest. In 2015 CFPB publicly released a comprehensive study of the impact of forced arbitration agreements on consumers. The Bureau released a proposed rule limiting the use of forced arbitration in consumer contracts. As you know, on Monday it released the final rule.

During that time CFPB surveyed, consulted with experts at prudential regulators like you. If any of your—a couple of questions and then one brief comment. If any of your staff had safety and soundness concerns about this rule, do you think they would have raised those concerns with the CFPB during the rulemaking process?

Ms. YELLEN. So I know my staff consulted, and I assume that they would have, but I am not certain just what those consultations were.

Senator BROWN. OK. And one more question. If the rule were likely to impact the safety of the U.S. banking system, do you think it would be unusual that no staff of any of the prudential regulators would raise concerns about the rulemaking process?

Ms. YELLEN. I assume that they might well have.

Senator BROWN. OK. That is why I thought it was unusual, and I was surprised to see Acting Comptroller Noreika, understanding his short time there and short horizon to stay there, that he raised issues with this rule so late in a 2-year-long process and mentioned safety and soundness. And I think the Director, Director Cordray, clearly explained the efforts that CFPB has made to consider input from safety and soundness regulators.

So, Mr. Chairman, I would just close with asking unanimous consent to enter Mr. Noreika's letter and Mr. Cordray's letter on this issue into the record.

Chairman CRAPO. Without objection.

Senator BROWN. Thank you.

Chairman CRAPO. And if I had known you were going to go into the arbitration rule, I might have rethought going back into that issue.

[Laughter.]

Senator BROWN. And the CRA, right?

Chairman CRAPO. That is right. We will discuss it further probably.

Chair Yellen, thank you again for being here with us today, and we always appreciate the opportunity we have to discuss these issues with you.

For Senators who wish to submit questions for the record, Thursday, July 20th, is the due date, and I encourage you, Chair Yellen, if you receive questions, to please respond promptly.

And, with that, this hearing is adjourned.

Ms. YELLEN. Thank you, Chair Crapo.

Chairman CRAPO. Thank you.

[Whereupon, at 11:30 a.m., the hearing was adjourned.]

[Prepared statements, responses to written questions, and additional material supplied for the record follow:]

PREPARED STATEMENT OF JANET L. YELLEN

CHAIR, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

JULY 13, 2017

Chairman Crapo, Ranking Member Brown, and other Members of the Committee, I am pleased to present the Federal Reserve's semiannual Monetary Policy Report to the Congress. In my remarks today I will briefly discuss the current economic situation and outlook before turning to monetary policy.

Current Economic Situation and Outlook

Since my appearance before this Committee in February, the labor market has continued to strengthen. Job gains have averaged 180,000 per month so far this year, down only slightly from the average in 2016 and still well above the pace we estimate would be sufficient, on average, to provide jobs for new entrants to the labor force. Indeed, the unemployment rate has fallen about ¼ percentage point since the start of the year, and, at 4.4 percent in June, is 5½ percentage points below its peak in 2010 and modestly below the median of Federal Open Market Committee (FOMC) participants' assessments of its longer-run normal level. The labor force participation rate has changed little, on net, this year—another indication of improving conditions in the jobs market, given the demographically driven downward trend in this series. A broader measure of labor market slack that includes workers marginally attached to the labor force and those working part time who would prefer full-time work has also fallen this year and is now nearly as low as it was just before the recession. It is also encouraging that jobless rates have continued to decline for most major demographic groups, including for African Americans and Hispanics. However, as before the recession, unemployment rates for these minority groups remain higher than for the Nation overall.

Meanwhile, the economy appears to have grown at a moderate pace, on average, so far this year. Although inflation-adjusted gross domestic product is currently estimated to have increased at an annual rate of only 1½ percent in the first quarter, more-recent indicators suggest that growth rebounded in the second quarter. In particular, growth in household spending, which was weak earlier in the year, has picked up in recent months and continues to be supported by job gains, rising household wealth, and favorable consumer sentiment. In addition, business fixed investment has turned up this year after having been soft last year. And a strengthening in economic growth abroad has provided important support for U.S. manufacturing production and exports. The housing market has continued to recover gradually, aided by the ongoing improvement in the labor market and mortgage rates that, although up somewhat from a year ago, remain at relatively low levels.

With regard to inflation, overall consumer prices, as measured by the price index for personal consumption expenditures, increased 1.4 percent over the 12 months ending in May, up from about 1 percent a year ago but a little lower than earlier this year. Core inflation, which excludes energy and food prices, has also edged down in recent months and was 1.4 percent in May, a couple of tenths below the year-earlier reading. It appears that the recent lower readings on inflation are partly the result of a few unusual reductions in certain categories of prices; these reductions will hold 12-month inflation down until they drop out of the calculation. Nevertheless, with inflation continuing to run below the committee's 2 percent longer-run objective, the FOMC indicated in its June statement that it intends to carefully monitor actual and expected progress toward our symmetric inflation goal.

Looking ahead, my colleagues on the FOMC and I expect that, with further gradual adjustments in the stance of monetary policy, the economy will continue to expand at a moderate pace over the next couple of years, with the job market strengthening somewhat further and inflation rising to 2 percent. This judgment reflects our view that monetary policy remains accommodative. Ongoing job gains should continue to support the growth of incomes and, therefore, consumer spending; global economic growth should support further gains in U.S. exports; and favorable financial conditions, coupled with the prospect of continued gains in domestic and foreign spending and the ongoing recovery in drilling activity, should continue to support business investment. These developments should increase resource utilization somewhat further, thereby fostering a stronger pace of wage and price increases.

Of course, considerable uncertainty always attends the economic outlook. There is, for example, uncertainty about when—and how much—inflation will respond to tightening resource utilization. Possible changes in fiscal and other Government policies here in the United States represent another source of uncertainty. In addition, although the prospects for the global economy appear to have improved somewhat this year, a number of our trading partners continue to confront economic

challenges. At present, I see roughly equal odds that the U.S. economy's performance will be somewhat stronger or somewhat less strong than we currently project.

Monetary Policy

I will now turn to monetary policy. The FOMC seeks to foster maximum employment and price stability, as required by law. Over the first half of 2017, the committee continued to gradually reduce the amount of monetary policy accommodation. Specifically, the FOMC raised the target range for the Federal funds rate by ¼ percentage point at both its March and June meetings, bringing the target to a range of 1 to 1¼ percent. In doing so, the committee recognized the considerable progress the economy had made—and is expected to continue to make—toward our mandated objectives.

The committee continues to expect that the evolution of the economy will warrant gradual increases in the Federal funds rate over time to achieve and maintain maximum employment and stable prices. That expectation is based on our view that the Federal funds rate remains somewhat below its neutral level—that is, the level of the Federal funds rate that is neither expansionary nor contractionary and keeps the economy operating on an even keel. Because the neutral rate is currently quite low by historical standards, the Federal funds rate would not have to rise all that much further to get to a neutral policy stance. But because we also anticipate that the factors that are currently holding down the neutral rate will diminish somewhat over time, additional gradual rate hikes are likely to be appropriate over the next few years to sustain the economic expansion and return inflation to our 2 percent goal. Even so, the committee continues to anticipate that the longer-run neutral level of the Federal funds rate is likely to remain below levels that prevailed in previous decades.

As I noted earlier, the economic outlook is always subject to considerable uncertainty, and monetary policy is not on a preset course. FOMC participants will adjust their assessments of the appropriate path for the Federal funds rate in response to changes to their economic outlooks and to their judgments of the associated risks as informed by incoming data. In this regard, as we noted in the FOMC statement last month, inflation continues to run below our 2 percent objective and has declined recently; the committee will be monitoring inflation developments closely in the months ahead.

In evaluating the stance of monetary policy, the FOMC routinely consults monetary policy rules that connect prescriptions for the policy rate with variables associated with our mandated objectives. However, such prescriptions cannot be applied in a mechanical way; their use requires careful judgments about the choice and measurement of the inputs into these rules, as well as the implications of the many considerations these rules do not take into account. I would like to note the discussion of simple monetary policy rules and their role in the Federal Reserve's policy process that appears in our current Monetary Policy Report.

Balance Sheet Normalization

Let me now turn to our balance sheet. Last month the FOMC augmented its Policy Normalization Principles and Plans by providing additional details on the process that we will follow in normalizing the size of our balance sheet. The committee intends to gradually reduce the Federal Reserve's securities holdings by decreasing its reinvestment of the principal payments it receives from the securities held in the System Open Market Account. Specifically, such payments will be reinvested only to the extent that they exceed gradually rising caps. Initially, these caps will be set at relatively low levels to limit the volume of securities that private investors will have to absorb. The committee currently expects that, provided the economy evolves broadly as anticipated, it will likely begin to implement the program this year.

Once we start to reduce our reinvestments, our securities holdings will gradually decline, as will the supply of reserve balances in the banking system. The longer-run normal level of reserve balances will depend on a number of as-yet-unknown factors, including the banking system's future demand for reserves and the committee's future decisions about how to implement monetary policy most efficiently and effectively. The committee currently anticipates reducing the quantity of reserve balances to a level that is appreciably below recent levels but larger than before the financial crisis.

Finally, the committee affirmed in June that changing the target range for the Federal funds rate is our primary means of adjusting the stance of monetary policy. In other words, we do not intend to use the balance sheet as an active tool for monetary policy in normal times. However, the committee would be prepared to resume reinvestments if a material deterioration in the economic outlook were to warrant a sizable reduction in the Federal funds rate. More generally, the committee would

be prepared to use its full range of tools, including altering the size and composition of its balance sheet, if future economic conditions were to warrant a more accommodative monetary policy than can be achieved solely by reducing the Federal funds rate.

Thank you. I would be pleased to take your questions.

RESPONSES TO WRITTEN QUESTIONS OF SENATOR BROWN FROM JANET L. YELLEN

Q.1. I believe the full employment part of the dual mandate has served the economy well, including reducing disparities in labor market data.

Can you talk about why the full employment mandate is so important and what would be the impact on groups that have traditionally been disadvantaged in the labor market if the mandate were eliminated or altered?

A.1. Congress set forth the mandate for monetary policy in the Federal Reserve Act, which directs the Federal Reserve Board (Board) to conduct monetary policy so as to promote maximum employment and stable prices. My colleagues and I on the Federal Open Market Committee (FOMC) are fully committed to pursuing the goals that Congress has given us. Both objectives of the dual mandate are important in promoting the economic well-being of the United States. Furthermore, the dual mandate has served the country well. For the past quarter century or so, inflation has been generally low and stable, and while the Great Recession severely impacted households and businesses, the Board had a clear mandate to counteract the profound economic weakness of that time and exercised that mandate forcefully. As a result of policies implemented by the Board, unemployment has declined substantially and deflation has been avoided.

When the economy softens, all major demographic groups tend to experience higher rates of unemployment. However, a marked characteristic of recent business cycles is that groups that have traditionally been disadvantaged in the labor market have tended to experience a higher-amplitude version of the unemployment experience of whites. For example, during the period around the Great Recession, the unemployment rate for whites increased from about 4 percent to about 9 percent. At roughly the same time, the unemployment rate for blacks or African Americans increased from about 8 percent to a little over 16 percent, a larger increase that started from a higher level. Similarly, the unemployment rate for Hispanics or Latinos increased from about 5 percent to nearly 13 percent. From the worst time of the Great Recession, all three groups have enjoyed substantial improvements in their respective unemployment rates. Most recently, these rates have been in the neighborhood of 3¾ percent for whites, 7½ percent for blacks, and 5 percent for Hispanics. It is important to note that all three rates have come down substantially, and that the rates for blacks and Hispanics have declined by more than the rate for whites in recent years. However, it is also important to point out that the rates for blacks and Hispanics remain well above the rate for whites. Overall, the relative labor market experience of these groups has not improved in recent years, and that is a matter of considerable concern. Still, an important consequence of success in achieving the maximum employment objective of the dual mandate is that the benefits of a strong economy are shared widely across the individuals and households that make up our Nation.

Q.2. I think the Federal Reserve Board and the Federal Reserve Bank of Atlanta made a great choice earlier this year of Raphael

Bostic as the new President of the Atlanta Fed. The Richmond Fed is currently undergoing a search for their President. Are you satisfied with the search process currently underway and confident that it will result in a diverse pool of candidates for consideration by the Richmond Federal Reserve Bank Board of Directors and the Federal Reserve Board of Governors?

A.2. As you know, I have repeatedly expressed my personal commitment, and our institutional commitment, to advancing the objectives of diversity and inclusion throughout our organization, including at the level of presidents and other senior leadership. Our searches for candidates for Reserve Bank presidents are planned and conducted with a particular emphasis placed on identifying highly qualified candidates from diverse personal, academic, and professional backgrounds.

As you noted, the search for the next president of the Federal Reserve Bank of Richmond (Richmond) is currently underway. The Reserve Bank's search committee, which is comprised of directors who are not affiliated with commercial banks or other entities supervised by the Board, has engaged a highly regarded, national executive search firm with a strong track record in identifying highly qualified and diverse candidate pools for executive positions to assist in the search process.

As we did during the Federal Reserve Bank of Atlanta search, and consistent with the Board of Governors' responsibilities under the Federal Reserve Act, my colleagues, typically represented by the Chair of the Board's Committee on Federal Reserve Bank Affairs, are following the Richmond search process closely at every stage. We have emphasized to the executive search firm and the search committee the importance that the Board attaches to the identification of as large a pool as possible of highly qualified candidates from diverse personal, academic, and professional backgrounds.

Indeed I am confident in the strength of these processes, and in the commitment of my colleagues here at the Board and in Richmond to our shared objectives for the search.

RESPONSES TO WRITTEN QUESTIONS OF SENATOR SASSE FROM JANET L. YELLEN

Q.1. Our financial system has become increasingly consolidated as community banks and credit unions either close their doors or merge with larger institutions.

Are you concerned about this pattern? Why?

What services can these smaller institutions provide that larger institutions cannot provide?

A.1. The Federal Reserve Board (Board) recognizes the vital role community banks play in local economies and closely monitors consolidation trends at community banks. The banking industry has been consolidating at a relatively steady pace for more than 30 years.[1] Despite this, community banks (defined as banks with assets totaling less than $10 billion) have continued to play a vital role in local economies and serve as a key source of financing to

[1] *https://www.federalreserve.gov/pubs/feds/2008/200860/200860pap.pdf*

small businesses and small farms. While community banks accounted for 20 percent of all insured depository institution assets at year-end 2016, they accounted for nearly 50 percent of all dollars lent to small businesses by insured depositories and 88 percent of all dollars lent to small farms. The Board believes it is important to maintain a diversified and competitive banking industry that comprises banking organizations of many sizes and specializations, including a healthy community banking segment.

Research conducted over many years has concluded that community banks provide several distinct advantages to their customers compared to larger banks. For example, given their smaller size and less complex organizational structure, community banks are often able to respond with greater agility to lending requests than their large national competitors. In addition, reflecting their close ties to the communities they serve and their detailed knowledge of their customers, community banks are able to provide customization and flexibility to meet the needs of their local communities and small business/farm customers that larger banks are less likely to provide. Community banks are particularly important for rural communities, where the closing of a bank can be associated with a material decline in local economic activity.

Q.2. As you know, the CFPB may be moving forward on a rulemaking for Section 1071 of Dodd–Frank, which grants the CFPB the authority to collect small business loan data. I've heard some concerns that implementing Section 1071 could impose substantial costs on small financial institutions and even constrict small business lending.

Are you concerned that a Section 1071 rulemaking could hurt small business access to credit?

A.2. Section 1071 of the Dodd–Frank Wall Street Reform and Consumer Protection Act (Dodd–Frank Act) amended the Equal Credit Opportunity Act to require that lenders collect information on credit applications and outcomes for small businesses, and women-owned and minority-owned businesses. The purpose is to facilitate enforcement of the fair lending laws, and allow communities, governmental entities, and creditors to identify business and community development needs and opportunities.

Although the Consumer Financial Protection Bureau (CFPB) must issue rules to implement section 1071 for most creditors, the Board is responsible for issuing rules for certain motor vehicle dealers that use installment contracts to finance vehicle purchases by small businesses.

Because the CFPB is still considering how to implement the law and has not yet issued a proposed rule, the scope of the rule in terms of the type of creditors, transactions, or data that will be covered has not been established. We expect the rulemaking process to include consideration of the relative costs and benefits of the proposed rule to assess its impact.

CFPB and Board staff have recently started to coordinate efforts to conduct additional outreach and gather information to assist in developing their regulatory proposals. In May, 2017, the CFPB published a "Request for Information" outlining the major issues on which the CFPB is seeking data and information from stakeholders

that will be affected by the rules. The CFPB is also required to conduct a small business review panel pursuant to the Small Business Regulatory Enforcement Fairness Act. The panel would meet with representatives of small businesses that can provide feedback on the impact of the proposed regulations and on regulatory options and alternatives that might minimize the impact.

Q.3. Has the Federal Reserve coordinated with the CFPB to ensure that implementing these requirements does not constrict small business access to credit?

A.3. The CFPB has primary rule-writing authority and must issue rules to implement section 1071 for most creditors. The Board is responsible for issuing rules that would apply to certain motor vehicle dealers that originate installment contracts to finance vehicle purchases by small businesses, and routinely sell or assign the contracts to a third party.

The Board believes that the two agencies should jointly develop rules that use consistent definitions and standards to ensure data are collected and reported uniformly, whether the loans are made by depository institutions, motor vehicle dealers, or another type of creditor. The Board will also participate in the CFPB consultation process, along with the other prudential regulators, that is mandated for all CFPB rulemakings under section 1022 of the Dodd–Frank Act. The CFPB has yet to commence its rulemaking consultation process.

In May 2017, the CFPB held a public field hearing in Los Angeles on small business lending and published a "Request for Information" outlining the major issues on which the CFPB seeks data and information from stakeholders that will be affected by the rules. This information is expected to assist the CFPB and the Board as they consider the scope of their proposed rules. In addition, CFPB and Board staff have recently started to coordinate efforts on planning joint outreach efforts to gather additional information.

Q.4. I am very disturbed by the most recently available data on job openings and hires. As you know there were a record number of job openings, 6 million, while job hires fell to 5.1 million. This problem manifests itself in Nebraska as many businesses tell me that they have extreme difficulties finding and retaining talent.

Does this mismatch between job openings and job hires represent a new normal? Or will economic growth eventually reduce this mismatch over time, without any major structural changes to our economy?

A.4. Data from the Job Openings and Labor Turnover Survey[2] show that the ratio of job openings to hires has moved up since the end of Great Recession and has surpassed its pre-recession level. There are likely several factors that are responsible for the increase in job openings relative to hiring:

- Most of the increase likely reflects typical cyclical behavior of the labor market, that is, the ratio of vacancies to hires goes up when the economy improves and down when the economy slows. In other words, in tightening labor markets there is an

[2] *https://www.bls.gov/news.release/jolts.htm*

increasing scarcity of job seekers overall, which may eventually impede firms' ability to fill job openings.

- Another possibility is that there have been changes in the ways that firms post job vacancies and search for workers. For example, online recruitment and job search have become increasingly popular, making it cheaper for firms to post job vacancies and possibly resulting in an elevated level of vacancies relative to earlier times.
- A third possibility is the mismatch between the skills that job seekers have and the skills that employers want. For example, such mismatch might arise because firms are less willing to hire those who have suffered long spells of non-employment during and after the Great Recession because firms perceive that these potential workers have lost job-related skills (or their skills have become otherwise obsolete). Alternatively, there may be a mismatch between low-skill workers and high-skill jobs, or a mismatch between locations where unemployed job seekers reside and where workers are in greatest demand.

If this third type of mismatch were a significant concern for the broader labor market, we would eventually expect to observe a substantial rise in wages as firms compete to hire workers with scarce skills. To date, however, we have not seen wage acceleration in the aggregate that exceeds what might be expected given the historical relationship between wage growth and other economic conditions. That said, in the Federal Reserve's Beige Book a number of respondents noted worker shortages at all skill levels and a couple Districts reported that labor shortages were beginning to push up wages.

Significant mismatch, if it exists, may be alleviated somewhat if aggregate labor market conditions remain favorable. For example, it may induce some workers who left the labor force out of discouragement to re-enter, some of whom may have skills matching those sought by firms. It may also encourage firms to consider less qualified applicants, perhaps by offering such workers additional training or education on the job.

Q.5. What are the most prominent causes of this mismatch?

A.5. As described above, an elevated level ratio of vacancies to hires does not necessarily indicate the emergence of significant mismatch, since factors such as advances in recruiting technology and usual cyclical improvement in the labor market may have also led to the increase. Nonetheless, it may also reflect specific factors, such as the increased use of information technology in many industries and jobs, leading to mismatch between the skills and attributes demanded by firms and the available job seekers.

Q.6. In what industries is this mismatch most prominent?

A.6. The ratio of vacancies to hires varies substantially across industries, although this need not indicate varying degrees of mismatch and may instead reflect industry differences in hiring conventions. (For example, for a given level of vacancies, firms hire fewer workers in the health and education sector on average than they do in the construction sector.) Even taking these differences into account, the ratio of vacancies to hires appears to have contin-

ued to increase in industries such as health care and education, professional and business services, and trade, transportation, and utilities. Consistent with this observation, some firms responding to the most recent Labor Shortage Index survey from The Conference Board[3] reported anticipating there would not be a sufficiently qualified supply of workers in "management, business, and financial service occupations" or "professional and related services occupations." That said, we have not seen significant wage growth in most of these sectors relative to other sectors, suggesting that factors other than mismatch may be boosting the ratio of vacancies to hires in these industries.

Q.7. What demographic groups are most hurt by this mismatch?

A.7. It is difficult to assess with any precision which demographic groups are disproportionately affected by mismatch due to data limitations. That said, there are some groups whose employment rates have declined substantially relative to other groups, which may represent weak labor demand relative to other groups and possibly owe, in part, to mismatch. For example, the employment rate for prime-age males (especially less-educated prime-age males) has declined more steeply than other groups, which could be partially because manufacturing (which disproportionately employed prime-age men) has contracted, while newly created jobs have been in occupations with different skills requirements or in different areas of the country.

Q.8. Today, many workers, including those late in their career, are forced to retool their skills to find a job in new fields. Can our economy's current ecosystem of education and job remaining programs adequately respond to this challenge? If not, what changes could better address this issue?

A.8. Some job retraining and education programs, such as WorkAdvance and Apprenticeship Carolina, have had success lately, though these types of programs are especially helpful for workers earlier in their career whose skills can more easily be matched to growing labor demand. In general, an expansion of career and technical education programs and apprenticeships may be effective in helping workers gain valuable skills and obtain a foothold in a labor market that increasingly requires technical proficiency. In addition, promoting entrepreneurship through programs that equip people with the management skills and knowledge they need to start and operate a successful small business could also be a fruitful approach for some workers.

Q.9. I am concerned about the impact of our recent trade disputes on our economy, particularly with agriculture.

How dependent is the agricultural economy on exports with other countries?

A.9. As reported by the U.S. Department of Agriculture, the export share of U.S. agricultural production has averaged about 20 percent in recent history. However, some specific agricultural products have had higher export shares. For example, cotton and tree nuts

[3] *https://www.conference-board.org/labor-shortages2016/index.cfm?id=38314*

have historically had export shares around 75 percent, while rice, wheat, and soybeans have had export shares around 50 percent.[4]

Q.10. U.S. corn exports to Mexico from January through May of this year are down by 7 percent compared to last year. Unfortunately, this may be due to reported efforts by Mexico to reduce corn imports from the United States, including by opening up trade with Brazil or Argentina. Are there historic examples of countries exploring other import markets in response to trade disputes?

A.10. Although there has been much reporting of efforts to diversify Mexico's supply, actual Government policy actions have not been implemented. In addition, U.S. corn exports to Mexico, after being weak earlier in the year, have stepped up in recent months. Corn exports to Mexico are now down only 1 percent relative to 2016.

That being said, Brazil and Argentina are major corn exporters, who compete worldwide with U.S. exporters for market share. Because of transportation cost advantages, Mexico currently buys most of its imported corn from the United States. If Mexico were to increase trade barriers, such as tariffs, trade diversion would likely occur. For example, when the United States has historically imposed tariffs on imports from one country, U.S. imports from other countries have increased (see Prusa 1996).[5] However, U.S. exporters would likely find other international markets, albeit less profitable for their corn.

Q.11. How significant is the risk that NAFTA renegotiations will drive other countries to explore import markets, including with agriculture?

A.11. Because there are fixed costs in establishing trading relationships, existing trade relationships are likely to continue even if North American Free Trade Agreement renegotiations cause increased uncertainty; However, the uncertainty could lead foreigners to consider diversifying their sources of imports. As such, U.S. producers will likely continue to export to Mexico and Canada, but U.S. producers may lose some sales as foreigners diversify their sources. In the short run, U.S. producers may find it hard to make up lost sales elsewhere, because it takes time to find new customers. However, in the long run, U.S. producers would find other foreign customers to buy their products, although the costs of transporting products to these markets would likely be higher and the prices received may be lower.

Q.12. The Trump administration is considering imposing new trade barriers on steel imports. Some have argued that other countries typically target retaliatory trade measures at the agricultural sector. Are there historical instances where this has occurred? If so, how strong were these measures?

A.12. When the U.S. Government levied tariffs on steel imports in 2002, the European Union initiated steps to retaliate on $2.2 billion of U.S. exports of products such as vegetables, fruits, nuts, motorcycles, textiles, paper products, and furniture. The United States

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[4] *https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartid=58396*

[5] Prusa, Thomas J., "The Trade Effects of U.S. Anti-Dumping Actions", NBER Working Paper No. 5440, January 1996.

withdrew these steel tariffs in 2003 before the European Union went through with its retaliatory tariffs.

As another example, in 2009, Mexico retaliated against the United States for the cancellation of the cross-border long-haul trucking program. Mexico raised tariffs on around 90 products, including agricultural products, with affected exports valued at around $2 billion. In 2011, retaliatory duties were removed after the United States agreed to allow Mexican trucks to operate in the U.S. as part of a pilot program.

Q.13. If there have been retaliatory measures in the past, how did these measures hurt the agricultural economy?

A.13. As estimated in Zahniser et al. (2016),[6] the Mexican tariffs reduced U.S. sales of targeted agricultural products by 22 percent, a value of $984 million. Although they do not find that reduced exports to Mexico were offset by increased sales of these same goods to other countries, they look over only a 2-year horizon, which may be too short a time to establish new trading relationships.

Q.14. Assume that similar agricultural retaliatory trade measures are imposed in response to new steel trade barriers. How would these measures impact the agricultural economy?

A.14. Similar to question (c), there may be lost agricultural sales in the short run. Eventually, U.S. agricultural producers likely would find other customers.

Q.15. Many economists point to weak productivity growth as one of the major contributors to slower economic growth overall.

Do you agree with this assessment?

A.15. Yes. Economic growth reflects contributions from both changes in output per hour, or productivity, and changes in the total number of hours worked in the economy. The step-down in business sector productivity growth in recent years has been substantial: productivity growth averaged 1½ percent in the 10-year period ending in 2016; over the previous 10 years, its average was 2½ percent. That being said, a secular decline in the growth of hours worked has reduced economic growth as well.

Q.16. Do you believe productivity measurements accurately account for new technology?

A.16. Most of the challenge in measuring productivity, especially with regard to new technology, is in measuring prices. For example, when "big box" retailers became prevalent in the 1980s and 1990s, they offered many items at lower prices than conventional stores. These lower prices were due in part to improvements in the technology used by retailers to manage their supply chain, but arguably also reflected changes in quality of service. Official statistics struggled with the challenge of how much of the big-box discount to attribute to a different shopping experience and how much to treat as a productivity improvement.

However, properly measuring the effects of new technology has always been a significant challenge. More recently, the same price

[6] Zahniser, Steven, Tom Hertz, and Monica Argoti, "Quantify the Effects of Mexico's Retaliatory Tariffs on Selected U.S. Agricultural Exports", *Applied Economic Perspectives and Policy*, Vol. 38, No. 1, 2016, pp. 93–112.

measurement challenge mentioned above has emerged with the shift in the retail sector toward e-commerce. More generally, economists have not found that measurement problems have gotten worse, or that economic activity has shifted to more poorly measured sectors in a way that would suggest that recent readings on productivity are less credible than those in the past. Thus, there is no compelling evidence that the recent productivity slowdown is simply an artifact of problems measuring new technology. However, this is an area of active research, and substantial uncertainty remains.

Q.17. How does current policy impede productivity growth?

A.17. Contributors to productivity growth include (1) technological innovation, (2) human capital, (3) business capital, and (4) reallocation (matching labor and capital resources to their best employment). Government policy can affect productivity through all four of these channels.

It would be inappropriate for the Federal Reserve to criticize or endorse specific Government policies for their effect on productivity, but the most constructive policy interventions address failures of the market system to guide resources to their best use. For example, practical technological innovation can depend on the performance of basic research (oftentimes undertaken many years earlier) with no known commercial application, and private sector research and development will tend to under-emphasize such things; so, policies that encourage basic research indirectly promote productivity growth. With regard to the labor force, Government support for education is justified because the cost to society when young adults fail to prepare for the job market exceeds the private cost to the individual.

Policy uncertainty is an important consideration as well. To the degree that risk-averse firms adopt a more cautious approach to investment when the future path of Government policy is unclear, such uncertainty can retard productivity growth.

Q.18. How can the United States improve productivity?

A.18. There may be opportunities to influence productivity through the channels discussed above. For example, although private research and development (R&D) has recovered since the Great Recession, Government R&D remains low by historical standards, raising the possibility that we are sowing fewer seeds that may yield future practical innovations. With regard to human capital, recent research has highlighted the lifelong impact of early childhood education for poor students who would not otherwise have been in a stimulating environment. And regarding business investment, as noted above, a stable and predictable policy regime may encourage capital spending. Also, the stock of capital employed by the private sector includes roads, bridges, and so forth that are provided by the Government, and such investment has slowed in recent years. Finally, Government policies should be evaluated critically with respect to their effects on the free flow of labor and capital.

