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EXAMINING CURRENT TRENDS AND CHANGES IN THE FIXED-INCOME MARKETS

JOINT HEARING

BEFORE THE

SUBCOMMITTEE ON SECURITIES, INSURANCE, AND INVESTMENT

AND THE

SUBCOMMITTEE ON ECONOMIC POLICY

OF THE

COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS

UNITED STATES SENATE

ONE HUNDRED FOURTEENTH CONGRESS

SECOND SESSION

ON

EXAMINING THE RECENT EFFORTS BY SEVERAL REGULATORS, INCLUDING THE DEPARTMENT OF TREASURY AND THE FEDERAL RESERVE, TO UNDERSTAND THE OCTOBER 15, 2014, TREASURY "FLASH RALLY," CHANGES IN THE TREASURY MARKET STRUCTURE, AND LIQUIDITY CONCERNS IN THE FIXED-INCOME MARKETS

APRIL 14, 2016

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C O N T E N T S

THURSDAY, APRIL 14, 2016

WITNESSES

EXAMINING CURRENT TRENDS AND CHANGES IN THE FIXED-INCOME MARKETS

THURSDAY, APRIL 14, 2016

U.S. SENATE,
SUBCOMMITTEE ON SECURITIES, INSURANCE, AND INVESTMENT, JOINT WITH THE SUBCOMMITTEE ON ECONOMIC POLICY,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
Washington, DC.

The Subcommittees met at 10:02 a.m., in room 538, Dirksen Senate Office Building, Hon. Mike Crapo, Chairman of the Subcommittee on Securities, Insurance, and Investment, presiding.

OPENING STATEMENT OF CHAIRMAN MIKE CRAPO

Senator CRAPO. This hearing will come to order.

I want to thank Senators Heller and Warner and Warren and their staffs for working with me on this joint Subcommittee hearing on "Examining Current Trends and Changes in the Fixed-Income Markets."

The U.S. Treasury market—oh, I also want to say, we have asked each of the Chairmen and Ranking Members to keep their introductory remarks to about 3 minutes so we can get to the witnesses, and we have all discussed that previously.

The U.S. Treasury market is one of the largest and most liquid financial markets in the world and is critical to the U.S. and global economy. On October 15, 2014, the yields of the 10-year Treasury experienced a 37-basis point trading range, one of the biggest swings of all time. The unusually high level of volatility has generated a robust debate about why this occurred and what it could mean during future bouts of market volatility. I have heard that several factors, including new regulations, have reduced certain participants' market-making capacity, and that during stressed market conditions, liquidity may disappear at times when it is most needed.

Following the October 15 event, several regulators, including Treasury, the Board of Governors of the Federal Reserve, the SEC, and the CFTC, have been working to better understand the causes of the event and, as well, how the Treasuries market has evolved to its present state by holding conferences, producing a report, and issuing a request for information. It will be helpful to understand what are the key take-aways from these efforts and how this information and feedback will be used going forward.

While many market participants and regulators may have different opinions or definitions of liquidity, there is agreement that this topic merits attention.

A recent report by the Bank for International Settlements Committee on the Global Financial System discussed how the fixed-income markets are in a state of transition. It identified technology and competition, bank deleveraging and regulation, and monetary policy as factors that have a bearing on market liquidity. The report shows that it is not just the U.S. Treasury's market that is affected, but the global fixed-income markets.

These are complicated issues and I look forward to hearing and following the witnesses' information on these topics. How are the factors set forth in the BIS report impacting liquidity, especially during stress markets conditions? What is the likelihood of future October 15 events? What options are being explored to mitigate liquidity from disappearing at times when it is needed most? And many other questions.

I want to thank again our witnesses for being here and I will turn to Senator Warner.

STATEMENT OF SENATOR MARK R. WARNER

Senator WARNER. Well, thank you, Mr. Chairman.

You know, you and I have spent a lot of time over the past couple years investigating particularly the equity market structure and asking the folks at the SEC to implement pilots to improve the way our stock markets trade. And while there are very legitimate concerns about the intricacies of the stock market that lead to questions about fair and orderly operation in that space, that equity space differs greatly from the complexity of the fixed-income markets, which, as we all know, lack a central exchange or a system for trading, have significant capacity with only post-trade reporting for corporate and municipal bonds, not Treasuries, and generally have margin of spreads that would make actually even most equity investors blush.

As you pointed out, a lot of focus on the events of October 2014. I think we have before us two extraordinarily distinguished public servants, and my questioning, and I hope they will even get to some of this in their opening, will focus on a couple of areas: Post-trade transparency, the role of prudential regulations, the actual fixed-income market structure, especially the role of hourly trading and we all know there are questions about liquidity—I sometimes do question some of our high-frequency folks who always at the altar of liquidity seeming to trump everything else, and the interaction between futures and other markets.

I had a longer statement that I will submit for the record, but to try to make sure I actually stick to my 2 ½ minutes, I will pass it back to you, Mr. Chairman.

Senator CRAPO. Well, thank you, Senator Warner.

Senator Heller is actually presiding on the floor and may or may not make it before we start with the witnesses, so we will let him have his shot maybe after the witnesses.

And, so, Senator Warren.

STATEMENT OF SENATOR ELIZABETH WARREN

Senator WARREN. Thank you very much. I appreciate it, Mr. Chairman.

Thank you to the witnesses for being here today.

I just have a couple of other comments to add to the opening statements. The title of today's hearing is "Examining Current Trends and Changes in the Fixed-Income Markets." I want to start with congratulations to the members of the audience who made it through that title without falling asleep. While it sounds dry, it is a powerfully important topic that goes to the heart of how our financial markets operate.

Liquid bond markets give participants confidence that they will be able to sell their holdings when they want to. That, in turn, gives them confidence to buy those bonds in the first place. This means that ensuring sufficient market liquidity is, in many ways, key to having a robust demand for Treasuries, for corporate debt, and for municipal debt.

That said, there seems to be no single measure of liquidity that everyone agrees on. In preparing for this hearing, I have seen some analysis that liquidity in the fixed-income markets is significantly less than before the 2008 crisis. I have seen other analysis that liquidity is not that different. I have seen some analysis that liquidity is less, but it does not really have much actual impact on the functioning of the market. And with such divergence in even the basic measure of liquidity or what it means for the markets, someone might conclude that any claim that liquidity is shrinking or growing is offset by someone else who can claim the opposite.

The other issue that often comes up, and mostly from the financial services industry, is the impact of our post-crisis rules on liquidity, and perhaps this—because it is such a slippery concept, liquidity seems like a convenient bogeyman that for companies that just want to see rollbacks to Dodd-Frank and other post-crisis financial reforms. Any claim that liquidity was much higher before the 2008 crash must address the question of whether there was too much liquidity, that is, too much leverage, too much short-term lending, leading up to the crash, and once the crash hit and the liquidity disappeared at exactly the moment when it was actually needed, right when the market started to panic, which suggests that the so-called liquidity in the pre-crash years was little more than an illusion.

If the post-crisis rules have reduced liquidity by some measures, although not by others, it may be that the current forms of liquidity are both more stable and more likely to stick around when they are really needed, and so I hope that is an issue that our witnesses will be able to address.

Thank you, Mr. Chairman.

Senator CRAPO. Thank you very much, Senator Warner.

And now, we will turn to our witnesses. We appreciate both of you for being here today and sharing your expertise on these issues, which have been—I think we have opened up some of the critical issues that we really need to understand better.

Our witnesses today are Jay Powell, Governor of the Federal Reserve Board of our Federal Reserve System, and Antonio Weiss, Counselor to the Secretary at the Department of Treasury.

Gentlemen, as I think you know, we allocate you 5 minutes for your opening statements. We will put your full statements on the full record, and I think you will get some very interesting and robust questioning from the panel today.

You know what, Senator Heller just arrived, so before I start with the first witness, if you are ready, Senator Heller, we will turn to you for your opening statement.

STATEMENT OF SENATOR DEAN HELLER

Senator HELLER. Sure. Thank you. Thank you, Mr. Chairman, and to all the Chairs and Co-Chairs and everybody else on this particular Committee, it is great to be here and I am glad that we are taking some time for this particular hearing.

I want to thank our witnesses for being here today, also, Governor and also Mr. Weiss.

The fixed-income markets are critical in the U.S. capital markets and our national economy. I do not think anybody in here disagrees with that. It may not be as sexy or as exciting as the equity markets, but in Nevada, entities like the Truckee Meadows Water Authority, the Nevada System of Fire Education, Clark County School District, cities of Las Vegas and Reno, all rely on issuing bonds in the fixed-income markets.

The fixed-income markets in the United States are very large. Market liquidity is critical in having effective and functioning markets. So, there is no doubt that the fixed-income markets are transforming. There are early warning signs that fixed-income markets are becoming more fragile, less liquid than they used to be. My fear is that sometime in the future, there may be a major period of stress in the markets that cause significant deterioration in liquidity, and if unchecked, these liquidity problems will spill over into our economy.

Recently, on August 12, 2015, the Global Financial Market Association and the Institute of International Finance released a commission study by PwC on the state of global markets liquidity, and in their conclusion, they said it would be helpful for all stakeholders to better understand liquidity conditions and the link between regulations and market liquidity so that future regulations strike the right balance between promoting stability and maintaining financial market liquidity.

So, the fact that this Congress, financial regulators, and the private sector are evaluating the current state of liquidity in the fixed-income markets shows a growing concern that the bond markets are not functioning as efficiently and as effectively as in the past, and I believe that the financial regulators need to devote more attention to the state of our fixed-income markets.

I also think that we can improve the fixed-income markets while also ensuring proper safety and soundness, and it is my hope moving forward that our collective agenda should be to preserve and restore liquidity in the markets.

So, I look forward to hearing from our witnesses. Mr. Chairman, thank you.

Senator CRAPO. Thank you very much, Senator Heller.

We have already introduced the witnesses, so we will begin, and Governor Powell, we will start with you.

STATEMENT OF JEROME H. POWELL, MEMBER, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

Mr. POWELL. Thank you, Chairmen Crapo and Heller and Ranking Members Warner and Warren. I know there are Subcommittee Members. I want to thank you for inviting me here to testify on fixed-income markets.

These markets perform important functions in our economy and it is imperative that we understand the significant changes that they are currently undergoing. As I will discuss, a number of factors have been driving these changes.

Some market participants have expressed concerns about low liquidity across fixed-income markets, although many recent studies have found it difficult to identify such a broad reduction. It may be that liquidity has deteriorated only in certain market segments. It may also be that even if liquidity is adequate in normal conditions, it has become more fragile or more prone to disappearing under stress.

I will offer just a couple of thoughts about the highly unusual price movements of October 15, 2014, in the Treasury market. As you know, the staff of the Treasury, Federal Reserve Board, SEC, CFTC, and Federal Reserve Bank of New York compiled a joint staff report that analyzed the factors that could have caused the rapid rise and subsequent reversal of Treasury prices in such a short span of time. This analysis did not point to a single factor accounting for the sharp swing in prices.

But, as in equity markets, advances in computing and communications technologies have allowed proprietary trading firms, sometimes called algorithmic firms or high-frequency trading firms, to capture a majority of the interdealer market in Treasuries, and as a consequence of these changes, trading in Treasury markets now moves at extreme speed. And it may be that these changes have also lead to greater liquidity risk or the risk of sudden declines in liquidity.

For example, researchers at the Federal Reserve Bank of New York have found that there are spikes in volatility and sudden declines in liquidity becoming more frequent in both Treasury and in equity markets. There is also evidence that liquidity shifts more rapidly and, hence, is less predictable in these markets. By contrast, researchers have not found these behaviors in corporate bond markets where traditional dealers still intermediate most trade and there is much less high-frequency trading.

Apart from such episodes of sudden volatility, questions about whether liquidity in fixed-income markets has broadly deteriorated are very difficult to answer definitively, and in exploring these topics, it is essential to distinguish between the Treasury markets and the corporate bond markets, which have different characteristics.

In Treasury markets, traditional measures of liquidity like bid-ask spreads have been fairly stable in recent years, but the changing market structure has also meant smaller average trade size and participants now must break up their larger trades and employ complicated strategies to avoid moving prices. Accurately measuring the effect of trading on prices, which is perhaps the most fundamental measure of liquidity, can be quite difficult in such an environment.

There are also differences between the on-the-run Treasury market and the off-the-run Treasury market, where less liquid off-the-run securities are traded. However, the spread between those two markets has not appreciably changed since the crisis.

Turning to corporate bond markets, estimated bid-ask spreads have actually declined, which could create the argument that liquidity has actually improved. However, given the nature of the corporate bond market, those measurements are based only on actual transactions as opposed to quotes to buy and sell bonds.

What we can directly observe is that trade sizes and turnover have declined in the most actively traded corporate bonds as they have in Treasury markets, and although observable measures of overall liquidity in corporate bond markets appear good, there is some evidence that liquidity in lower-rated bonds has deteriorated. Trading in these less liquid segments may rely heavily on intermediation by dealers, and dealers have scaled back their capital commitments and inventories in corporate bonds since the financial crisis.

As I have mentioned, a number of factors are driving these changes in fixed-income markets. The financial crisis gave the dealers a heightened awareness of the risks of large portfolios and of liquidity provision and they substantially reduced their portfolios and their market-making footprints soon after the crisis and, frankly, well before the new regulations took effect.

On the other hand, in the interdealer cash Treasury market, the main theme is really the increased importance of trading that is enabled by high-speed telecommunications and computer power.

Finally, regulation has, by design, increased the costs of balance sheet usage and in doing so has encouraged a smaller footprint among these firms and their market-making activities. I would say, though, that no one seems to doubt that the same regulation has also made the core of the financial system much safer and sounder and much more resilient.

My view is that these regulations are new and we should be willing to adjust them as we learn. That said, we should also recognize that some reduction in market liquidity is a cost worth paying in helping to make the overall financial system significantly safer.