Q.19. According to research compiled by AEI scholar, Nicholas Eberstadt, in his book "Men Without Work", the proportion of

prime-age men out of the labor force more than tripled in the past 50 years, from only 3.4 percent in 1965 to 11.8 percent in 2015. In addition, eight times as many prime-age men were economically inactive and not pursuing education in 2014 than in 1965.

What priority should we give this measurement in our broader economic calculus?

A.19. One important indicator of the health of the labor market is the labor force participation rate (LFPR), defined as the fraction of the working-age (16 years and older) population that is working or looking for work. The LFPR increased from less than 60 percent in the early 1960s to about 67 percent by the late 1990s, with much of the rise reflecting an increase in women's labor force attachment. Since then, the LFPR has fallen to about 63 percent. Although much of this decline is attributable to population aging as members of the baby boom cohort (born 1946 to 1964) have begun to reach retirement age, some of the decline in the overall LFPR is also attributable to the continued decline in LFPR for prime-age (25–54 year old) men.

The decline in LFPR for prime-age men is especially notable because they have historically had high levels of labor force participation. Moreover, this decline has been particularly steep relative to trends in the LFPR for other demographic groups, and has been especially steep for prime-age men with no more than a high school education. Understanding why the LFPR for prime-age men has fallen, and how responsive the LFPR for this group may be to further economic expansion, is important for determining whether the LFPR for prime-age men can reverse some of its longer-run decline, and how much additional improvement in labor force participation overall is possible if broader economic conditions remain favorable. Of particular interest to monetary policymakers is assessing where the labor market stands in the aggregate relative to the full-employment benchmark.

Q.20. To what do you attribute this decline in labor force participation?

A.20. One possibility is that there has been a change in the composition of the types of available jobs, which may have disproportionately reduced employment opportunities for prime-age men (especially men with no more than a high school degree). Researchers have highlighted at least two potentially significant changes in the labor market that may have led to diminished job availability for these men. The first is the increased use of automation in the production process and computers in the workplace more generally, which has likely resulted in the elimination of some jobs over the past few decades that are now more efficiently performed by machines. The second is increased globalization, which is likely reinforcing the effects of automation. Though trade is generally beneficial, increased competition from lower-priced imports in some industries, according to some researchers, may be contributing to the decline in manufacturing employment. Both of these changes may have contributed to the decline in jobs that were particularly common for prime-age men, especially in manufacturing, and some of the workers who have been displaced by these changes may have opted to drop out of the labor force.

Another possibility is that prime-age men's ability to work or desire to work given available employment opportunities has diminished. For example, evidence suggests that significant health limitations may inhibit many individuals from participating in the labor force, and opioid use may also be an increasingly important barrier to employment for some individuals. Also, the severity and length of the Great Recession, and the sluggishness of the recovery, may have degraded somewhat the skills of individuals who experienced long spells of non-employment, or caused some employers to believe that such individuals' skills have decayed. Consequently, some individuals who lost their jobs during or after the Great Recession may have come to believe that they were unlikely to find suitable employment, and responded by dropping out of the labor force.

Q.21. What types of policies could be effective in improving labor force participation among prime-age men?

A.21. Most broadly, it seems likely that policies supportive of continued economic expansion would improve job opportunities and encourage labor force attachment among all workers, including prime-age men.

Designing policies that aim to improve the labor force attachment for prime-age men can be challenging but should probably focus on some of the previously mentioned issues. For example, workforce development programs targeted to individuals displaced from jobs in shrinking industries and occupations could provide information on the current needs of local employers, provide re-training or additional education to meet those demands, and perhaps offer relocation assistance for moving to areas where job opportunities are most abundant. These programs may be particularly effective for younger workers (who are more geographically mobile and have more of their career remaining to benefit from the new skills provided by re-training), and may be most productively targeted at areas of the country where the decline in job opportunities has been most significant (such as locations that specialized in certain manufacturing industries). Another potentially fruitful approach may be promoting entrepreneurship as a path to a productive career, by offering education in the management and business skills necessary for operating a successful small business.

Q.22. According to research from the Economic Innovation Group, the new startup rate is near record lows, dropping by "half since the late 1970s." The total number of firms in the U.S. dropped by around 182,000 from 2007–2014.

Are you concerned about this decline in new startups and broader economic consolidation?

A.22. The decline in new startups has been attracting a lot of attention, including within the Federal Reserve System, partly out of concern that some of the more recent decline might have played a role in the slow recovery after the Great Recession.

The startup rate (defined as the share of firms that are new in a given year) fell from 12.5 percent in 1980 to 8.0 percent in 2014 (the latest year for which data are available). The decline in startup activity is worth studying for several reasons. Research has shown that new firm entry is a significant driver of aggregate job

gains and of productivity growth. Moreover, changes in employment at new and young films tend to account for a large share of job growth during recoveries.

Economists have found that the decline in startup activity since 2000 looks somewhat different from the decline between 1980 and 2000. Two factors can account for much of the decline in the startup rate prior to 2000, neither of which is believed to have reduced American living standards broadly.

- Due to demographic changes, particularly birth rate patterns during the late-20th century, the U.S. labor force has grown more slowly in recent decades than previously. This slowing is believed to have reduced firm entry rates because new firm formation is typically highly responsive to labor force growth.
- Substantial consolidation to the retail trade sector in the 1980s and the 1990s, which was a slow growth sector that had historically been characterized by high rates of entrepreneurship.

While the demographic and industrial patterns described above have continued to affect startup rates after 2000, the sources of the decline in startup activity appear to have expanded and may be cause for concern.

- The decline in activity of young and startup firms spread to the information and high tech sectors after 2000, and across most industries rapid growth in employment, revenue, and value among young firms became less common. Falling startup activity in highly innovative sectors, along with the decline in high-growth outcomes among startups more broadly, may have negative implications for productivity and, therefore, American living standards.
- Reduced competition from high-performing new entrants may also be contributing to increased concentration in many industries in the U.S. Whether rising concentration reflects a consumer-harming decline in the intensity of competition is still au open question, and the causes of the post-2000 decline in high-growth startup activity remain unknown. Researchers in the Federal Reserve System and elsewhere are actively investigating this topic.

Q.23. What, if any, policy solutions should be explored in order to respond to these challenges?

A.23. The underlying causes of the post-2000 decline in high-growth entrepreneurship are still not well understood, so identifying policy remedies for these patterns is difficult. However, there is a large body of research on the policy determinants of entrepreneurship generally. It would be inappropriate for the Federal Reserve to criticize or endorse specific Government policies in this area, but a number of academic studies have explored these issues and can be summarized here.

In some cases, lack of access to financing can inhibit the formation and growth of new firms. In the wake of the financial crisis, credit markets were severely impaired, though functioning has largely recovered. Research suggests that entrepreneurship may also be supported by efforts to: reduce barriers to starting a firm more broadly (including policies that implicitly subsidize wage-

earning work over self-employment); maintain a robust education system to ensure potential entrepreneurs (particularly women and minorities, a partially untapped pool of potential entrepreneurs) and their potential employees can acquire crucial technical skills; ensure an equal playing field between incumbents and potential entrants; and preserve competition and the mobility of labor.

Q.24. In 2007 you stated that the Phillips curve, the inverse relationship between unemployment and inflation, "is a core component of every realistic macroeconomic model." Is this still true? If so, how does the current trend of low inflation and low unemployment fit into this model? If not, what new models are in place to give the American people confidence in the Federal Reserve's ability to manage inflation?

A.24. The evidence does suggest that labor market conditions (as summarized by the unemployment rate for example) influence inflation, and in my view this Phillips curve relationship is an important component of macroeconomic models. However, the magnitude of this influence seems to be modest, and especially over short periods of time, the effect can easily be overshadowed by other factors influencing inflation. For example, the drop in oil prices and the strengthening exchange value of the dollar that began around mid-2014 held down inflation appreciably over the following couple of years, and those influences far outweighed the effect of a tightening labor market.

Moreover, given the limits of our knowledge and noise in the data, those "other factors" are not always readily identifiable. As l said in my recent testimony, the softening of inflation this past spring appeared to reflect unusual reductions in certain categories of prices, and I would expect those not to be repeated. In the Summary of Economic Projections from June, the median inflation projection from Federal Open Market Committee (FOMC) policymakers calls for inflation to reach 2 percent over the next 2 years, as recent softness is not repeated and as the labor market strengthens further. Policymakers certainly recognize the risks around their projections, and with inflation having run below the FOMC's 2 percent objective for most of the period since the last recession, the FOMC has emphasized that we are carefully monitoring progress toward our symmetric inflation goal.

RESPONSES TO WRITTEN QUESTIONS OF SENATOR ROUNDS FROM JANET L. YELLEN

Q.1. During your appearance before the Banking Committee in February, you mentioned that commercial and industrial or C and I lending has grown by over 75 percent since the end of 2010. This statistic was also mentioned in a hearing our colleagues in the House Financial Services Committee held in April when Mr. Peter Wallison from the American Enterprise Institute explained that the 75 percent increase in C and I lending is somewhat misleading. According to Mr. Wallison, the banking sector as a whole has yet to reach the lending level it was at in 2008 aside from a few of the very largest banks.

In addition, Mr. Wallison's written testimony cited two Fed researchers—Dean Amel and Traci Mach—who have found that there

is a significant difference between the volume of loans made for amounts under 1 million dollars, which is oftentimes a proxy for lending from small institutions, and loans made for amounts over 1 million.

Can you please comment on the degree to which our banking sector, and our small banks in particular, have yet to make up the ground in C and I lending post-crisis? And what's your take on the research from Dr. Amel and Dr. Mach?

A.1. Total commercial and industrial (C&I) loans outstanding have grown since the end of 2010 for all commercial banking organizations—including for large commercial banking organizations as a group and for small commercial banking organizations as a group. Although growth has been more rapid for the group comprised of larger banking organizations, smaller banks, in aggregate, have also experienced significant growth in C&I lending during this time period. For example, total C&I loan balances at banking organizations with less than $10 billion in consolidated assets (a commonly used threshold for defining community banks) grew by more than 20 percent from 2010 to 2016, and the aggregate volume of C&I loans at these smaller banks was greater at year-end 2016 than at year-end 2007 or year-end 2008. The lower rate of growth in lending for the group comprised of smaller banks is, in part, attributable the fact that the number of banks in this size category has declined, while the number of banks with more than $10 billion in assets has increased. This shift in the size distribution of banks is due to the combined effects of the acquisition of some community banks by larger banks and the growth of some community banks beyond the $10 billion threshold by 2016.

The research by Dr. Amel and Dr. Mach,[1] which is referenced in Mr. Wallison's testimony, notes that business loans under $1 million at origination are often used as a proxy for small business lending, not as a proxy for lending by community banks. Bank Call Reports filed by all commercial banks and thrift institutions provide data on their small loans to businesses. However, the Call Reports do not provide information on the size of the business obtaining the Joan.

Amel and Mach (2017) look specifically at small business lending by community banks. They note in their paper that following the financial crisis, total outstanding loans to businesses at commercial banks declined sharply. As of the third quarter of 2010, larger loans to businesses had begun to recover, but smaller loans to businesses were still in decline. The lack of recovery in smaller loans to businesses was a primary reason for the creation of the Small Business Lending Fund (SBLF) in 2010. Amel and Mach's work finds that the SBLF had little effect on small business lending by community banks. Although SBLF-participating community banks did increase their small business lending by a greater percentage than did nonparticipating community banks, this higher rate of growth in lending was already evident prior to the implementation of the SBLF, and did not change following the introduction of the SBLF.

[1] Dean Amel and Traci Mach (2017), "The Impact of the Small Business Lending Fund on Community Bank Lending to Small Businesses", *Economic Notes*, vol. 46, no. 2, pp. 307–328.

RESPONSES TO WRITTEN QUESTIONS OF SENATOR TILLIS FROM JANET L. YELLEN

Q.1. I am very concerned about the method the Board has implemented to make determinations about the systemic risk profile of bank holding companies. As noted in the final rule issued July 20, 2015, the Board developed an "expected impact" framework, which is a consideration of each firm's expected impact on the financial system, determined as a function of the harm it would cause to the financial system were it to fail multiplied by the probability that it will fail.

To determine this potential harm, which Board staff deemed the "systemic footprint" of a particular firm, a multifactored assessment methodology was developed. This test uses five equally weighted categories that the Board asserts are "correlated with systemic importance"—size, interconnectedness, cross-jurisdictional activity, substitutability, and complexity. Covered firms are then "scored" using these factors and firms with the highest scores are deemed to present systemic risks.

I believe that tracking and addressing systemic risks to the financial system is one of the most important responsibilities delegated to the Board of Governors. Due to the considerable significance, it is essential for the Board to use thoughtful, robust, and ultimately predicative tests/criteria/methods in its efforts.

Please indicate why you believe the five factor test that is currently being used is the best manner to determine the systemic impact of firms. Additionally, I respectfully request that you share the background materials/information/analyses that lead you (and or the Board) to draw this conclusion.

A.1. In all of our efforts, our goal is to establish a regulatory framework that helps ensure the resiliency of our financial system, the availability of credit, economic growth, and financial market efficiency. The Federal Reserve has been working for many years to make sure that our regulation and supervision is tailored to the size and risk posed by individual institutions.

The five-factor test for determining the systemic footprint of global systemically important banks (G–SIBs) is used by the Federal Reserve Board (Board) to determine which banking firms are G–SIBs and to determine the capital surcharge for each G–SIB. The Board believes that the five factor measure is a meaningful, but approximate, measure of a banking firm's systemic importance. The Board realizes that any such measure should evolve over time. As a result, the methodology is regularly reviewed, and is in the process of being reviewed now.[1]

The five-factor measure reflects substantial research efforts by both the international community and the Federal Reserve System. The analytical background for the Board's approach to G–SIB capital surcharges is spelled-out in a Board white paper,[2] along with the discussion in the *Federal Register* notice of the final rule.[3] The

[1] See Basel Committee on Banking Supervision, "Consultative Document: Globally-Systemically Important Banks—revised assessment framework". Issued for comment by June 30, 2017. March 2017.

[2] "Calibrating the G–SIB Surcharge", Board of Governors of the Federal Reserve System, July 20, 2015.

[3] 80 *FR* 49088 (August 14, 2015).

Basel Committee also has provided an explanation of its five-factor measure.[4] An in-depth study of the Basel Committee's G–SIB capital surcharge system found that the weights used by its systemic indicator system produced results that were consistent with other approaches to creating a G–SIB index.[5] Moreover, the surcharges that were assigned under the five-factor measure are consistent with a range of alternative parameterizations of key variables in the formula.

The selected indicators in the Board's G–SIB capital surcharge framework were chosen to reflect the different aspects of how G–SIBs generate negative externalities when they are in financial trouble, and the different aspects of what makes a G–SIB critical for the stability of the financial system. The Board recognizes that there is no perfect measure of systemic importance and, as a result, the G–SIB measure focuses on indicators where there is substantial supervisory agreement about their link to systemic importance.

Additionally, while not directly asked in your question, an important topic related to this is ensuring that the Board continually assess its approaches to regulation to ensure that rules are tailored as much as possible to the actual risk of a regulated entity.

The Board has been making efforts to do this in many areas, such as our recent changes to our Comprehensive Capitol Analysis and Review qualitative analysis. However, as my colleague Governor Powell and I have noted, the Board has limited authority in tailoring certain provisions, such as the thresholds applied in section 165 of the Dodd–Frank Wall Street Reform and Consumer Protection Act. Further tailoring in areas such as these would require congressional action.

RESPONSES TO WRITTEN QUESTIONS OF SENATOR HEITKAMP FROM JANET L. YELLEN

Macroeconomic Policy

Q.1. Today we have the strongest labor market in a decade, a 4.4 percent unemployment rate, yet wages are rising barely faster than inflation. Many economists have pointed to low productivity growth as the driving factor for why Americans haven't seen significant growth in real wages.

Do you believe productivity is the biggest factor holding back wage growth?

Is slow productivity growth in part the result of businesses that have failed to pass on the gains from a growing economy by training and investing in their workers?

What can we do to help turn the tide on productivity growth and boost wages for American workers?

A.1. It is true that wage gains have been disappointing, and while this is not the only factor, sluggish productivity growth has been an important reason that wage growth has not been higher. Productivity in the business sector has increased only 1¼ percent per

[4] Basel Committee on Banking Supervision, "Global Systemically Important Banks Assessment Methodology and Higher Loss Absorbency Requirement", July 2013.

[5] Wayne Passmore and Alex H. von Hafften, "Are Basel's Capital Surcharges for Global Systemically Important Banks Too Small?" Finance and Economics Discussion Series, Working Paper 2017-021, Appendix 1.

year since 2006, compared with its average of 2½ percent from 1949 to 2005. And over the past years, productivity rose less than ¾ percent per year, on average. Over time, sustained increases in productivity are necessary to support rising household incomes and living standards.

Economists do not fully understand the exact causes of the slowdown in productivity growth. To some extent, the slowdown may reflect the aftermath of the global financial crisis and recession. For example, research and development spending, an important source of innovation, fell sharply during the recession. To the extent such factors are at play, we may expect productivity growth to improve as the economy strengthens further. However, some analyses emphasize factors that predate the financial crisis and recession. For example, evidence suggests that the effects of the information technology revolution were fading by the early 2000s. Moreover, some see recent technological advances, including in information technology (IT), as less revolutionary than earlier technologies like electricity and the internal combustion engine. These more structural explanations might portent a longer period of slow productivity growth; though it certainly is possible that IT-related innovations, such as robotics and genomics, will eventually produce significant advances.

While there is disagreement about what policies would most effectively boost productivity, a variety of policy initiatives would likely contribute. More investment, both through improved public infrastructure and more encouragement for private investment, would likely play a meaningful role. More effective regulation likely could contribute as well. And better education, at all grade levels and including adult education, could both promote productivity growth and contribute to higher incomes not just on average, but throughout our society.

Q.2. How proactive are you going to be able to be during the unprecedented unwinding of the Fed's portfolio, should the impact of balance normalization deteriorate financial conditions to a point where the real economy is adversely impacted'?

A.2. Provided that the economy evolves broadly as anticipated, the Federal Open Market Committee (FOMC) expects to begin implementing a balance sheet normalization program this year. Consistent with the Policy Normalization Principles and Plans released in 2014, this program would gradually decrease reinvestments and initiate a gradual and largely predictable decline in the Federal Reserve's securities holdings.

For both Treasury and agency securities, we will reinvest proceeds from our holdings only to the extent that they exceed gradually rising caps on the reductions in our securities holdings. Initially, these caps will be set at relatively low levels—$6 billion per month for Treasuries and $4 billion per month for agency securities. Any proceeds exceeding those amounts would be reinvested. These caps will gradually rise over the course of a year to maximums of $30 billion per month for Treasuries and $20 billion per month for agency securities, and will remain in place through the normalization process. By limiting the volume of securities that private investors will have to absorb as we reduce our holdings, the

caps should guard against outsized moves in interest rates and other potential market strains. The FOMC announced the details of this plan in advance so that when it goes into effect, no one is taken by surprise and market participants understand how it will work.

The FOMC expects this plan for reducing the Federal Reserve's securities holdings will run quietly in the background. Of course, the FOMC will be monitoring the process of balance sheet normalization over time and its effects in financial markets. The FOMC has noted that it would be prepared to resume reinvestments if a material deterioration in the economic outlook were to warrant a sizable reduction in the Federal funds rate. More generally, the FOMC would be prepared to use its full range of tools, including altering the size and composition of its balance sheet, if future economic conditions were to warrant a more accommodative monetary policy than can be achieved solely by reducing the Federal funds rate.

Asset Thresholds for Systemically Important Financial Institutions

Q.3. On several occasions before this Committee Governor Tarullo stated that the dollar asset thresholds in Dodd–Frank such as the $50 billion threshold for SIFI designation, is far too high.

Do you believe regulators could effectively address systemic risk if the threshold were raised above $50 billion?

Are there specific provisions in Dodd–Frank which you believe are particularly costly or unnecessary for a certain subset of banks above the $50 billion threshold?

Are there specific provisions in Dodd–Frank which you believe are necessary for all banks above $50 billion in assets that should be retained in order to mitigate systemic risk?

What concerns do you have with having a purely qualitative test for identifying systemic risk?

A.3. In all of our efforts, our goal is to establish a regulatory framework that helps ensure the resiliency of our financial system, the availability of credit, economic growth, and financial market efficiency. The Federal Reserve Board (Board) has been working for many years to make sure that our regulation and supervision is tailored to the size and risk posed by individual institutions.

The failure or distress of a large bank can harm the U.S. economy. The recent financial crisis demonstrated that excessive risk-taking at large banks makes the U.S. economy vulnerable. The crisis led to a deep recession and the loss of nearly nine million jobs. Our regulatory framework must reduce the risk that bank failures or distress will have such a harmful impact on economic growth in the future.

The Board has already implemented, via a regulation that was proposed and adopted following a period of public notice and comment, a methodology to identify global systemically important banking organizations (G–SIBs), whose failure could pose a signifi-

cant risk to the financial stability of the United States.[1] The "systemic footprint" measure that determines whether a large firm is identified as a G–SIB includes attributes that serve as proxies for the firm's systemic importance across a number of categories: size, interconnectedness, complexity, cross-jurisdictional activity, substitutability, and reliance on short-term wholesale funding.

There are many large financial firms whose failure would pose a less significant risk to U.S. financial stability, but whose distress could nonetheless cause notable harm to the U.S. economy (large regional banks). Some level of tailored enhanced regulation is appropriate for these large regional banks. The failure or distress of a large regional bank could harm the U.S. economy in several ways: by disrupting the flow of credit to households and businesses, by disrupting the functioning of financial markets, or by interrupting the provision of critical financial services, including payments, clearing, and settlement. Economic research has documented that a disruption in the flow of credit through banks or a disruption to financial market functioning can affect economic growth.[2]

The application of tailored enhanced regulation should consider the size, complexity, and business models of large regional banks. The impact on economic growth of a large regional bank's failure will depend on factors such as the size of the bank's customer base and how many borrowers depend on the bank for credit. Asset size is a simple way to proxy for these impacts, although other measures may also be appropriate. For large regional banks with more complex business models, more sophisticated supervisory and regulatory tools may be appropriate. For example, the Board recently tailored our Comprehensive Capital Analysis and Review qualitative assessment to exclude some smaller and less complex large regional banks, using asset size and nonbank assets to measure size and complexity, respectively.[3] In other contexts, foreign activity or short-term wholesale funding may be another dimension of complexity to consider. Any characteristics or measures that are used to tailor enhanced regulation for large regional banks should be supported with clear analysis that links them with the potential for the bank's failure or distress to cause notable harm to the U.S. economy.

The Board currently has only limited authority to tailor the enhanced prudential standards included in section 165 of the Dodd–Frank Wall Street Reform and Consumer Protection Act (Dodd–Frank Act). In particular, Congress required that certain enhanced prudential standards must apply to firms with $10 billion in total assets, with other standards beginning to apply at $50 billion in total assets.

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[1] Board of Governors of the Federal Reserve System (2015), "Regulatory Capital Rules: Implementation of Risk-Based Capital Surcharges for Global Systemically Important Bank Holding Companies", final rule, *FR* 80 (August 14), pp. 49082–49116.

[2] For evidence on the link between bank distress and economic growth, see Mark A. Carlson, Thomas King, and Kurt Lewis (2011) "Distress in the Financial Sector and Economic Activity", *The B.E. Journal of Economic Analysis & Policy*: Vol. 11: Iss. 1 (Contributions), Article 35. For evidence on the link between financial market functioning and economic growth, see Simon Gilchrist and Egon Zakrajsek (2012), "Credit Spreads and Business Cycle Fluctuations", *American Economic Review*, Vol. 102(4): 1692–1720.

[3] Board of Governors of the Federal Reserve System (2017), "Amendments to the Capital Plan and Stress Test Rules; Regulations Y and YY", final rule, *FR* 82 (February 3), pp. 9308–9330.

You asked whether regulators could effectively address systemic risk if these statutory thresholds were raised. The Board has supported increasing these thresholds. We believe that the risks to financial stability from large banks, as noted above, can be addressed with tailored enhanced regulation, including higher thresholds.

You also asked about the specific provisions in section 165 of the Dodd–Frank Act. The Board has not taken a position on the relative merits of these provisions. As noted above, some level of tailored enhanced regulation is appropriate for large banks, taking into account how a particular regulatory standard affects a bank's size, complexity, and business model. Among these many provisions, the Board believes that supervisory stress testing is one of the most valuable, providing a forward-looking assessment of the largest firms' ability to continue providing credit to the real economy in the event of a significant macroeconomic and financial stress.

You asked whether I have concerns about using a qualitative test in place of the existing quantitative thresholds. As my answer above noted, I believe that it would be logical to use a wider range of factors than asset size to determine the application of tailored enhanced regulation for large regional banks. Such factors should include quantitative metrics.

Congress could usefully decide to pursue either raising dollar thresholds or giving authority to the Board to decide which firms are subject to enhanced prudential standards. The Board stands ready to work with Members on the design of either approach.

Liquidity Coverage Ratio

Q.4. As watchdogs of the financial system, we know that the Fed, OCC, and FDIC focus on promoting safety and soundness, and support transparency. To that end, firms are required to disclose extensive information on their financial health to the public.

Like all things, balance is important and in drafting rules and regulations, the agencies consider what is useful information versus what can be misleading and inadvertently hurt the markets. We've seen the Federal Reserve be thoughtful about that—for example, the Fed does not disclose to the public who accesses its discount window for at least 2 years, balancing transparency with risk of public misconception. The Fed has recognized in that case that immediate information could actually lead to a market stress.

In December, the Federal Reserve finalized a rule requiring banks to publicly disclose—within 45 days of the end of quarter—the details of a complex liquidity metric called the Liquidity Coverage Ratio.

Why does the Fed allow a 2-year disclosure period for the discount window and only 45 days for this complex metric when the risks of public misconception are the same?

How is the Fed promoting safety and soundness by asking banks to disclose complicated liquidity information that could lead to a financial stress?

Since the Fed is already monitoring firms' liquidity data every day, why do we need this additional disclosure requirement?

Would the Fed find it beneficial to conduct further study on the rule before requiring disclosures?

A.4. The different timelines required for discount window and Liquidity Coverage Ratio (LCR) disclosures reflect the different purposes of the disclosures.

The Dodd–Frank Act specified the content of the discount window disclosures as well as the 2-year disclosure period. The primary purpose of the discount window disclosure is to provide transparency and accountability to the public regarding the Board's lending activities. Eligible borrowers may choose to borrow from the discount window both under normal conditions and when they are experiencing a liquidity stress. The discount window disclosures require all borrowing institutions to disclose transaction-specific information about a bank's business decision to borrow at the window, including the amounts borrowed and the collateral provided to secure each loan. A key reason for the 2-year lag in disclosing this information is to preserve the willingness of solvent institutions to use the discount window, ensuring the effectiveness of the discount window as a backstop liquidity facility and systemic liquidity shock absorber for solvent institutions. In passing the Dodd–Frank Act, the Congress weighed the need for greater transparency about the Board's lending operations and the need to maintain the discount window as an effective liquidity backstop, and concluded that a 2-year lag in disclosing transaction-level information on discount window borrowing appropriately balanced these two policy objectives.

In contrast, the primary purpose of the LCR public disclosure requirements is to promote safety and soundness by providing market participants high-level information about the liquidity risk profile of large banking organizations to support the ability of market participants to understand and constrain bank risk-taking. This sort of market discipline can usefully complement the Board's supervisory practices and policies. During times of stress, public disclosures can also enhance stability by providing relevant and sufficiently timely information that assures counterparties and other market participants regarding the resilience of covered companies. Without information about the liquidity strength of their counterparties, market participants may assume the worst regarding banking institutions and draw back from the entire market, exacerbating the problem.

The LCR public disclosures must be sufficiently informative and timely to serve their intended purpose. In order to mitigate potential financial stability and firm-specific risks related to disclosing real-time liquidity information, the LCR public disclosure rule requires covered companies to disclose average values of broad categories of liquidity sources and uses over a quarter, with a 45-day lag after the end of the quarter. Unlike event-driven discount window disclosures, the LCR public disclosure rule requires a set of firms to make regular periodic disclosures and does not require disclosure of transaction-specific information. They are more analogous to the Board's quarterly capital public disclosure requirements, which also focus on a firms' financial condition and risk management practices.

Given the fundamentally different purposes of the discount window and LCR disclosures, the Board did not provide for a common timeframe for the disclosures. While I do not believe it is necessary to conduct further study on the LCR public disclosure rule at this time, the Board will carefully monitor the implementation of these requirements going forward. If warranted, I would be willing to revisit aspects of the LCR disclosures that result in significant undesirable or unintended consequences.

Additional Material Supplied for the Record

For use at 11:00 a.m., EDT
July 7, 2017

Monetary Policy Report

July 7, 2017

Board of Governors of the Federal Reserve System

Letter of Transmittal

Board of Governors of the
Federal Reserve System

Washington, D.C., July 7, 2017

The President of the Senate
The Speaker of the House of Representatives

The Board of Governors is pleased to submit its *Monetary Policy Report* pursuant to section 2B of the Federal Reserve Act.

Sincerely,

Janet L. Yellen

Janet L. Yellen, Chair

Statement on Longer-Run Goals and Monetary Policy Strategy

Adopted effective January 24, 2012; as amended effective January 31, 2017

The Federal Open Market Committee (FOMC) is firmly committed to fulfilling its statutory mandate from the Congress of promoting maximum employment, stable prices, and moderate long-term interest rates. The Committee seeks to explain its monetary policy decisions to the public as clearly as possible. Such clarity facilitates well-informed decisionmaking by households and businesses, reduces economic and financial uncertainty, increases the effectiveness of monetary policy, and enhances transparency and accountability, which are essential in a democratic society.

Inflation, employment, and long-term interest rates fluctuate over time in response to economic and financial disturbances. Moreover, monetary policy actions tend to influence economic activity and prices with a lag. Therefore, the Committee's policy decisions reflect its longer-run goals, its medium-term outlook, and its assessments of the balance of risks, including risks to the financial system that could impede the attainment of the Committee's goals.

The inflation rate over the longer run is primarily determined by monetary policy, and hence the Committee has the ability to specify a longer-run goal for inflation. The Committee reaffirms its judgment that inflation at the rate of 2 percent, as measured by the annual change in the price index for personal consumption expenditures, is most consistent over the longer run with the Federal Reserve's statutory mandate. The Committee would be concerned if inflation were running persistently above or below this objective. Communicating this symmetric inflation goal clearly to the public helps keep longer-term inflation expectations firmly anchored, thereby fostering price stability and moderate long-term interest rates and enhancing the Committee's ability to promote maximum employment in the face of significant economic disturbances. The maximum level of employment is largely determined by nonmonetary factors that affect the structure and dynamics of the labor market. These factors may change over time and may not be directly measurable. Consequently, it would not be appropriate to specify a fixed goal for employment; rather, the Committee's policy decisions must be informed by assessments of the maximum level of employment, recognizing that such assessments are necessarily uncertain and subject to revision. The Committee considers a wide range of indicators in making these assessments. Information about Committee participants' estimates of the longer-run normal rates of output growth and unemployment is published four times per year in the FOMC's Summary of Economic Projections. For example, in the most recent projections, the median of FOMC participants' estimates of the longer-run normal rate of unemployment was 4.8 percent.

In setting monetary policy, the Committee seeks to mitigate deviations of inflation from its longer-run goal and deviations of employment from the Committee's assessments of its maximum level. These objectives are generally complementary. However, under circumstances in which the Committee judges that the objectives are not complementary, it follows a balanced approach in promoting them, taking into account the magnitude of the deviations and the potentially different time horizons over which employment and inflation are projected to return to levels judged consistent with its mandate.

The Committee intends to reaffirm these principles and to make adjustments as appropriate at its annual organizational meeting each January.

Contents

Note: This report reflects information that was publicly available as of noon EDT on July 6, 2017. Unless otherwise stated, the time series in the figures extend through, for daily data, July 5, 2017; for monthly data, June 2017; and, for quarterly data, 2017:Q1. In bar charts, except as noted, the change for a given period is measured to its final quarter from the final quarter of the preceding period.

Summary

Economic activity increased at a moderate pace over the first half of the year, and the jobs market continued to strengthen. Measured on a 12-month basis, inflation has softened some in the past few months. The Federal Open Market Committee (FOMC) judged that, on balance, current and prospective economic conditions called for a further gradual removal of policy accommodation. At its most recent meeting in June, the Committee boosted the target range for the federal funds rate to 1 to 1¼ percent. The Committee also issued additional information regarding its plans for reducing the size of its balance sheet in a gradual and predictable manner.

Economic and Financial Developments

Labor markets. The labor market has strengthened further so far this year. Over the first five months of 2017, payroll employment increased 162,000 per month, on average, somewhat slower than the average monthly increase for 2016 but still more than enough to absorb new entrants into the labor force. The unemployment rate fell from 4.7 percent in December to 4.3 percent in May—modestly below the median of FOMC participants' estimates of its longer-run normal level. Other measures of labor utilization are also consistent with a relatively tight labor market. However, despite the broad-based strength in measures of employment, wage growth has been only modest, possibly held down by the weak pace of productivity growth in recent years.

Inflation. Consumer price inflation, as measured by the 12-month change in the price index for personal consumption expenditures, briefly reached the FOMC's 2 percent objective earlier this year, but it more recently has softened. The latest reading, for May, was 1.4 percent—still up from a year earlier when falling energy prices restrained overall consumer prices. The 12-month measure of inflation that excludes food and energy items (so-called core inflation), which historically has been a better indicator than the headline figure of where overall inflation will be in the future, was also 1.4 percent over the year ending in May; this reading was a bit lower than it had been one year earlier. Measures of longer-run inflation expectations have been relatively stable, on balance, though some measures remain low by historical standards.

Economic growth. Real gross domestic product (GDP) is reported to have risen at an annual rate of about 1½ percent in the first quarter of 2017, but more recent data suggest growth stepped back up in the second quarter. Consumer spending was sluggish in the early part of the year but appears to have rebounded recently, supported by job gains, rising household wealth, and favorable consumer sentiment. Business investment has turned up this year after having been weak for much of 2016, and indicators of business sentiment have been strong. The housing market continues its gradual recovery. Economic growth has also been supported by recent strength in foreign activity.

Financial conditions. On balance, domestic financial conditions for businesses and households have continued to support economic growth. Long-term nominal Treasury yields and mortgage rates have decreased so far in 2017, although yields remain somewhat above levels that prevailed last summer. Broad measures of equity prices increased further during the first half of the year. Spreads of yields on corporate bonds over comparable-maturity Treasury securities decreased. Most types of consumer loans remained widely available, while mortgage credit stayed readily available for households with solid credit profiles but was still difficult to access for households with low credit scores or harder-to-document incomes.

In foreign financial markets, equity prices increased and risk spreads decreased amid generally firming economic growth and robust corporate earnings. The broad U.S. dollar index depreciated modestly against foreign currencies.

Financial stability. Vulnerabilities in the U.S. financial system remained, on balance, moderate. Contributing to the financial system's improved resilience, U.S. banks have substantial amounts of capital and liquidity. Valuation pressures across a range of assets and several indicators of investor risk appetite have increased further since mid-February. However, these developments in asset markets have not been accompanied by increased leverage in the financial sector, according to available metrics, or increased borrowing in the nonfinancial sector. Household debt as a share of GDP continues to be subdued, and debt owed by nonfinancial businesses, although elevated, has been either flat or falling in the past two years. (See the box "Developments Related to Financial Stability" in Part 1.)

Monetary Policy

Interest rate policy. Over the first half of 2017, the FOMC continued to gradually reduce the amount of monetary policy accommodation. Specifically, the Committee decided to raise the target range for the federal funds rate in March and in June, bringing it to the current range of 1 to 1¼ percent. Even with these rate increases, the stance of monetary policy remains accommodative, supporting some further strengthening in labor market conditions and a sustained return to 2 percent inflation.

The FOMC continues to expect that, with gradual adjustments in the stance of monetary policy, economic activity will expand at a moderate pace and labor market conditions will strengthen somewhat further. Inflation on a 12-month basis is expected to remain somewhat below 2 percent in the near term but to stabilize around the Committee's 2 percent objective over the medium term. The federal funds rate is likely to remain, for some time, below levels that are expected to prevail in the longer run. Consistent with this outlook, in the most recent Summary of Economic Projections (SEP), compiled at the time of the June FOMC meeting, most participants projected that the appropriate level of the federal funds rate would be below its longer-run level through 2018. (The June SEP is presented in Part 3 of this report.) However, as the Committee has continued to emphasize, monetary policy is not on a preset course; the actual path of the federal funds rate will depend on the evolution of the economic outlook as informed by incoming data. In particular, the Committee is monitoring inflation developments closely.

Balance sheet policy. To help maintain accommodative financial conditions, the Committee has continued its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and rolling over maturing Treasury securities at auction. In June, the FOMC issued an Addendum to the Policy Normalization Principles and Plans that provides additional details regarding the approach the FOMC intends to follow to reduce the Federal Reserve's holdings of Treasury and agency securities in a gradual and predictable manner. The Committee currently expects to begin implementing the balance sheet normalization program this year provided that the economy evolves broadly as anticipated. (See the box "Addendum to the Policy Normalization Principles and Plans" in Part 2.)

Special Topics

Education and climbing the economic ladder. Education, particularly a college degree, is often seen as a path to improved economic opportunities. However, despite the fact that young blacks and Hispanics have increased their educational attainment over the past

quarter-century, their representation in the top 25 percent of the income distribution for young people has not materially increased. In part, this outcome has occurred because educational attainment has increased for young non-Hispanic whites and Asians as well. While education continues to be an important determinant of whether one can climb the economic ladder, sizable differences in economic outcomes across race and ethnicity remain even after controlling for educational attainment. (See the box "Does Education Determine Who Climbs the Economic Ladder?" in Part 1.)

The global productivity slowdown. Over the past decade, labor productivity growth both in the United States and in other advanced economies has slowed markedly. This slowdown may reflect a waning of the effects from advances in information technology in the 1990s and early 2000s. Productivity growth may also be low because of the severity of the Global Financial Crisis, in part because spending for research and development was muted. Some of the factors restraining productivity growth may eventually fade, but it is difficult to ascertain whether the recent subdued performance of productivity represents a new normal. (See the box "Productivity Developments in the Advanced Economies" in Part 1.)

Liquidity in the corporate bond market. A series of changes, including regulatory reforms, since the Global Financial Crisis have likely altered financial institutions' incentives to provide liquidity. Many market participants are particularly concerned with liquidity in markets for corporate bonds. However, the available evidence suggests that financial markets have performed well in recent years, with minimal impairment in liquidity, either in the market for corporate bonds or in markets for other assets. (See the box "Recent Developments in Corporate Bond Market Liquidity" in Part 1.)

Monetary policy rules. Monetary policymakers consider a wide range of information on current economic conditions and the outlook before deciding on a policy stance they deem most likely to foster the FOMC's statutory mandate of maximum employment and stable prices. They also routinely consult monetary policy rules that connect prescriptions for the policy interest rate with variables associated with the dual mandate. The use of such rules requires careful judgments about the choice and measurement of the inputs into these rules as well as the implications of the many considerations these rules do not take into account. (See the box "Monetary Policy Rules and Their Role in the Federal Reserve's Policy Process" in Part 2.)

Part 1
Recent Economic and Financial Developments

Domestic Developments

The labor market tightened further during the first half of the year . . .

Labor market conditions continued to strengthen in the first five months of this year. On average, payrolls expanded 162,000 per month between January and May, a little slower than the average monthly employment gain in 2016 but still more than enough to absorb new entrants to the labor force and therefore consistent with a further tightening of the labor market (figure 1). The unemployment rate has declined 0.4 percentage point since December 2016, and in May it stood at 4.3 percent, its lowest level since late 2000 and modestly below the median of Federal Open Market Committee (FOMC) participants' estimates of its longer-run normal level.

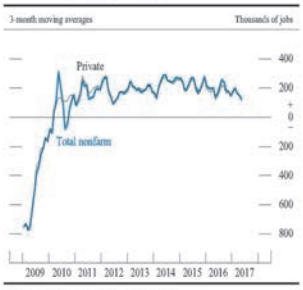
The labor force participation rate (LFPR)—that is, the share of adults either working or actively looking for work—was 62.7 percent in May and is little changed, on net, since early 2014 (figure 2). Along with other factors, the aging of the population implies a downward trend in participation, so the flattening out of the LFPR during the past few years is consistent with an overall picture of improving labor market conditions. The employment-to-population ratio—that is, the share of the population that is working—was 60 percent in May and has been increasing for the past couple of years, reflecting the combination of the declining unemployment rate and the flat LFPR.

The strengthening condition of the labor market is evident in other measures as well. The number of people filing initial claims for unemployment insurance has fallen to the lowest level in decades. In addition, as reported in the Job Openings and Labor Turnover Survey, the rate of job openings remained elevated in the first part of the year, while the rate of layoffs remained low; both are signs that firms' demand for labor is still solid. In addition, the rate of quits stayed high, an indication that workers are confident in their ability to obtain a new job. Another measure, the share of workers who are working part time but would prefer to be employed full time—which is part of the U-6 measure of underutilization from the Bureau of Labor Statistics—fell noticeably further in the first five months of 2017 (figure 3).

. . . though unemployment rates remain elevated for some demographic groups

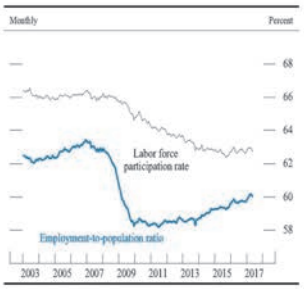
Although the aggregate unemployment rate was at a 16-year low in May, there are substantial disparities across demographic groups (figure 4). Notably, the unemployment rate for whites averaged 4 percent during the first five months of the year, and the rate for Asians was about 3½ percent. However, the unemployment rates for Hispanics (5.4 percent) and African Americans (7.8 percent) were substantially higher. The differences in the unemployment rates across racial and ethnic groups are long-standing, and they also vary over the business cycle.

1. Net change in payroll employment



Note: The data extend through May 2017.
Source: Department of Labor, Bureau of Labor Statistics.

2. Labor force participation rate and employment-to-population ratio



NOTE: The data extend through May 2017. Both series are a percentage of the population aged 16 and over.
SOURCE: Department of Labor, Bureau of Labor Statistics.

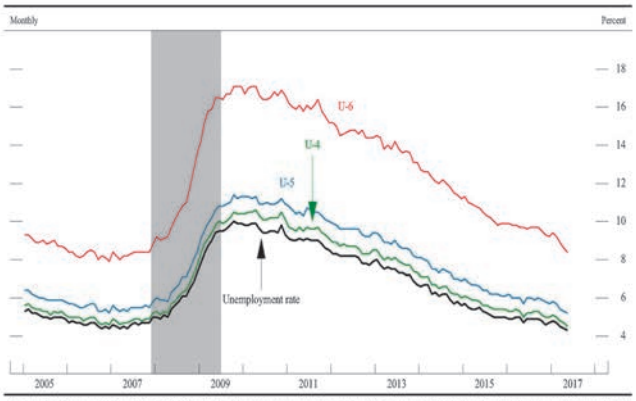
Indeed, the unemployment rates for blacks and Hispanics both rose considerably more than the rates for whites and Asians during the Great Recession, and their subsequent declines have been more rapid. On balance, however, the differences in unemployment rates across the groups have not narrowed relative to the pre-recession period. (For additional discussion on differences in economic outcomes by race and ethnicity, see the box "Does Education Determine Who Climbs the Economic Ladder?")

Growth of labor compensation has been modest . . .

Indicators of hourly compensation suggest that wage growth has remained modest. Growth of compensation per hour in the business sector—a broad-based measure of wages, salaries, and benefits—has slowed in recent quarters and was 2¼ percent over the four quarters ending in 2017:Q1 (figure 5).[1]

1. The recent data on compensation per hour reflect a decline in wages and salaries at the end of 2016, which

3. Measures of labor underutilization



NOTE: The data extend through May 2017. Unemployment rate measures total unemployed as a percentage of the labor force. U-4 measures total unemployed plus discouraged workers, as a percentage of the labor force plus discouraged workers. Discouraged workers are a subset of marginally attached workers who are not currently looking for work because they believe no jobs are available for them. U-5 measures total unemployed plus all marginally attached to the labor force, as a percentage of the labor force plus persons marginally attached to the labor force. Marginally attached workers are not in the labor force, want and are available for work, and have looked for a job in the past 12 months. U-6 measures total unemployed plus all marginally attached workers plus total employed part time for economic reasons, as a percentage of the labor force plus all marginally attached workers. The shaded bar indicates a period of business recession as defined by the National Bureau of Economic Research.
SOURCE: Department of Labor, Bureau of Labor Statistics.

4. Unemployment rate by race and ethnicity

NOTE: The data extend through May 2017. Unemployment rate measures total unemployed as a percentage of the labor force. Persons whose ethnicity is identified as Hispanic or Latino may be of any race. The shaded bar indicates a period of business recession as defined by the National Bureau of Economic Research.

SOURCE: Department of Labor, Bureau of Labor Statistics.

This measure can be quite volatile even at annual frequencies (and a smoothed version is shown in figure 5 for that reason). The employment cost index—which also measures both wages and the cost to employers of providing benefits—also was up 2¼ percent in the first quarter relative to its year-ago level, about ½ percentage point faster than its gain of a year earlier. Among measures limited to wages, average hourly earnings growth—at 2½ percent through May—was little changed from a year ago, and a compensation measure computed by the Federal Reserve Bank of Atlanta that tracks median 12-month wage growth of individuals reporting to the Current Population Survey was about 3½ percent in May, also similar to its reading from a year earlier.

5. Measures of change in hourly compensation

NOTE: Business-sector compensation is the four-quarter percentage change of the four-quarter moving average. For the employment cost index, change is over the 12 months ending in the last month of each quarter; for average hourly earnings, change is from 12 months earlier, and the data extend through May 2017; for the Atlanta Fed's Wage Growth Tracker, the data are shown as a three-month moving average of the 12-month percent change and extend through May 2017.

SOURCE: Department of Labor, Bureau of Labor Statistics; Federal Reserve Bank of Atlanta, Wage Growth Tracker.

might be the result of a shifting of bonuses or other types of income into 2017 in anticipation of a possible cut in personal income tax rates. If that is the case, the current estimate of compensation growth in the first quarter might be revised up once full data become available later this summer.

Does Education Determine Who Climbs the Economic Ladder?

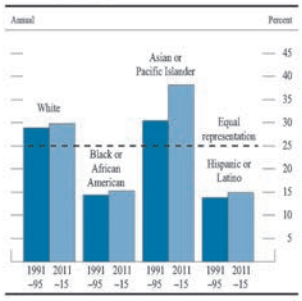
The persistent gaps in economic outcomes by race and ethnicity in the United States raise important questions about how people ascend the economic ladder. Education, particularly a college degree, is often seen as a path to improved economic opportunities. Past research has shown that human capital in the form of education and experience can explain about one-third of the variation in wages across individuals.[1] However, while education continues to be an important determinant of whether one can climb the economic ladder, sizable differences in economic outcomes across race and ethnicity remain even after controlling for educational attainment.

Data on earnings for two cohorts of young adult workers (aged 25 to 34) approximately a generation apart confirm both the gaps in economic outcomes and the lack of substantial upward progress for disadvantaged groups over the past quarter-century (figure A). People of this age typically have limited years of work experience, but most have completed their schooling. Therefore, focusing on young adults allows us to better isolate the effect of education from the influence of other variables, including experience. Furthermore, research has shown that the level of wages received early in an individual's career persists over time and influences that individual's wage trajectory for years to come.[2] The figure shows the fraction of each group that has reached the top quartile of earnings for young adults as a whole. The black dashed line at 25 percent marks the fraction of each group that would be in this top quartile if each group were equally represented in proportion to its population size.[3]

Non-Hispanic whites, for example, are overrepresented in the top 25 percent of the earnings distribution of young adults for both cohorts, with just under 30 percent of the group in the top quartile in both the 1991–95 and 2011–15 periods. Black or African American young adults are underrepresented in the top quartile in both periods, at about 15 percent. Hispanics are likewise underrepresented, and again there has been little improvement over time. Asians stand out in terms of both high representation and changes over time, though these measures obscure the very high levels of inequality within this group.[4]

1. Pedro Carneiro and James J. Heckman (2003), "Human Capital Policy," in Benjamin M. Friedman, ed., *Inequality in America: What Role for Human Capital Policies?* (Cambridge, Mass.: MIT Press), pp. 77–239.

A. Percent of workers in top quartile of earnings among all young adults



NOTE: Data cover the preceding calendar year. Young adults include those aged 25 to 34. Earnings include wages, salaries, business income, and farm income. Threshold for crossing into the top earnings quartile is based on workers aged 25 to 34 only. The black dashed line marks 25 percent, the fraction of each group that would be in the top quartile if each group were equally represented in proportion to its population size.

SOURCE: U.S. Census Bureau, Current Population Survey, March 1992–2016.

2. See, for example, past research that shows that the average starting wage faced by a cohort is correlated with wages later on, such as George Baker, Michael Gibbs, and Bengt Holmstrom (1994), "The Wage Policy of a Firm," *Quarterly Journal of Economics*, vol. 109 (November), pp. 921–55. Furthermore, research also shows that higher national unemployment rates faced by a cohort are also correlated with lower wages later on; for instance, see Paul Beaudry and John DiNardo (1991), "The Effect of Implicit Contracts on the Movement of Wages over the Business Cycle: Evidence from Micro Data," *Journal of Political Economy*, vol. 99 (August), pp. 665–88; and Lisa B. Kahn (2010), "The Long-Term Labor Market Consequences of Graduating from College in a Bad Economy," *Labour Economics*, vol. 17 (April), pp. 303–16.

3. In other words, if 25 percent of a group reached the top quartile, then that group's share of the top quartile would be the same as its share in the full population.

4. See, for example, Christian E. Weller and Jeffrey Thompson (2016), *Wealth Inequality among Asian Americans Greater Than among Whites*, Center for American Progress (Washington: CFAP, December 20), https://www.americanprogress.org/issues/race/reports/2016/12/20/295359/wealth-inequality-among-asian-americans-greater-than-among-whites.

Note that it is possible for the within-group representation in the top quartile to improve for all groups because the composition of the young adult population by race and ethnicity is itself changing, with whites becoming a much smaller share and all other groups being stable or increasing as a share of the total population.

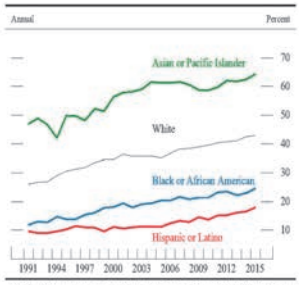
Overall, the representation of black and Hispanic workers in the top earnings quartile continues to lag in the later period. This lag in representation occurs despite the gains in educational attainment—the critical driver of improved incomes—that blacks and Hispanics have achieved over time. For both blacks and Hispanics, the share achieving a bachelor's degree or higher has doubled over the period of study (figure B). However, even with these improvements, the educational attainment gap between each of those groups and whites persists, because the fraction of whites attaining a bachelor's degree has also increased substantially in the past quarter-century.

Across all groups, it is true that completing a bachelor's degree or higher roughly doubles one's chances of reaching the top 25 percent of earners (figure C). This relationship strongly corroborates the conventional wisdom that, for many individuals, a college education can indeed represent a path to improved economic opportunities. However, even within this group, representation is substantially unequal, with college-educated white and Asian people much more likely to achieve the top quartile of income than their black or African American and Hispanic or Latino peers.

Here the interpretation of changes over time is a bit more nuanced, because the overall increase in college attainment among young adults implies increased competition for crossing into the top quartile of earnings. In the 1991–95 period, 35 percent of those in the top income quartile had only a bachelor's degree, and an additional 14 percent had gone on to receive a graduate degree. By the period from 2011 to 2015, these shares had risen to 42 percent and 24 percent, respectively, suggesting that the average skill level needed to reach the top quartile of income has increased between generations.

Taken together, these observations show that educational attainment can help young adults improve their lifetime earning potential. However, increased levels of educational attainment across all groups have created greater competition for positions at the top of the economic ladder. Even among those with college degrees, important differences remain in representation at the top of the income distribution by race and ethnicity. The relationship between educational attainment and economic outcomes is complex and heterogeneous across people, suggesting that the specific nature of that attainment—the types of degrees received and the specific schools attended, among other factors—may matter much more than previously thought.[5]

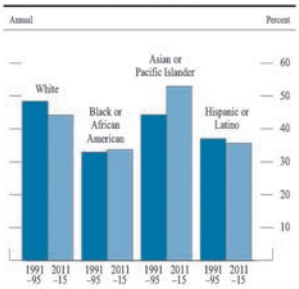
B. Percent of young adults with a bachelor's degree or higher



NOTE: Data cover the preceding calendar year. Young adults include those aged 25 to 34.

SOURCE: U.S. Census Bureau, Current Population Survey, March 1992–2016.

C. Percent of workers with a bachelor's degree in top quartile of earnings among all young adults

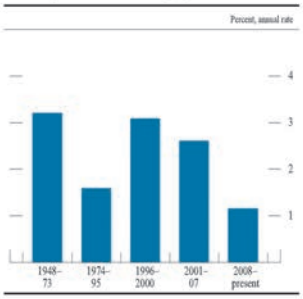


NOTE: Data cover the preceding calendar year. Young adults include those aged 25 to 34. Earnings include wages, salaries, business income, and farm income. Threshold for crossing into the top earnings quartile is based on workers aged 25 to 34 only.

SOURCE: U.S. Census Bureau, Current Population Survey, March 1992–2016.

5. See, in particular, Raj Chetty, John Friedman, Emmanuel Saez, Nicholas Turner, and Danny Yagan (2017), "Mobility Report Cards: The Role of Colleges in Intergenerational Mobility," paper, Equality of Activity Project (Stanford, Calif.: Stanford University, EOAP), www.equality-of-opportunity.org/papers/coll_mrc_paper.pdf.

6. Change in business-sector output per hour



NOTE: Changes are measured from Q4 of the year immediately preceding the period through Q4 of the final year of the period. The final period is measured from 2007:Q4 through 2017:Q1.
SOURCE: Department of Labor, Bureau of Labor Statistics.

7. Change in the price index for personal consumption expenditures

NOTE: The data extend through May 2017; changes are from one year earlier.
SOURCE: For trimmed mean, Federal Reserve Bank of Dallas; for all else, U.S. Department of Commerce, Bureau of Economic Analysis.

. . . and likely restrained by slow growth of labor productivity

These modest rates of compensation gain likely reflect the offsetting influences of a tightening labor market and persistently weak productivity growth. Since 2008, labor productivity has increased only about 1 percent per year, on average, well below the average pace from 1996 through 2007 and also below the gains in the 1974–95 period (figure 6). For most of the period since 2011, labor productivity growth has been particularly weak, although it has turned up in recent quarters. The longer-term softness in productivity growth may be partly attributable to the sharp pullback in capital investment during the most recent recession and the relatively modest rebound that followed. But there may be other explanations, too, and considerable debate remains about the reasons for the general slowdown in productivity growth. (For a more comprehensive discussion of productivity, see the box "Productivity Developments in the Advanced Economies.")

Price inflation moved up but softened in the spring and remains below 2 percent

In the early months of 2017, consumer price inflation, as measured by the 12-month change in the price index for personal consumption expenditures (PCE), continued its climb from the very low levels that prevailed in 2015 and early 2016 when it was held down by falling oil and import prices. Indeed, consumer price inflation briefly reached the FOMC's 2 percent objective earlier this year before falling back to 1.4 percent in May (figure 7). Core inflation, which typically provides a better indication than the headline measure of where overall inflation will be in the future, also was 1.4 percent over the 12 months ending in May, a slightly slower rate than a year earlier. As is the case with headline inflation, the 12-month measure of core inflation had been higher earlier this year, reaching 1.8 percent. Both measures of inflation have recently been held down by steep and likely idiosyncratic price

declines for a few specific categories, including wireless telephone services and prescription drugs, which do not appear to be related to the overall trends in consumer prices. The 12-month change in the trimmed mean PCE price index—an alternative indicator of underlying inflation produced by the Federal Reserve Bank of Dallas—slowed by less than overall or core PCE price inflation over the past several months.

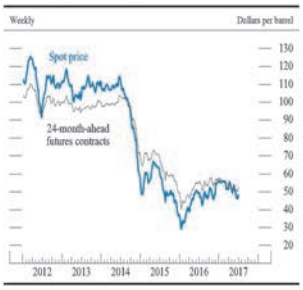
Oil prices declined somewhat but remain well above their early 2016 lows . . .

After rebounding from their early 2016 lows, oil prices leveled off early this year (figure 8). Since then they have declined somewhat, despite OPEC's decision in late May to renew its November 2016 agreement to reduce its oil production, thereby extending the November production cuts through early 2018. Reflecting lower crude oil prices as well as smaller retail margins, seasonally adjusted retail gasoline prices have also declined since the beginning of the year. Nevertheless, prices of both crude oil and retail gasoline remain above their early 2016 lows, and futures prices suggest that market participants expect oil prices to rise gradually in coming years.

. . . while prices of imports other than energy have been bolstered by higher commodity prices

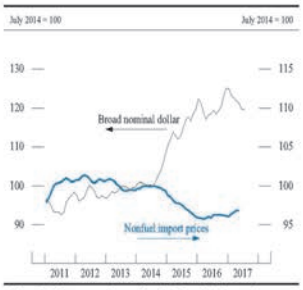
Throughout 2015, nonfuel import prices declined because of appreciation of the dollar and declines in nonfuel commodity prices (figure 9). Nonfuel import prices stabilized last year and have risen since then, as the dollar stopped appreciating and supply disruptions boosted world prices of some nonfuel commodities, especially industrial supplies and metals. In recent months, depreciation of the dollar has further pushed up non-oil import prices, which are now slightly higher than in mid-2016.

8. Brent spot and futures prices



NOTE: The data are weekly averages of daily data and extend through July 5, 2017.
SOURCE: NYMEX via Bloomberg.

9. Nonfuel import prices and U.S. dollar exchange rate



NOTE: The data are monthly, and the data for nonfuel import prices extend through May 2017.
SOURCE: Department of Labor, Bureau of Labor Statistics; Federal Reserve Board, Statistical Release H.10, "Foreign Exchange Rates."

Productivity Developments in the Advanced Economies

The slow pace of U.S. productivity growth has attracted much attention of late, with vigorous debate on whether the slowdown represents the lingering, but temporary, effect of the Global Financial Crisis (GFC) or marks the start of an era of prolonged lower economic growth. This discussion reviews recent productivity developments in the United States and the major advanced foreign economies (AFEs) and outlines possible causes of the slowdown.[1]

Over the past decade, labor productivity growth in advanced economies has weakened markedly (figure A). Labor productivity growth in the United States has averaged only 1 percent since 2005, about half the pace of the years 1990 to 2004.[2] Productivity growth has been even weaker in the AFEs, with the United Kingdom experiencing a meager ½ percent growth. As shown in the table, the widespread slowdown in labor productivity growth reflects weak capital deepening and, more importantly, very poor performance of total factor productivity (TFP)—a measure of how efficiently labor and capital are combined to produce output.[3] TFP across the advanced economies has stagnated in the past decade against historical average growth of about ¾ percent.

Accounting for labor productivity growth, 2005–2016

	Labor productivity growth	Contribution of capital deepening	Contribution of total factor productivity
United States	1	.7	.3
Canada	.9	1	-.1
Japan	.9	.9	0
Euro area	.7	.8	0
United Kingdom	.5	.5	0
Cross-country average			
2005–2016	.8	.8	0
1990–2004	1.9	1.2	.7

NOTE: Average annual rates.
SOURCE: The Conference Board, Total Economy Database.