And, I will close by noting that the supervisors do have inadequate regular data access in the cash markets. This is something that is a principal focus of the Treasury's request for information and it is a very important thing.

I will stop there, and I look forward to our conversation.

Senator CRAPO. Thank you.

Mr. Weiss.

STATEMENT OF ANTONIO WEISS, COUNSELOR TO THE SECRETARY, DEPARTMENT OF THE TREASURY

Mr. WEISS. Chairmen Crapo and Heller, Ranking Members Warren and Warner, and Members of the Subcommittees, thank you for inviting Treasury to testify today. We have been partners with the Federal Reserve and Governor Powell, in particular, on several topics related to today's hearing.

Fixed-income markets, as you have all noted, play a central role in the U.S. economy, channeling savings into investment and providing credit to households, governments, and businesses.

Now, the primary markets for fixed income are functioning exceptionally well. Indeed, the past 4 years have seen record issuance of corporate bonds, as both domestic and foreign companies continue to rely on U.S. markets to raise capital. Trading in secondary markets is, for the most part, also functioning well. There is little compelling evidence of a broad-based deterioration in liquidity. But, there have been episodes of volatility in Treasuries, as Governor Powell noted, most notably on October 15, 2014, as well as anecdotes that large transactions in corporate bonds are challenging to complete.

Now, prior to the crisis, liquidity was abundant by almost any measure. However, this liquidity was a result of soaring financial sector leverage and an over-reliance on short-term funding. And when the crisis hit, that liquidity not only disappeared, but led to forced selling that greatly exacerbated financial distress.

Reforms adopted in response to the crisis have demonstrably strengthened the core of the financial system and reduced markets' vulnerability to these fire sale dynamics. Since 2009, the largest banks have more than doubled their capital levels and holdings of high-quality liquid assets, while cutting short-term funding in half and increasing their deposit base.

At the same time, fixed-income markets, as you have all noted, are undergoing a period of structural change, and this is driven by technology, changing risk appetites and business models, changes in the investor base, and much needed financial reform.

The Treasury market today remains the deepest and most liquid securities market in the world. We should have confidence in that reality. Nearly half-a-trillion dollars of Treasury securities change hands every day, and Treasuries remain the global benchmark risk-free asset. And traditional measures of liquidity in Treasury markets are healthy.

But, the extraordinary volatility in Treasuries on the morning of October 15, 2014, with no clear catalyst, raised the possibility that improved day-to-day liquidity may have come at the cost of rarer but severe bouts of volatility.

The joint staff report that Governor Powell mentioned highlighted important changes underway in Treasury markets, including the increased presence of algorithmic trading in the interdealer market, and we are currently seeking public comment on the evolution of Treasury market structure and the implications for market functioning, liquidity provision, and risk management practices. The comment deadline is April 22, and we would be happy to report back to the Subcommittees with key findings.

Now, the most immediate conclusion from our work to date is that the official sector needs more access to data and more effective data sharing mechanisms. We expect to have a comprehensive plan in place by the end of this year for regulatory reporting of cash Treasury transactions.

Now, in corporate bonds, measures of transaction costs are also within historical ranges and trading volumes have increased, showing no broad withdrawal from the market. Average trade sizes have begun to decline, though, as well as the proportion of large block trades. As Governor Brainard recently noted, these data points are consistent with anecdotes from market participants of the need to break up large trades into smaller ones over time. Now, in itself, this is neither good nor bad, but it does require adjustment by both investors and intermediaries.

Concerns have also been raised about the potential liquidity mismatch present in open-ended investment funds that offer daily liquidity to investors but invest in less liquid assets. The SEC has proposed new roles to improve liquidity risk management, and FSOC has engaged in a thorough analysis of these risks as part of its ongoing review of asset management activities.

In summary, fixed-income markets are healthy, providing support to the economic recovery, but they are in a period of transition. Policy makers are focused on enhancing financial stability and maintaining well functioning markets through periods of stress. And financial reform has built a buffer for volatile times. We now need to build on that progress and adapt to the dynamics of the new marketplace.

Thank you, and I look forward to answering your questions.

Senator CRAPO. Thank you very much. I appreciate the testimony both of you have provided.

I will begin the questioning. I will begin it with a statement. I appreciate the attention that you are both, and that our regulators are, giving to this issue. I think one of the messages I heard both of you give is that we need more data and we need to analyze this better and understand all of the factors that we are dealing with in terms of liquidity in these fixed-income markets, and I appreciate that. I do believe that we have got to get the answers to these questions, because as has been indicated by both the introductory statements by the Senators as well as your testimony, there are some serious questions there about just exactly how are the markets functioning and what are the causes of the issues that are being raised.

In that context, I would like to essentially read a few highlights to you from the European Parliamentary Financial Services Forum that recently analyzed these issues and just ask your comment on these highlights. So, what I am going to read to you is from the European Parliamentary Financial Services Forum that recently analyzed this issue.

Quote:

> Since the crisis, there have been a significant number of regulatory initiatives that have impacted banks and nonbanks and their clients. On a standalone basis, many of these reforms have been successful in that banks and investment firms are now holding far greater amounts and higher quality of capital with ample liquidity, intended consequences of financial reform. However, the linkages between all the regulatory reforms and the market liquidity are not always well understood, which can create unintended consequences. In particular, banks have been deleveraging, refocusing activities, exiting from markets and capital and funding intensive areas, such as market making in fixed income, repo, credit, and derivatives. These responses appear to be reducing the resilient liquidity of some financial markets and with it passing trade execution risk from banks to end investors or issuers.

Let us start with you, Governor Powell. Could you react to that analysis.

Mr. POWELL. Senator Crapo, that is generally in line with a great deal of what the research has shown, which is that firms have reduced the size of their portfolios. They have reduced their market-making activities in many markets, in fixed-income, and it does raise questions that we need to address about what the liquidity is in the underlying markets.

I think you actually have to look at markets one by one, though. Prudential regulation is really not the headline in the Treasury markets. If you were going to find problems that were driven by prudential regulation, you would find them in a corporate bond market, where much smaller portfolios, much more demand, tremendous amounts of primary issuance, and you would find them there. But, at the same time, read the report by FINRA, which looks carefully at many, many different elements of liquidity, and it just does not find a consistent story of a broad reduction in liquidity.

So, nonetheless, we hear from market participants and also from the group that you read about, and, you know, I do not want to dismiss those concerns. I think we have to keep paying attention. But, it just is not a case that is proven on the data that we have.

Senator CRAPO. So, before I go to you, Mr. Weiss, are you saying that the evidence is not there that banks are moving to other markets?

Mr. POWELL. It is very clear that banks have reduced their portfolios of fixed-income securities. No one disagrees with that. But, if you look at measures of liquidity, such as bid-ask spreads, such as the impact of trades on price, you just do not see a consistent story. You see those measures, price impact and things like that, as well within historical ranges. They move up and down——

Senator CRAPO. Well, you indicated that they were actually closing, the bid-ask price ratios were closing, is that correct?

Mr. POWELL. In corporate bonds, interestingly enough, the bid-ask spread has actually declined.

Senator CRAPO. But, how deep is that? Do we know how deep that liquidity is?

Mr. POWELL. So, market depth is well within historical ranges, but has decreased just a little bit here. Same thing in the Treasury market. I think the issue, really, with the corporate bond market is more that you only see bonds that actually trade. If liquidity is preventing certain bonds from trading, you do not see that.

At the same time, everyone is looking at the same data, which is the TRACE data, and I would steer you again, and your staffs, to the FINRA report, which looks at this in great detail. And, we are looking for this story, but it is just not in the data that we have so far.

Senator CRAPO. Thank you.

Mr. Weiss.

Mr. WEISS. Senator, I am looking at the clock, and you asked a pretty complicated question. I will perhaps answer just one aspect of it and build on Governor Powell's remarks, which were about dealer inventories.

Now, it is the case that dealer inventories were far higher in the period prior to the crisis than today, but the vast majority of those inventories were RMBS and structured credit that are no longer being issued today for good reason. And if you look at corporate bond inventories *per se,* there was a report from Goldman Sachs which actually suggested that corporate bond inventories in 2005 were about $40 billion and today have contracted to around $19 billion. But, there were $5 trillion of corporate bonds outstanding in 2005 and there are $8.5 trillion today, so the inventory was not really the core of the liquidity market in 2005 and it really, in our judgment, is not a good measure for inventories today.

Senator CRAPO. All right, thank you. We can get into this further, but I do need to go on to the next Senator.

Senator Warner.

Senator WARNER. Well, thank you, Mr. Chairman.

I would just echo what the witnesses have said. I think if we are going to make comparisons, comparing back to that 2005–2008 time period is not the appropriate comparison marker, as Mr. Weiss just said. Liquidity was higher, but it was filled with instruments that led to the crisis. And if we are going to look particularly in the corporate bond market, we ought to be comparing back to earlier historic numbers, and I think that is what Governor Powell pointed out.

Going to a slightly different place, one of the things you and I have both worked on is a greater transparency in both the corporate and the muni bond markets, particularly in questions around disclosure of mark-up and mark-downs, and we are hopeful that FINRA will come out with rules that will not be toothless, quite honestly.

I have also been interested, as we think about some of this transformation taking place in Treasuries, as we see more move toward algorithmic trading, which has positives and negatives I would be happy to hear a comment from both witnesses on some of the concerns about that movement.

One of the things I have been interested in is transparency around post-trade trading in Treasuries, and obviously, folks make the argument that that would give away a bank's position and there would be front running, although that was the same arguments that were made against TRACE and EMMA before they were put in place. So, I guess, in your opinion, if we were trying to improve post-trade transparency in the Treasury market, can we do that without impairing liquidity, and is the Treasury Department doing anything on a structural basis to improve that transparency?

So, if you want to both address the question around the comparison back as well as the move toward algorithmic trading, any value judgment around that, and then in particular around post-trading of Treasuries.

Mr. WEISS. So, in the RFI which we have issued comments in April 22, a whole section, Senator Warner, is on post-trade transparency, around the level of transparency that should be attached to official sector data. And, this is a controversial topic. I do not think we are here to make any announcements about that today.

What we do expect is that by the end of the year, we will have a process in place to ensure that the official sector has access to all cash Treasuries data and that we will have articulated a point of view about post-trade reporting.

Your analysis of TRACE is exactly right. The market participants anticipated a huge amount of upheaval. I think the data would suggest, as Governor Powell reviewed, that a lot of that has not come to be.

As regards algorithmic trading, the second part of your question, you know, we think a couple of things. Number one, you had hearings about equity market structure just recently and algorithmic trading really started in equity markets, moved into FX, and then into futures, and is now present for the past 10 years or so in cash Treasuries. And, really, all standardized securities are now traded predominately algorithmically, certainly on the interdealer market for Treasuries.

And, we asked a couple of questions in this regard in the report and in the RFI. Number one, there are questions of operational resiliency. Some of the entities that trade cash Treasuries, for example, are not regulated for those activities. There are questions as to the robustness of the pre-test environment for algorithms and introduction of algorithms into markets. CFTC has a proposed rule, Reg AT, which addresses some of those questions. And, you know, there are also valid issues of practices, such as spoofing and layering and order stuffing, which in our judgment do need to be addressed and monitored.

Senator WARNER. Governor Powell, a comment, because I do want to get in one more question, as well, but——

Mr. POWELL. Yes, just quickly. I would agree with everything Mr. Weiss said.

On algorithmic trading and all that, it is driven by technological advance. It is not going away. It is with us, and it has benefits and it also has risks. The risks may be, and it is not firmly established, but may be that liquidity can be more flighty under stress. I would also say it is not just the principal firms that are using this. All market participants are electronic traders now, and it affects the structure of the markets and the functioning of the markets and we have to get used to it and adapt to it, and it is something we are looking at very carefully.

Senator WARNER. And I agree, we are not going to roll back technology, but I do think sometimes, and nobody wants to sound like a Luddite, but the idea of speed for the sake of speed at least has to be evaluated.

I am going to just take one more question, then, Dean, if I can, and then I will head off, and this is directed to you, Governor Powell. One of the things that the Fed has recently acted on, the Fed's proposal to confer Level 2B status on certain municipal bonds, the purpose of LCR. I really worry about this. It seems like a very conservative move. The FDIC and the OCC have not even ruled in on this, and it is just kind of hard for me to understand why we would say we will take a triple-A bond rated Virginia debt instrument, or New York Port Authority debt instrument, and somehow make that a lower status in terms of LCR than, say, sub-sovereign bonds issued by European nations. Why should Bavaria get a higher ranking in terms of the level of quality of capital than a triple-A rated United States muni?

Mr. POWELL. Senator, the LCR, of course, requires these largest financial institutions to hold amounts of highly, highly liquid instruments that can be turned into cash to a near certainty to cover 30 days of potential outflow. So, it is really all about liquidity. It is not about the creditworthiness of the underlying issuers or anything like that. So—and what we have done is we want them to be mostly in Treasuries, and then there is a middle box for the GSEs, and then there is corporate bonds and munis. It simply is just that it reflects the liquidity, the amount of trading that occurs in these instruments, so we wanted to include them.

By the way, banks can own as much of them as they want. This is not a limit on what banks can own—or as much as the law allows. This is a limit as to what counts for highly liquid. And, so, for investment-grade bonds that are general obligations, they can, you know, amount to up to 5 percent of your highly liquid assets.

Senator WARNER. The effect, I think, and I will again turn it over to Senator Heller, is that you are, in effect, giving sub-sovereign debt that may be European-based, does not have the same level of restriction that American muni debt would have. And, again, I understand the need to have that liquidity, but it does seem to be a—and, you know, we are going to urge you to reconsider or look at legislative solutions.

But, thank you, Senator Heller.

Senator HELLER. [Presiding.] Senator, thank you.

As you probably heard, the bell went off for a vote down on the floor, so as you can tell, I am the only one up here right now. My job is to hold down the fort until they make themselves back. I do not know if that is good news or bad news for you, but I want to again thank you for your time and for your expertise on this particular effort.