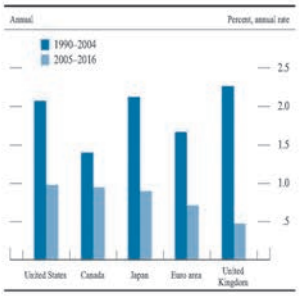
A number of potential explanations have been put forward for the abysmal performance of TFP. Some authors emphasize structural factors that predate the GFC. For example, Gordon (2012) sees recent technological advances such as information technology (IT) as less revolutionary than earlier general-purpose technologies like electricity and internal combustion.[4] Relatedly, Fernald (2015) provides evidence that the effects of the IT revolution—an important factor boosting productivity since the 1990s—began to fade in the early 2000s.[5] There are signs, however, that the influence of IT is still spreading, as exemplified by the surge in cloud-computing technology investments in recent years, and we may not yet have reaped the full benefits of this major technological innovation. Under this more optimistic view, slow TFP growth may reflect a temporary "productive pause" as firms spend resources on activities such as equipment retooling, reorganization of management practices, and workforce training. After all, it took several decades for the full effect of electricity to materialize.[6]

1. Emerging market economies have also experienced declines in productivity growth in recent years, although not necessarily for the same reasons as in the advanced economies.

2. Here labor productivity is measured as overall gross domestic product per hour, in contrast to the business-sector measure shown in the main text. Productivity growth is faster in the business sector.

3. Capital deepening refers to increases in the amount of capital per worker.

A. Labor productivity growth



NOTE: Labor productivity is constructed as real gross domestic product per hour worked.
SOURCE: The Conference Board, Total Economy Database.

4. Robert J. Gordon (2012), "Is U.S. Economic Growth Over? Faltering Innovation Confronts the Six Headwinds," NBER Working Paper Series 18315 (Cambridge, Mass.: National Bureau of Economic Research, August).

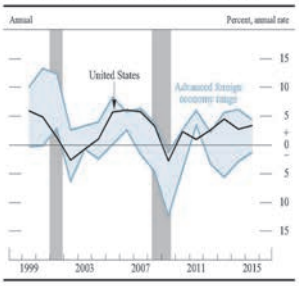
5. John G. Fernald (2015), "Productivity and Potential Output before, during, and after the Great Recession," in Jonathan A. Parker and Michael Woodford, eds., *NBER Macroeconomics Annual 2014*, vol. 29 (Chicago: University of Chicago Press), pp. 1–51.

6. For a description of the lengthy process of diffusion of electrification, see Paul A. David (1990), "The Dynamo and the Computer: An Historical Perspective on the Modern Productivity Paradox," *American Economic Review*, vol. 80 (May), pp. 355–61.

Other explanations blame the weak TFP growth on the unusual severity of the GFC. Some empirical evidence suggests that the "Schumpeterian" process in which workers move toward higher-productivity firms—a key source of productivity growth following previous recessions—has been greatly impaired since the GFC.[7] In addition, measures of innovation such as research and development (R&D) spending fell sharply during the GFC, as shown in figure B, partly in response to tight financial conditions and weak demand. Declines in R&D tend to induce gradual and persistent declines in TFP, suggesting that the recent low TFP growth may in part be traced to GFC-induced weakness in R&D.[8] In this view, the recent pickup in R&D spending could anticipate some normalization in productivity growth. Finally, the slowdown in TFP growth may also be related to the slowdown of global trade in the wake of the GFC. Conventional trade theories suggest that greater trade integration should bring productivity gains by facilitating the diffusion of new technologies and by allowing countries to specialize in the production of goods for which they have a comparative advantage. After decades of steady increases, however, trade integration appears to have plateaued in recent years (figure C).

In sum, it is difficult to ascertain whether the recent subdued performance of labor productivity represents a new normal. Some of the GFC-related factors restraining productivity growth may eventually fade, leading to a rise in productivity growth from its anemic post-GFC pace. However, to the extent that longer-run factors—such as the waning effects of the IT revolution—are at work, productivity growth in the future may be noticeably below historical averages. Sustained low rates of productivity growth would greatly restrain the improvement of living standards. In addition, they would put downward pressure on the long-run neutral interest rate, making the policy rate more likely to reach its effective lower bound and thus constraining the ability of monetary policy to provide economic stimulus, even in the presence of shallow recessions.

B. Change in private real research and development



NOTE: "Advanced foreign economy range" is the min-max range for Canada, Japan, the euro area, and the United Kingdom. U.S. data refer to real research and development (R&D) spending. Advanced foreign economy data refer to nominal R&D spending (in national currency) deflated by the gross domestic product (GDP) deflator. The shaded bars indicate periods of global recession defined as 55 percent of world GDP in recession.

SOURCE: Department of Commerce, Bureau of Economic Analysis for the United States; advanced foreign economies data downloaded from OECD Science, Technology and R&D Statistics, June 7, 2017; recession data are from Economic Cycle Research Institute (ECRI).

C. World trade as a share of gross domestic product

NOTE: The shaded bars indicate periods of global recession defined as 55 percent of world gross domestic product in recession.

SOURCE: World Development Indicators, World Bank; recession data are from Economic Cycle Research Institute (ECRI).

7. See Lucia Foster, Cheryl Grim, and John Haltiwanger (2016), "Reallocation in the Great Recession: Cleansing or Not?" *Journal of Labor Economics*, vol. 34 (S1, January), pp. S293–S331. For an analysis of the role of sectoral labor misallocation in accounting for the productivity slowdown in the United Kingdom, see Christina Patterson, Aysegül Şahin, Giorgio Topa, and Giovanni L. Violante (2016), "Working Hard in the Wrong Place: A Mismatch-Based Explanation to the U.K. Productivity Puzzle," *European Economic Review*, vol. 84 (May), pp. 42–56.

8. See Patrick Moran and Albert Queralto (2017), "Innovation and the Productivity Growth Slowdown," unpublished paper, May, https://sites.google.com/site/albertqueralto/home/research—albert-queralto/MQ_May2017.pdf.

10. Median inflation expectations

NOTE: The Michigan survey data are monthly. The SPF data for inflation expectations for personal consumption expenditures are quarterly and extend from 2007:Q1 through 2017:Q2.

SOURCE: University of Michigan Surveys of Consumers; Federal Reserve Bank of Philadelphia, Survey of Professional Forecasters (SPF).

11. 5-to-10-year-forward inflation compensation

NOTE: The data are weekly averages of daily data and extend through June 30, 2017. TIPS is Treasury Inflation-Protected Securities.

SOURCE: Federal Reserve Bank of New York; Barclays; Federal Reserve Board staff estimates.

Survey-based measures of inflation expectations are little changed this year . . .

Expectations of inflation likely influence actual inflation by affecting wage- and price-setting decisions. Survey-based measures of inflation expectations at medium- and longer-term horizons have remained relatively stable so far in 2017. In the second-quarter Survey of Professional Forecasters conducted by the Federal Reserve Bank of Philadelphia, the median expectation for the annual rate of increase in the PCE price index over the next 10 years was 2.1 percent, the same as in the first quarter and little changed from the readings during 2016 (figure 10). In the University of Michigan Surveys of Consumers, the median value for inflation expectations over the next 5 to 10 years—which has been drifting downward for the past few years—has held about flat at a low level since late last year.

. . . while market-based measures of inflation compensation fell back somewhat

Inflation expectations can also be gauged by market-based measures of inflation compensation, though the inference is not straightforward because inflation compensation can be importantly affected by changes in premiums associated with risk and liquidity. Measures of longer-term inflation compensation—derived either from differences between yields on nominal Treasury securities and those on comparable Treasury Inflation-Protected Securities (TIPS) or from inflation swaps—have fallen back somewhat this year after having moved up in late 2016 (figure 11).[2] The TIPS-based measure of

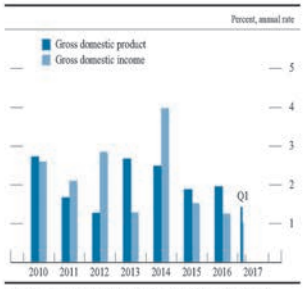
2. Inflation compensation implied by the TIPS breakeven inflation rate is based on the difference, at comparable maturities, between yields on nominal Treasury securities and yields on TIPS, which are indexed to the headline consumer price index (CPI). Inflation swaps are contracts in which one party makes payments of certain fixed nominal amounts in exchange for cash flows that are indexed to cumulative CPI inflation over

5-to-10-year-forward inflation compensation is now 1¾ percent, and the analogous measure of inflation swaps is now about 2 percent. Both measures are well below the 2½ to 3 percent range that persisted for most of the 10 years before 2014.

Real gross domestic product growth slowed in the first quarter, but spending by households and businesses appears to have picked up in recent months

After having moved up at an annual rate of 2¾ percent in the second half of 2016, real gross domestic product (GDP) is reported to have increased about 1½ percent in the first quarter of this year (figure 12).[3] The step-down in first-quarter growth was largely attributable to soft inventory investment and a lull in the growth of consumer spending; in contrast, net exports increased a bit, residential investment grew robustly, and spending by businesses surged. Indeed, business investment was strong enough that overall private domestic final purchases—that is, final purchases by U.S. households and businesses, which tend to carry more signal for future GDP growth than most other components of overall spending—moved up at an annual rate of about 3 percent in the first quarter. For more recent months, indicators of spending by consumers and businesses have been strong and suggest that growth of economic activity rebounded in the second quarter; thus, overall activity appears to have expanded moderately, on average, over the first half of the year.

12. Change in real gross domestic product and gross domestic income

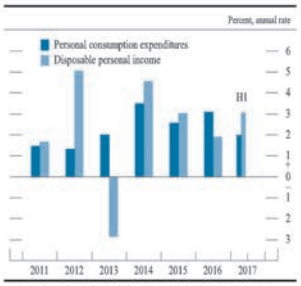


SOURCE: Department of Commerce, Bureau of Economic Analysis.

some horizon. Focusing on inflation compensation 5 to 10 years ahead is useful, particularly for monetary policy, because such forward measures encompass market participants' views about where inflation will settle in the long term after developments influencing inflation in the short term have run their course.

3. Real gross domestic income (GDI), which is conceptually the same as GDP but is constructed from different source data, had been rising at roughly the same rate as real GDP for most of 2016. However, real GDI was held down by the very weak reading for personal income in the fourth quarter of last year, which may prove to have been transitory.

13. Change in real personal consumption expenditures and disposable personal income

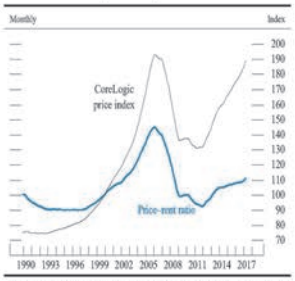


NOTE: The values for 2017:H1 are the annualized May/Q4 changes.
SOURCE: Department of Commerce, Bureau of Economic Analysis.

14. Prices of existing single-family houses

NOTE: The data for the S&P/Case-Shiller index extend through April 2017. The data for the CoreLogic and Zillow indexes extend through May 2017.
SOURCE: CoreLogic Home Price Index; Zillow; S&P/Case-Shiller U.S. National Home Price Index. The S&P/Case-Shiller Index is a product of S&P Dow Jones Indices LLC and/or its affiliates. (For Dow Jones Indices licensing information, see the note on the Contents page.)

15. Nominal house prices and price–rent ratio



NOTE: The data extend through May 2017. The CoreLogic price index is seasonally adjusted by Federal Reserve Board staff. The price–rent ratio is the ratio of nominal house prices to the consumer price index of rent of primary residence. The data are indexed to 100 in January 2000.
SOURCE: For prices, CoreLogic; for rents, Department of Labor, Bureau of Labor Statistics.

The economic expansion continues to be supported by accommodative financial conditions, including the low cost of borrowing and easy access to credit for many households and businesses, continuing job gains, rising household wealth, and favorable consumer and business sentiment.

Gains in income and wealth continue to support consumer spending . . .

After increasing strongly in the second half of 2016, consumer spending in the first quarter of this year was tepid. Unseasonably warm weather depressed spending on energy services, and purchases of motor vehicles slowed from an unusually high pace late last year. However, household spending seems to have picked up in more recent months, as purchases of energy services returned to seasonal norms and retail sales firmed. All told, consumer spending increased at an annual rate of 2 percent over the first five months of this year, only a bit slower than in the past couple of years (figure 13).

Beyond spending, other indicators of consumers' economic well-being have been strong in the aggregate. The ongoing improvement in the labor market has supported further gains in real disposable personal income (DPI), a measure of income after accounting for taxes and adjusting for inflation. Real DPI increased at a solid annual rate of 3 percent over the first five months of this year.

Gains in the stock market and in house prices over the first half of the year have boosted household net wealth. Broad measures of U.S. equity prices have continued to increase in recent months after moving up considerably late last year and in the first quarter. House prices have also continued to climb, adding to the balance sheet strength of homeowners (figure 14). Indeed, nominal house price indexes are close to their peaks of the mid-2000s. However, while the ratio of house prices to rents has edged higher, it remains well below its previous peak (figure 15). As a result of the

increases in home and equity prices, aggregate household net worth has risen appreciably. In fact, at the end of the first quarter of 2017, household net worth was more than six times the value of disposable income, the highest-ever reading for that ratio (figure 16).

Consumer spending has also been supported by low burdens from debt service payments. The household debt service burden—the ratio of required principal and interest payments on outstanding household debt to disposable income, measured for the household sector as a whole—has remained at a very low level by historical standards. As interest rates rise, the debt burden will move up only gradually, as most household debt is in fixed-interest products.

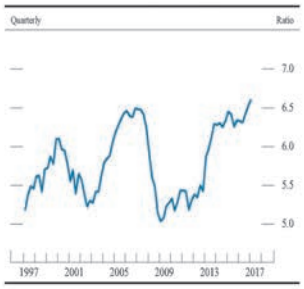
. . . as does credit availability

Consumer credit has continued to expand this year but more moderately than in 2016 (figure 17). Financing conditions are generally favorable, with auto and student loans remaining widely available and outstanding balances continuing to expand at a robust, albeit somewhat reduced, pace. Even though delinquency rates on most types of consumer debt have remained low by historical standards, credit card and auto loan delinquencies among subprime borrowers have drifted up some. Possibly in response to this deteriorating credit performance, banks have tightened standards for credit cards and auto lending. Mortgage credit has remained readily available for households with solid credit profiles, but it was still difficult to access for households with low credit scores or harder-to-document incomes.

Consumer confidence is strong

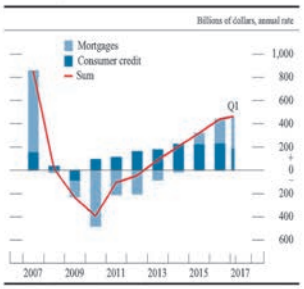
Consumers have remained optimistic about their financial situation. As measured by the Michigan survey, consumer sentiment was solid through most of 2016, likely reflecting rising income and job gains. Sentiment moved up appreciably after the presidential election last November and has remained at a high level so far this year (figure 18). Furthermore,

16. Wealth-to-income ratio



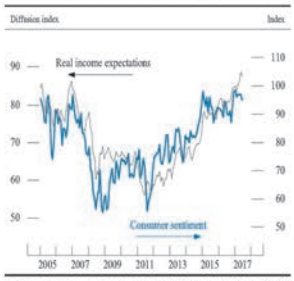
NOTE: The series is the ratio of household net worth to disposable personal income.
SOURCE: For net worth, Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States"; for income, Department of Commerce, Bureau of Economic Analysis.

17. Changes in household debt



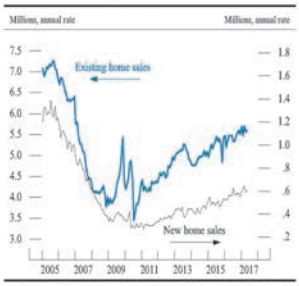
NOTE: Changes are calculated from year-end to year-end except 2017 changes, which are calculated from Q1 to Q1.
SOURCE: Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

18. Indexes of consumer sentiment and income expectations



NOTE: The consumer sentiment data are monthly and are indexed to 100 in 1966. The real income expectations data are calculated as the net percentage of survey respondents expecting family income to go up more than prices during the next year or two plus 100 and are shown as a three-month moving average.
SOURCE: University of Michigan Surveys of Consumers.

19. New and existing home sales

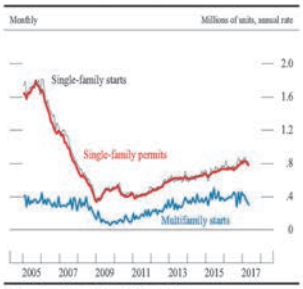


NOTE: The data extend through May 2017. New home sales includes only single-family sales. Existing home sales includes single-family, condo, townhome, and co-op sales.
SOURCE: For new home sales, Census Bureau; for existing home sales, National Association of Realtors.

20. Mortgage rates and housing affordability

NOTE: The housing affordability index data are monthly through April 2017, and the mortgage rate data are weekly through July 6, 2017. At an index value of 100, a median-income family has exactly enough income to qualify for a median-priced home mortgage. Housing affordability is seasonally adjusted by Board staff.
SOURCE: For housing affordability index, National Association of Realtors; for mortgage rates, Freddie Mac Primary Mortgage Market Survey.

21. Private housing starts and permits



NOTE: The data extend through May 2017.
SOURCE: Department of Commerce, Bureau of the Census.

the share of households expecting real income to rise over the next year or two has gone up markedly in the past few months and is now in line with its pre-recession level.

Activity in the housing sector has improved modestly

Several indicators of housing activity have continued to strengthen gradually this year. Sales of existing homes have gained, on net, while house prices have continued to rise and mortgage rates have remained low, even though they are up from last year (figures 19 and 20). In addition, single-family housing starts registered a slight increase, on average, in the first five months of the year, although multifamily housing starts have slipped (figure 21). Despite the modest increase in construction activity, the months' supply of homes for sale has remained near the low levels seen in 2016, and the aggregate vacancy rate has fallen back to levels observed in the mid-2000s. Lean inventories are likely to support further gains in homebuilding activity going forward.

Business investment has turned up after a period of weakness . . .

Led by a surge in spending on drilling and mining structures, real outlays for business investment—that is, private nonresidential fixed investment—rose robustly at the beginning of the year after having been about flat for 2016 as a whole (figure 22). The sharp gains in drilling and mining in the first quarter mark a turnaround for the sector; energy-sector investment had declined noticeably following the drop in oil prices that began in mid-2014 and ran through early 2016. More recently, rapid increases in the number of drilling rigs in operation suggest that investment in this area remained strong in the second quarter of this year.

Moreover, business spending on equipment and intangibles (such as research and development) advanced solidly at the beginning of the year after having been

roughly flat in 2016. Furthermore, indicators of business spending are generally upbeat: Orders and shipments of capital goods have posted net gains in recent months, and indexes of business sentiment and activity remain elevated after having improved significantly late last year.

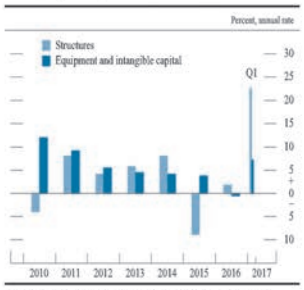
. . . while corporate financing conditions have remained accommodative

Aggregate flows of credit to large nonfinancial firms have remained solid, supported in part by continued low interest rates (figure 23). The gross issuance of corporate bonds was robust during the first half of 2017, and yields on both speculative- and investment-grade corporate bonds remained low by historical standards (figure 24). Gross equity issuance by nonfinancial firms stayed solid, on average, as seasoned equity offerings continued at a robust pace and the pace of initial public offerings picked up from the low levels seen in 2016.

Despite the pickup in business investment, demand for business loans was subdued early this year, and outstanding commercial and industrial (C&I) loans on banks' books contracted in the first quarter. In the April Senior Loan Officer Opinion Survey on Bank Lending Practices (SLOOS), banks reported a broad-based decline in demand for C&I loans during the first quarter of 2017 even as lending standards on such loans were reported to be basically unchanged.[4] Banks also reported weaker demand for commercial real estate loans as well as a continued tightening of standards on such loans. However, lending to large nonfinancial firms appeared to be strengthening somewhat during the second quarter. Meanwhile, measures of small business credit demand remained weak amid stable supply.

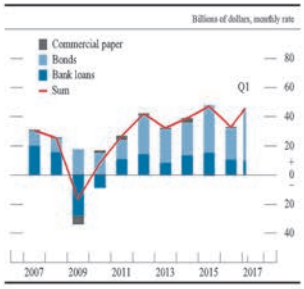
4. The SLOOS is available on the Board's website at https://www.federalreserve.gov/data/sloos/sloos.htm.

22. Change in real private nonresidential fixed investment



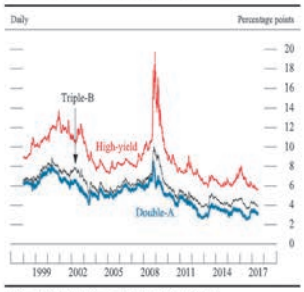
Source: Department of Commerce, Bureau of Economic Analysis.

23. Selected components of net debt financing for nonfinancial businesses



Source: Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

24. Corporate bond yields, by securities rating

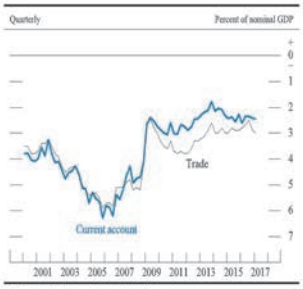


Note: The yields shown are yields on 10-year bonds.
Source: BofA Merrill Lynch Global Research, used with permission.

25. Change in real imports and exports of goods and services

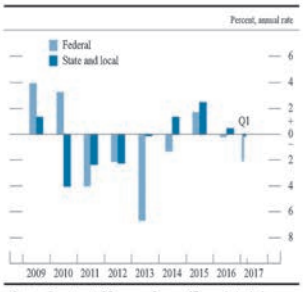
SOURCE: Department of Commerce, Bureau of Economic Analysis.

26. U.S. trade and current account balances



NOTE: GDP is gross domestic product.
SOURCE: Department of Commerce, Bureau of Economic Analysis.

27. Change in real government expenditures on consumption and investment



SOURCE: Department of Commerce, Bureau of Economic Analysis.

U.S. exports grew at a faster pace

In the first quarter of 2017, U.S. real exports increased briskly and broadly following moderate growth in the second half of last year that was driven by a surge in agricultural exports (figure 25). At the same time, real import growth declined somewhat from its strong pace in the second half of last year. As a result, real net exports contributed slightly to U.S. real GDP growth in the first quarter. Available trade data through May suggest that the growth of real exports slowed to a modest pace in the second quarter. Nevertheless, the average pace of export growth appears to have stepped up in the first half of 2017 compared with last year, partly reflecting stronger growth abroad and a diminishing drag from earlier dollar appreciation. All told, the available data for the first half of this year suggest that net exports added a touch to U.S. real GDP growth and that the nominal trade deficit widened slightly relative to GDP (figure 26).

Federal fiscal policy had a roughly neutral effect on economic growth . . .

Federal purchases moved sideways in 2016, and policy actions had little effect on federal taxes or transfers (figure 27). Under currently enacted legislation, federal fiscal policy will likely again have a roughly neutral influence on the growth in real GDP this year.

After narrowing significantly for several years, the federal unified deficit has widened from about 2½ percent of GDP in fiscal year 2015 to 3¼ percent currently. Although expenditures as a share of GDP have been relatively stable over this period at a little under 21 percent, receipts moved lower in 2016 and have edged down further so far this year to roughly 17½ percent of GDP (figure 28). The ratio of federal debt held by the public to nominal GDP is quite elevated relative to historical norms. Nevertheless, the deficit remains small enough to roughly stabilize this ratio in the neighborhood of 75 percent (figure 29).

. . . and the fiscal position of most state and local governments is stable

The fiscal position of most state and local governments is stable, although there is a range of experiences across these governments. Many state governments are experiencing lackluster revenue growth, as income tax collections have been only edging up, on average, in recent quarters. In contrast, house price gains have continued to push up property tax revenues at the local level. Employment growth in the state and local government sector has been anemic so far this year following a pace of hiring in 2016 that was the strongest since 2008. Outlays for construction by these governments have been declining (figure 30).

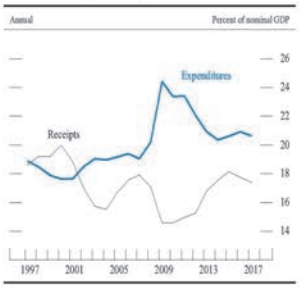
Financial Developments

The expected path for the federal funds rate flattened

The path for the expected federal funds rate implied by market quotes on interest rate derivatives has flattened, on net, since the end of December, moving higher for 2017 but slightly lower further out (figure 31). The expected policy path moved up at the beginning of the year, reportedly reflecting investor perceptions that expansionary fiscal policy would likely be forthcoming over the near term, but subsequently fell amid some waning of these expectations as well as FOMC communications that were interpreted as signaling a somewhat slower pace of policy rate increases than had been anticipated.

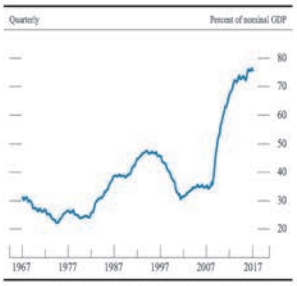
Survey-based measures of the expected path of policy also moved up for 2017. Most of the respondents to the Federal Reserve Bank of New York's Survey of Primary Dealers and Survey of Market Participants—which were conducted just before the June FOMC meeting—projected an additional 25 basis point increase in the FOMC's target range for the federal funds rate, relative to what they projected in surveys conducted before the December FOMC meeting, as the most likely outcome for this year.

28. Federal receipts and expenditures



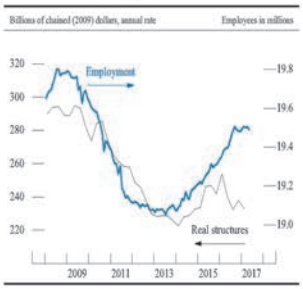
NOTE: Through 2016, receipts and expenditures are for fiscal years (October to September); gross domestic product (GDP) is for the four quarters ending in Q3. For 2017, receipts and expenditures are for the 12 months ending in May, and GDP is the average of 2016:Q4 and 2017:Q1. Receipts and expenditures are on a unified-budget basis.
SOURCE: Office of Management and Budget.

29. Federal government debt held by the public



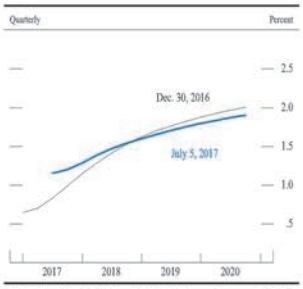
NOTE: The data for gross domestic product (GDP) are at an annual rate. Federal debt held by the public equals federal debt less Treasury securities held in federal employee defined benefit retirement accounts, evaluated at the end of the quarter.
SOURCE: For GDP, Department of Commerce, Bureau of Economic Analysis; for federal debt, Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

30. State and local employment and structures investment



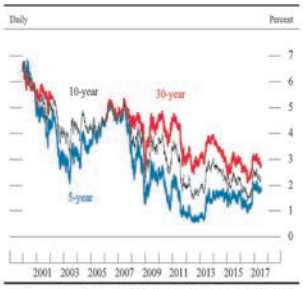
NOTE: The employment data are monthly and extend through May 2017, and the structures data are quarterly.
SOURCE: For employment data, Department of Labor, Bureau of Labor Statistics; for structures data, Department of Commerce, Bureau of Economic Analysis.

31. Market-implied federal funds rate



NOTE: The federal funds rate path is implied by quotes on overnight index swaps—a derivative contract tied to the effective federal funds rate. The implied path as of July 5, 2017, is compared with that as of December 30, 2016. The path is estimated with a spline approach, assuming a term premium of 0 basis points. The data extend through 2020:Q4.
SOURCE: Bloomberg; Federal Reserve Board staff estimates.

32. Yields on nominal Treasury securities



NOTE: The Treasury ceased publication of the 30-year constant maturity series on February 18, 2002, and resumed that series on February 9, 2006.
SOURCE: Department of the Treasury.

Expectations for the number of rate hikes in 2018 were about unchanged. Market-based measures of uncertainty about the policy rate approximately one to two years ahead decreased slightly, on balance, from their year-end levels.

Longer-term nominal Treasury yields remain low

After rising significantly during the second half of 2016, yields on medium- and longer-term nominal Treasury securities have decreased 5 to 25 basis points, on net, so far in 2017 (figure 32). The decrease in longer-term nominal yields since the beginning of the year largely reflects declines in inflation compensation due in part to soft incoming data on inflation, with real yields little changed on net. Consistent with the changes in Treasury yields, yields on 30-year agency mortgage-backed securities (MBS)—an important determinant of mortgage interest rates—decreased slightly over the first half of the year (figure 33). Treasury and MBS yields picked up somewhat in late June, driven in part by increases in government yields overseas. However, yields remain quite low by historical standards.

Broad equity price indexes increased further . . .

Broad U.S. equity indexes continued to increase during the period (figure 34). Equity prices were reportedly supported by lower interest rates and increased optimism that corporate earnings will continue to strengthen this year. Stock prices of companies in the technology sector increased notably on net. After rising significantly toward the end of last year, stock prices of banks performed about in line with the broader market during the first half of 2017. The implied volatility of the S&P 500 index one month ahead—the VIX—decreased, on net, ending the period close to the bottom of its historical range. (For a discussion of financial stability issues, see the box "Developments Related to Financial Stability.")

. . . and risk spreads on corporate bonds decreased

Bond spreads for investment- and speculative-grade firms decreased, and spreads for speculative-grade firms now stand near the bottom of their historical ranges.

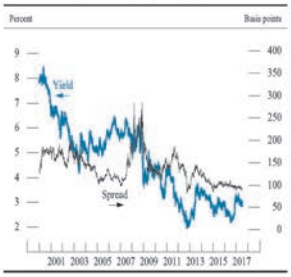
Treasury and mortgage securities markets have functioned well

Available indicators of Treasury market functioning remained stable over the first half of 2017. A variety of liquidity metrics—including bid-ask spreads, bid sizes, and estimates of transaction costs—either improved or remained unchanged over the period, displaying no notable signs of liquidity pressures. The agency MBS market also continued to function well. (For a detailed discussion of corporate bond market functioning, see the box "Recent Developments in Corporate Bond Market Liquidity.")

Money market rates have moved up in line with increases in the FOMC's target range

Conditions in domestic short-term funding markets have remained stable so far in 2017. Yields on a broad set of money market instruments moved higher in response to the FOMC's policy actions in March and June. The effective federal funds rate generally traded near the middle of the target range and was closely tracked by the overnight Eurodollar rate. The spread between the three-month LIBOR (London interbank offered rate) and the OIS (overnight index swap) rate has returned to historical norms over the first half of 2017, declining from the elevated levels that prevailed at the end of last year around the implementation of the Securities and Exchange Commission money market fund reform.

33. Yield and spread on agency mortgage-backed securities



NOTE: The data are daily. Yield shown is for the Fannie Mae 30-year current coupon, the coupon rate at which new mortgage-backed securities would be priced at par, or face, value. Spread shown is to the average of the 5- and 10-year nominal Treasury yields.
SOURCE: Department of the Treasury; Barclays.

34. Equity prices

SOURCE: Standard & Poor's Dow Jones Indices and NASDAQ index via Bloomberg. (For Dow Jones Indices licensing information, see the note on the Contents page.)

Developments Related to Financial Stability

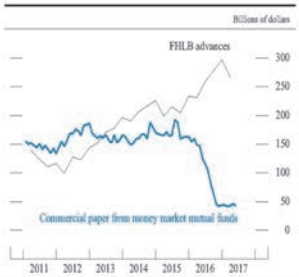
Vulnerabilities in the U.S. financial system remain moderate on balance. Capital and liquidity ratios at most large U.S. banks continue to be at historical highs, and reliance on short-term wholesale funding at these institutions has continued to decline. Valuation pressures across a range of assets and several indicators of investor risk appetite have increased further since mid-February, but apparent high risk appetite in asset markets has not led to increased borrowing in the nonfinancial sector. Debt owed by nonfinancial corporations remains elevated, although it has been flat or falling in the past two years. Household debt as a share of gross domestic product has remained subdued, and new borrowing has been driven primarily by households with strong credit histories.

The strong capital position of the financial sector has contributed to the improved resilience of the U.S. financial system. Regulatory capital ratios at most bank holding companies have continued to be historically high, mainly as a result of the higher regulatory capital requirements. At the same time, measures of bank profitability have increased modestly on a year-on-year basis. Regulatory capital ratios at insurance companies are also high by historical standards.

Vulnerabilities stemming from maturity and liquidity transformation in the financial sector remain low. High-quality liquid asset holdings at all large domestic bank holding companies are above regulatory liquidity coverage ratio requirements. Moreover, banks have continued to replace short-term wholesale funding, such as commercial paper held by money market mutual funds (also referred to as money market funds, or MMFs), with relatively more stable core deposits. The use of Federal Home Loan Bank (FHLB) advances as a source of funding for the banks, which had increased notably through 2016, has fallen slightly in the first quarter of 2017 (figure A). The MMF reforms, designed by the Securities and Exchange Commission and fully implemented in October 2016, have led to a shift of about $1.2 trillion in assets from prime funds—which can hold a range of risky instruments, including commercial paper issued by banks—to government funds, which can hold only assets collateralized by Treasury and agency securities. This shift has reduced the risk of runs on MMFs. However, run risk could increase if investors shift out of MMFs into more opaque and fragile alternative vehicles. Thus, continued monitoring of this sector is important. The FHLBs have increased their issuance of short-maturity liabilities, mainly to government funds. However, the FHLBs have not reduced the maturity of their own assets, which increases their liquidity mismatch and potential vulnerability to funding strains. This mismatch has also been highlighted by the Federal Housing Finance Agency, which continues to evaluate ways to formalize its supervisory expectations regarding the appropriate amount of short-term funding of long-term assets by the FHLBs.[1]

Valuation pressures have increased further across a range of assets, including Treasury securities, equities, corporate bonds, and commercial real estate (CRE).

A. Selected funding for large banks



NOTE: Commercial paper from money market mutual fund data are monthly and extend through May 2017. Federal Home Loan Bank (FHLB) data are quarterly and are seasonally adjusted. FHLB advances data for different subsets of Comprehensive Capital Analysis and Review banks depending on their use of each funding source.

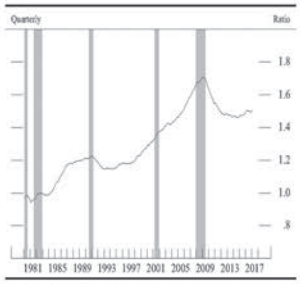
SOURCE: U.S. Securities and Exchange Commission, Form N-MFP, "Monthly Schedule of Portfolio Holdings of Money Market Funds," accessed via the Office of Financial Research; Federal Financial Institutions Examinations Council, Call Report Form FFIEC 031, "Consolidated Reports of Condition and Income for a Bank with Domestic and Foreign Offices."

1. See Melvin L. Watt (2017), "Prepared Remarks," speech delivered at the 2017 Federal Home Loan Bank Directors' Conference, Washington, May 23, https://www.fhfa.gov/Media/PublicAffairs/Pages/Prepared-Remarks-of-Melvin-L-Watt-Director-of-FHFA-FHLBank-Directors-Conference.aspx.

Term premiums on Treasury securities continue to be in the lower part of their historical distribution. A sudden rise in term premiums to more normal levels poses a downside risk to long-maturity Treasury prices, which could in turn affect the prices of other assets. Forward equity price-to-earnings ratios rose a bit further and are now at their highest levels since the early 2000s, while a measure of the risk premium embedded in high-yield corporate bond spreads declined a touch from an already low level, implying high asset valuations in this market as well. Prices of CRE have continued to advance at a rapid clip amid slowing rent growth and rising interest rates, though there are signs of tightening credit conditions in CRE markets. In contrast, farmland prices have declined, albeit more slowly than prevailing rents, implying that farmland price-to-rent ratios have continued to move up to very high levels. In derivatives markets, investor compensation for bearing near-term volatility risk has remained low, suggesting a sustained investor risk appetite.

The ratio of private nonfinancial (household and nonfinancial business) debt to gross domestic product, shown in figure B, remains below the estimates of its long-term upward trend. The debt-to-income ratio of households has changed little over the past few years and remains at a relatively low level. Moreover, new borrowing is concentrated among borrowers with high credit scores. In contrast, the leverage of nonfinancial corporations continues to be notably elevated. New borrowing is concentrated among firms with stronger balance sheets, and the total outstanding amount of speculative-grade bonds and leveraged loans edged down, especially in the oil sector.

B. Private nonfinancial sector credit-to-GDP ratio



NOTE: The shaded bars indicate periods of business recession as defined by the National Bureau of Economic Research.

SOURCE: Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States"; Department of Commerce, Bureau of Economic Analysis, national income and product accounts (NIPA), Table 1.1.5: Gross Domestic Product; Board staff calculations.

As part of its effort to reduce regulatory burden while promoting the financial stability of the United States, the Federal Reserve Board has taken two key steps since mid-February. First, member agencies of the Federal Financial Institutions Examination Council, including the Board, issued a joint report to the Congress under the Economic Growth and Regulatory Paperwork Reduction Act of 1996 detailing their review of regulations affecting smaller financial institutions, such as community banks, and describing burden-reducing actions the agencies plan to take.[2] Second, the Board and the Federal Deposit Insurance Corporation jointly announced the completion of their evaluation of the 2015 resolution plans of 16 domestic banks and separately issued resolution plan guidance to 4 foreign banks.[3] The agencies identified shortcomings in one domestic firm's resolution plan, which must be satisfactorily addressed in the firm's 2017 plan by December 31. For foreign banking organizations, resolution plans are focused on their U.S. operations, and guidance issued to these organizations reflects the significant restructuring they have undertaken to form intermediary holding companies.

2. See Board of Governors of the Federal Reserve System (2017), "Banking Agencies Issue Joint Report to Congress under the Economic Growth and Regulatory Paperwork Reduction Act of 1996," press release, March 21, https://www.federalreserve.gov/newsevents/pressreleases/bcreg20170321a.htm.

3. See Board of Governors of the Federal Reserve System (2017), "Agencies Complete Resolution Plan Evaluation of 16 Domestic Firms; Provide Resolution Plan Guidance to Four Foreign Banking Organizations," press release, March 24, https://www.federalreserve.gov/newsevents/pressreleases/bcreg20170324a.htm.

Recent Developments in Corporate Bond Market Liquidity

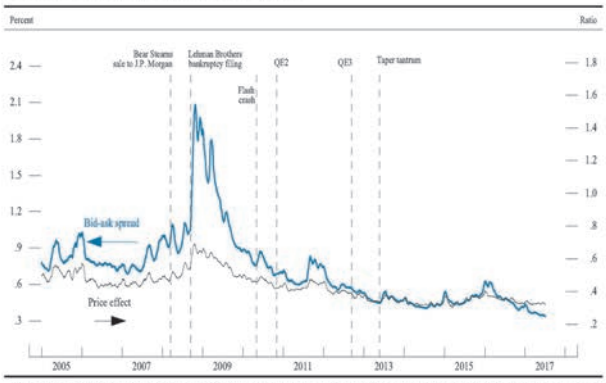
Market liquidity refers to the extent to which investors can rapidly execute sizable securities transactions at a low cost and with a limited price effect. A high degree of market liquidity facilitates informationally efficient market pricing and lowers the returns required by investors to hold financial assets; it therefore decreases the cost of valuable economic projects and so contributes to the efficient allocation of capital. Moreover, liquidity conditions that are resilient in the face of economic and financial shocks reduce the risk of excess volatility and fire sale losses, thus helping mitigate systemic risk.

Financial institutions that serve as "market makers," by posting prices and standing ready to buy or sell, are critical to healthy liquidity in the markets for certain assets, including corporate bonds. A series of changes, including regulatory reforms, since the Global Financial Crisis have likely altered financial institutions' incentives to provide liquidity, raising concerns about decreased liquidity in these markets, especially during periods of market stress. However, the available evidence does not point to any substantial impairment in liquidity in major financial markets in recent years. In addition, financial markets have generally performed well during recent episodes of financial stress.[1] Even in instances in which liquidity conditions in certain markets appear to have deteriorated, the effects have been mild and suggest limited economic consequences. In the remainder of this discussion, we illustrate these points with emphasis on the market for corporate bonds.

In recent years, market participants have been particularly concerned with liquidity conditions in the corporate bond market because the securities are traded less frequently, and the liquidity provision has relied more heavily on dealer intermediation, than in many other markets. However, a range of conventional metrics of liquidity indicate that liquidity strains in corporate bond markets have been minimal. Figure A

1. For a discussion of the behavior of bond prices during recent flash events (that is, extremely rapid and large price moves during very short periods), see Jerome H. Powell (2015), "Structure and Liquidity in Treasury Markets," speech delivered at the Brookings Institution, Washington, August 3, https://www.federalreserve.gov/newsevents/speech/powell20150803a.htm.

A. Mean bid-ask spread and market effect for corporate bonds



NOTE: The data are daily. The bid-ask spread is the 21-day moving average of the difference between trade size weighted-average dealer bid prices and ask prices of non-defaulted bonds on the secondary market, scaled by the midprice. Price effect data are the 21-day moving average of the Amihud (2002) measure (see footnote 2), which is defined as the daily average of the ratio of the absolute value of the percentage price changes to transaction volume for non-defaulted bonds on the secondary market that traded at least 10 times between 10:30 a.m. and 3:30 p.m. Excludes 144a bonds.

SOURCE: FINRA Trade Reporting and Compliance Engine; Thomson Reuters SDC Platinum; Mergent Fixed Income Securities Database; Moody's Default and Recovery Database.

shows that the estimated mean effective bid-ask spread for U.S. corporate bonds has remained low in recent years. Before the financial crisis, bid-ask spreads averaged about 1 percent of the price of the bond. This measure of trading costs skyrocketed during the financial crisis but has returned to the range seen before the crisis. Measures of the effect of trades on prices follow a similar pattern and have been fairly stable in recent years.[2] In addition, other measures related to factors associated with market liquidity, such as trends in average trade size and turnover, also suggest market liquidity conditions are benign.[3]

That said, some recent work suggests that these traditional measures of transaction costs might exaggerate the degree of liquidity in part because dealers have increasingly shifted from acting as principals to acting as agents to reduce their risk exposure, resulting in tighter bid-ask spreads.[4] Indeed, many market participants have expressed a concern that declines in dealer inventories may reflect in part a reduced willingness or capacity of the primary dealers to make markets, which may in turn lead to lower liquidity.

Figure B shows that primary dealers' inventories of corporate bonds (including foreign bonds issued in the United States), which are predominantly used for market making, indeed began to decline sharply following the Bear Stearns collapse in March 2008 and fell further after Lehman Brothers failed in October 2008. Such a sharp decline in dealer inventories may be the result of dealers' actions on their own, reflecting changes in risk preferences in reaction to the financial crisis. In addition, changing

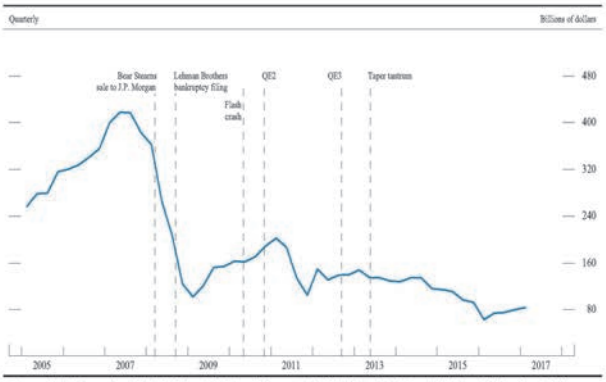
(continued on next page)

2. See Yakov Amihud (2002), "Illiquidity and Stock Returns: Cross-Section and Time-Series Effects," *Journal of Financial Markets*, vol. 5 (January), pp. 31–56. The Amihud price effect measure is defined as the ratio of the percentage change in price (in absolute value) and the daily trading volume.

3. For detailed definitions of trade size and turnover in the context of corporate bond markets, see Francesco Trebbi and Kairong Xiao (2015), "Regulation and Market Liquidity," NBER Working Paper Series 21739 (Cambridge, Mass.: National Bureau of Economic Research, November).

4. See Jaewon Choi and Yesol Huh (2016), "Customer Liquidity Provision: Implications for Corporate Bond Transaction Costs," unpublished paper, July (revised January 2017), https://sites.google.com/site/yesolhuh/research/Choi_Huh_CLP.pdf. The authors suggest that transactions in which dealers act simply as brokers (that is, agents), rather than as intermediaries that hold assets on their balance sheets (principals), could reflect price concessions that dealers make to entice counterparties into the other side of a trade so that the dealers will not need to hold the traded assets.

B. Broker-dealer holdings of corporate and foreign bonds



SOURCE: Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States," L.130 Security Brokers and Dealers, June 8, 2017.

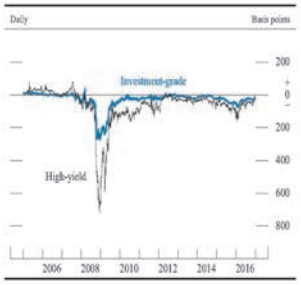
Recent Developments in Corporate Bond Market Liquidity *(continued)*

regulations—such as the Volcker rule and the supplementary leverage ratio, which aimed to make the financial system safer and sounder—and changes in technology may have contributed to the continued trend of lower dealer inventories.[5]

The factors affecting a dealer's willingness or capacity to facilitate trading may also affect other activities such as arbitrage trading, which equates prices for financing arrangements with economically similar risks. Therefore, impediments in arbitrage may also indicate market illiquidity. One widely studied no-arbitrage relationship is the so-called CDS–bond basis, the difference between bonds' credit default swap (CDS) spreads and bond-implied credit spreads.[6] Figure C shows that the CDS–bond basis for corporate bonds was close to zero before the crisis, widened dramatically during the crisis (indicating a significant unrealized arbitrage opportunity), and has returned to a level closer to, but still below, zero in recent years. More recently, the CDS–bond basis has narrowed further.

Overall, the degree to which dealer balance sheet constraints affect corporate bond market liquidity depends not only on dealers' capacity and willingness to provide liquidity, but also on the extent to which nonbank financial institutions such as hedge funds, mutual funds, and insurance companies fill any lost market-making capacity. Other factors such as changes in technology, risk preferences, and investor composition also interact to shape the trading environment.[7] There are indications that market structure has changed in recent years, and trades in certain situations and market segments might have been more costly at times. But markets have also adjusted, and some measures of dislocation have lessened with these adjustments. In summary, liquidity conditions have been quite good overall since the Global Financial Crisis. The sharp deterioration of market liquidity during 2007 and 2008 illustrates clearly that the most significant risk has been distress at financial institutions. Any modest potential effects of regulation on liquidity should be balanced with the gains to resilience at large financial institutions associated with regulation.

C. CDS (credit default swap)–bond basis



NOTE: Data extend through December 30, 2016. The figure plots the CDS–bond basis for investment-grade and high-yield bonds. The CDS–bond basis is from J.P. Morgan and is computed for investment-grade and high-yield corporate bonds as the average difference between each bond's market CDS spread (interpolated to the bond maturity) and the theoretical CDS spread implied by the bond yield. See Boyarchenko and others (2016) in footnote 6 for details.

SOURCE: J.P. Morgan, CDS Data. (For additional information about the data from J.P. Morgan, see the note on the Contents page.)

5. See Tobias Adrian, Nina Boyarchenko, and Or Shachar (forthcoming), "Dealer Balance Sheets and Bond Liquidity Provision," *Journal of Monetary Economics*. They find that dealers subject to stricter regulations after the crisis are less able to intermediate customer trades in the corporate bond market. Also see Jack Bao, Maureen O'Hara, and Alex Zhou (2016), "The Volcker Rule and Market-Making in Times of Stress," Finance and Economics Discussion Series 2016-102 (Washington: Board of Governors of the Federal Reserve System, December), https://www.federalreserve.gov/econresdata/feds/2016/files/2016102pap.pdf. They show that recently downgraded bonds trade with a higher price effect after the introduction of the Volcker rule, although Anderson and Stulz find no such effects. See Mike Anderson and René M. Stulz (2017), "Is Post-Crisis Bond Liquidity Lower?" NBER Working Paper Series 23317 (Cambridge, Mass.: National Bureau of Economic Research, April).

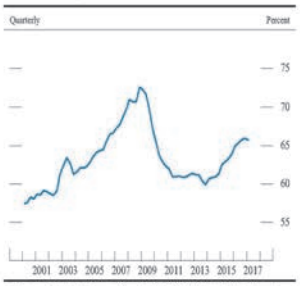
6. For a more detailed discussion of the CDS–bond basis, see Nina Boyarchenko, Pooja Gupta, Nick Steele, and Jacqueline Yen (2016), "Trends in Credit Market Arbitrage," Staff Report 784 (New York: Federal Reserve Bank of New York, July; revised July 2016), https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr784.pdf.

7. See Darrell Duffie (2012), "Market Making under the Proposed Volcker Rule," Working Paper 3118 (Stanford, Calif.: Stanford Graduate School of Business, January), available at https://www.gsb.stanford.edu/faculty-research/working-papers/market-making-under-proposed-volcker-rule. He argues that the negative effect the Volcker rule may have on market liquidity in the short run may disappear in the long run as nonbanks step in to provide liquidity. See also Hendrik Bessembinder, Stacey E. Jacobsen, William F. Maxwell, and Kumar Venkataraman (2016), "Capital Commitment and Illiquidity in Corporate Bonds," unpublished paper, March, http://finance.bus.utk.edu/UTSMC/documents/BillMaxwellPapertopresent042016.pdf. The authors find that bank dealers are less willing to provide liquidity now than in the recent past, while nonbank dealers are now more willing.

Bank credit continued to expand, though at a slower pace than in 2016, and bank profitability improved

Aggregate credit provided by commercial banks continued to increase through the first quarter of 2017, though at a slower pace than in 2016, leaving the ratio of total commercial bank credit to nominal GDP slightly lower (figure 35). The expansion of core loans slowed during 2017, consistent with banks' reports in the April SLOOS of weakened demand for most loan categories and tighter lending standards for commercial real estate loans. However, the growth of core loans appeared to be picking up somewhat during the second quarter. Measures of bank profitability have continued to improve so far this year but remained below their historical averages (figure 36).

35. Ratio of total commercial bank credit to nominal gross domestic product



SOURCE: Federal Reserve Board, Statistical Release H.8, "Assets and Liabilities of Commercial Banks in the United States"; Department of Commerce, Bureau of Economic Analysis.

36. Profitability of bank holding companies

NOTE: The data are quarterly and are seasonally adjusted.
SOURCE: Federal Reserve Board, Form FR Y-9C, Consolidated Financial Statements for Bank Holding Companies.

Credit conditions in municipal bond markets have generally been stable

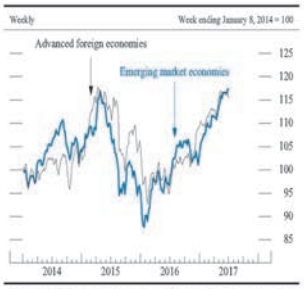
Credit conditions in municipal bond markets have generally remained stable since year-end. Over that period, yield spreads on 20-year general obligation municipal bonds over comparable-maturity Treasury securities were little changed on balance. Puerto Rico filed to enter a court-supervised process to restructure its debt after it failed to reach an agreement with bondholders, and several credit rating agencies downgraded the bond ratings of the state of Illinois. However, these events have had no noticeable effect on broader municipal bond markets.

International Developments

Foreign financial market conditions eased

Financial market conditions in both the advanced foreign economies (AFEs) and the emerging market economies (EMEs) have generally eased since January. Better-than-expected data releases, robust corporate earnings, and the passage of risk events—such as national elections in some European countries—boosted investor confidence. Broad

37. Equity indexes for selected foreign economies



NOTE: The data are weekly averages of daily data and extend through July 5, 2017.
SOURCE: For advanced foreign economies, MSCI EAFE Index via Thomson Reuters Eikon with Datastream for Office; for emerging market economies, MSCI Emerging Markets Index via Thomson Reuters Eikon with Datastream for Office.

38. Emerging market mutual fund flows and spreads

NOTE: The EMBI+ data are weekly averages of daily data and extend through July 5, 2017. The EPFR data are monthly sums of weekly data. The fund flows data exclude funds located in China.
SOURCE: For bond and equity fund flows, EPFR Global; for EMBI+, J.P. Morgan Emerging Markets Bond Index Plus via Bloomberg.

39. Nominal 10-year government bond yields in selected advanced economies

NOTE: The data are weekly averages of daily benchmark yields and extend through July 5, 2017.
SOURCE: Bloomberg.

equity indexes in advanced and emerging foreign economies rose further (figure 37). In addition, spreads of emerging market sovereign bonds over U.S. Treasury securities narrowed, and capital flows into emerging market mutual funds picked up (figure 38). Government bond yields in the AFEs generally remained very low, partly reflecting investor expectations that substantial monetary policy accommodation would be required for some time (figure 39). In the United Kingdom, softer macroeconomic data and uncertainty about future policies and growth as the country begins the process of exiting the European Union also weighed on yields. However, AFE government bond yields picked up somewhat in late June, partly reflecting investors' focus on remarks by officials from some AFE central banks suggesting possible shifts toward less accommodative policy stances. In the euro area, bank supervisors intervened to prevent the disorderly failure of a few small to medium-sized lenders in Italy and Spain; business disruptions were minimal, and spillovers to other European banks were limited.

The dollar depreciated somewhat

Since the start of the year, the broad dollar index—a measure of the trade-weighted value of the dollar against foreign currencies—has depreciated about 5 percent, on balance, after rising more than 20 percent between mid-2014 and late 2016 (figure 40). The weakening since the start of the year partly reflected growing uncertainty about prospects for more expansionary U.S. fiscal policy as well as mounting confidence in the foreign economic outlook. The euro rose against the dollar following the French presidential election, and the Mexican peso appreciated substantially as the Mexican central bank tightened monetary policy and as investor concerns about the potential for substantial disruptions of U.S.–Mexico trade appeared to ease.

Economic activity in the AFEs grew at a solid pace

In the first quarter, real GDP grew at a solid pace in Canada, the euro area, and Japan, partly reflecting robust growth in fixed investment in all three economies (figure 41). In contrast, economic growth slowed to a tepid pace in the United Kingdom, reflecting weaker consumption growth and a decline in exports. In most AFEs, economic survey indicators, such as purchasing manager surveys, generally remained consistent with continued economic growth at a solid pace during the second quarter.

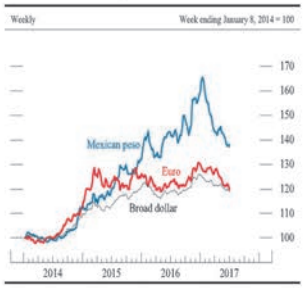
Inflation leveled off in most AFEs . . .

In late 2016, consumer price inflation (measured as a 12-month percent change) rose substantially in most AFEs, partly reflecting increases in energy prices (figure 42). Since then, inflation has leveled off in Japan and declined somewhat in the euro area as upward pressure from energy prices eased, core inflation stayed low, and wage growth was subdued even as unemployment rates declined further in both economies. In contrast, in the United Kingdom, headline inflation rose well above the Bank of England's (BOE) 2 percent target, largely reflecting upward pressure from the substantial sterling depreciation since the Brexit referendum in June 2016.

. . . and AFE central banks maintained highly accommodative monetary policies

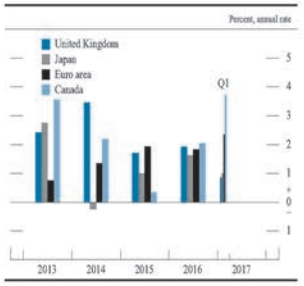
AFE central banks kept their policy rates at historically low levels, and the Bank of Japan kept its target range for 10-year government bond yields near zero. The European Central Bank (ECB) maintained its asset purchase program, though it slightly reduced the pace of purchases, and the BOE completed the bond purchase program it announced last August. However, the Bank of Canada, BOE, and ECB have recently suggested that if growth continues to reduce resource slack, some policy accommodation could be withdrawn. The ECB remarked that the forces

40. U.S. dollar exchange rate indexes



NOTE: The data, which are in foreign currency units per dollar, are weekly averages of daily data and extend through July 5, 2017.
SOURCE: Federal Reserve Board, Statistical Release H.10, "Foreign Exchange Rates."

41. Real gross domestic product growth in selected advanced foreign economies

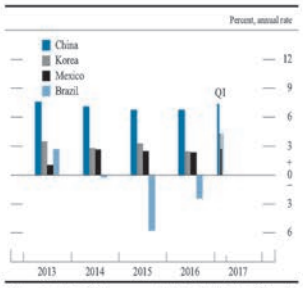


SOURCE: For the United Kingdom, Office for National Statistics; for Japan, Cabinet Office, Government of Japan; for the euro area, Eurostat; for Canada, Statistics Canada; all via Haver Analytics.

42. Inflation in selected advanced foreign economies

NOTE: The data for the euro area incorporate the flash estimate for June 2017. The data for Canada, Japan, and the United Kingdom extend through May 2017.
SOURCE: For the United Kingdom, Office for National Statistics; for Japan, Ministry of International Affairs and Communications; for the euro area, Statistical Office of the European Communities; for Canada, Statistics Canada; all via Haver Analytics.

43. Real gross domestic product growth in selected emerging market economies



NOTE: The data for China are seasonally adjusted by Board staff. The data for Korea, Mexico, and Brazil are seasonally adjusted by their respective government agencies.

SOURCE: For China, China National Bureau of Statistics; for Korea, Bank of Korea; for Mexico, Instituto Nacional de Estadística y Geografía; for Brazil, Instituto Brasileiro de Geografia e Estatística; all via Haver Analytics.

holding down inflation could be temporary. The BOE indicated that some monetary accommodation might need to be removed if the tradeoff between supporting employment and expediting the return of inflation to its target is reduced.

In EMEs, Asian growth was solid . . .

Chinese economic activity was robust in the first quarter of 2017 as a result of solid domestic and external demand (figure 43). More recent indicators suggest that growth moderated in the second quarter as Chinese authorities tightened financial conditions and as export growth slowed. In some other emerging Asian economies, growth picked up in early 2017 as a result of stronger external demand and manufacturing activity. However, growth of the region's exports, especially to China, slowed so far in the second quarter.

. . . and many Latin American economies continue their tepid recovery

In Mexico, growth decelerated a touch in the first quarter of 2017, partly reflecting a slowdown in private consumption following sharp hikes in domestic fuel prices. These price hikes, together with the effects of earlier peso depreciation on import prices, contributed to a sharp rise in Mexican inflation, which prompted the Bank of Mexico to further tighten monetary policy. Following a prolonged period of contraction, the Brazilian economy posted solid growth in the first quarter of 2017, partly reflecting a surge in exports and a strong harvest. However, domestic demand has remained very weak amid high unemployment and heightened political tensions, and indicators of economic activity have stepped down recently. In Brazil and some other South American economies, declining inflation has led central banks to reduce their policy interest rates.

Part 2
Monetary Policy

The Federal Open Market Committee raised the federal funds rate target range in March and June

Over the past year and a half, the Federal Open Market Committee (FOMC) has been gradually increasing its target range for the federal funds rate as the economy continued to make progress toward the Committee's objectives of maximum employment and price stability. After having raised the target range for the federal funds rate last December, the Committee decided to raise the target range again in March and in June, bringing it to 1 to 1¼ percent (figure 44).[5] The FOMC's decisions reflected the progress the economy has made, and is expected to make, toward the Committee's objectives.

When the Committee met in March, it decided to raise the target range for the federal funds rate to ¾ to 1 percent. Available information suggested that the labor market had continued to strengthen even as growth in economic activity slowed during the first quarter. Inflation measured on a 12-month basis had moved up appreciably and was close to the Committee's 2 percent longer-run objective. Core inflation, which excludes volatile energy and food prices, continued to run somewhat below 2 percent.