I would like to ask a question based on what you were just talking about when it comes to liquidity. It seems to me, and maybe you can answer this question, electronic trading seems to have made the equity markets more liquid. Why does it appear that it has made the debt markets less liquid? Is that——

Mr. POWELL. I do not know that I would say it has made the debt markets less liquid at all. I think the question really is—these are new liquidity providers who are providing liquidity in a different way, in a different form, in different amounts, and at certainly a different speed than traditional providers had. That does not mean that there is less liquidity. I would not say that at all.

I think the question with the high-frequency traders is when they become the dominant liquidity provider, is that liquidity—and it is a question, it is not an answer, it is a question—does that liquidity become somewhat more fragile, more likely to disappear, as happened on October 15. That is not to blame October 15 on the high-frequency trading firms, but that is a question we have a responsibility to answer and understand as it relates to this change in market structure.

Senator HELLER. Thank you, Governor.

Let me quote from former Treasury Secretary Larry Summers. He stated recently that there is a legitimate concern that through your regulatory actions, you are losing sight of keeping markets open and liquid. Can you respond to that, Mr. Weiss.

Mr. WEISS. So, I believe what former Secretary Summers was referring to was this so-called tradeoff between financial institution stability and market stability, and I think as I made clear in my opening remarks, our view is that this is comparing two completely different environments, really, that do not bear comparison.

The liquidity that was in place in 2005, 2006, and 2007 was fueled by banks that were leveraged 40-to-1, 50-to-1, 30 percent short-term wholesale funding, substantial off-balance sheet lending that came on-balance sheet, and the liquidity conditions that exist today, however one may characterize them, are far more stable as a result of all of the reforms that have been made.

There was a letter from JPMorgan's CEO attached to the 2015 annual report, and I quote, he concluded, "We may have had artificially higher liquidity in the past and are returning closer to normal." Now, that is not to say that there are not profound changes taking place in the nature of liquidity provision and the structure of fixed-income markets, but it is important to note that the liquidity benchmark of pre-crisis really should not apply to any future assessment, in our judgment.

Senator HELLER. So, do you believe or not believe it is fair to question whether regulations are having a profound impact on these fixed-income markets? From your testimony, unlike the Governor's, I think you mentioned that taking a look at these regulations may make some sense. Do you feel that the regulations that are currently in place are doing exactly what they intended to do?

Mr. WEISS. I think the prudential regulators, and I would defer to them in the first instance, really have tailored regulatory tools in order to differentiate between smaller financial institutions, regional financial institutions, and the largest ones, and the tailoring that is available to the prudential regulators through the design of these rules, coupled with the discretion which is afforded to prudential regulators to develop—to react to developments in the marketplace, you know, in our judgment gives the current framework ample flexibility to address changing conditions.

Senator HELLER. OK. So, let me ask you this as a follow-up. Was it your intention through regulations to push banks out of their traditional role of fixed-income market makers?

Mr. WEISS. As a matter of fact, the banks are still, you know, a majority of market making, you know, both in Treasuries, if one aggregates off-the-run securities and on-the-run securities, and in corporate bonds, and are active market makers as we speak in all fixed-income markets. And, so, to the contrary, because——

Senator HELLER. But you are not disagreeing that their participation is decreasing?

Mr. WEISS. Their participation is still at the core of the way fixed-income markets are intermediated.

Senator HELLER. Well, the market participants themselves, I think, may raise some questions to those comments, believing that it is much more difficult for them to stay in these debt markets with the regulations that are currently in place. Is that a fair assessment on their part?

Mr. WEISS. I think market participants are adjusting to all of the factors which Governor Powell highlighted and which I have stated, and those include technology, changes in risk appetite. They include, as well, changes in business models. Different banks are pursuing different business models and strategies. And, they reflect much needed reforms, which I referred to in my opening comments.

But, I would like to go back to our premise. Liquidity conditions as a whole in fixed-income markets, while evolving, do not show on an evidence-based approach broad deterioration.

Senator HELLER. OK. Governor, do you have any comments?

Mr. POWELL. I am in the same place. I would agree with that.

Senator HELLER. At the end of your opening statement, you talked about the Treasury Department looking for information, asked for a request for information from industry participants. What do you anticipate doing with that information?

Mr. POWELL. So, this is Treasury's—it's Treasury's request for information, but I will just say that we do not actually have post-trade reporting that is available to any regulator on a routine basis in the cash Treasury market, either on the interdealer platforms or on the dealer to customer market. So, doing the analysis to deal with one 12-minute trade event took almost a year. It took several months to get an interagency agreement. So, this is not where we need to be. I think for us to do our jobs and provide the kind of oversight we need to provide for these markets to assure the public that they are safe and sound, I think we do need to have better information. The question of what to do with it is also the subject, though, of the Treasury's request for information.

Senator HELLER. Yes. Would you follow up, please?

Mr. WEISS. I would concur with Governor Powell's comment that it is clearly inadequate, given all of the technology evolution that has taken place in cash Treasuries, for it to take five supervisory agencies 9 months to put out a report that is comprehensive on what took place October 15. And, I would point out that if that report itself was really based on only partial data, it was based on interdealer markets where we had access to data, there was then the Federal Reserve Bank of New York introduced a subsequent report a couple of months later.

You know, all of that suggests that with transactions happening in microseconds, the agencies which are charged with overseeing these markets do need more robust access to data, and we will have a plan in place by year end to assure that that happens.

Senator HELLER. Thank you very much.

I need to get down to the vote, so I will kick it over to Senator Warren for now for her questions, and hopefully, the Chairman will get back before she is done. Senator Warren.

Senator WARREN. All right. Thank you.

So, thank you all for being here. Let us pick up on this issue. Republicans have suggested that the changes in the law to prevent another 2008 crash have undermined market liquidity, and I just want to dig into what that really means.

Mr. Weiss, you wrote an op-ed in the Wall Street Journal last year in which you noted that while there may have been more liquidity before the crisis than there is now, quote, "pre-crisis liquidity built on excessive leverage and unstable funding turned out to be available in good times, but not in bad. During the crisis, those inventories did little to prevent the financial markets or the broader economy from freezing up." And I think that is consistent with the testimony that you have offered today.

I think this is a very interesting point, and what I want to ask is whether you think that because of the new rules, including Dodd-Frank, there is now a better chance that liquidity will be available the next time there is panic in the markets.

Mr. WEISS. So, Senator, that is really at the heart of the question, and it is absolutely the case that pre-crisis liquidity, for reasons that we have all stated, is a poor benchmark for overall liquidity. And, it is our judgment that however one wants to characterize liquidity conditions today, and again, I think Governor Powell and I have given generally a sense that liquidity is sufficient in fixed-income markets, although there are those who argue to the contrary, but the evidence again suggests it is within normal ranges, I do think that what regulation has produced is a higher likelihood that the liquidity conditions that exist today will be available tomorrow in a period of stress.

Senator WARREN. So, let me just underline that point and make sure we are exactly on the same page. I do not want there to be any ambiguity about this. Do you think that Dodd-Frank and the ancillary rules have made financial markets more resilient and better equipped to handle the kind of stress we saw in 2008?

Mr. WEISS. Without a doubt.

Senator WARREN. Thank you. You know, I think some of this discussion of liquidity may miss the forest for the trees. Liquidity that disappears exactly when the market needs it is not very valuable. Our focus should be on ensuring liquidity during times of stress, and it sounds like Dodd-Frank has helped us do exactly that.

Now, while we are on the subject of liquidity, Governor Powell, I wanted to ask you about the Fed's recently finalized rule on the liquidity coverage ratio, and I think Senator Warner may have started this while I was gone. As you know, the liquidity coverage ratio is a joint requirement of the Fed, the OCC, and the FDIC. It currently applies only to a small group of the largest financial institutions, largest banks in the country, and it requires those banks to hold a certain amount of highly liquid assets. The idea is that the biggest banks should have a minimum amount of liquidity so they can weather a crisis without needing a bailout.

How much credit a bank gets for an asset depends on the asset's liquidity. So, for example, cash and Treasuries are considered Level 1 assets and they are given the most credit. Fannie Mae and Freddie Mac securities are considered Level 2A assets and given less credit than Level 1 assets. And then certain highly liquid and marketable corporate debt securities are considered Level 2B assets and given less credit than Level 2A assets. Originally, municipal debt was not given any credit at all.

Now, the Fed recently changed this rule to allow certain highly liquid and readily marketable municipal securities debt to count as Level 2B assets. The Fed determined, however, that municipal securities were not liquid enough to count as Level 2A assets.

So, my question is, can you explain why the Fed was more comfortable counting certain municipal debt securities as Level 2B assets rather than Level 2A assets?

Mr. POWELL. Yes, Senator. First, I think you accurately stated the point, that the Level 1 assets are highly liquid, highly reliably turned into cash in moments of stress when they are needed to do so. Level 2B is the middle ground and it tends to be the GSEs in our market. And Level 2B is——

Senator WARREN. You meant 2A.

Mr. POWELL. I am sorry, 2A. Level 2A is the GSEs, effectively, and Level 2B is corporates, highly rated corporates that have good liquidity. It just—it seemed to us, and it seemed to me, in particular, as well, that investment-grade munis that are general obligation bonds were more akin in their liquidity, if you look at their actual liquidity trading statistics, they were more akin to highly rated corporate bonds than they were to, you know, the subsovereigns, which trade almost like Treasuries.

Senator WARREN. OK. Would you have concerns about liquidity in a time of crisis if municipal debt securities were counted as 2A Level assets instead of 2B Level assets?

Mr. POWELL. I think that would give them too much credit. You know, we have to make a judgment here, and I think they are—in their liquidity characteristics, they are much more like corporate bonds. We really want these large institutions to have highly liquid assets. I do not think that munis qualify to be 2A.

Senator WARREN. OK. So, these characterizations are what really go to the heart of the liquidity issues that we are dealing with now, and making sure that the liquidity is there when we really need it, which is also what we are trying to accomplish here.

It is critically important that our biggest banks have sufficient assets in a time of crisis and that those assets be liquid, but it is also important that municipal bonds are treated fairly under the new rules, and I appreciate your perspective on how we try to get that balance. Thank you.

Thank you, Mr. Chairman.

Senator CRAPO. [Presiding.] Thank you very much, Senator Warren.

As you can see, a lot of the Senators have had to leave for a vote. I do not know how many of them we will be seeing pulled back here, because they all have multiple hearings and activities today, but I am going to take the next round.

First, I want to get back into the topic we were discussing before I had to yield my time for further questions earlier, and I guess for both of you, I have a question. Do you have concerns that the liquidity for corporate bonds that do not necessarily trade in high frequency has deteriorated over the past few years?

Mr. WEISS. I mean, this is something we are obviously monitoring. I think, as has been mentioned, it is important to break corporate bonds down into subcategories, and I will go back to the fact that issuance has been strong, primary issuance, over the whole 4-year period. In fact, a record has been set for the category as a whole in each of those years, and that volumes, trading volumes have also been strong.

What we have noticed by the evidence are two trends. One is that there was a decline in the size of corporate bond trades immediately following the crisis, and although it has picked up somewhat, as the chart attached to my testimony shows. And the second point is that there has been a decline in the proportion of block trades, large transactions, and, therefore, intermediaries and investors are having to internalize and take greater responsibility for achieving liquidity for larger transactions.

Senator CRAPO. Governor Powell, did you want to add anything to that?

Mr. POWELL. Sure. So, I agree with that. I would add two quick things. One is that we are now seeing a significant number of electronic platforms springing up in the corporate bond market for the first time, which would enable buyers and sellers to meet, and that is a new thing which we will see if it pans out. But, this is the kind of thing that is constantly happening as these markets transition.

The second is corporate bond markets have been through, really, two significant shocks in the last year, one of which would be the significant decline in oil prices and the other of which was really the global turmoil and recession fears and that sort of thing that went through the market. And in both cases, the corporate bond markets navigated through that with pretty normal behavior. There was some increase in bid-ask spreads and things like that, but very high volumes of trading and really well within the historical range. So, we do not see the kind of problems.

Senator CRAPO. In your analysis, are you not seeing a decrease in dealer inventories and a reduction in market-making activities?

Mr. WEISS. I mean, I think I gave the figures previously about dealer inventories were, in corporate bonds, by independent estimates, at about $40 billion in 2005 and that are about $20 billion in 2015, and that is relative to outstanding levels of $5 trillion in 2005 and around $8.5 trillion in 2015. So, I think however you position the numerator and the denominator, the outstanding has always been well in excess of dealer inventories.

Senator CRAPO. I want to get back into the question of post-reform regulatory impact. I do not think there is any question, as Senator Warren indicated in her questioning, that following the post-regulatory, or the post-crisis regulatory impact that we have—the reform impact that we have seen, that we see greater leverage and higher quality of leverage in the system, which is a good.

The question that I think that I see raised by a number of those who are studying this is, and I think, Governor Powell, you referenced this, there is a tradeoff, is there not, between this regulatory safety and soundness that we are seeking to achieve here and the liquidity in the markets. And the question, is it not, whether we have achieved the right balance in this process, or do you believe that we have reached the right balance and that there is no issue here to evaluate?

Mr. POWELL. Senator, I do not know that there is a tradeoff, and I think, again—I do not want to look at the pre-crisis levels of liquidity as any kind of a benchmark. So, we are in a new world post-crisis where we are trying to strengthen the core of the financial system, trying to strengthen these firms, trying to make them less risky, and that is having the effects that we have talked about—smaller portfolios in some fixed-income securities and others.

So, what you would worry about is that you would see the capital markets not functioning well, not performing the service they are supposed to perform for borrowers and lenders, and we do not really see that. We see isolated examples of it, but the case is really not made, in my mind, and I try to keep up with this pretty carefully.