The data available at the time of the June FOMC meeting suggested a rebound in economic activity in the second quarter, leaving the projected average pace of growth over the first half of the year at a moderate level. The labor market had continued to strengthen, with the unemployment rate falling nearly ½ percentage point since the beginning of the year to 4.3 percent in May, a low level by historical standards and modestly below the median of FOMC participants' estimates of its longer-run normal level. Inflation measured on a 12-month basis had declined over the previous few months but was still up significantly since last summer. Like the headline inflation measure, core inflation was running somewhat below 2 percent. With employment expected to remain near its maximum sustainable level, the Committee continued to expect that inflation would move up and stabilize around 2 percent over the next couple of years, in line with the Committee's

5. See Board of Governors of the Federal Reserve System (2017), "Federal Reserve Issues FOMC Statement," press release, March 15, https://www.federalreserve.gov/newsevents/pressreleases/monetary20170315a.htm; and Board of Governors of the Federal Reserve System (2017), "Federal Reserve Issues FOMC Statement," press release, June 14, https://www.federalreserve.gov/newsevents/pressreleases/monetary20170614a.htm.

44. Selected interest rates

Note: The 2-year and 10-year Treasury rates are the constant-maturity yields based on the most actively traded securities.
Source: Department of the Treasury; Federal Reserve Board.

longer-run objective. In view of realized and expected labor market conditions and inflation, the Committee decided to raise the target another ¼ percentage point to a range of 1 to 1¼ percent.

Monetary policy continues to support economic growth

Even with the gradual reductions in the amount of policy accommodation to date, the Committee judges that the stance of monetary policy remains accommodative, thereby supporting some further strengthening in labor market conditions and a sustained return to 2 percent inflation. In particular, the federal funds rate appears to remain somewhat below its neutral level—that is, the level of the federal funds rate that is neither expansionary nor contractionary.

In evaluating the stance of monetary policy, policymakers routinely consult prescriptions from a variety of policy rules, which can serve as useful benchmarks. However, the use and interpretation of such prescriptions require careful judgments about the choice and measurement of the inputs to these rules as well as the implications of the many considerations these rules do not take into account (see the box "Monetary Policy Rules and Their Role in the Federal Reserve's Policy Process").

Future changes in the federal funds rate will depend on the economic outlook as informed by incoming data

The FOMC has continued to emphasize that, in determining the timing and size of future adjustments to the target range for the federal funds rate, it will assess realized and expected economic conditions relative to its objectives of maximum employment and 2 percent inflation. This assessment will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments. The Committee will carefully monitor actual and expected inflation developments relative to its symmetric inflation goal.

The Committee currently expects that the ongoing strength in the economy will warrant gradual increases in the federal funds rate, and that the federal funds rate will likely remain, for some time, below the levels that the Committee expects to prevail in the longer run. Consistent with this outlook, in the most recent Summary of Economic Projections, which was compiled at the time of the June FOMC meeting, most FOMC participants projected that the appropriate level of the federal funds rate would be below its longer-run level through 2018.[6]

The size of the Federal Reserve's balance sheet has remained stable so far this year

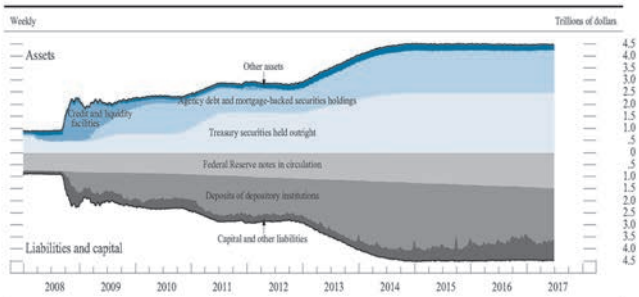
To help maintain accommodative financial conditions, the Committee has continued its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and rolling over maturing Treasury securities at auction. Consequently, the Federal Reserve's total assets have held steady at around $4.5 trillion, with holdings of U.S. Treasury securities at $2.5 trillion and holdings of agency debt and agency mortgage-backed securities at approximately $1.8 trillion (figure 45). Total liabilities on the Federal Reserve's balance sheet were also mostly unchanged over the first half of 2017.

The Committee intends to implement a balance sheet normalization program

In June, policymakers augmented the Committee's Policy Normalization Principles and Plans issued in September 2014 by providing additional details regarding the approach the FOMC intends to use to reduce

6. See the June 2017 Summary of Economic Projections, which appeared as an addendum to the minutes of the June 13–14, 2017, meeting of the Federal Open Market Committee and is included as Part 3 of this report.

45. Federal Reserve assets and liabilities



NOTE: "Credit and liquidity facilities" consists of primary, secondary, and seasonal credit; term auction credit; central bank liquidity swaps; support for Maiden Lane, Bear Stearns, and AIG; and other credit facilities, including the Primary Dealer Credit Facility, the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility, the Commercial Paper Funding Facility, and the Term Asset-Backed Securities Loan Facility. "Other assets" includes unamortized premiums and discounts on securities held outright. "Capital and other liabilities" includes reverse repurchase agreements, the U.S. Treasury General Account, and the U.S. Treasury Supplementary Financing Account. The data extend through June 28, 2017.
SOURCE: Federal Reserve Board, Statistical Release H.4.1, "Factors Affecting Reserve Balances."

the Federal Reserve's holdings of Treasury and agency securities once normalization of the federal funds rate is well under way.[7] The Committee intends to gradually reduce the Federal Reserve's securities holdings by decreasing its reinvestment of the principal payments it receives from the securities held in the System Open Market Account. Specifically, such payments will be reinvested only to the extent that they exceed gradually rising caps. Initially, these caps will be set at relatively low levels to limit the volume of securities that private investors will have to absorb. The Committee currently expects that, provided the economy evolves broadly as anticipated, it would likely begin to implement the program this year. In addition, the Committee affirmed that changing the target range for the federal funds rate remains its primary means of adjusting the stance of monetary policy (see the box "Addendum to the Policy Normalization Principles and Plans").

7. See Board of Governors of the Federal Reserve System (2017), "FOMC Issues Addendum to the Policy Normalization Principles and Plans," press release, June 14, https://www.federalreserve.gov/newsevents/pressreleases/monetary20170614c.htm.

The Federal Reserve's implementation of monetary policy has continued smoothly

The Federal Reserve successfully raised the effective federal funds rate in March and June of 2017 by increasing the interest rate paid on reserve balances along with the interest rate offered on overnight reverse repurchase agreements (ON RRPs). Specifically, the Federal Reserve increased the interest rate paid on required and excess reserve balances to 1.00 percent in March and 1.25 percent in June while increasing the ON RRP offering rate to 0.75 percent in March and 1.00 percent in June. In addition, the Board of Governors approved ¼ percentage point increases in the discount rate (the primary credit rate) in March and June. In both March and June, the effective federal funds rate rose near the middle of its new target range amid orderly trading conditions in money markets, closely tracked by most other overnight money market rates.

Usage of the ON RRP facility, which had increased late last year as a result of higher demand by government money market funds in the wake of last October's money fund reform, has declined some, on average, in recent months. However, usage has remained somewhat above its levels of one year ago.

Monetary Policy Rules and Their Role in the Federal Reserve's Policy Process

What are monetary policy rules?

Monetary policy rules are formulas that prescribe a tight link between a small number of economic variables—typically including the gap between actual and target inflation along with an estimate of resource slack in the economy—and the setting of a policy rate, such as the federal funds rate.[1] While policy rules can provide helpful guidance for policymakers, their interpretation requires careful judgment about the measurement of the inputs to these rules and the implications of the many considerations these rules do not take into account.

Policy rules can incorporate key principles of good monetary policy. One key principle is that monetary policy should respond in a predictable way to changes in economic conditions. A second key principle is that monetary policy should be accommodative when inflation is below the desired level and employment is below its maximum sustainable level; conversely, monetary policy should be restrictive when the opposite holds. A third key principle is that, to stabilize inflation, the policy rate should be adjusted by more than one-for-one in response to persistent increases or decreases in inflation.

Economists have analyzed many monetary policy rules, including the well-known Taylor (1993) rule as well as other rules discussed later: the "balanced approach" rule, the "adjusted Taylor (1993)" rule, the "change" rule, and the "first difference" rule (figure A).[2] These policy rules generally embody the three key principles of good monetary policy noted earlier. Each rule takes into account two gaps—the difference between inflation and its objective (2 percent as measured by the price index for personal consumption expenditures (PCE), in the case of the Federal Reserve) as well as the difference between the rate of unemployment in the longer run (u^{LR}) and the current unemployment rate.[3] Unlike the other rules, the first-difference rule considers the change in the unemployment gap rather than its level.

The Taylor (1993), balanced-approach, and adjusted Taylor (1993) rules provide prescriptions for the *level* of the federal funds rate and require an estimate of the neutral real interest rate in the longer run (r^{LR})—that is, the level of the real federal funds rate that is expected to be consistent with sustaining maximum employment and stable inflation in the longer run.[4] In contrast, the change and first-difference rules prescribe how the level of the federal funds rate at a given time should be altered from its previous level—that is, they indicate how the existing rate should *change* over time. The adjusted Taylor (1993) rule recognizes that the federal funds rate cannot be reduced materially below zero, implying that interest rate policy alone may not be able to provide enough policy accommodation during periods when the unadjusted Taylor (1993) rule prescribes setting the federal funds rate below zero. To make up for the cumulative shortfall in accommodation (Z_t), the adjusted rule prescribes only a gradual return of the policy rate to the (positive) levels prescribed by the unadjusted Taylor (1993) rule as the economy recovers.

The small number of variables involved in policy rules makes them easy to use. However, the U.S.

1. There is a lengthy academic and intellectual debate about using rules to guide monetary policy; prominent examples of rules heavily discussed in the literature and influential on policymaking in earlier periods include the gold standard and Milton Friedman's constant money growth rule.

2. The Taylor (1993) rule was first suggested in John B. Taylor (1993), "Discretion versus Policy Rules in Practice," *Carnegie-Rochester Conference Series on Public Policy*, vol. 39 (December), pp. 195–214. The balanced-approach rule was analyzed in John B. Taylor (1999), "A Historical Analysis of Monetary Policy Rules," in John B. Taylor, ed., *Monetary Policy Rules* (Chicago: University of Chicago Press), pp. 319–41. The adjusted Taylor (1993) rule was studied in David Reifschneider and John C. Williams (2000), "Three Lessons for Monetary Policy in a Low-Inflation Era," *Journal of Money, Credit, and Banking*, vol. 32 (November), pp. 936–66. The change rule was discussed in John B. Taylor (1999), "The Robustness and Efficiency of Monetary Policy Rules as Guidelines for Interest Rate Setting by the European Central Bank," *Journal of Monetary Economics*, vol. 43 (June), pp. 655–79. Finally, the first-difference rule was introduced by Athanasios Orphanides (2003), "Historical Monetary Policy Analysis and the Taylor Rule," *Journal of Monetary Economics*, vol. 50 (July), pp. 983–1022. A comprehensive review of policy rules is in John B. Taylor and John C. Williams (2011), "Simple and Robust Rules for Monetary Policy," in Benjamin M. Friedman and Michael Woodford, eds., *Handbook of Monetary Economics*, vol. 3B (Amsterdam: North-Holland), pp. 829–59. The same volume of the *Handbook of Monetary Economics* also discusses approaches other than policy rules for deriving policy rate prescriptions.

3. The Taylor (1993) rule represented slack in resource utilization using an output gap (the difference between the current level of real gross domestic product (GDP) and what GDP would be if the economy was operating at maximum employment). The rules in figure A represent slack in resource utilization using the unemployment gap instead, because that gap better captures the Federal Open Market Committee's statutory goal to promote maximum employment. Movements in these alternative measures of resource utilization are highly correlated. For more information, see the note below figure A.

4. Taylor-type rules—including John Taylor's original rule—have often been estimated assuming that the value of the neutral real interest rate in the longer run, r^{LR}, is equal to 2 percent, which roughly corresponds to the average historical value of the real federal funds rate before the financial crisis.

A. Monetary policy rules

Taylor (1993) rule	$R_t^{T93} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + (u_t^{LR} - u_t)$
Balanced-approach rule	$R_t^{BA} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + 2(u_t^{LR} - u_t)$
Taylor (1993) rule, adjusted	$R_t^{T93adj} = maximum\,\{R_t^{T93} - Z_t,\ 0\}$
Change rule	$R_t^{C} = R_{t-1} + 1.2(\pi_t - \pi^{LR}) + 2(u_t^{LR} - u_t)$
First-difference rule	$R_t^{FD} = R_{t-1} + 0.5(\pi_t - \pi^{LR}) + (u_t^{LR} - u_t) - (u_{t-4}^{LR} - u_{t-4})$

NOTE: R_t^{T93}, R_t^{BA}, R_t^{T93adj}, R_t^{C}, and R_t^{FD} represent the values of the nominal federal funds rate prescribed by the Taylor (1993), balanced-approach, adjusted Taylor (1993), change, and first-difference rules, respectively.

R_t denotes the actual nominal federal funds rate for quarter t, π_t is four-quarter price inflation for quarter t, and u_t is the unemployment rate in quarter t. r_t^{LR} is the level of the neutral real federal funds rate in the longer run that, on average, is expected to be consistent with sustaining maximum employment and inflation at its 2 percent longer-run objective, π^{LR}. u_t^{LR} is the rate of unemployment in the longer run. Z_t is the cumulative sum of past deviations of the federal funds rate from the prescriptions of the Taylor (1993) rule when that rule prescribes setting the federal funds rate below zero.

The Taylor (1993) rule and other policy rules are generally written in terms of the deviation of real output from its full capacity level. In these equations, the output gap has been replaced with the gap between the rate of unemployment in the longer run and its actual level (using a relationship known as Okun's law) in order to represent the rules in terms of the FOMC's statutory goals. Historically, movements in the output and unemployment gaps have been highly correlated. Footnote 2 provides references for the policy rules.

economy is highly complex, and these rules, by their very nature, do not capture that complexity. For example, while the unemployment rate is an important measure of the state of the labor market, it often lags business cycle developments and does not provide a complete measure of slack or tightness. In practice, Federal Open Market Committee (FOMC) policymakers examine a great deal of information about the labor market to gauge its health; this information includes broader measures of labor underutilization, the labor force participation rate, employment, hours worked, and the rates of job openings, hiring, layoffs, and quits, as well as anecdotal information not easily reduced to numerical indexes.[5]

Another issue related to the implementation of rules involves the measurement of the variables that drive the prescriptions generated by the rules. For example, there are many measures of inflation, and they do not always move together or by the same amount. The broadest measure of inflation, shown by the percent change in the gross domestic product price index, displays notable differences from measures that gauge changes in consumer prices (figure B). Even measures that focus

(continued on next page)

B. Inflation measures

SOURCE: Gross domestic product (GDP) and personal consumption expenditures (PCE) data are from the Bureau of Economic Analysis, Gross Domestic Product: Implicit Price Deflator (GDPDEF) and Personal Consumption Expenditures, retrieved from FRED, Federal Reserve Bank of St. Louis; consumer price index data are from the Department of Labor, Bureau of Labor Statistics.

5. For a discussion of these and other metrics of the labor market, see Hess Chung, Bruce Fallick, Christopher Nekarda, and David Ratner (2014), "Assessing the Change in Labor Market Conditions," FEDS Notes (Washington: Board of Governors of the Federal Reserve System, May 22), https://www.federalreserve.gov/econresdata/notes/feds-notes/2014/assessing-the-change-in-labor-market-conditions-20140522.html.

Monetary Policy Rules and Their Role in the Federal Reserve's Policy Process *(continued)*

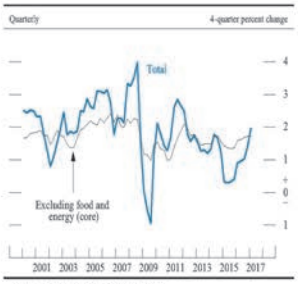
on the prices paid by consumers differ importantly. For example, inflation as measured by the consumer price index (or CPI) has generally been somewhat higher historically than inflation measured using the PCE price index (the index to which the FOMC's 2 percent longer-run inflation objective refers). Core inflation, meaning inflation excluding changes in food and energy prices, is less volatile than headline inflation and is often used in estimating monetary policy rules because it has historically been a good predictor of future headline inflation (figure C).

In addition, both the level of the neutral real interest rate in the longer run and the level of the unemployment rate that is sustainable in the longer run are difficult to estimate precisely, and estimates made in real time may differ substantially from estimates made later on, after the relevant economic data have been revised and additional data have become available.[6] For example, since 2000, respondents to the Blue Chip survey have markedly reduced their projections of the longer-run level of the real short-term interest rate (figure D). Survey respondents have also made considerable changes over time to their estimates of the rate of unemployment in the longer run, with consequences for the unemployment gap. Revisions of this magnitude to the neutral real interest rate and the rate of unemployment in the longer run can have important implications for the federal funds rate prescribed by monetary policy rules. Sensible estimation of policy rules requires that policymakers take into account these changes in the projected values of longer-run rates as they occur over time.

Furthermore, the prescribed responsiveness of the federal funds rate to its determinants differs across policy rules. For example, the sensitivity of the federal funds rate to the unemployment gap in the balanced-approach rule is twice as large as it is in the Taylor (1993) rule. The fact that the policy interest rate responds differently to the inflation and unemployment gaps in the different policy rules means that the rules provide different tradeoffs between stabilizing inflation and stabilizing unemployment.

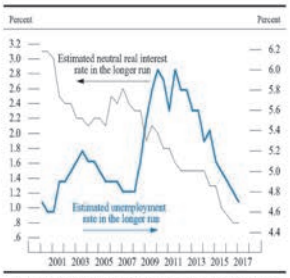
Finally, monetary policy rules do not take account of broader risk considerations. For example, policymakers routinely assess risks to financial stability. Furthermore, over the past few years, with the federal funds rate still close to zero, the FOMC has recognized that it would have limited scope to respond to an unexpected weakening in the economy by lowering short-term interest rates. This asymmetric risk has, in recent years, provided a sound rationale for following a more gradual path of rate increases than that prescribed by policy rules. (Asymmetric risk need not always provide a rationale for a more gradual path; if the risks were strongly tilted toward substantial and persistent overheating and too-high inflation, the asymmetric

C. Total inflation versus core inflation



SOURCE: Bureau of Economic Analysis.

D. Real-time estimates of the neutral real interest rate and the unemployment rate in the longer run



NOTE: The data for the estimated neutral real interest rate in the longer run and the estimated unemployment rate in the longer run are biannual and have been interpolated to yield quarterly values. The estimated neutral real interest rate in the longer run equals the three-month Treasury bill rate projected in the long run deflated by the long-run projected annual change in the price index for gross domestic product.

SOURCE: Wolters Kluwer, Blue Chip Economic Indicators.

6. The change and first-difference rules shown in figure A reduce the need for good estimates of longer-run rates because they do not require an estimate of the neutral real interest rate in the longer run. However, these rules have their own shortcomings. For example, research suggests that such rules will result in greater volatility in employment and inflation relative to what would be obtained under the Taylor (1993) and balanced-approach rules unless the estimates of the neutral real federal funds rate in the longer run and the rate of unemployment in the longer run are sufficiently far from their true values.

risk could argue for higher rates than prescribed by simple rules.)

How does the FOMC use monetary policy rules?

In the briefing materials prepared for FOMC meetings, Federal Reserve staff regularly report prescriptions for the current setting of the federal funds rate from a number of monetary policy rules.[7] FOMC policymakers discussed prescriptions from monetary policy rules as long ago as 1995 and have consulted them routinely since 2004. The materials that FOMC policymakers see also include forecasts of how the federal funds rate and key macro indicators would evolve, under each of the rules, several years into the future. Policymakers weigh this information, along with other information bearing on the economic outlook.[8]

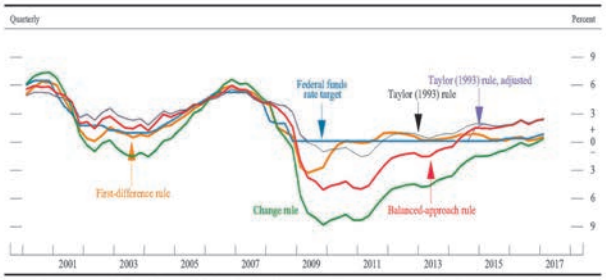
Different monetary policy rules often offer quite different prescriptions for the federal funds rate; moreover, there is no obvious metric for favoring one rule over another. While monetary policy rules often agree about the direction (up or down) in which policymakers should move the federal funds rate, they frequently disagree about the appropriate level of that rate. Historical prescriptions from policy rules differ from one another and also differ from the Committee's target for the federal funds rate, as shown in figure E. (These prescriptions are calculated using both the actual data and the estimates of the neutral real interest rate in the longer run and of the rate of unemployment in the longer run—data and estimates that were available to FOMC policymakers at the time.) Moreover, the rules sometimes prescribe setting short-term interest rates well below zero—a setting that is not feasible. With the exception of the adjusted Taylor (1993) rule, which imposes a lower limit of zero, all of the rules shown in figure E called for the federal funds rate to turn negative in 2009 and to stay below zero for several years thereafter. Thus, these rules indicated that the Federal Reserve should provide more monetary stimulus than could be achieved by setting the federal funds rate at zero. While all of the policy rules have called for higher values of the federal funds rate in recent years, the pace of tightening that the rules prescribe has varied widely. Prescriptions from these rules for the level of the federal funds rate in the first quarter of 2017 ranged from 37 basis points (change rule) to 2.5 percent (balanced-approach rule).[9]

7. Prescriptions from monetary policy rules are included in the Board staff's Tealbook (previously the Bluebook); the precise set of rules presented has changed from time to time. The transcripts and briefing materials for FOMC meetings through 2011 are available on the Board's website at https://www.federalreserve.gov/monetarypolicy/fomc_historical.htm. In the materials from 2011, the policy rule prescriptions are contained in the Monetary Policy Strategies section of Tealbook B.

8. The briefing materials that FOMC policymakers review regularly include the Board staff's baseline forecast for the economy and model simulations of a variety of alternative scenarios intended to provide a sense of the effects of other plausible developments that were not included in the staff's baseline forecast.

9. As noted earlier, the adjusted rule limits increases in the federal funds rate for a time during economic recoveries to make up for past shortfalls in accommodation caused by the zero lower limit on interest rates. This principle can also be applied to the prescriptions of the other rules. If applied to the balanced-approach rule, for example, it would have called for the federal funds rate to have remained at zero at least through the first quarter of 2017.

E. Historical federal funds rate prescriptions from simple policy rules



NOTE: The rules use real-time historical values of inflation, the federal funds rate, and the unemployment rate. Inflation is measured as the four-quarter percent change in the price index for personal consumption expenditures excluding food and energy. Quarterly projections of long-run values for the federal funds rate and the unemployment rate are derived through interpolations of biannual projections from Blue Chip Economic Indicators. The long-run value for inflation is taken as 2 percent.

SOURCE: Federal Reserve Bank of Philadelphia; Wolters Kluwer, Blue Chip Economic Indicators; Federal Reserve Board staff estimates.

Addendum to the Policy Normalization Principles and Plans

Adopted effective September 16, 2014; as amended effective June 14, 2017

All participants agreed to augment the Committee's Policy Normalization Principles and Plans by providing the following additional details regarding the approach the FOMC intends to use to reduce the Federal Reserve's holdings of Treasury and agency securities once normalization of the level of the federal funds rate is well under way.[1]

- The Committee intends to gradually reduce the Federal Reserve's securities holdings by decreasing its reinvestment of the principal payments it receives from securities held in the System Open Market Account. Specifically, such payments will be reinvested only to the extent that they exceed gradually rising caps.
  - For payments of principal that the Federal Reserve receives from maturing Treasury securities, the Committee anticipates that the cap will be $6 billion per month initially and will increase in steps of $6 billion at three-month intervals over 12 months until it reaches $30 billion per month.
  - For payments of principal that the Federal Reserve receives from its holdings of agency debt and mortgage-backed securities, the Committee anticipates that the cap will be $4 billion per month initially and will increase in steps of $4 billion at three-month intervals over 12 months until it reaches $20 billion per month.
  - The Committee also anticipates that the caps will remain in place once they reach their respective maximums so that the Federal Reserve's securities holdings will continue to decline in a gradual and predictable manner until the Committee judges that the Federal Reserve is holding no more securities than necessary to implement monetary policy efficiently and effectively.
- Gradually reducing the Federal Reserve's securities holdings will result in a declining supply of reserve balances. The Committee currently anticipates reducing the quantity of reserve balances, over time, to a level appreciably below that seen in recent years but larger than before the financial crisis; the level will reflect the banking system's demand for reserve balances and the Committee's decisions about how to implement monetary policy most efficiently and effectively in the future. The Committee expects to learn more about the underlying demand for reserves during the process of balance sheet normalization.
- The Committee affirms that changing the target range for the federal funds rate is its primary means of adjusting the stance of monetary policy. However, the Committee would be prepared to resume reinvestment of principal payments received on securities held by the Federal Reserve if a material deterioration in the economic outlook were to warrant a sizable reduction in the Committee's target for the federal funds rate. Moreover, the Committee would be prepared to use its full range of tools, including altering the size and composition of its balance sheet, if future economic conditions were to warrant a more accommodative monetary policy than can be achieved solely by reducing the federal funds rate.

1. The Committee's Policy Normalization Principles and Plans were adopted on September 16, 2014, and are available at www.federalreserve.gov/monetarypolicy/files/FOMC_PolicyNormalization.pdf. On March 18, 2015, the Committee adopted an addendum to the Policy Normalization Principles and Plans, which is available at www.federalreserve.gov/monetarypolicy/files/FOMC_PolicyNormalization.20150318.pdf.

Part 3
Summary of Economic Projections

The following material appeared as an addendum to the minutes of the June 13–14, 2017, meeting of the Federal Open Market Committee.

In conjunction with the Federal Open Market Committee (FOMC) meeting held on June 13–14, 2017, meeting participants submitted their projections of the most likely outcomes for real output growth, the unemployment rate, and inflation for each year from 2017 to 2019 and over the longer run.[8] Each participant's projection was based on information available at the time of the meeting, together with his or her assessment of appropriate monetary policy, including a path for the federal funds rate and its longer-run value, and assumptions about other factors likely to affect economic outcomes.[9] The longer-run projections represent each participant's assessment of the value to which each variable would be expected to converge, over time, under appropriate monetary policy and in the absence of further shocks to the economy.[10] "Appropriate monetary policy" is defined as the future path of policy that each participant deems most likely to foster outcomes for economic activity and inflation that best satisfy his or her individual interpretation of the Federal Reserve's objectives of maximum employment and stable prices.

All participants who submitted longer-run projections expected that, under appropriate monetary policy, growth in real gross domestic product (GDP) this year would run somewhat above their individual estimates of its longer-run rate. Over half of these participants expected that economic growth would slow a bit in 2018, and almost all of them expected that in 2019 economic growth would run at or near its longer-run level. All participants who submitted longer-run projections expected that the unemployment rate would run below their estimates of its longer-run normal level in 2017 and remain below that level through 2019. The majority of participants also lowered their estimates of the longer-run normal rate of unemployment by 0.1 to 0.2 percentage point. All participants projected that inflation, as measured by the four-quarter percentage change in the price index for personal consumption expenditures (PCE), would run below 2 percent in 2017 and then step up in the next two years; over half of them projected that inflation would be at the Committee's 2 percent objective in 2019, and all judged that inflation would be within a couple of tenths of a percentage point of the objective in that year. Table 1 and figure 1 provide summary statistics for the projections.

As shown in figure 2, participants generally expected that evolving economic conditions would likely warrant further gradual increases in the federal funds rate to achieve and sustain maximum employment and 2 percent inflation. Although some participants raised or lowered their federal funds rate projections since March, the median projections for the federal funds rate in 2017 and 2018 were essentially unchanged, and the median projection in 2019 was slightly lower; the median projection for the longer-run federal funds rate was

8. Four members of the Board of Governors, one fewer than in March 2017, were in office at the time of the June 2017 meeting and submitted economic projections. The office of the president of the Federal Reserve Bank of Richmond was vacant at the time of this FOMC meeting; First Vice President Mark L. Mullinix submitted economic projections.

9. All participants submitted their projections in advance of the FOMC meeting; no projections were revised following the release of economic data on the morning of June 14.

10. One participant did not submit longer-run projections for real output growth, the unemployment rate, or the federal funds rate.

Table 1. Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents under their individual assessments of projected appropriate monetary policy, June 2017

Percent

Variable	Median[1]				Central tendency[2]				Range[3]			
	2017	2018	2019	Longer run	2017	2018	2019	Longer run	2017	2018	2019	Longer run
Change in real GDP	2.2	2.1	1.9	1.8	2.1–2.2	1.8–2.2	1.8–2.0	1.8–2.0	2.0–2.5	1.7–2.3	1.4–2.3	1.5–2.2
March projection	2.1	2.1	1.9	1.8	2.0–2.2	1.8–2.3	1.8–2.0	1.8–2.0	1.7–2.3	1.7–2.4	1.5–2.2	1.6–2.2
Unemployment rate	4.3	4.2	4.2	4.6	4.2–4.3	4.0–4.3	4.1–4.4	4.5–4.8	4.1–4.5	3.9–4.5	3.8–4.5	4.5–5.0
March projection	4.5	4.5	4.5	4.7	4.5–4.6	4.3–4.6	4.3–4.7	4.7–5.0	4.4–4.7	4.2–4.7	4.1–4.8	4.5–5.0
PCE inflation	1.6	2.0	2.0	2.0	1.6–1.7	1.8–2.0	2.0–2.1	2.0	1.5–1.8	1.7–2.1	1.8–2.2	2.0
March projection	1.9	2.0	2.0	2.0	1.8–2.0	1.9–2.0	2.0–2.1	2.0	1.7–2.1	1.8–2.1	1.8–2.2	2.0
Core PCE inflation[4]	1.7	2.0	2.0		1.6–1.7	1.8–2.0	2.0–2.1		1.6–1.8	1.7–2.1	1.8–2.2	
March projection	1.9	2.0	2.0		1.8–1.9	1.9–2.0	2.0–2.1		1.7–2.0	1.8–2.1	1.8–2.2	
Memo: Projected appropriate policy path												
Federal funds rate	1.4	2.1	2.9	3.0	1.1–1.6	1.9–2.6	2.6–3.1	2.8–3.0	1.1–1.6	1.1–3.1	1.1–4.1	2.5–3.5
March projection	1.4	2.1	3.0	3.0	1.4–1.6	2.1–2.9	2.6–3.3	2.8–3.0	0.9–2.1	0.9–3.4	0.9–3.9	2.5–3.8

Note: Projections of change in real gross domestic product (GDP) and projections for both measures of inflation are percent changes from the fourth quarter of the previous year to the fourth quarter of the year indicated. PCE inflation and core PCE inflation are the percentage rates of change in, respectively, the price index for personal consumption expenditures (PCE) and the price index for PCE excluding food and energy. Projections for the unemployment rate are for the average civilian unemployment rate in the fourth quarter of the year indicated. Each participant's projections are based on his or her assessment of appropriate monetary policy. Longer-run projections represent each participant's assessment of the rate to which each variable would be expected to converge under appropriate monetary policy and in the absence of further shocks to the economy. The projections for the federal funds rate are the value of the midpoint of the projected appropriate target range for the federal funds rate or the projected appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. The March projections were made in conjunction with the meeting of the Federal Open Market Committee on March 14–15, 2017. One participant did not submit longer-run projections for the change in real GDP, the unemployment rate, or the federal funds rate in conjunction with the March 14–15, 2017, meeting, and one participant did not submit such projections in conjunction with the June 13–14, 2017, meeting.