Senator CRAPO. Well, I guess you may have answered this, but I have not suggested that we should be comparing to pre-crisis levels. What I am talking about is today and whether we see an impact on liquidity in the markets, whether we see market participation going down, market makers leaving the market. And are you telling me that you are not seeing that?

Mr. POWELL. I would say, by most measures, if you look across a broad set of liquidity measures in most markets, you really do not see—you cannot prove a broad decline in liquidity as it really matters for buyers and sellers. You do not see that big of a decrease in market depth. There is no story to be told around bid-ask spreads, for example, which are a key indicator of liquidity. In terms of the impact of trades on price, which is a very important, probably the most fundamental one, there is no clear trend there that would say, yes, there is a liquidity problem here that is hurting the financial markets and, hence, the economy.

Mr. WEISS. You know, if I could just build on that, there is kind of a basic premise here, which is is it the case that it is a law of nature that under all market conditions, all market participants can sell large blocks of exposure without impacting market price, and there is no such law of nature. And, in fact, it has never been the case that under all stressed conditions, there would be no movement in price.

And, there was a recent op-ed put out by PIMCO which was articulate on this point, and what it concluded was, in essence, that not all repricing events are themselves liquidity events, and, you know, we agree with that.

Now, that being said, we do bear a real responsibility as regulators and as agencies to monitor the liquidity conditions, and in our judgment, the right reference period is not today's liquidity conditions, and it is not the pre-crisis liquidity conditions, it is potential liquidity conditions 5 years from now and 10 years from now as technology evolves, as markets evolve, as the world becomes more interconnected, and as we anticipate future events of potential stress. And, the work that we should be held accountable for is the anticipation of those market conditions.

And, so, as I mentioned at the outset, we are heavily engaged in a review of Treasury markets, which is the first such Treasury market review since 1998. And, we are also working at the FSOC in looking at asset management activities and the questions that have been raised about underlying liquidity conditions in mutual funds that may hold less liquid assets and at the same time offer daily redemption.

And, so, our agenda is rather full looking forward. What we would not advocate is to revisit the regulations that have been put in place in the United States and globally which have created confidence in our financial institutions and solidity in our liquidity conditions.

Senator CRAPO. Well, so, you know, I have read most of the studies that we have referenced here today, and it seemed to me that in every one of them, a list of possible factors for the issues we are dealing with was put out, and in every one of them, if I recall correctly, one of the issues that it was suggested we need to look at was the regulatory climate and the impact and the balance there. For example, the European Commission has issued a call for evidence on the EU regulatory framework and its impact on liquidity in these markets, to look at it and study it.

I am afraid I am hearing you saying that you do not even think we need to look at those kinds of issues because that is not an issue. Is that what you are saying to me?

Mr. POWELL. Senator, I think every study does consider the question—every study I have seen—I have not read them all, but I have read a lot of them—every study that I have seen does consider the question and consider regulation as one of a series of factors. I have not found any studies that think that this is all about regulation——

Senator CRAPO. No, I am not suggesting that, either.

Mr. POWELL. No, I know you are not. I am just saying it is clearly a factor, and, you know, some of that is by design, frankly. You know, if you take, like, take the repo market, for example, which is—there is no question, I think, that capital requirements and prudential regulatory requirements generally have raised the balance sheet costs of repo, and so there is an effect in that market. But, what comes with that is significant increases in safety and soundness.

Senator CRAPO. And I understand that, and I do believe there is a tradeoff in here. But, what I want to hear from the two of you is that you recognize this is an issue and that you are looking at it among the other issues that you are studying.

Mr. WEISS. Again, as I stated earlier, Senator, it is a fair question. The response that I think you are hearing from both of us is that liquidity provision in fixed-income markets is evolving, that it is a period of historic change, that technology, changing business models, changing risk appetite, and much-needed regulatory reform are all playing a role in that, that we have our work to do with the agenda that we have set that is forward looking. And, again, I would underline, we need to focus on where markets are headed in the future and the potential for how those future markets may react to stress events.

Senator CRAPO. Well, thank you. I have gone way over my time. Senator Warren, do you want another round?

Senator WARREN. Yes. Thank you very much, Mr. Chairman.

You know, let us pick up on this question about regulatory climate and market security. Yesterday's announcement by the FDIC and the Federal Reserve Bank that five of the largest financial institutions in this country did not have credible living wills is a clear statement that too-big-to-fail is still a problem. The finding was that with these five financial institutions, there is no credible plan in place that if they start to get into financial trouble, that they will not bring down the entire economy.

Now, many of the plans were found deficient because the banks were said not to have sufficient liquidity in a crisis situation. Governor Powell, could you talk for just a minute about the role that liquidity played in the living-will determinations?

Mr. POWELL. Sure. So, we look at these, at all of these plans across multiple dimensions, and that is one of them, and it is a different thing. Many of these firms have plenty of liquidity for the ordinary course of events. This is really about having a plan and having the right quantity of liquidity and having it in the right places for that event, which we hope never comes, that you actually have to be resolved. And, so, what we require of them is to have a model that clearly estimates that and a system throughout their, what can be very complicated global structures, of placement of the liquidity and, really more importantly, a way to think about it, are they thinking about it correctly, and that kind of thing.

So, we identified deficiencies for a number of them and I think we gave clear guidance as to what they need to do to address that deficiency, and all the other deficiencies, for that matter.

Senator WARREN. You know, the giant banks want to advance the story that they are over-regulated, but it seems to me that the report yesterday on living wills demonstrates that, if anything, today, they continue to be under-regulated. That is, they pose significant threats to the entire economy, and I think that is something we have to take into account when we think about what regulations and what changes are needed going forward.

I want to ask one more question and that is a question about data. Both of you have said that the Government needs more data to adequately oversee the Treasury markets. Mr. Weiss, could you explain what kind of data you are lacking and what kind of vulnerabilities it creates not to have those data.

Mr. WEISS. Yes, Senator. So, in the futures market, which is centrally cleared through a single exchange in Treasuries, there is ample visibility and access to data.

Cash Treasury markets are fragmented. We have access to interdealer markets on request, which is what we produced in the October 15 report. We have relatively less access to the dealer to customer flows, which still account for, I should highlight, a majority of trading activity in cash Treasuries.

And, so, what we believe is imperative, and it is the first course of action we are going to pursue, is to have a concrete plan in place that cannot be reversed by year end such that in the future, if and when there is another event, it will not take five agencies 9 months to put in place information sharing agreements and compile data and release to the public further analysis.

Senator WARREN. So, I am hearing you say you are on the path here, and by the end of the year, you will have in place the ability to gather the data you need on an ongoing basis, both the data you need and in a timely fashion to gather those data, so that you will be able to make faster decisions about liquidity and other shifts in the market, is that right?

Mr. WEISS. Senator, I think we will have a plan, and that plan will lead to the gathering of the data——

Senator WARREN. OK. So, you will have the plan. You just will not have it executed by that point.

Mr. WEISS. Senator——

Senator WARREN. You will have a plan.

Mr. WEISS. We will have a plan and it will happen.

Senator WARREN. And, how long will it take for this to be executed? Do you have any clue?

Mr. WEISS. Not long after year end.

Senator WARREN. OK. All right. Not long after year end. That sounds good. All right.

Senator CRAPO. All right. Thank you, Senator Warren.

Senator Warner.

Senator WARNER. I am trying to get the update on what I missed.

Senator WARREN. You missed some good stuff.

Senator WARNER. Good stuff.

[Laughter.]

Senator WARNER. I think, because I missed Senator Warren's questions, but I would like to, maybe not right now, but come back again to the muni bond conversation at some point. I, just again, basically feel that the notion that foreign-based debt is going to have a higher capital standard than American-based equivalent debt is not the right way to proceed.

Let me—this is a little, kind of in the bucket that we are in, but slightly off topic, an issue that I have discussed with both of you a number of times, and that is the overall question of our balance sheet and the $19 trillion of debt and the effect, I think, that the rise in interest rates will have on the Federal Government's ability to, frankly, invest in anything in the discretionary realm.

I give the Fed a lot of credit, and others, for stepping up when we as policymakers have not stepped up, but you are almost out of tools. One tool that I would like your comments on, Governor Powell, is inside our current debt portfolio at the Federal level, I think the average duration of most of the bond portfolio is about 69 months. Yet, if you look at the United Kingdom, their average sovereign debt has terms of about 10 years. We have the longest term instrument we use, which is a 30-year instrument. Japan uses a 50-year instrument. Princeton uses a 50-year instrument.

Has there been thought inside the Fed about looking toward, you know, with interest rates at such record lows and, unfortunately, us still borrowing at the rates we are, and obviously everyone agrees that the deficit numbers are going back up, looking at longer-term instruments in terms of locking in more of this debt at these record low levels in terms of interest?

Mr. POWELL. Senator, that is very much a Treasury Department question, if I may so. It is not something we have responsibility for.

Senator WARNER. You are right.

Mr. WEISS. It would have been a question of Governor Powell 20 years ago.

[Laughter.]

Senator WARNER. And, I actually——

Mr. WEISS. I was going to ask Governor Powell to defer.

Senator WARNER.——back to in his earlier private sector experience, and then switch to you, Mr. Weiss.

Mr. WEISS. But, in any case, you know, so we look at this constantly. We look at the composition and issuance of the Federal debt constantly. You know, in the wake of the financial crisis, the duration of the Federal bond portfolio was 49 months. We issued masses of bills at a time when there were two wars and huge deficits following the Great Recession. That number is, as you suggest, Senator Warner, now up to 69 months, and our policy has really been to extend this.

We have two tenets we try to stick to at Treasury, which are, on the one hand, to issue at the lowest cost possible over time, and on the other hand, to be regular and predictable. And, what this does underline is that Treasuries are different. We do not introduce new instruments and then withdraw them. The market views Treasuries as a risk-free asset. I mean, our short-term rate is 19 basis points for 1-month bills now, 10 years at 1.75, long bond is at 2.6-something. So, we try to issue and maintain low rates across the curve, and the steadiness of issuance and the predictability of our issuance is really a core tenet of——

Senator WARNER. I guess I would just comment that when we see—and, obviously, because of the depth of the Treasury market, you need to have that predictability. I understand that. But, when you look at similar, you know, the United Kingdom having an average timeframe of 10-year framework, when you look—I think Senator Crapo and I spent a long time on balance sheet issues, and those debates have disappeared, unfortunately, from most of the political discussion today, but they are coming back. Any prediction, left or right, shows the deficit going up dramatically, and the deficit really, my belief is, is not necessarily the sole driver right now.

It is the challenge of the aggregate debt totals and the effect of even relatively modest interest increase in rates has an enormous effect in terms of decreasing the ability, again, for this Government to have any kind of discretionary spend. So, I just ask for further consideration on this.

Mr. WEISS. Senator, I would be happy to come with my team and brief you in great detail, along with Senator Crapo. We do have a policy of extending the maturity. There are some limitations to how quickly that can be done. They stem from the regular and predictable need for issuance, but also the fact that our deficit has come down so dramatically in the last few years. But, I would be happy to go through——

Senator WARNER. Which is also starting to ramp back up.

Mr. WEISS. But at the same time, given the $13 trillion of marketable securities, the ultimate duration of that portfolio does not change quickly.

Senator WARNER. I would love to have that brief.

Thank you, Mr. Chairman.

Mr. WEISS. Happy to do it.

Senator CRAPO. Senator Heller.

Senator HELLER. Mr. Chairman, thank you.

I will mention that I am probably less than satisfied with the direction this particular hearing is going. I am more concerned that here on this panel, most of us on this panel are concerned about the liquidity of these markets, and yet with regulators in front of us, I feel that the only message that I am really getting from them, that there is nothing wrong with the debt market. Yet, the market participants are all concerned that we have seen some dips and some volatility in these markets that we should be concerned about. And, my concern about it is we have got two regulators in front of us that, frankly, do not share the concern that market participants have about the viability of long-term debt.

I will give you ample time, if you need it, to share with us, but hearing from our witnesses today, outside of one cheerleader here on our side, that, frankly, most market participants are very, very concerned about the long-term viability of our debt market. So, maybe I can try again.

Let me ask you this question. Do either of you believe that ultra-low interest rates and perhaps quantitative easing is masking some of the impacts that we have on reduced market liquidity?

Mr. POWELL. I guess I should take that. So, I think very low interest rates have been a big factor in promoting primary issuance, which has been at record levels and greatly expanded. Any company that could finance has financed and certainly should have done by now. So, I do not think that has masked—I would not say that it is masking liquidity.

I guess the question I would worry about is what will happen as the process of raising interest rates goes on. And, that will happen in a changed marketplace, it is very fair to say, and in that marketplace, asset managers, asset holders are going to bear more of the liquidity risk, because the dealers, however much they were bearing before, are going to be bearing less, although it is not clear that they were really going to be there in stress, anyway, for the corporate bond market.

So, the question there is, are the asset holders, mutual funds, HFTs, hedge funds, and the like, are they going to be able to deal with stressed market conditions if they arise, and in any case, with a higher rate environment. So, I think those companies need to focus on that, and if you talk to the big asset managers, they are very focused on this. They are very focused on having enough liquidity on hand and on being ready to manage this new and changing environment, which is very different from the pre-crisis environment.

Senator HELLER. Mr. Weiss.

Mr. WEISS. I would concur with Governor Powell. As to our level of focus on this topic, it is intense. I would say it is among our top priorities at Treasury to understand the evolving nature of fixed-income markets. This is why we commissioned and published the joint staff report which was made public in July of last year on Treasury markets, and it is also why we have initiated the first fundamental review of secondary markets in Treasuries since 1998. We feel an awesome responsibility to maintain the depth and liquidity of this vital market, you know, not just for today, but for the decades ahead.

Senator HELLER. Changing subjects just a little bit here, in your review of the global regulatory markets and the rules that are out there in order to—frankly, are you reviewing some of these global rules in order to avoid some of the harmful liquidity that we have, may have, or has occurred or may occur here in the United States? Mr. Weiss.