1. For each period, the median is the middle projection when the projections are arranged from lowest to highest. When the number of projections is even, the median is the average of the two middle projections.
2. The central tendency excludes the three highest and three lowest projections for each variable in each year.
3. The range for a variable in a given year includes all participants' projections, from lowest to highest, for that variable in that year.
4. Longer-run projections for core PCE inflation are not collected.

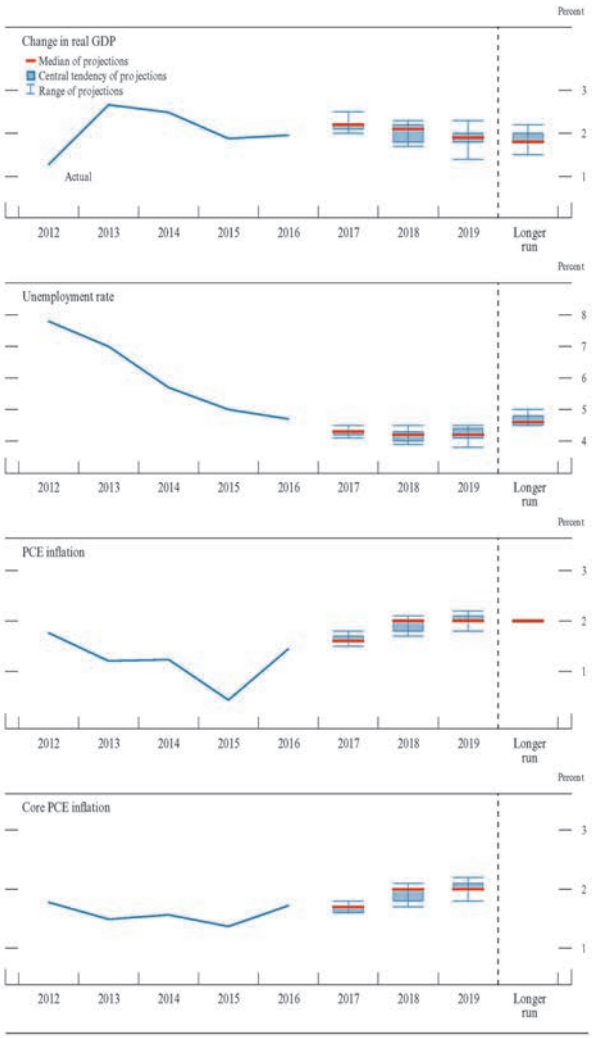
unchanged. However, the economic outlook is uncertain, and participants noted that their economic projections and assessments of appropriate monetary policy could change in response to incoming information.

In general, participants viewed the uncertainty attached to their projections as broadly similar to the average of the past 20 years, although a couple of participants saw the uncertainty associated with their real GDP growth forecasts as higher than average. Most participants judged the risks around their projections for economic growth, the unemployment rate, and inflation as broadly balanced.

Figures 4.A through 4.C for real GDP growth, the unemployment rate, and inflation, respectively, present "fan charts" as well as charts of participants' current assessments of the uncertainty and risks surrounding the economic projections. The fan charts (the panels at the top of these three figures) show the median projections surrounded by confidence intervals that are computed from the forecast errors of various private and government projections made over the past 20 years. The width of the confidence interval for each variable at a given point is a measure of forecast uncertainty at that horizon. For all three macroeconomic variables, these charts illustrate that forecast uncertainty is substantial and generally increases as the forecast horizon lengthens. Reflecting, in part, the uncertainty about the future evolution of GDP growth, the unemployment rate, and inflation, participants' assessments of appropriate monetary policy are also subject to considerable uncertainty. To illustrate the uncertainty regarding the appropriate path for monetary policy, figure 5 shows a comparable fan chart around the median projections for the federal funds rate.[11] As with the

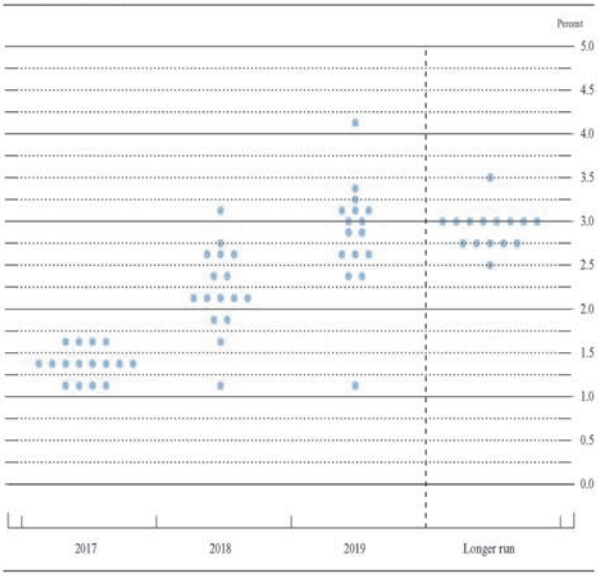
11. The fan chart for the federal funds rate depicts the uncertainty about the future path of appropriate monetary policy and is closely connected with the uncertainty about the future value of economic variables. In contrast, the dot plot shown in figure 2 displays the

Figure 1. Medians, central tendencies, and ranges of economic projections, 2017–19 and over the longer run



Note: Definitions of variables and other explanations are in the notes to table 1. The data for the actual values of the variables are annual.

Figure 2. FOMC participants' assessments of appropriate monetary policy: Midpoint of target range or target level for the federal funds rate



NOTE: Each shaded circle indicates the value (rounded to the nearest 1/8 percentage point) of an individual participant's judgment of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. One participant did not submit longer-run projections for the federal funds rate.

macroeconomic variables, forecast uncertainty for the federal funds rate is substantial and increases at longer horizons.

The Outlook for Economic Activity

The median of participants' projections for the growth rate of real GDP, conditional on their individual assumptions about appropriate monetary policy, was 2.2 percent in 2017, 2.1 percent in 2018, and 1.9 percent in 2019; the median of projections for the longer-run normal rate of real GDP growth was 1.8 percent. Compared with the March Summary of Economic Projections (SEP), the medians of the forecasts for real GDP growth over the period from 2017 to 2019, as well as the median assessment of the longer-run growth rate, were mostly unchanged. Fewer than half of the participants incorporated expectations of fiscal stimulus into their projections, and a couple indicated that they had marked down the magnitude of expected fiscal stimulus relative to March.

All participants revised down their projections for the unemployment rate in the fourth quarter of 2017 and of 2018, and almost all also revised down their projections for the

dispersion of views across individual participants about the appropriate level of the federal funds rate.

unemployment rate in the fourth quarter of 2019. Many who did so cited recent lower-than-expected readings on unemployment. The median of the projections for the unemployment rate was 4.3 percent in 2017 and 4.2 percent in each of 2018 and 2019, 0.2 percentage point and 0.3 percentage point lower than in the March projections, respectively. The majority of participants also revised down their estimates of the longer-run normal rate of unemployment by 0.1 or 0.2 percentage point, and the median longer-run level was 4.6 percent, down 0.1 percentage point from March.

Figures 3.A and 3.B show the distributions of participants' projections for real GDP growth and the unemployment rate from 2017 to 2019 and in the longer run. The distribution of individual projections for real GDP growth for this year shifted up, with some participants now expecting real GDP growth between 2.4 and 2.5 percent and none seeing it below 2 percent. The distributions of projected real GDP growth in 2018, 2019, and in the longer run were broadly similar to the distributions of the March projections. The distributions of individual projections for the unemployment rate shifted down noticeably for 2017 and 2018. Most participants projected an unemployment rate of 4.2 or 4.3 percent at the end of this year, and the majority anticipated an unemployment rate between 4.0 and 4.3 percent at the end of 2018. Participants' projections also shifted down in 2019 but were more dispersed than the distributions of their projected unemployment rates in the two earlier years. The distribution of projections for the longer-run normal unemployment rate shifted down modestly.

The Outlook for Inflation

The median of projections for headline PCE price inflation this year was 1.6 percent, down 0.3 percentage point from March. As in March, median projected inflation was 2.0 percent in 2018 and 2019. About half of the participants anticipated that inflation would continue to run a bit below 2 percent in 2018, while only one participant expected inflation above 2 percent in that year—and, in that case, just modestly so. More than half projected that inflation would be equal to the Committee's objective in 2019. A few participants projected that inflation would run slightly below 2 percent in that year, while several projected that it would run a little above 2 percent. The median of projections for core PCE price inflation was 1.7 percent in 2017, a decline of 0.2 percentage point from March; the median projection for 2018 and 2019 was 2.0 percent, as in the March projections.

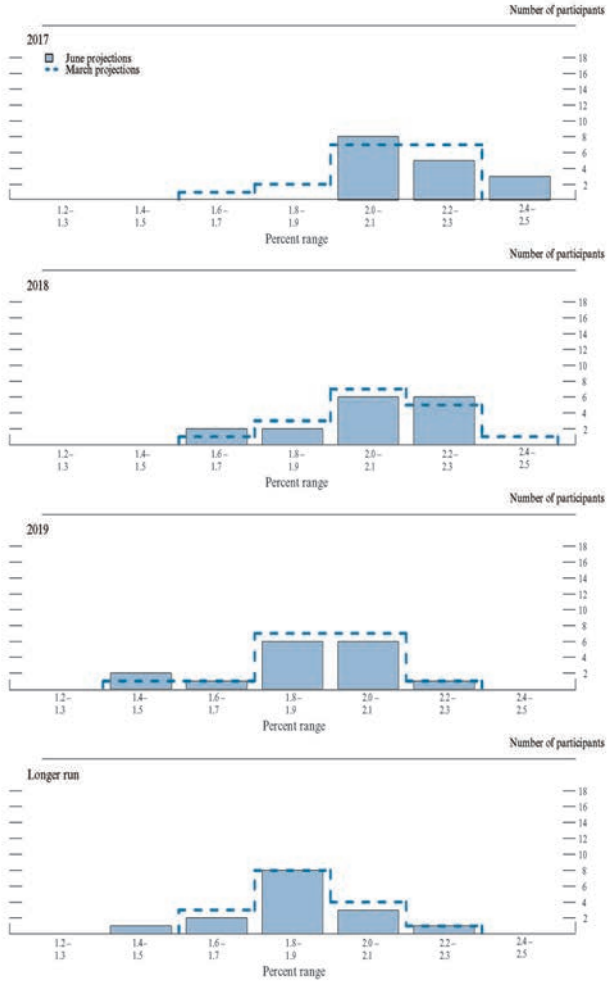
Figures 3.C and 3.D provide information on the distributions of participants' views about the outlook for inflation. The distributions of projections for headline PCE price inflation and for core PCE price inflation in 2017 shifted down noticeably from March, while the distributions for both measures of inflation in 2018 shifted down slightly. Many participants cited recent surprisingly low readings on inflation as a factor contributing to the revisions in their inflation forecasts.

Appropriate Monetary Policy

Figure 3.E provides the distribution of participants' judgments regarding the appropriate target or midpoint of the target range for the federal funds rate at the end of each year from 2017 to 2019 and over the longer run.[12] The distribution for 2017 was less dispersed than that in March, while the distribution for 2018 was slightly less

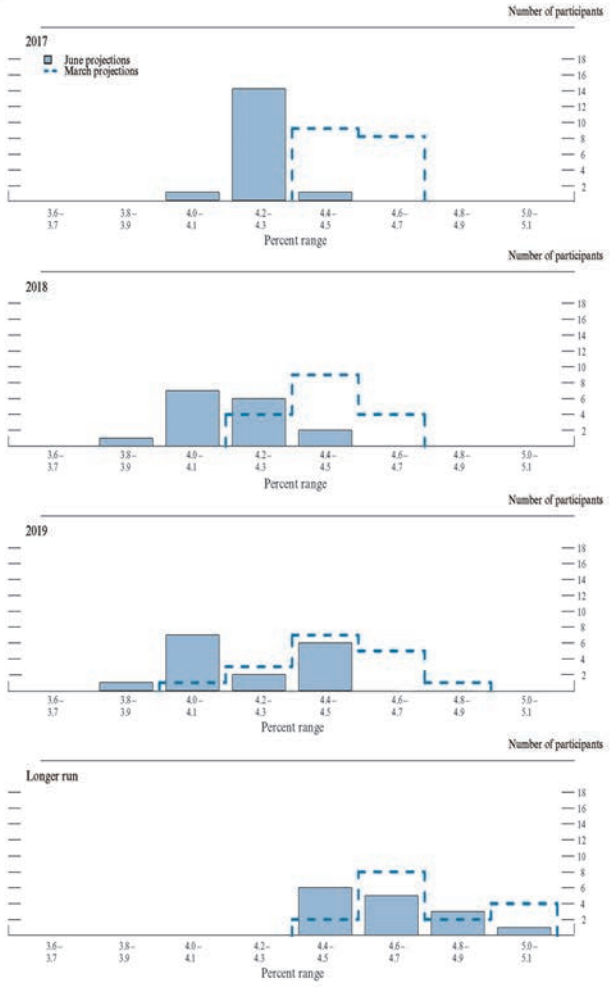
12. One participant's projections for the federal funds rate, real GDP growth, the unemployment rate, and inflation were informed by the view that there are multiple possible medium-term regimes for the U.S. economy, that these regimes are persistent, and that the economy shifts between regimes in a way that cannot be forecast. Under this view, the economy currently is in a regime characterized by expansion of economic activity with low productivity growth and a low short-term real interest rate, but longer-term outcomes for variables other than inflation cannot be usefully projected.

Figure 3.A. Distribution of participants' projections for the change in real GDP, 2017–19 and over the longer run



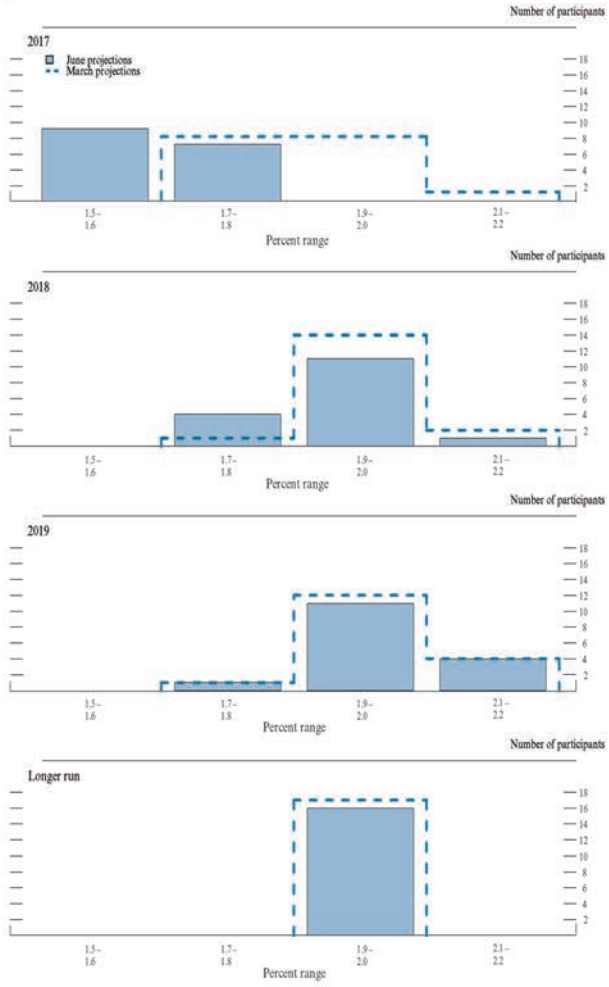
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.B. Distribution of participants' projections for the unemployment rate, 2017–19 and over the longer run



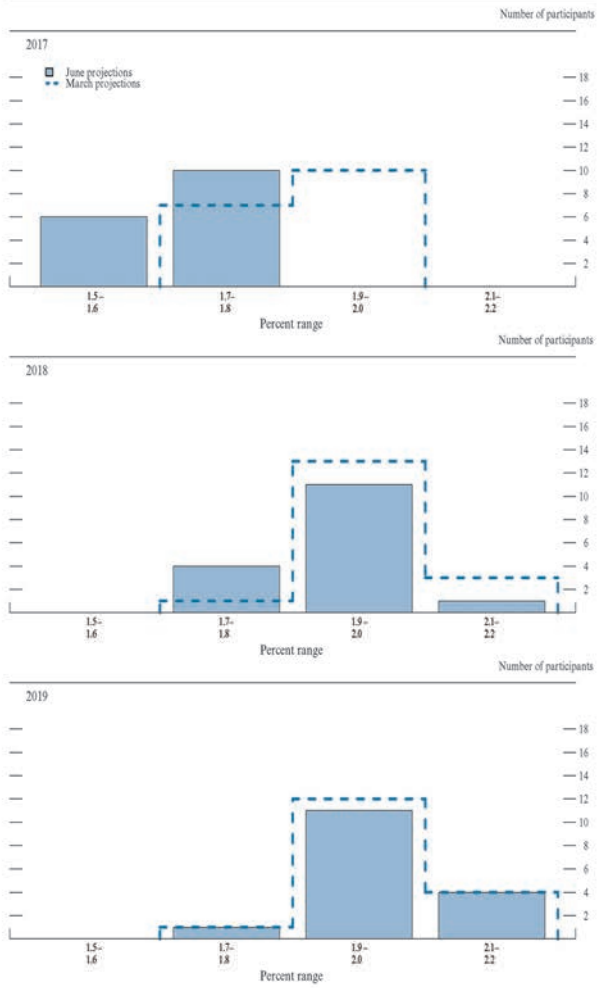
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.C. Distribution of participants' projections for PCE inflation, 2017–19 and over the longer run



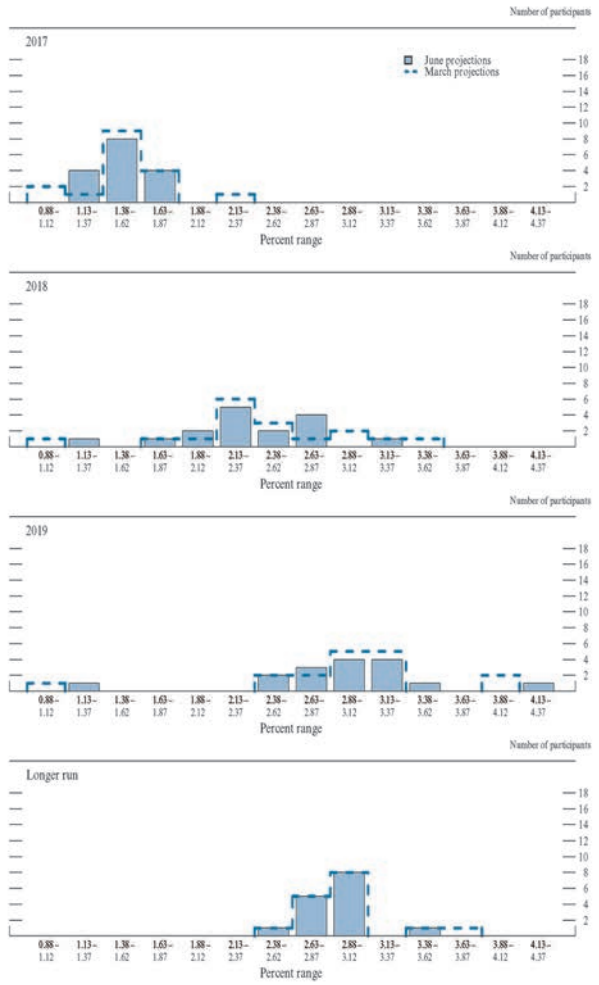
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.D. Distribution of participants' projections for core PCE inflation, 2017–19



NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.E. Distribution of participants' judgments of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate, 2017–19 and over the longer run



NOTE: Definitions of variables and other explanations are in the notes to table 1.

dispersed. The distributions in 2019 and in the longer run were broadly similar to those in March. The median projections of the federal funds rate continued to show gradual increases, with the median assessment for 2017 standing at 1.38 percent, consistent with three 25 basis point increases this year. Thereafter, the medians of the projections were 2.13 percent at the end of 2018 and 2.94 percent at the end of 2019; the median of the longer-run projections of the federal funds rate was 3.00 percent.

In discussing their June projections, many participants continued to express the view that the appropriate upward trajectory of the federal funds rate over the next few years would likely be gradual. That anticipated pace reflected a few factors, such as a neutral real interest rate that was currently low and was expected to move up only slowly as well as a gradual return of inflation to the Committee's 2 percent objective. Several participants judged that a slightly more accommodative path of monetary policy than in their previous projections would likely be appropriate, citing an apparently slower rate of progress toward the Committee's 2 percent inflation objective. In their discussions of appropriate monetary policy, half of the participants commented on the Committee's reinvestment policy; all of those who did so expected a change in reinvestment policy before the end of this year.

Uncertainty and Risks

Projections of economic variables are subject to considerable uncertainty. In assessing the path of monetary policy that, in their view, is likely to be most appropriate, FOMC participants take account of the range of possible outcomes, the likelihood of those outcomes, and the potential benefits and costs to the economy should they occur. Table 2 provides one measure of forecast uncertainty for the change in real GDP, the unemployment rate, and total consumer price inflation—the root mean squared error (RMSE) for forecasts made over the past 20 years. This measure of forecast uncertainty is incorporated graphically in the top panels of figures 4.A, 4.B, and 4.C, which display fan charts plotting the median SEP projections for the three variables surrounded by symmetric confidence intervals derived from the RMSEs presented in table 2. If the degree of uncertainty attending these projections is similar to the typical magnitude of past forecast errors and if the risks around the projections are broadly balanced, future outcomes of these variables would have about a 70 percent probability of occurring within these confidence intervals. For all three variables, this measure of forecast uncertainty is substantial and generally increases as the forecast horizon lengthens.

Table 2. Average historical projection error ranges

Percentage points

Variable	2017	2018	2019
Change in real GDP[1]	±1.4	±2.0	±2.2
Unemployment rate[1]	±0.4	±1.2	±1.8
Total consumer prices[2]	±0.8	±1.0	±1.0
Short-term interest rates[3]	±0.7	±2.0	±2.2

NOTE: Error ranges shown are measured as plus or minus the root mean squared error of projections for 1997 through 2016 that were released in the summer by various private and government forecasters. As described in the box "Forecast Uncertainty," under certain assumptions, there is about a 70 percent probability that actual outcomes for real GDP, unemployment, consumer prices, and the federal funds rate will be in ranges implied by the average size of projection errors made in the past. For more information, see David Reifschneider and Peter Tulip (2017), "Gauging the Uncertainty of the Economic Outlook Using Historical Forecasting Errors: The Federal Reserve's Approach," Finance and Economics Discussion Series 2017-020 (Washington: Board of Governors of the Federal Reserve System, February), available at www.federalreserve.gov/econresdata/feds/2017/files/2017020pap.pdf.

1. Definitions of variables are in the general note to table 1.

2. Measure is the overall consumer price index, the price measure that has been most widely used in government and private economic forecasts. Projection is percent change, fourth quarter of the previous year to the fourth quarter of the year indicated.

3. For Federal Reserve staff forecasts, measure is the federal funds rate. For other forecasts, measure is the rate on 3-month Treasury bills. Historical projections are the average level, in percent, in the fourth quarter of the year indicated.

FOMC participants may judge that the width of the historical fan charts shown in figures 4.A through 4.C does not adequately capture their current assessments of the degree of uncertainty that surrounds their economic projections. Participants' assessments of the current level of uncertainty surrounding their economic projections are shown in the bottom-left panels of figures 4.A, 4.B, and 4.C. All or nearly all participants viewed the uncertainty attached to their economic projections as

broadly similar to the average of the past 20 years, with three fewer participants than in March seeing uncertainty about GDP growth, the unemployment rate, and inflation as higher than its historical average.[13] In their discussion of the uncertainty attached to their current projections, most participants again expressed the view that, at this point, uncertainty surrounding prospective changes in fiscal and other government policies is very large or that there is not yet enough information to make reasonable assumptions about the timing, nature, and magnitude of the changes.

The fan charts—which are constructed so as to be symmetric around the median projections—also may not fully reflect participants' current assessments of the balance of risks to their economic projections. Participants' assessments of the balance of risks to their economic projections are shown in the bottom-right panels of figures 4.A, 4.B, and 4.C. As in March, most participants judged the risks to their projections of real GDP growth, the unemployment rate, headline inflation, and core inflation as broadly balanced—in other words, as broadly consistent with a symmetric fan chart. Three participants judged the risks to the unemployment rate as weighted to the downside, and one participant judged the risks as weighted to the upside (as shown in the lower-right panel of figure 4.B). In addition, the balance of risks to participants' inflation projections shifted down slightly from March (shown in the lower-right panels of figure 4.C), as two fewer participants judged the risks to inflation to be weighted to the upside and two more viewed the risks as weighted to the downside.

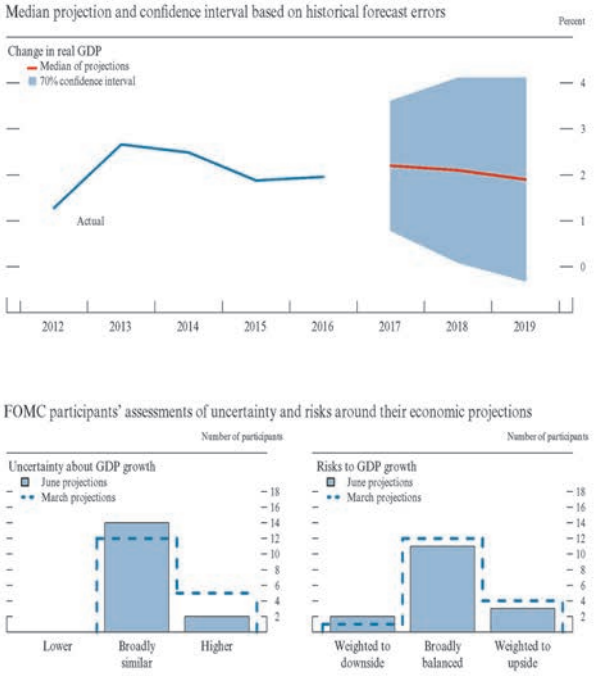
13. At the end of this summary, the box "Forecast Uncertainty" discusses the sources and interpretation of uncertainty in the economic forecasts and explains the approach used to assess the uncertainty and risks attending the participants' projections.

Participants' assessments of the future path of the federal funds rate consistent with appropriate policy are also subject to considerable uncertainty, reflecting in part uncertainty about the evolution of GDP growth, the unemployment rate, and inflation over time. The final line in table 2 shows the RMSEs for forecasts of short-term interest rates. These RMSEs are not strictly consistent with the SEP projections for the federal funds rate, in part because the SEP projections are not forecasts of the likeliest outcomes but rather reflect each participant's individual assessment of appropriate monetary policy. However, the associated confidence intervals provide a sense of the likely uncertainty around the future path of the federal funds rate generated by the uncertainty about the macroeconomic variables and additional adjustments to monetary policy that may be appropriate to offset the effects of shocks to the economy.

Figure 5 shows a fan chart plotting the median SEP projections for the appropriate path of the federal funds rate surrounded by confidence intervals derived from the results presented in table 2. As with the macroeconomic variables, forecast uncertainty is substantial and increases at longer horizons.[14]

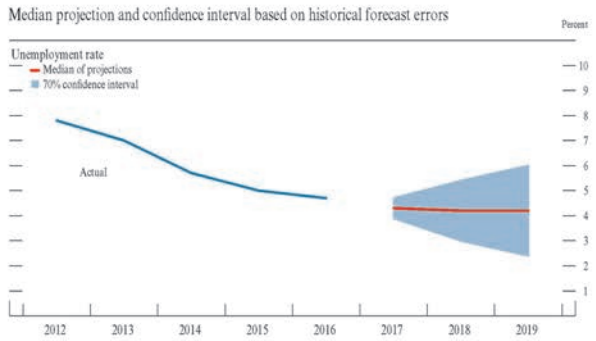
14. If at some point in the future the confidence interval around the federal funds rate were to extend below zero, it would be truncated at zero for purposes of the chart shown in figure 5; zero is the bottom of the lowest target range for the federal funds rate that has been adopted by the Committee in the past. This approach to the construction of the federal funds rate fan chart would be merely a convention and would not have any implication for possible future policy decisions regarding the use of negative interest rates to provide additional monetary policy accommodation if doing so were appropriate.

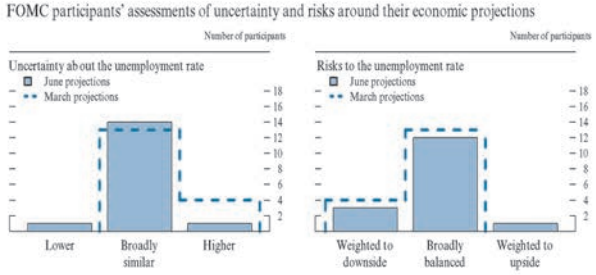
Figure 4.A. Uncertainty and risks in projections of GDP growth



NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in real gross domestic product (GDP) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years; more information about these data is available in table 2. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections; these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty."