Mr. WEISS. I mean, I would defer to Governor Powell.

Mr. POWELL. I am sorry. Which rules, Senator?

Senator HELLER. Basel.

Mr. POWELL. The Basel rules, OK. I guess I would say it this way. We are—I am, and I think we are, and I know Treasury is, as well, very focused on conditions in fixed-income markets, and that includes Treasury, cash markets, and futures, and it includes the corporate bond markets, investment grade, non-investment grade, and such.

Senator HELLER. Do you think capitalization has any effect on liquidity?

Mr. POWELL. I do think capital requirements—the capital requirements that we have imposed on the largest financial institutions have raised the cost of balance sheet. They have made balance sheet heavy businesses more expensive for them to run, and undoubtedly that is one of the reasons why they have—running smaller balance sheet. Repo would be sort of the center of the bull's-eye on that for me. So, yes, there will have been an effect there. But, I would say again, it is not an effect that was unintended and we do not think it has negative consequences, particularly, that cannot be dealt with in an evolving marketplace.

Senator HELLER. Mr. Chairman, thank you.

Senator CRAPO. Thank you, Senator Heller.

I have just got a couple more questions, and then we will see if anybody else wants to——

Senator WARNER. Mr. Chairman, I am going to have to leave, but I am going to leave Senator Warren to ably——

Senator CRAPO. In charge. All right. Very well. That will just reduce the number of questions.

Senator WARREN. But not the intensity.

Senator CRAPO. Not the intensity.

[Laughter.]

Senator CRAPO. I am just going to come at this one more time from a different direction, and I am going to talk—let us talk about liquidity risk. In one of the New York Fed's research posts entitled, "Has Liquidity Risk in the Treasury and Equity Markets Increased?," the authors noted that, frankly, liquidity risk has risen, and I am going to just quote an excerpt and ask for your reaction to this. This is a quote:

> While current levels of liquidity appear similar to those observed before the crisis, the sudden spikes in illiquidity, like the equity market flash crash of 2010, the recent equity market volatility on August 24, and the flash rally in Treasury yields on October 15, 2014, seem to have become more common. Our findings suggest a tradeoff between liquidity levels and liquidity risk. While equity and Treasury markets have been highly liquid in recent years, liquidity risk appears elevated.

Do you agree with that?

Mr. WEISS. In fact, that is one of the areas in our request for information where we pose a whole set of questions, and it has very much to do with the evolution in market structure. Equities started to be traded primarily algorithmically, as you know, in the 1990s. That then moved to FX and to futures and it began in Treasuries in around 2003. This creates a new paradigm. The speed of markets today is measured in microseconds, as you know, and the difference between the equity market hearing which you held, I think it was a month ago, and the discussion of Treasuries is a difference in kind, not of degree.

When the market structure changes that radically for Treasuries, which are a benchmark security, although we have not noted an impact on trading volumes or the ability to issue debt or the ability to transact, we do need to look forward and to make sure that the operational risk measures that need to be in place are strong and that the protections against practices which have arisen in other markets are strong, as well. And, so, our whole effort is made to be forward looking and to assure that those safeguards are in place for our deepest market.

Senator CRAPO. Governor Powell.

Mr. POWELL. I cited that and referred to that in my testimony, so I do not think you can take any single piece of research as wholly dispositive. It is probably a good idea not to. But, nonetheless, I found that to be persuasive. And, I would just point out that they found no such effects in the corporate bond market. And, as I was referring to earlier—that is where you would expect to find these problems, because that is where prudentially regulated firms do their business, the on-the-run interdealer platform is so entirely electronic, that story of what is happening there is really not about prudential capital requirements. It is about what is going on with trading at billions of seconds and how that affects liquidity.

Senator CRAPO. All right. Thank you.

I will just conclude on this aspect before I go to my last question, which is a wholly different topic, by saying I appreciate the investigation and the activity that you have already engaged in. I am heartened by the request for information, and I just encourage and hope that you will look at all potential aspects of the cause of the issues that we are dealing here with regarding liquidity in the fixed-income markets.

I am going to just go into one other question really fast. I hope I do not open up a whole big discussion by this, because I do not think this is going to be controversial, but earlier this week, the Government Accountability Office released its report, which Senator Warren has referenced, with regard to its recommendations on improving the transparency and timeliness of the Federal Reserve and the FDIC living-will process. I guess this question is going to be for you, Governor Powell.

The credibility of the living-will process was undermined that very same day when the results of the Federal Reserve and FDIC living wills were leaked to the press the day before they were made public, and my question has to do with that leak. Whatever one thinks of the results of the living-wills process, this is not how the process is supposed to play out, and it shows that the process needs to be reformed. Something is wrong.

And, so, my question is, Governor Powell, do you expect that the Inspectors General of the Federal Reserve and the FDIC will be tasked with finding the source of this leak and how this leak could have occurred?

Mr. POWELL. Senator, let me say that I am very troubled by the leak, and I think both at the FDIC and at the Fed, the matter has been referred to the Inspector Generals. I would add, if I may, that the GAO report—offered some things that are well worth considering around—and I think we have actually followed through on some of those recommendations already.

Senator CRAPO. All right. Thank you.

I note that Governor—I mean, that Senator Rounds has joined us. I do not know if you have any questions——

Senator ROUNDS. I do, and thank you for the compliment, Senator.

[Laughter.]

Senator ROUNDS. I do have just a few, if——

Senator CRAPO. If you would like. We will do that.

Senator ROUNDS. Thank you, and just a couple. I apologize for not being here. I had floor duty today, so that takes precedence.

I know that the issues that we are talking about, they are very important, and that there was a real question that occurred during this particular event back in October of 2014. Specifically, though, I understand that Senator Warner had some specific questions on high-quality liquid municipal bonds. We have been discussing these issues, and I think it is an important issue that needs to be addressed.

So, my question today is, with the fact that these Treasuries make up a significant part of the total bond, but there are other types of bonds, as well, that are also important, does this event support the argument that banks should be incentivized to hold a wide variety of potentially liquid capital rather than concentrate their liquid capital in assets such as Treasuries, and in particular, we are thinking of municipals and so forth. Would you care to comment on that?

Mr. POWELL. I guess that is probably for me, Senator.

Senator ROUNDS. Please, yes.

Mr. POWELL. The liquidity coverage ratio requires that you have a certain amount of liquid assets to cover a 30-day outflow in stress conditions and it counts different securities that have different levels of liquidity at different——

Senator ROUNDS. Two-A, 2B——

Mr. POWELL. Right. You have got it. So, we put them in 2B. I think the other regulators did not want to count them at all——

Senator ROUNDS. Right.

Mr. POWELL.——and are not counting them at all, so we are counting them to some extent. It does not in any way limit the ability of a financial institution from holding more than that. It just does not count in liquidity coverage ratio, that is all. And the reason that they are in that bucket is that they are just a little less liquid, or significantly less liquid, than the 2A assets.

Senator ROUNDS. But, is there enough—and, once again, I understand that you have identified and have accepted 2B. Someone said is it 2B or not 2B, and I think 2B is better than not at all——

[Laughter.]

Senator ROUNDS.——but, nonetheless, you are one of the organizations, not all—my question is, just in terms of a discussion on it, it seems to me that there is a logic behind promoting not just Treasuries, and it seems to me that having other types, and this particular event that occurred in October of 2014 seems to bring that to the forefront, that there are other types of securities besides Treasuries that are also very, very valid and that should be considered. And, I guess I am using this as a way to point that out, and any other comments you may have, I would appreciate.

Mr. POWELL. So, I would agree. We do not want our banks to turn into Government mutual funds, where they hold only Government securities. That is not the intention. That is not the plan. It would be highly undesirable because we need them to be making loans and intermediating credit in our economy, performing the role that they are supposed to perform. So, that is not what we are trying to achieve with this at all, and, I think, certainly not what we are—what any part of our supervisory or regulatory program is aimed at.

Senator ROUNDS. I also understand that I have come into this meeting late today, and you have been working on it already, but I understand that the need for stronger capital standards, but do you ever worry that requiring banks to hold more and more capital may have unintended consequences?

Mr. POWELL. Yes. We try to set the levels—when we make a proposal for capital requirements, we put it out in a Notice of Proposed Rulemaking and we get plenty of comments and we consider them very carefully. We do. We try very hard to calibrate these things at the right level to take into consideration all of the things that matter. With the very largest institutions, there is a surcharge that they have which is supposed to really force them to internalize the cost of their systemic-ness, if you will. So, you know, it is a constant concern that we do the right level, certainly not too little, but we are also not trying to do too much.

Mr. WEISS. I think we know that the wrong level was the level of capital that existed in 2006 and 2007, when banks and investment banks were capitalized at 40-to-1 or 50-to-1, with large amounts of off-balance sheet financial leverage and an over-reliance on short-term wholesale funding. And, so, that has now been remediated through the prudential standards that have been put in place, and we now know that in periods of volatility, and I would not suggest that the last 9 months have been a stress event, but I would suggest that they have been highly volatile market conditions as market participants would say, that we heard a lot about oil markets and structured—and credit markets. We heard nothing about the health of our financial institutions and we heard nothing anecdotally about hedge funds who are unable to deliver on margin calls. And, so, the solidity that we have built into our financial institutions really does confer on the broader market a level of confidence that we cannot take for granted.

Senator ROUNDS. Thank you, gentlemen.

Thank you, Mr. Chairman.

Senator CRAPO. Thank you, Senator Rounds.

And, I think we are done with questions.

Senator WARREN. Can I just say one thing, Mr. Chairman——

Senator CRAPO. Sure.

Senator WARREN.——just because of Mr. Weiss' last comment and Senator Rounds' comment about the unintended consequences of higher capital reserves, the fact that you say over the last 9 months we have heard nothing about the health of our largest financial institutions. We just got a report yesterday from the Federal Reserve Bank and the FDIC that there are five banks in America that are too big to fail. And if we have a regulatory problem, what that suggests to me is the regulatory problem is we still have not done enough in terms of capital reserve, in terms of regulation, in terms of making sure that these banks are reined in and do not put the rest of the economy at risk.

The report is there. And, the report makes it clear. We are all at risk, not because of over-regulation, but because of under-regulation of the biggest financial institutions.

That is it for me, Mr. Chairman.

Senator CRAPO. Senator Rounds.

Senator ROUNDS. And I think it is a healthy discussion to have. The important part, I think, is that when we take a look at making changes in it, naturally, there is a reason why they settle on a particular number. I do not think any number is perfect. I think the question becomes, talk to us about how you come up with the numbers involved and what type of analysis is done, and then as you move through and you learn, go up, go down, but when you analyze them, what is the process in place in order to do that.

And, I think it is healthy to have that discussion, because if you require more capital, then that is money that is not going to be available for other resources. And, that does not mean that we have a perfect number at any point in the process. And, while we want stability within the market, we also want those regulators to have a process that the individuals, the institutions that are being regulated understand and have the opportunity to give positive input in making changes in the future.

And, that is the reason why I ask. I just do not simply think that one determining time period, one decision should be infallible. And, so, I like the idea of being able to revisit, and the idea of being able to have that on an ongoing basis, but in a stable manner, one in which the members have a process, the institutions understand the process, and there is input which makes for a better decision-making process. That is the reason why I asked the question.

Senator WARREN. And I very much appreciate that, that we have to have the right process in place. But we also have to pay attention to the fact it is now 8 years after a crash that brought us to the edge of economic oblivion. And what the Fed and the FDIC are saying very publicly today is that we have at least five too-big-to-fail banks in this country, that if any one of them starts to go down, they risk taking the entire economy with them.

And that tells me, you are right, we need to keep checking, but the place we need to keep pushing is we need to keep pushing on tougher regulations over these financial institutions. They come to Congress and want to lobby us on, oh, it is too tough, and let me tell you why it is too costly and we want fewer, fewer, fewer regulations. But the reality is, they put everybody else at risk when they are not properly supervised.

Senator ROUNDS. It is good to have the give and take.

Senator CRAPO. I was about to wrap it up. I was going to take the last word, and I still will, but I am going to go to Senator Reed, if you have some questions, Senator Reed.

Senator REED. Thank you very much, Mr. Chairman, and thank you, Senator Warren, for making sure I—no, thanks.

[Laughter.]

Senator REED. I am going to be, I hope, succinct. Thank you, gentlemen, for your wonderful testimony.

It struck me as we talked about the liquidity of Treasuries, particularly, that there are many factors, and you describe them, the market structure, *et cetera,* but one factor which Mr. Weiss highlighted in his comments, at the Federal Reserve back in 2015, is the debate here about the debt ceiling, about suggesting that we might not respond favorably to—can you comment about that as a factor that would affect liquidity or market activity with Treasuries.

Mr. WEISS. Well, I have lived through one debt ceiling from inside Treasury and I can confirm that it is truly scary from inside the institution. Fortunately, Congress worked with the administration to agree to a 2-year budget deal which also dealt with the debt ceiling in that particular period, but, Senator, you are quite right. If you look back at 2013, and 2013 was different in that there was a Government shutdown, as well, but consumer confidence declined by, I think it was 12 percent. The S&P traded off. The U.S. had its sovereign debt rating downgraded. And there are some estimates that GDP growth was cut by as much as a half-a-percentage point, a half-a-percentage point which is hard to recover.

And, so, all I can say, Senator, is I hope that following the smooth process that was in place at this past year end, that we not revisit these kinds of self-inflicted wounds due to the breadth of damage they do to the economy.

Senator REED. Just a final very quick point, too. As I would assume that you were trying to count, figure out what would happen to Treasuries in that situation, because it is uncharted terrain, and mercifully we did not get there, but for a moment, it looked as if all the rules would be erased and you would have these——

Mr. WEISS. Absolutely. As Governor Powell will remember from his time at Treasury, we had our fiscal teams and our debt management teams in hourly standby to deal with every possible eventuality.

Senator REED. Thank you.