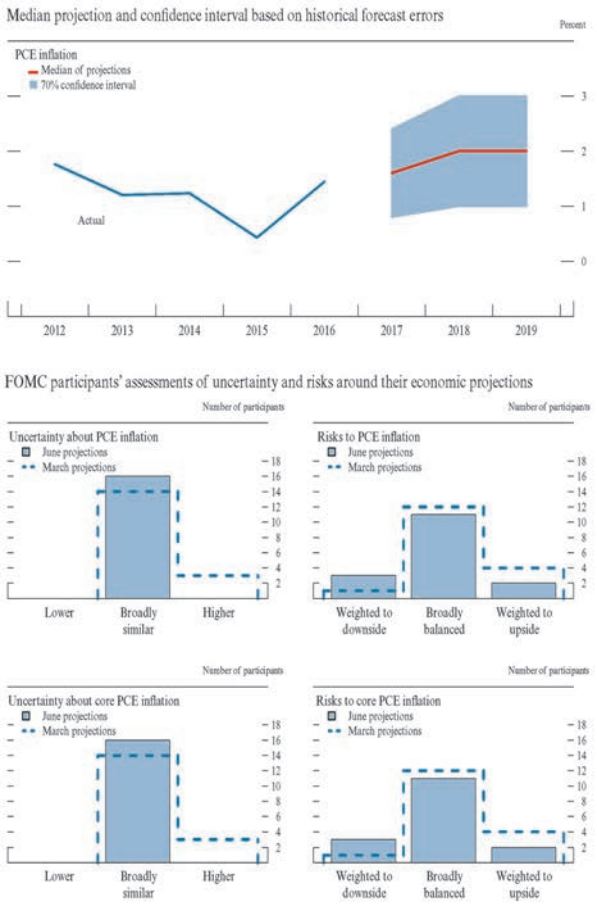
Figure 4.B. Uncertainty and risks in projections of the unemployment rate





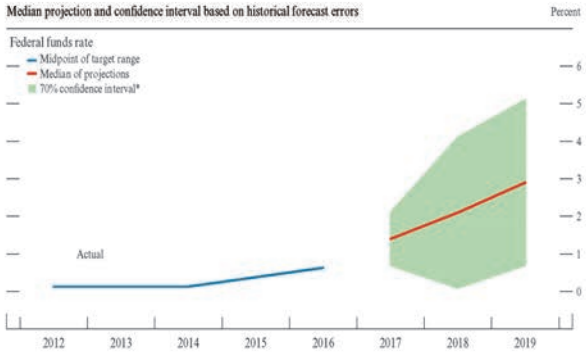
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the average civilian unemployment rate in the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years; more information about these data is available in table 2. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections; these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty."

Figure 4.C. Uncertainty and risks in projections of PCE inflation



NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in the price index for personal consumption expenditures (PCE) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years; more information about these data is available in table 2. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections; these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty."

Figure 5. Uncertainty in projections of the federal funds rate



NOTE: The blue and red lines are based on actual values and median projected values, respectively, of the Committee's target for the federal funds rate at the end of the year indicated. The actual values are the midpoint of the target range; the median projected values are based on either the midpoint of the target range or the target level. The confidence interval around the median projected values is based on root mean squared errors of various private and government forecasts made over the previous 20 years. The confidence interval is not strictly consistent with the projections for the federal funds rate, primarily because these projections are not forecasts of the likeliest outcomes for the federal funds rate, but rather projections of participants' individual assessments of appropriate monetary policy. Still, historical forecast errors provide a broad sense of the uncertainty around the future path of the federal funds rate generated by the uncertainty about the macroeconomic variables as well as additional adjustments to monetary policy that may be appropriate to offset the effects of shocks to the economy.

The confidence interval is assumed to be symmetric except when it is truncated at zero—the bottom of the lowest target range for the federal funds rate that has been adopted in the past by the Committee. This truncation would not be intended to indicate the likelihood of the use of negative interest rates to provide additional monetary policy accommodation if doing so was judged appropriate. In such situations, the Committee could also employ other tools, including forward guidance and large-scale asset purchases, to provide additional accommodation. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections.

* The confidence interval is derived from forecasts of the average level of short-term interest rates in the fourth quarter of the year indicated; more information about these data is available in table 2. The shaded area encompasses less than a 70 percent confidence interval if the confidence interval has been truncated at zero.

Forecast Uncertainty

The economic projections provided by the members of the Board of Governors and the presidents of the Federal Reserve Banks inform discussions of monetary policy among policymakers and can aid public understanding of the basis for policy actions. Considerable uncertainty attends these projections, however. The economic and statistical models and relationships used to help produce economic forecasts are necessarily imperfect descriptions of the real world, and the future path of the economy can be affected by myriad unforeseen developments and events. Thus, in setting the stance of monetary policy, participants consider not only what appears to be the most likely economic outcome as embodied in their projections, but also the range of alternative possibilities, the likelihood of their occurring, and the potential costs to the economy should they occur.

Table 2 summarizes the average historical accuracy of a range of forecasts, including those reported in past *Monetary Policy Reports* and those prepared by the Federal Reserve Board's staff in advance of meetings of the Federal Open Market Committee (FOMC). The projection error ranges shown in the table illustrate the considerable uncertainty associated with economic forecasts. For example, suppose a participant projects that real gross domestic product (GDP) and total consumer prices will rise steadily at annual rates of, respectively, 3 percent and 2 percent. If the uncertainty attending those projections is similar to that experienced in the past and the risks around the projections are broadly balanced, the numbers reported in table 2 would imply a probability of about 70 percent that actual GDP would expand within a range of 1.6 to 4.4 percent in the current year, 1.0 to 5.0 percent in the second year, and 0.8 to 5.2 percent in the third year. The corresponding 70 percent confidence intervals for overall inflation would be 1.2 to 2.8 percent in the current year, and 1.0 to 3.0 percent in the second and third years. Figures 4.A through 4.C illustrate these confidence bounds in "fan charts" that are symmetric and centered on the medians of FOMC participants' projections for GDP growth, the unemployment rate, and inflation. However, in some instances, the risks around the projections may not be symmetric. In particular, the unemployment rate cannot be negative; furthermore, the risks around a particular projection might be tilted to either the upside or the downside, in which case the corresponding fan chart would be asymmetrically positioned around the median projection.

Because current conditions may differ from those that prevailed, on average, over history, participants provide judgments as to whether the uncertainty attached to their projections of each economic variable is greater than, smaller than, or broadly similar to typical levels of forecast uncertainty seen in the past 20 years, as presented in table 2 and reflected in the widths of the confidence intervals shown in the top panels of figures 4.A through 4.C. Participants' current assessments of the uncertainty surrounding their projections are summarized in the bottom-left panels of those figures. Participants also provide judgments as to whether the risks to their projections are weighted to the upside, are weighted to the downside, or are broadly balanced. That is, while the symmetric historical fan charts shown in the top panels of figures 4.A through 4.C imply that the risks to participants' projections are balanced, participants may judge that there is a greater risk that a given variable will be above rather than below their projections. These judgments are summarized in the lower-right panels of figures 4.A through 4.C.

As with real activity and inflation, the outlook for the future path of the federal funds rate is subject to considerable uncertainty. This uncertainty arises primarily because each participant's assessment of the appropriate stance of monetary policy depends importantly on the evolution of real activity and inflation over time. If economic conditions evolve in an unexpected manner, then assessments of the appropriate setting of the federal funds rate would change from that point forward. The final line in table 2 shows the error ranges for forecasts of short-term interest rates. They suggest that the historical confidence intervals associated with projections of the federal funds rate are quite wide. It should be noted, however, that these confidence intervals are not strictly consistent with the projections for the federal funds rate, as these projections are not forecasts of the most likely quarterly outcomes but rather are projections of participants' individual assessments of appropriate monetary policy and are on an end-of-year basis. However, the forecast errors should provide a sense of the uncertainty around the future path of the federal funds rate generated by the uncertainty about the macroeconomic variables as well as additional adjustments to monetary policy that would be appropriate to offset the effects of shocks to the economy.

If at some point in the future the confidence interval around the federal funds rate were to extend below zero, it would be truncated at zero for purposes of the fan chart shown in figure 5; zero is the bottom of the lowest target range for the federal funds rate that has been adopted by the Committee in the past. This approach to the construction of the federal funds rate fan chart would be merely a convention; it would not have any implications for possible future policy decisions regarding the use of negative interest rates to provide additional monetary policy accommodation if doing so were appropriate. In such situations, the Committee could also employ other tools, including forward guidance and asset purchases, to provide additional accommodation.

While figures 4.A through 4.C provide information on the uncertainty around the economic projections, figure 1 provides information on the range of views across FOMC participants. A comparison of figure 1 with figures 4.A through 4.C shows that the dispersion of the projections across participants is much smaller than the average forecast errors over the past 20 years.

Abbreviations

AFE	advanced foreign economy
BOE	Bank of England
C&I	commercial and industrial
DPI	disposable personal income
ECB	European Central Bank
EME	emerging market economy
FOMC	Federal Open Market Committee; also, the Committee
GDP	gross domestic product
LFPR	labor force participation rate
LIBOR	London interbank offered rate
MBS	mortgage-backed securities
Michigan survey	University of Michigan Surveys of Consumers
OIS	overnight index swap
ON RRP	overnight reverse repurchase agreement
OPEC	Organization of the Petroleum Exporting Countries
PCE	personal consumption expenditures
SEP	Summary of Economic Projections
SLOOS	Senior Loan Officer Opinion Survey on Bank Lending Practices
S&P	Standard & Poor's
TIPS	Treasury Inflation-Protected Securities

LETTER FROM KEITH A. NORIEKA, ACTING COMPTROLLER OF THE CURRENCY

Office of the Comptroller of the Currency

Washington, DC 20219

July 10, 2017

The Honorable Richard Cordray
Director
Consumer Financial Protection Bureau
1275 First St. NE
Washington DC 20002

Dear Rich:

I am requesting the Consumer Financial Protection Bureau's (CFPB) share with OCC data used to develop and support its proposed final rule banning class-action waivers in arbitration agreements and to have our agencies work together to resolve potential safety and soundness concerns with the proposal.

The OCC has a mandate to ensure the safety and soundness of the federal banking system. A variety of OCC staff have reviewed the CFPB's arbitration proposal from this perspective and have expressed concerns about its potential impact on the institutions that make up the federal banking system and its customers. We feel obligated to communicate our safety and soundness concerns regarding this proposal given the requirements of section 1023 of the Dodd-Frank Act.

As you know, arbitration can be an effective alternative dispute resolution mechanism that can provide better outcomes for consumers and financial service providers without the high costs associated with litigation. As some have noted, the CFPB's proposal may effectively end the use of arbitration in cases related to consumer financial products and services. Eliminating the use of this tool could result in less effective consumer protection and remedies, while simply enriching class-action lawyers. At the same time, the proposal may potentially decrease the products and services offered to consumers, while increasing their costs.

The proposal also may force institutions to confront "potentially ruinous liability" and to settle unmeritorious claims to mitigate the significant costs and risks associated with class-action law suits.[1] The increased cost associated with litigation and the loss of arbitration as a viable alternative dispute resolution mechanism could adversely affect reserves, capital, liquidity, and reputations of banks and thrifts, particularly community and midsize institutions.

While staff have raised these questions, we can only answer them through shared analysis of your agency's data. We would like to work with you and your staff to address the potential safety and soundness implications of the CFPB's arbitration proposal. That is why I am requesting the CFPB share its data, which will be given appropriate confidential treatment. I have directed OCC staff to work expeditiously with CFPB staff to examine the data once we receive it and determine if our concerns are allayed by the data or to work with CFPB staff to resolve any safety and soundness concerns that persist.

Finally, I want to commend you and your staff for the work the CFPB has done on this important issue. At the OCC, we share the mission of ensuring that our supervised institutions provide fair access to financial services, treat customers fairly, and comply with applicable laws and regulations.

Sincerely,

Keith A. Noreika
Acting Comptroller of the Currency

[1] *Shady Gove orthopedic Assocs., P.A. v. Allstate Ins. Co.*, 130 S. Ct. 1431, 1465 n.3 (Ginsburg, J., dissenting)(observing that defendants in class actions suits face "pressure . . . to settle even unmeritorious claims" once a class is certified due to the "potentially ruinous liability" of such suits).

LETTER FROM RICHARD CORDRAY, DIRECTOR, CONSUMER FINANCIAL PROTECTION BUREAU

cfpb Consumer Financial Protection Bureau

1700 G Street, N.W., Washington, DC 20552

July 12, 2017

The Honorable Keith A. Noreika
Acting Comptroller of the Currency
Office of the Comptroller of the Currency
400 Seventh Street SW
Washington, D.C. 20219

Dear Keith:

I am writing in response to your letter of July 10, 2017, in which you suggest that the arbitration rule which the Consumer Financial Protection Bureau issued that day might raise concerns with respect to the safety and soundness of the federal banking system.

I was surprised to receive your letter. As you may be aware, the issuance of the rule marked the conclusion of a multi-year process that included the Bureau's completion in March 2015 of an arbitration study that was required by law.[1] The rulemaking process itself spanned more than two years. Throughout that process, the Bureau consulted repeatedly with representatives of the staff of the Office of the Comptroller of the Currency, as well as the other prudential regulators, precisely to discuss "prudential, market, or systemic objectives administered by such agencies" in accordance with Section 1022 of the Dodd-Frank Wall Street Reform and Consumer Protection Act. At no time during this process did anyone from the OCC express any suggestion that the rule that was under development could threaten the safety and soundness of the banking system. Nor did you express any such concerns to me when we have met or spoken. Indeed, the only recent communication we had received from the OCC on this subject prior to July 10 was an e-mail from your staff on June 26 "confirm[ing] that the OCC has no comments on the draft text and commentary." The points you now raise in your letter were not conveyed until after the Bureau had completed the interagency consultation process, and had already transmitted the final rule to the Office of the Federal Register for publication. Thus they do not satisfy the statutory requirement that an agency "has in good faith attempted to work with the Bureau to resolve concerns regarding the effect of the rule on the safety and soundness of the United States banking system or the stability of the financial system of the United States" and has been unable to do so.[2]

Additionally, there is no basis for claiming that the arbitration rule puts the federal banking system at risk. The Bureau found in the final rule that it will create an effective means by which consumers can seek to vindicate their legal rights under federal and state consumer protection laws and under their contracts. There is no question, and considerable past and present experience to

[1] CFPB, "Arbitration Study: Report to Congress, Pursuant to Dodd-Frank Wall Street Reform and Consumer Protection Act § 1028(a)," (2015), available at http://files.consumerfinance.gov/f/201503_cfpb_arbitration-study-report-to-congress-2015.pdf.
[2] Section 1023(b)(1)(A) of the Dodd-Frank Act.

demonstrate, that U.S. banks are capable of operating safely and soundly in a legal system in which consumers can pursue redress for violations of the law. To the extent the rule makes redress available to consumers, it also will affect the incentives for providers of financial services to conform their conduct to the law. Indeed, the deterrent effect of the rule is designed to prevent exactly the type of unlawful conduct that itself can raise safety and soundness concerns, as it did in the lead-up to the financial crisis.

I have asked Bureau staff to review this issue and they have prepared the attached memorandum for me. To highlight a few key points:

- A majority of depository institutions today operate without arbitration agreements. There is no evidence that these banks and credit unions are less safe and sound than their counterparts with such agreements, and no regulator (including the OCC) has ever indicated that is so.

- The Bureau's final rule estimates an annual cost for additional federal litigation for all covered (bank and non-bank) entities of $523 million per year and a significant but smaller amount for additional state court litigation.[3] These costs would be borne by an industry with trillions of dollars in assets, and in which last year the banks alone earned over $171 billion in profits. In other words, if all of the projected costs were borne by banks (and they are not), the rule would reduce net revenue by .3 percent.

- The mortgage market, the largest consumer financial market (dwarfing the other consumer markets in which banks participate), currently operates with a ban on arbitration agreements and has effectively done so since 2004. That prohibition has not posed any discernable risk to the safety and soundness of the mortgage lending markets that are a key part of the United States' economic, financial, and banking systems, and no regulator (including the OCC) has given any indication to the contrary.

- Similarly, since 2009, banks representing approximately 47% of credit card loans outstanding have operated without arbitration agreements; the rulemaking did not adduce any evidence that this absence impaired the safety and soundness of these institutions. Indeed, when certain major credit card issuers agreed to temporarily eliminate their mandatory arbitration provisions, which they did as a provision in a class action settlement, the OCC received notice pursuant to the Class Action Fairness Act and did not interpose any objection on safety and soundness or other grounds. Nor, so far as we are aware, has the OCC downgraded these institutions – or any other institution which eschews arbitration agreements – in its CAMELS rating, which is a nonpublic indicator of the safety and soundness of the bank, on the basis that these institutions are exposed to class action liability. And none of the banks covered by the settlement has elected to reinstate an arbitration clause after the settlement expired.

I believe these data conclusively put to rest any safety and soundness concerns.

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[3] *See* Final Rule at 671 Table 1.

In your letter you suggest that the Consumer Bureau staff and OCC staff conduct a "shared analysis" of the Bureau's data. This, too, is a more than belated request: as I noted earlier, the Bureau publicly released its arbitration study on which our rule is predicated over two years ago. Furthermore, the Bureau's estimates as to the rule's impacts were set forth in the Notice of Proposed Rulemaking which the Bureau issued over a year ago. Until I received your letter this week, the OCC had not expressed any interest in the data relating to the rule.

With that said, I would be happy to have our staff who worked on the arbitration study and on our cost estimates in the rule take the time to review the study data and our rulemaking analysis with your staff. I am confident that a briefing will prove sufficient to answer any questions and allay any concerns.

Let me conclude by thanking you for your interest in the Bureau's work. We appreciate the concern you stated that institutions supervised by the OCC provide fair access to financial services, treat customers fairly, and comply with applicable laws and regulations. Please do not hesitate to call me anytime to discuss these matters further.

Sincerely,

Richard

Richard Cordray
Director

MEMORANDUM TO THE CFPB DIRECTOR FROM THE ARBITRATION AGREEMENTS RULEMAKING TEAM

Consumer Financial Protection Bureau

1700 G Street, N.W., Washington, DC 20552

July 12, 2017

Memorandum for the Director

FROM	Arbitration Agreements Rulemaking Team
THROUGH	David Silberman, Associate Director, Research, Markets and Regulations
SUBJECT	Letter from the Acting Comptroller

This memorandum analyzes the suggestion in the letter from Acting Comptroller Noreika to you that the arbitration agreements rule, which the Consumer Financial Protection Bureau sent to the Office of the Federal Register on June 30 and publicly announced on Monday, implicates the safety and soundness of the federal banking system.

Procedural Background

As you know, section 1022(b)(2)(B) of the Dodd-Frank Act directs the Bureau to "consult with the appropriate prudential regulators or other Federal agencies prior to proposing a rule and during the comment process regarding consistency with prudential, market, or systemic objectives administered by such agencies." Dodd-Frank section 1023, in turn, provides a process by which a prudential regulator can petition the Financial Stability Oversight Council to overturn a Bureau rule if the petitioner "has in good faith attempted to work with the Bureau to resolve concerns regarding the effect of the rule on the safety and soundness of the United States banking system or the stability of the financial system of the United States." Any such action to overturn the arbitration rule would be subject to a legal challenge over whether this standard has been satisfied, as the statute explicitly authorizes.[1]

As it does in every rulemaking, the Bureau consulted with the prudential regulators (and other potentially interested agencies) throughout the rulemaking process. Specifically, Bureau staff first consulted with OCC staff in September 2015, about the same time that we started our small entity review panel process in accordance with the Small Business Regulatory Enforcement Fairness Act of 1996. Bureau staff again consulted with OCC staff in February 2016, prior to our release of the Notice of Proposed Rulemaking. Most recently, Bureau staff consulted with OCC staff yet again prior to our release of the final rule, which did not change drastically from the proposal. On June 6, Bureau staff held an interagency consultation on the final rule at which several OCC staff participated, and on June 9 we sent

[1] Dodd-Frank section 1023(c)(8) of the Dodd-Frank Act ("JUDICIAL REVIEW OF DECISIONS BY THE COUNCIL.—A decision by the Council to set aside a regulation prescribed by the Bureau, or provision thereof, shall be subject to review under chapter 7 of title 5, United States Code.").

draft regulatory text to the OCC. On both the June 6th call and in the June 9th e-mail, Bureau staff requested feedback on the rule no later than June 23.

At no time during this consultation process stretching over almost two years did the OCC express any concern over the potential impact of the rule that was under consideration on the safety and soundness of the banking system. In fact, in response to the most recent consultation, Bureau staff received an e-mail on June 26th "confirm[ing] that the OCC has no comments on the draft text and commentary."[2]

In his letter to you, the Acting Comptroller stated that "staff have raised … questions" pertaining to the impact of the rule on the safety and soundness of the banking system. No such concerns have been raised with the Bureau.

Given this history, and the requirements of section 1023, invoking those statutory processes at this point, as suggested in the letter, would be procedurally improper and would also fail to make a plausible case for meeting the required standard. As noted above, the Dodd-Frank Act provides for consultation *during* the rulemaking process to resolve prudential concerns and allows for a petition only if the process fails – *i.e.*, if an agency "has in good faith attempted to work with the Bureau to resolve concerns regarding the effect of the rule on the safety and soundness of the United States banking system or the stability of the financial system of the United States" and has been unable to do so.[3] The belated statements of the Acting Comptroller that the OCC has unspecified safety and soundness concerns, conveyed in a letter received after the Bureau had completed the interagency consultation process and had already transmitted the final rule to the Office of the Federal Register for publication, do not satisfy the OCC's statutory obligations.[4]

The Safety and Soundness Concern

Procedural issues aside, we believe the rulemaking record here – including the Bureau's Arbitration Study[5] on which the rule is predicated – demonstrate that this rule does not put the safety and soundness of the United States banking system or the stability of the financial system of the United States at risk.

As you know, the principal effect of the rule will be to create an effective means by which consumers can seek to vindicate their legal rights under federal and state consumer protection laws and under their contracts. To the extent the rule makes redress available to consumers, it also will affect the incentives of financial service providers to conform their conduct to the

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[2] E-mail from Fred Petrick, OCC to Eric Goldberg, CFPB (June 26, 2017).
[3] Dodd-Frank section 1023(b)(1)(A).
[4] As an aside, we would note that Dodd-Frank section 1023(b)(1) provides for petitions to be filed "in accordance with rules prescribed pursuant to subsection (f)." It is our understanding that the FSOC has not issued any such rules. Thus, it is unclear whether the FSOC is even in position to entertain a petition at this time.
[5] CFPB, "Arbitration Study: Report to Congress, Pursuant to Dodd-Frank Wall Street Reform and Consumer Protection Act § 1028(a)," (2015), available at http://files.consumerfinance.gov/f/201503_cfpb_arbitration-study-report-to-congress-2015.pdf ("the Study").

law. The financial crisis has taught us all that greater attention by providers to conformity with consumer protection laws would aid safety and soundness.

Moreover, the Bureau's Study shows that a majority of depository institutions do not use arbitration agreements.[6] As the Bureau stated in the preamble to the final rule, this evidence shows that depository institutions without arbitration agreements

> are able to remain safe and sound despite their exposure to class action liability. The Bureau has no reason to believe that depository institutions with arbitration agreements are less financially sound than those without or that requiring certain depository institutions to amend their agreements will cause them to become less financially sound.[7]

Additionally, the potential costs of the arbitration rule do not raise any concern about such risks. Under the Dodd-Frank Act, the Bureau is required to assess the costs and benefits of any proposed or final rule on covered persons as well as on consumers.[8] The Bureau's final rule estimates an annual cost for additional federal litigation for covered entities of $523 million per year and a significant but smaller amount for additional state court litigation.[9] These sums will be spread across approximately 600 additional federal class actions and a similar number of additional state class actions. The final rule also estimates that depository institutions with less than $10 billion in assets will face very few of these cases. In particular, the final rule estimates that there will be, on average, less than one federal class settlement per year involving these depository institutions and that the magnitude of these settlements would be relatively smaller.[10] Taken as a whole, the rule is estimated to affect approximately 53,000 providers in various covered markets, which extend well beyond the banking system to thousands of non-bank entities as well. These are conservative (*i.e.*, upper bound) estimates; indeed, during the comment process a number of trade associations representing financial institutions argued that the Bureau's data was skewed by a few large class settlements (specifically in the overdraft multidistrict litigation) and that therefore the Bureau was overestimating the benefits of class actions for consumers and, derivatively, the costs to providers.

Importantly, these estimates, and the assumptions on which they are based, were set forth in detail in the Notice of Proposed Rulemaking, which was issued more than a year ago.[11] At no time until now has anyone from the OCC expressed any interest in further discussion about any data pertaining to the rule, including these estimates, or contested any of the data on which they are based.

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[6] *See* Study, section 2 at 9-17.
[7] Final Rule at 648; *see also id.* at 649.
[8] *See* Dodd-Frank section 1022(b)(2).
[9] *See* Final Rule at 671, tbl. 1.
[10] *See id.* at 694-95
[11] 81 FR 32829 (May 24, 2016).

It seems clear that a rule that would result in the annual costs set forth above – under a billion dollars per year – and additional investments in compliance with the law to prevent additional class litigation exposure, spread over some portion of the entire universe of consumer financial markets, including both banks and non-bank entities, cannot pose a threat to the stability of the financial system with its trillions of dollars of assets. In fact, the annual costs for depository institutions would be less than a half-billion dollars per year, whereas the profits of those institutions exceeded $171 billion in 2016.[12]

It is instructive in this regard to consider what we know about markets in which arbitration agreements do *not* operate. As the final rule noted, the mortgage market – which is, of course, the largest consumer financial market (dwarfing the other consumer markets in which banks participate) – currently operates with a ban on arbitration agreements and has effectively done so since 2004.[13] To our knowledge, that prohibition has not posed any discernable risk to the safety and soundness of the mortgage lending markets that are a key part of the United States' economic, financial, and banking systems. Similarly, banks representing approximately 47% of credit card loans outstanding at the end of 2013 operated without arbitration agreements; the Bureau did not receive any evidence that this absence impaired the safety and soundness of these institutions, or that their regulators identified any risk differential between companies that did or did not use arbitration agreements. When certain major credit card issuers agreed to eliminate their mandatory arbitration provisions, which they did as a provision in a class action settlement, the OCC received notice pursuant to the Class Action Fairness Act and did not interpose any objection on safety and soundness grounds, or any other grounds.[14] Nor, so far as we are aware, has the OCC downgraded its CAMELS rating of these institutions – or any other institution which eschews arbitration agreements – on the basis that these institutions are exposed to class action liability.[15] Further, when the class action settlement expired, none of the card issuers elected to reinstate their arbitration agreements, indicating that they did not believe the absence of such agreements was posing any substantial threat to their institutions.

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[12] FDIC, "Quarterly Banking Profile: Fourth Quarter 2016" (vol. 11, num. 1; 2017) available at https://www.fdic.gov/bank/analytical/quarterly/2017_vol11_1/fdic_v11n1_4q16.pdf.

[13] *See* Kenneth Harney, "Fannie Follows Freddie in Banning Mandatory Arbitration," Wash. Post, Oct. 9, 2004, available at http://www.washingtonpost.com/wp-dyn/articles/A18052-2004Oct8.html. Since 2004, Fannie Mae and Freddie Mac underwriting guidelines have prohibited arbitration agreements. Subsequently, the Congress expressly prohibited arbitration agreements in the mortgage market more broadly in the Dodd-Frank Act. *See* Dodd-Frank section 1414, codified in Regulation Z at 12 CFR 1026.36(h).

[14] We understand that the OCC Bulletin 2006-20 (Apr. 21, 2006) requires depository institutions to provide these notices to the OCC within 10 days of filing of a proposed settlement.

[15] The OCC's handbook explains that: "A bank's composite rating under Uniform Financial Institutions Rating System (UFIRS) or "CAMELS" integrates ratings from six component areas: Capital adequacy, Asset quality, Management, Earnings, Liquidity, and Sensitivity to market risk. Evaluations of the component areas take into consideration the institution's size and sophistication, the nature and complexity of its activities, and its risk profile." OCC Bank Supervision Process: Comptroller's Handbook at 14 (September 2007, updated 2012), available at https://www.occ.treas.gov/publications/publications-by-type/comptrollers-handbook/index-comptrollers-handbook.html.

The Acting Comptroller's Data Request

In his letter to you, the Acting Comptroller requests access to the Bureau's data. It may be helpful to you in responding to have some background on the data on which the Bureau's estimates as to the impacts of the rule on financial institutions are based.

As you will recall, as part of the Bureau's Arbitration Study, the Bureau developed estimates as to the prevalence of arbitration agreements in various financial markets. To do so, the Bureau assembled a dataset consisting of approximately 850 standard-form contracts used by various providers of financial products and services. Most of those contracts are publicly available, including credit card agreements which card issuers are required to furnish to the Bureau pursuant to the CARD Act, and deposit account agreements which are typically found on bank websites. As explained in the Bureau's Study, the Bureau supplemented this publicly-available data with contracts obtained from certain providers pursuant to an information order under Dodd-Frank section 1022(b)(4). From these data, the Bureau estimated the percentage of various markets covered by arbitration agreements and thus potentially affected by the Bureau's rule.

To estimate the impact the rule would have on this segment of the market, the Bureau relied on its findings as to the amount that financial institutions had paid in class action settlements (both to consumers and in attorney fees and defense costs) over a five-year period. Those findings were derived from the case records of 419 consumer finance class actions that were settled in federal court over a period of five years. The Bureau's study explains the methodology the Bureau used to identify these cases – which we believe comprise all or virtually all class action settlements in consumer finance cases during the period studied. The records from those cases are, of course, public and the Bureau provided full case citations to the cases in its Notice of Proposed Rulemaking.[16]

Recognizing that the Bureau's rule also could open the door to putative class actions that are settled individually or otherwise not resolved on a class basis, the Bureau estimated those impacts by relying on a separate data set consisting of 562 consumer finance cases filed as putative class actions in federal court and certain state courts over a three-year period. The Bureau's study explains the methodology the Bureau used to identify those cases. Those case records, too, are of course public.

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[16] 81 FR 32829 at App'x A (May 24, 2016).