And, Governor Powell, again, thank you, not only for your testimony, but for your service for the many years. We appreciate it.

One of the points that you made in your testimony and also in your comments is about the role of high-frequency trading on October 15, 2014. I know my colleagues have been asking questions, but do you have any further thoughts about high-frequency trading and its effect on the crash or its ongoing sort of challenges?

Mr. POWELL. Senator, I just would say that it is here to stay. Electronic trading, algorithmic trading is now very prevalent in the equity markets and in the interdealer part of the Treasury market. It is enabled by technology and telecommunications, and we need to know that it is here to stay and we need to make sure that it takes part in these markets in a way that protects the safety and soundness and allows the public to retain confidence. And, that is just how we look at it, and I think it is—I would not blame the events of October 15——

Senator REED. No——

Mr. POWELL. I would not, and I know you did not.

Senator REED. Right.

Mr. POWELL. But, nonetheless, I think our obligation is to understand the evolution of these markets and make sure that the public has a basis for continued confidence.

Senator REED. And, I have one final question for both of you. We all, or many of us engaged—Senator Crapo particularly was an incredibly thoughtful, active Member of the Committee when we passed the Dodd-Frank reforms. I know there are things we would like to rearrange, change, improve, *et cetera.* But, by and large, do you have a sense of whether they are helping to stabilize the financial institutions in a positive way? Governor Powell first.

Mr. POWELL. I think it is, to me, very clear that financial institutions are much stronger, safer, sounder, more resilient, better capitalized, more liquidity, less risky, and all of those things than they were before the financial crisis and Dodd-Frank certainly gets some of the credit for that.

Senator REED. Thank you, Governor.

Mr. Weiss, please.

Mr. WEISS. You know, it is undoubtedly the case. It is also the case that we have work cut out for us and this is why we have issued our request for information on Treasury markets. It is also why the FSOC is looking into issues of liquidity and redemption risk in certain asset management activities. So, I would not want to say that we are satisfied. There is plenty of work to do, but as to the past, those regulations have stood us in good stead.

Senator REED. Just a final point. In your research now, I hope you can fully engage OFR——

Mr. WEISS. Absolutely. OFR will be central.

Senator REED.——and do it in a very positive, constructive way. That would be another aspect of Dodd-Frank that could be very productive.

Thank you, Mr. Chairman. Thank you for waiting for me.

Senator CRAPO. Well, thank you, Senator.

So, let me wrap this up. You know, toward the end of the hearing today, and actually throughout the hearing, we had several occasions when the question of what is the appropriate level of regulation has arisen, and I would just like to throw in my two cents before I rap the gavel.

Undoubtedly, as I said in my opening statement, and as you just both have reiterated, our financial institutions are stronger, safer, sounder, better capitalized with higher quality capital than they were before the crisis, and that is a positive development.

I personally believe that, and as I indicated to you, Governor Powell, from my reading of the studies that have been done with regard to our fixed-income markets and the question of whether we have a liquidity risk increasing in those markets, that one of the factors that has been identified, I think by every entity that has studied it, is whether the—and this is not just the capital regulatory issue. It is whether the cumulative effect of regulations by the different regulators on the different aspects of the financial system is creating liquidity risk.

And, I think, first and foremost, we need to recognize, I believe, that there is a tradeoff, and it is a tradeoff that is one we need to make. We need to understand it and we need to reach the right levels of tradeoff in these decisions.

And, so, while we can all have different opinions about what may or may not be the right level of capital that is required, the right level of leverage, the right qualities of capital, or as we go on to increasing issues that are covered in the regulatory system, to me, the point that I would like to make is, and I hope that you are doing this, is that we have got to look at these issues and evaluate what the causes are—that is what your request for information is seeking to do—evaluate what the causes are if there is a liquidity risk issue in these markets, and then identify those causes and then make a decision as to whether those causes can be remedied or whether there is other risk or danger that would be created by proposed or by adjustments in those.

That is the kind of decision that we need to engage in, and so—and you are the experts. You are the ones who are charged, along with some of the other regulators, to make these evaluations and assure that our system is promoting the maximum safety and soundness that we can achieve with a recognition of the impacts on liquidity and other impacts on our markets that are caused by that.

That is what I am trying to get at here, and I am very hopeful that as you go forward in your analysis, that you will take those into consideration. We will probably continue to have political debates about this for a long time, but what we hope to see is that our regulators will continue to review their own activities in terms of the impacts of their activities on these markets and make sure we get that balance right.

I am just going to make one other observation here. I think you are aware, we have a Federal law that requires some of our regulators to review their own regulations on a regular basis, the EGRPRA process. Not all of our Federal regulators or financial regulators are subject to EGRPRA. I have got a bill that says that all of them should be subject to EGRPRA, simply because of the principle that we should always be reviewing the status of our regulatory system and the legal system that we put into place to assure that we have safety and soundness and vibrant and strong markets.

So, with that, I want to thank you both for being here. I appreciate the attention you are giving to these issues. I am sure that you will continue to get a lot of input from the members of this panel as you move forward, and we look forward with anticipation to the outcome of your analysis.

Mr. WEISS. Thank you. We would be happy to come and share the outcome of the RFI when it is complete.

Senator CRAPO. Thank you. This hearing is adjourned.

Mr. POWELL. Thanks very much.

[Whereupon, at 11:45 a.m., the hearing were adjourned.]

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

PREPARED STATEMENT OF JEROME H. POWELL

MEMBER, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

APRIL 14, 2016

Chairmen Crapo and Heller, Ranking Members Warner and Warren, other Subcommittee Members, I would like to thank you for inviting me to testify today on trends in fixed-income markets. Because these markets perform important functions in our economy, it is imperative that we understand the significant changes they are currently undergoing. As I will discuss, a number of factors have been driving these changes.

Some market participants have expressed concerns about low liquidity across fixed-income markets, although many recent studies have found it difficult to identify such a broad reduction. It may be that liquidity has deteriorated only in certain market segments. It may also be that, even if liquidity is adequate in normal conditions, it has become more fragile, or prone to disappearing under stress.

The sharp swing in Treasury prices that took place on October 15, 2014, led the Federal Reserve Board, in conjunction with the Treasury Department, the Commodity Futures Trading Commission, the Federal Reserve Bank of New York, and the Securities and Exchange Commission, to create a Joint Staff Report and to host a conference on the structure of Treasury markets at the Federal Reserve Bank of New York (FRBNY) in October 2015.[1] The staff of the four agencies and the FRBNY compiled transactions data across both Treasury cash and futures markets and analyzed the factors that could have caused the rapid rise and subsequent reversal in Treasury prices in such a short span of time. This analysis did not find a single factor that caused the sharp swing in prices.

As had already occurred in equity markets, advances in computing and communications technologies have allowed proprietary trading firms (PTFs, also often called high-frequency trading firms) to capture a majority of the interdealer market in Treasuries. As a consequence of these changes, trading in Treasury markets now moves at extreme speed. It may be that these changes have also led to greater liquidity risk, or sudden declines in liquidity. Researchers at the FRBNY have shown that spikes in volatility and sudden declines in liquidity have become more frequent in both Treasury and equity markets.[2] There is also evidence that liquidity shifts more rapidly and hence is less predictable in these markets.[3] In contrast, researchers have not found evidence of these behaviors in corporate bond markets, where traditional dealers still intermediate most trades and there is much less high-frequency trading.[4]

Apart from such episodes of sudden volatility, questions about whether liquidity in fixed-income markets has broadly deteriorated are difficult to answer definitively. In exploring these topics, it is important to distinguish between Treasury and corporate bond markets, which have different characteristics.

In Treasury markets, traditional measures of liquidity, such as bid-ask spreads, have been fairly stable in recent years.[5] But the changing market structure has also meant smaller average trade sizes,[6] and participants now must break up their larger trades and employ complicated strategies in order to avoid moving prices.

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[1] See *Joint Staff Report: The U.S. Treasury Market on October 15, 2014,* U.S. Department of the Treasury, Board of Governors of the Federal Reserve System, Federal Reserve Bank of New York, U.S. Securities and Exchange Commission, U.S. Commodity Futures Trading Commission, July 13, 2015, *www.treasury.gov/press-center/press-releases/Documents/Joint__Staff__Report__Treasury__10-15-2015.pdf,* and *Conference Summary: The Evolving Structure of the U.S. Treasury Market (October 20–21, 2015),* Federal Reserve Bank of New York, October 20, 2015, *www.newyorkfed.org/medialibrary/media/newsevents/events/markets/2015/Conference-Summary.pdf.*

[2] See Tobias Adrian, Michael Fleming, Daniel Stackman, and Erik Vogt, *Has Liquidity Risk in the Treasury and Equity Markets Increased?,* Liberty Street Economics (blog), October 6, 2015, *http://libertystreeteconomics.newyorkfed.org/2015/10/has-liquidity-risk-in-the-treasury-and-equity-markets-increased.html#.Vv7UvOab-p0.*

[3] See Dobrislav Dobrev and Ernst Schaumburg, *The Liquidity Mirage,* Liberty Street Economics (blog), October 9, 2015, *http://libertystreeteconomics.newyorkfed.org/2015/10/the-liquidity-mirage-.html#.Vv7Woeab-p0.*

[4] See Tobias Adrian, Michael Fleming, Or Shachar, Daniel Stackman, and Erik Vogt, *Has Liquidity Risk in the Corporate Bond Market Increased?,* Liberty Street Economics (blog), October 6, 2015, *http://libertystreeteconomics.newyorkfed.org/2015/10/has-liquidity-risk-in-the-corporate-bond-market-increased.html#.Vwu8__Oab-p0.*

[5] See Tobias Adrian, Michael Fleming, Daniel Stackman, and Erik Vogt, *Has U.S. Treasury Market Liquidity Deteriorated?,* Liberty Street Economics (blog), August 17, 2015, *http://libertystreeteconomics.newyorkfed.org/2015/08/has-us-treasury-market-liquidity-deteriorated.html#.Vv7HQDP2bT4.*

[6] *Ibid.*

Accurately measuring the effect of trading on prices, perhaps the most fundamental gauge of market liquidity, can be quite difficult in such an environment.[7] There are also differences between on-the-run Treasury securities, the securities that were most recently issued and that are the most liquid, and off-the-run Treasury securities. However, observable measures such as the spread between on- and off-the-run Treasury securities do not show any trend change in liquidity between the two market segments since the financial crisis.

In corporate bond markets, estimated bid-ask spreads have declined, indicating that, if anything, liquidity may have improved.[8] However, given the nature of the corporate bond market, these estimates are based on transactions rather than on direct observations of quotes to buy or sell these bonds. What we can directly observe is that trade sizes and turnover have declined in the most actively traded corporate bonds as they have in Treasury markets.[9] And although observable measures of *overall* liquidity in corporate bond markets appear good, there is some evidence that liquidity has deteriorated for the lowest-rated bonds.[10] Trading in these less liquid segments may rely heavily on intermediation by dealers, and dealers have scaled back their capital commitments and inventories in corporate bonds since the financial crisis.[11]

Immediately after the financial crisis, dealers began to move away from a principal model of market making, whereby they would facilitate trades using their own inventories and assume some risk, toward an agency model. Many point to post-crisis regulation as a key factor in this process. One area in particular where market participants point to the impact of regulation is Treasury repo markets. At the 2015 conference, participants noted that required spreads on Treasury repo trades have widened significantly since the crisis and attributed some of this increase to regulation.[12]

But post-crisis regulations have also greatly strengthened the major banks and made another financial crisis far less likely. Evidence also indicates that certain regulations have *increased* liquidity; for example, the mandate that more standardized derivatives be traded on organized exchanges or platforms appears to have improved market functioning.[13] My view is that these regulations are new, and we should be willing to adjust them as we learn. That said, we should also recognize that some reduction in market liquidity is a cost worth paying in helping to make the overall financial system significantly safer.

It is important, however, not to overemphasize any effects of regulation. Banks have independently recalibrated their own approaches to risk and scaled back their market-making activities. Dealers significantly reduced their fixed-income portfolios beginning in 2009, well ahead of most post-crisis changes in regulation.[14]

Corporate debt issuance has been at record levels in recent years. With dealer balance sheets shrinking, buy-side investors now bear greater liquidity risk. It is important that mutual funds and other investors in fixed-income securities continue to take measures to understand and manage these risks. In addition, we should

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[7] See for example, Terrence Hendershott, Charles M. Jones, and Albert J. Menkveld, "Implementation Shortfall with Transitory Price Effects," *in High Frequency Trading; New Realities for Trades, Markets and Regulators,* David Easley, Marcos Lopez de Prado, and Maureen O'Hara (editors), Risk Books (London: 2013), *http://albertjmenkveld.org/public/papers/chapter_ELOv5.pdf.*

[8] See Bruce Mizrach, "Analysis of Corporate Bond Liquidity," Financial Industry Regulatory Authority (FINRA), Office of the Chief Economist Research Note, December 2015, *www.finra.org/sites/default/files/OCE_researchnote_liquidity_2015_12.pdf.*

[9] *Ibid.*

[10] See Tobias Adrian, Michael Fleming, Erik Vogt, and Zachary Wojtowicz, *Further Analysis of Corporate Bond Market Liquidity,* Liberty Street Economics (blog), February 10, 2016, *http://libertystreeteconomics.newyorkfed.org/2016/02/further-analysis-of-corporate-bond-market-liquidity.html#.Vv7ZcOab-p0.*

[11] See Hendrik Bessembinder, Stacey E. Jacobsen, William F. Maxwell, and Kumar Venkataraman, *Capital Commitment and Illiquidity in Corporate Bonds,* Social Science Research Network (SSRN), March 21, 2016, *http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2752610.*

[12] *Conference Summary: The Evolving Structure of the U.S. Treasury Market (October 20–21, 2015),* Federal Reserve Bank of New York, 2015, *www.newyorkfed.org/medialibrary/media/newsevents/events/markets/2015/Conference-Summary.pdf.*

[13] See Evangelos Benos, Richard Payne, and Michalis Vasios, *Centralized trading, transparency and interest rate swap market liquidity: evidence from the implementation of the Dodd-Frank Act,* Bank of England, Staff Working Paper No. 580, January 15, 2016, *www.bankofengland.co.uk/research/Documents/workingpapers/2016/swp580.pdf.*

[14] See Tobias Adrian, Michael Fleming, Daniel Stackman, and Erik Vogt, *What's Driving Dealer Balance Sheet Stagnation?,* Liberty Street Economics (blog), August 21, 2015, *http://libertystreeteconomics.newyorkfed.org/2015/08/whats-driving-dealer-balance-sheet-stagnation.html#.Vwz69Oab-p0.*

distinguish between systemic risk and market risk. The risks to investors generally represent market risk and do not appear to pose risks to the financial system as a whole. The movement of these risks away from the Nation's most systemically important financial institutions is one of many reasons that they are far stronger and more resilient than before the crisis.

Markets are adapting to this new environment. Where there is an unmet demand for liquidity, new market makers are emerging to meet that demand. For example, some PTFs are seeking entry to dealer-to-customer platforms for Treasury trading. Seven new electronic trading venues entered the market for corporate and municipal bonds over the last 2 years, and several more are preparing to launch this year.[15] While there is no guarantee of success for these entrants, markets will continue to evolve. Thus, it is too early to judge the ultimate impact of factors affecting fixed-income liquidity.

One thing that will help in this judgment is better data. At the 2015 conference, many market participants expressed a desire for more publicly available data on Treasury markets. It is striking that so little data is available—even to regulators—on trading in our Nation's Treasury market. It took considerable effort to gather detailed trade data for just the single day of October 15, 2014, in writing the Joint Staff Report. The Board has been supportive of the Treasury Department's current Request for Information (RFI), which will be concluding on April 22. The RFI will provide information on this issue, as we reassess the adequacy of public information and of the data available to the official sector for its own monitoring of these markets.

Thank you. I would be pleased to answer any questions you may have.

PREPARED STATEMENT OF ANTONIO WEISS

COUNSELOR TO THE SECRETARY, DEPARTMENT OF THE TREASURY

APRIL 14, 2016

Chairmen Crapo and Heller, Ranking Members Warner and Warren, and Members of both Subcommittees:

Thank you for inviting me to testify today on behalf of Treasury and alongside Governor Powell from the Federal Reserve Board (Fed). We have been partners with the Fed, and Governor Powell in particular, on several topics related to today's hearing. Thank you to both Committees for choosing to hold a hearing on fixed-income markets, which are at the heart of our financial system and are undergoing substantial change.

The primary markets for fixed income are functioning exceptionally well in the United States. Indeed, the past 4 years have seen record issuance of corporate bonds, as both domestic and foreign companies continue to rely on U.S. markets to raise capital.

By most traditional measures, U.S. secondary markets are also functioning well. There is no compelling evidence of a broad deterioration in liquidity. But financial markets, fixed-income markets in particular, are undergoing structural changes, driven by technology, changing risk appetites and business models, much-needed financial reform, and changes in the investor base.

Moreover, these developments are occurring against a cyclical backdrop in which the United States is transitioning toward normalization from nearly a decade of unprecedented monetary policy, a transition long expected to be accompanied by volatility.

Policy makers are focused on enhancing financial stability and maintaining well-functioning markets through periods of stress. In this regard, reforms adopted in response to the crisis have demonstrably strengthened the core of the financial system. Markets have experienced several bouts of turbulence over the past few years—from the "taper tantrum" to European sovereign debt crises to the volatility last August and earlier this year. In each case, U.S. financial institutions have demonstrated resilience, instilling confidence in the broader system. This is no accident. Financial reform has built stronger, more stable institutions. And the stress tests every large bank undergoes annually are far more severe than anything experienced since the crisis. Financial reform has created a buffer for volatile times.

But the tests will surely become more difficult, and we cannot afford to become complacent. At Treasury, our focus is on understanding the transitions that are

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[15] See *SIFMA Electronic Bond Trading Report: U.S. Corporate and Municipal Securities,* Securities Industry and Financial Markets Association (SIFMA), February 17, 2016, *www.sifma.org/issues/item.aspx?id=8589958906.*

underway, and anticipating the demands of the new environment. Treasury is working with the other agencies with authorities in Treasury markets to undertake the most comprehensive review of the Treasury market since 1998. And U.S. market regulators continue to address potential operational risks associated with technological changes in their respective markets.

Record Issuance in Fixed-Income Primary Markets

Fixed income markets play a central role in the U.S. economy, channeling savings into investment and providing credit to households, governments, and businesses. Well-functioning markets facilitate critical financing to Federal, State, and local governments, to households for mortgage and automobile loans, and to businesses for investments, job creation, and innovation.

Capital markets play a larger role in the U.S. economy than in other large, developed economies. Roughly two-thirds of credit is provided by capital markets in the United States, and one-third through bank lending, compared to a roughly 50/50 split in the European Union (EU). The EU, in fact, is taking steps to develop a "capital markets union" to foster more dynamic markets and reduce reliance on bank funding, which proved costly in the crisis and has likely contributed to Europe's slower pace of recovery relative to the United States.

Primary markets for fixed income in the United States have performed exceptionally well for the past several years. Issuance has been strong—indeed, corporate bond issuance reached record levels over the past 4 years. Companies have taken advantage of low interest rates and strong investor demand to issue $7.8 trillion in bonds since the beginning of 2010. This funding is being used for investments in plants, equipment, software, research and development, and new workers, to return money to shareholders, or to build cash buffers to provide financial flexibility. Issuance has not been limited to U.S. companies—foreign corporations raised over a trillion dollars in debt in the U.S. market in the same period.

The market for private residential mortgage-backed securities has yet to recover. Investor confidence was badly damaged during the crisis and economic incentives for banks to securitize their non-agency mortgages remain weak. But the market for residential mortgage securities backed by Fannie Mae and Freddie Mac has remained strong, and mortgage rates remain near record lows, supporting the ongoing recovery in the U.S. housing market.

The Administration remains focused on expanding access to credit for creditworthy individuals and businesses who remain underserved. But for borrowers with access to the capital markets, the past several years have been a time of plenty.

Secondary Market Liquidity

For the most part, U.S. secondary markets are also functioning well, demonstrating resilience through recent periods of volatility that were driven by an uncertain global economic outlook.

Despite repeated claims to the contrary, there is no compelling evidence of a broad-based deterioration in liquidity. In fact, most traditional measures of liquidity across U.S. fixed-income sectors are well within historical levels.

There is no standard definition of liquidity that encompasses all the variables that matter across products and investor categories. In the broadest sense, market liquidity refers to the ease with which buyers and sellers can meet in the marketplace and transact. Market participants point to a number of measures as proxies for liquidity, including bid-ask spreads, trading volume, market depth, and the price impact of trades. Each of these measures captures some aspect of liquidity, but none is comprehensive. Which measure of liquidity matters also depends on which element of liquidity you prioritize. For certain professional investors who trade frequently, low transaction costs and minimal impact on price may be important. For long-term investors, keeping costs down over time may matter more than short-term transaction costs. For large investors such as pensions or retirement funds, the ability to execute a large transaction may be most important. And these priorities will shift in response to changing market conditions.

In the Treasury market, bid-ask spreads and measures of the price impact of trades in the market for the most-recently issued Treasury securities are all well within historical ranges (Charts A and B). Market participants often cite as evidence of worsening liquidity conditions smaller trade sizes or recent declines in measures of depth—*i.e.,* the amount available to be purchased or sold at the top levels in the order book. However, smaller trade sizes are consistent with the increasing predominance of electronic and algorithmic trading in the Treasury market. And while depth appears to have declined from recent high levels, it is well within historical ranges. The elevated levels from late 2011 into 2013 may have been due to investor conviction regarding a stable outlook for interest rates (Charts C and D).

There have, however, been isolated episodes in recent years of brief spikes in volatility, associated with deteriorating liquidity conditions during those spikes. The most extreme example was the October 15, 2014 "flash rally" in Treasuries, when the yield on 10-year notes experienced a 37-basis point roundtrip over a span of roughly 12 minutes. This episode raises the possibility that improved day-to-day liquidity, as measured by bid-ask spreads and price impact, may have come at the cost of rare but severe bouts of volatility and strains in liquidity.

If these episodes remain rare and fleeting, like October 15, the ultimate impact on the Treasury market will likely be minimal. But if the disruptions become more frequent, the effect could be more significant. We have seen similar episodes in U.S. equities, such as the May 2010 "flash crash," and foreign exchange markets—two other markets with significant levels of algorithmic trading. But we must be especially watchful when it comes to the world's risk-free benchmark, and this is why we initiated the first comprehensive review of the Treasury market since 1998.

Market participants also report challenges in the market for aged, or "off-the-run," Treasuries. The price differences between on- and off-the-run Treasuries do not indicate a great disparity in liquidity conditions (Chart E), but due to data limitations we do not have as granular a view into off-the-run markets. As discussed further below, we are working to address these data limitations.

In U.S. corporate bond markets, measures of transaction costs are also well within historical ranges, and perhaps even healthier than in the early 2000s (Chart F). Some have pointed to a decline in dealer inventories of corporate bonds since 2006 and 2007 as a harbinger of declining liquidity, because dealers would be less likely to act as "shock absorbers." But analysis by Goldman Sachs and others shows that pre-crisis inventory levels were inflated by holdings of mortgage-backed securities and esoteric structured products that are no longer used. Actual corporate inventories have declined, but were not large in relation to the overall market to begin with. Moreover, the relationship between inventories and liquidity is far from clear. Research from the Federal Reserve Bank of New York shows that dealer positions tend to be *procyclical* (Chart G). In other words, rather than acting as shock absorbers, dealers have historically *reduced* their positions during periods of stress.

Overall, corporate bond trading volumes have increased (Chart H), a sign that there has been no broad withdrawal from the U.S. market. Average trade sizes have begun to decline, as well as the proportion of large "block" trades (Charts I and J). These data points are consistent with trends toward greater electronification and more "agency-based" intermediation, which are discussed below. As Fed Governor Lael Brainard recently pointed out, these data points are also consistent with reports by market participants of the need to break up large trades into smaller trades over time.

Financial Reform Strengthened the Core of the Financial System

Market liquidity is an important element in a well-functioning financial system. As we learned so painfully in the crisis, and less dramatically in many other instances, when secondary markets cease to function effectively, firms and households can lose access to the primary markets, cutting off their access to financing for investments, hiring, and home purchases.

But liquidity is also a function of market dynamics, and varies across markets and over cycles. Prior to the crisis, liquidity was abundant by almost any measure. However, this liquidity was a result of soaring financial sector leverage, an overreliance on short-term funding, and financial activity driven by a proliferation of structured and synthetic vehicles, often held off-balance sheet. Some investment banks were leveraged 40- or 50-to-1, while short-term wholesale funding had grown to over 30 percent of the largest banks' and investment banks' total assets. That apparent liquidity not only disappeared when it was needed most, but led to forced selling that greatly exacerbated financial distress.

Policy makers have taken significant steps following the crisis to strengthen the core of the financial system, to reduce the vulnerability of markets to those kinds of fire sale dynamics. In particular, financial reform has created more resilient financial intermediaries, more stable funding profiles, and sounder market structures. These steps have contributed to more resilient financial markets that are better prepared to continue to support the economy through periods of stress.

A major pillar of post-crisis reform has been to create more resilient financial institutions, most fundamentally by increasing capital requirements. Stronger market intermediaries are better able to absorb risks under stressed conditions, and reduce the risk of market disruptions. Policy reforms and changes in market practices following the crisis have also led to significant declines in leverage, as the largest banks have more than doubled their capital levels since 2009.

A second pillar of reform is more resilient funding structures. The largest financial institutions have more than doubled their holdings of high-quality liquid assets, increased their deposit base, and reduced their reliance on short-term funding by nearly half. Off-balance sheet funding vehicles have all but disappeared.

A third pillar in these efforts is building more fundamentally sound market structures. Financial reform required certain standardized derivatives to be centrally cleared and traded on transparent platforms, and all derivatives contracts to be reported to swap data repositories. According to CFTC Chairman Massad, 75 percent of interest rate swaps are now centrally cleared, compared to 15 percent in 2007. These reforms are enhancing resilience and transparency in one of the largest markets in the world, a market closely linked to other fixed-income markets.

In the remainder of my testimony I will describe the changes underway in U.S. fixed-income market structure, and the efforts by Treasury and other policymakers and market participants to respond to these changes.

Changes in Fixed-Income Market Structure

The structure of fixed-income markets is undergoing significant transition. This transition is driven by advances in technology, changes in business models and risk appetite, and much-needed regulatory reforms adopted in response to the crisis. Many of these changes are also contributing to a change in the way intermediaries match buyers and sellers in these markets. Shifts in the composition of asset owners are also playing an important role.

In a trend that pre-dates the crisis, technology is enabling the spread of electronic trading across fixed-income markets. In markets for standardized, benchmark securities, algorithmic trading has become predominant. This transition began in the 1990s in equities, and then spread to futures and foreign exchange markets. Beginning just over a decade ago, the inter-dealer market for the most recently issued Treasury securities-so-called "on-the-run" securities-began to transition toward algorithmic trading. Partly as a result of technology upgrades in recent years, algorithmic trading by principal trading firms (PTFs) now accounts for over half of trading volume in this market on most days, and up to 70 percent of volume during volatile trading.

In markets for securities with a greater degree of customization, like corporate bonds, algorithmic trading has not taken root, but more basic electronification has begun. In some cases, the old ways of doing business over the telephone—that is, customers requesting dealers to provide quotes—have simply migrated to the computer screen. There is also a small, but growing, portion of corporate bond trading happening on "all-to-all" venues—that is, trading directly between end investors without a dealer between them.

There is also a transition underway in how intermediaries match buyers and sellers. Fixed-income securities markets have historically been a predominantly "principal-based" market. Intermediaries bought securities from investors looking to sell, and held them on their own balance sheet until a buyer could be found. The majority of fixed-income securities markets remain principal-based, with dealers accounting for well over half of all volume in both Treasury and corporate bond markets. But "agency" intermediation, where intermediaries match buyers and sellers for a commission, is increasingly prevalent in fixed-income markets, especially markets for standardized, benchmark securities.

Changes in business models, competition from new entrants, and much-needed regulatory reforms adopted in response to the crisis have likely contributed to the shifts described above. Large banks and broker-dealers have significantly reduced their leverage, reined in their risk appetites, and sought more resilient sources of funding. Meanwhile, new entrants such as PTFs, previously active mostly in equities and futures markets, are increasingly competing with traditional dealers for market share in standardized products such as on-the-run Treasuries.

The composition of buyers and sellers is also changing. The growth of open-end mutual funds investing in corporate bonds has received significant attention—mutual funds now own over 20 percent, or over $2 trillion, of U.S. corporate bonds. There is concern that funds offering daily liquidity to investors but investing in less liquid assets may be forced sellers in a stressed environment, or may contribute to spillovers by selling more liquid assets to meet redemptions.

At the same time, large investors like pension funds, sovereign wealth funds, and insurance companies have continued to grow. These investors typically buy and hold large portfolios of bonds, as they seek to match their long-term liabilities with fixed-income returns. In total, there are over $30 trillion of fixed-income securities held by this diverse set of buyers, with differing investment objectives. These investors may ultimately be the buyers of last resort during periods of turbulence. Indeed, research shows that was likely the case during the 2013 "taper tantrum." These shifts are all taking place against a backdrop in which the United States is transitioning to a path of normalization from nearly a decade of unprecedented monetary policy. Market participants have always expected this period of adjustment would be accompanied by turbulence as expectations for economic and financial conditions adjust. Indeed, volatility in Treasuries has typically preceded other recent rate hiking cycles.

In this regard, it is important to distinguish between re-pricing events, driven by fundamental factors, and breakdowns in market functioning that may be exacerbated by poor liquidity. As PIMCO noted in a recent op-ed, "[a]brupt changes in valuations are not necessarily liquidity events."

All of these shifts are changing the way buyers and sellers meet and transact in fixed-income markets. The end-state for fixed-income trading remains far from certain, but it is important to understand that economic and financial cycles, advances in technology, financial product innovations, and policy all play a role.

Policy Priorities to Build More Resilient Market Structures

At Treasury, we are engaged in several efforts to understand and respond to the changes underway in financial markets, and safeguard the resilience of the U.S. financial system. Most importantly, we are focused on completing and safeguarding financial reform. Nothing would do more to undermine the resilience of our markets than rolling back Wall Street Reform. The Administration is working with regulators to implement all remaining material elements of Dodd-Frank by the end of the year. Internationally, Treasury is working to ensure other countries follow through on their commitments as well, to reduce risks that may emanate from abroad.

We are also working to address potential vulnerabilities in financial market structure. Most notably, Treasury is engaged, together with the Fed, Federal Reserve Bank of New York, CFTC and SEC, in the most comprehensive review of the Treasury market since 1998. As part of this review, in January Treasury issued a Request for Information (RFI) on the evolution of Treasury market structure seeking feedback on a series of detailed questions across four areas:

- The evolution of the Treasury market;
- Risk management practices and market conduct across the Treasury market;
- The types of data that should be made available to the official sector regarding Treasury cash market activity, and numerous practical considerations associated with gathering that data; and
- Potential additional reporting of Treasury market transactions to the public. The comment deadline is April 22, and we look forward to reviewing all responses, and would be happy to report back to these Subcommittees with key findings.

At this point, the most immediate conclusion from our work is that the official sector needs access to more data, on a more timely basis, with more effective data sharing mechanisms. The RFI seeks comment on the most effective and efficient way to achieve these objectives, and by the end of the year we expect to have in place a comprehensive plan for reporting of transactions in the Treasury cash market to the official sector.

Separately, the Financial Stability Oversight Council, or FSOC, is closely examining potential vulnerabilities related to changes in market structure, which it highlighted in its most recent annual report. FSOC is analyzing potential risks along three dimensions, which dovetail with the themes identified in the Joint Staff Report on October 15th:

- First, risks related to operational resiliency and preparedness arising from the increase in electronification across several markets;
- Second, the need to coordinate, to the extent possible, prudential and supervisory standards across different venues for products that share similar risk characteristics; and
- Third, to look at ways to improve data collection and sharing in certain markets.

FSOC is also analyzing risks associated with asset management activities, including potential risks arising from mutual funds offering daily liquidity to investors while investing in less liquid underlying assets, particularly fixed-income assets. Policy makers and market participants have increased their focus on these potential risks as the proportion of corporate bonds owned by mutual funds has more than doubled over the past several years.

A recent example of the potential risks associated with that liquidity mismatch occurred in December, when the Third Avenue Focused Credit Fund suspended redemptions because it could not sell assets quickly enough to meet large redemption requests. Third Avenue's actions came in the midst of overall stress in the broader high-yield market, contributing to pressure that led investors to pull nearly $10 billion—four percent of assets under management—from high-yield funds during a 3-week period in December.

FSOC is analyzing these and other risks related to asset management products and activities, and will be providing an update on its work this spring. The SEC has pending proposals in this area, and additional proposals are expected, including standards for stress testing by asset managers.

Finally, I should note the efforts by market regulators, the CFTC and SEC, to address risks related to evolving technology and market structures in their respective markets. Most recently, the CFTC proposed Reg AT to impose risk controls, transparency measures, and other safeguards to enhance the regulatory regime for algorithmic trading in futures. In addition, the SEC proposed rules related to alternative trading platforms in the equities market, and asked a series of questions related to the operation and regulation of similar platforms in fixed-income markets. Treasury will continue to engage with both regulators in areas of common interest.

Conclusion

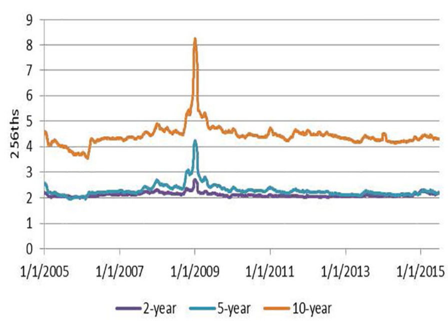
In the years since the crisis, primary market issuance has been robust, helping to support the economic recovery in the United States. But the structure of fixed-income markets is undergoing a period of major transition, and the nature of liquidity provision in these markets is changing in parallel. Technology, changing risk appetites and business models, and policy changes are all contributing. One would expect the public and private sectors to make significant changes following the second largest financial crisis in 100 years.

The past 9 months have seen a period of heightened volatility in financial markets, and the U.S. financial system demonstrated resilience. Financial reform has strengthened the core of our financial system, increasing confidence in volatile times. But inevitably the tests will become more difficult, and neither market participants nor policymakers can afford to become complacent.

In fixed-income markets, it's clear we haven't reached an end state. At Treasury, we are in the midst of the first comprehensive review of the Treasury market in nearly two decades, and working with regulators to collect and share information more effectively. We are also working with FSOC member agencies to identify and address potential risks to financial stability arising from changing market structures and shifts in the composition of market participants. Internationally, we are working with our counterparts to analyze and monitor market liquidity trends in overseas markets. There is much left to do. But the progress made since the crisis is real, and the financial system is more resilient as a result. These efforts ultimately provide the foundation for deep, liquid, and resilient capital markets, and will provide ballast when the next period of market turbulence strikes.

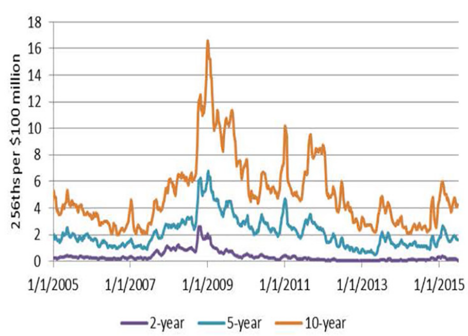
Appendix 1: Charts

Chart A: Treasury Market Bid/Ask Spread



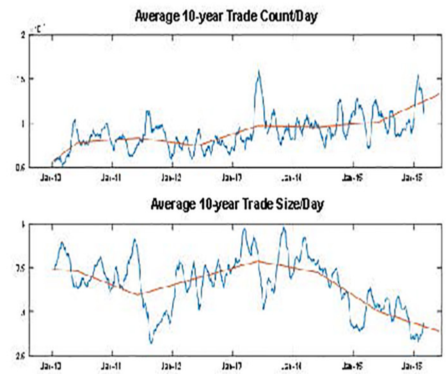
Source: Federal Reserve Bank of New York

Chart B: Price Impact of Treasury Trades



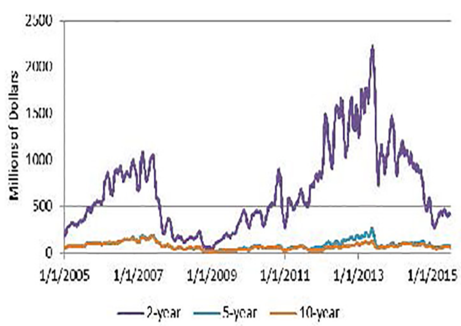
Source: Federal Reserve Bank of New York

Chart C: Treasury Trade Count and Trade Size



Source: Treasury, ICAP

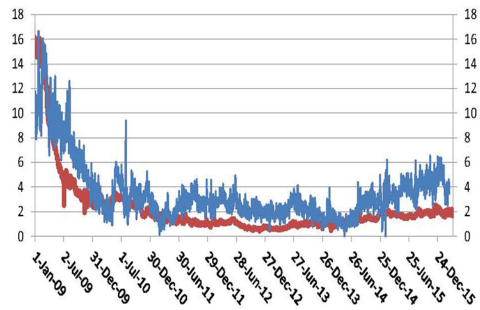
Chart D: Treasury Market Depth



Note: Top three bids and the top three offers in ICAP's Central Limit Order Book for Treasury securities.

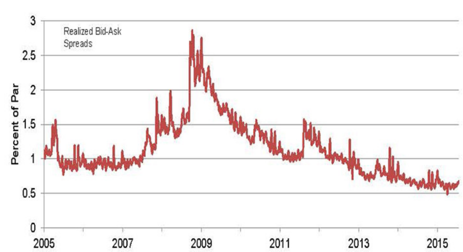
Source: Federal Reserve Bank of New York

Chart E: Treasury Off-the-Run Liquidity



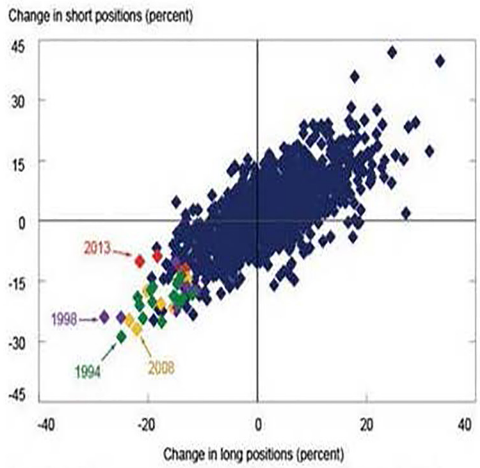
Source: Treasury

Chart F: Corporate Bid/Ask Spread



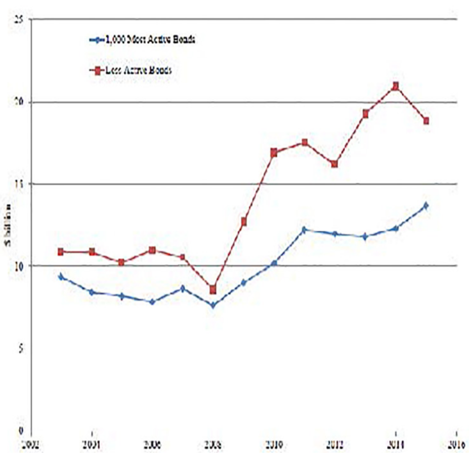
Source: Federal Reserve Bank of New York, FINRA

Chart G: Dealer Positions during Financial Stress



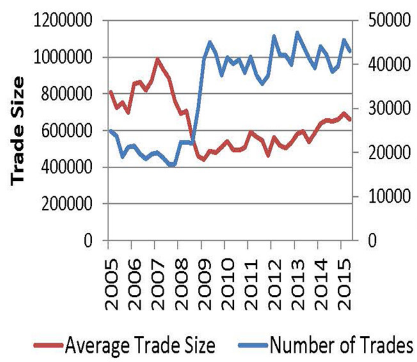
Source: Federal Reserve Bank of New York

Chart H: Daily Average Corporate Trading Volume



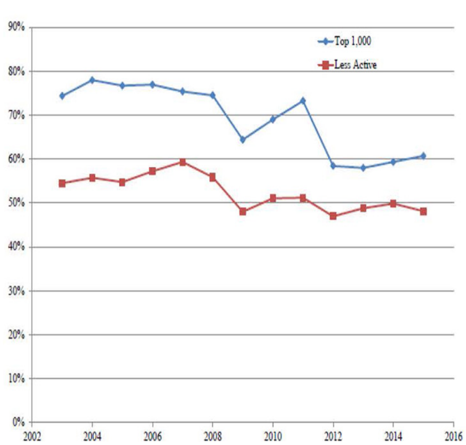
Source: Federal Reserve Bank of New York, FINRA

Chart I: Average Corporate Trade Size



Source: Federal Reserve Bank of New York, FINRA

Chart J: Proportion of Volume in Corporate Block Trades



Source: Federal Reserve Bank of New York, FINRA

RESPONSE TO WRITTEN QUESTION OF CHAIRMAN CRAPO FROM JEROME H. POWELL

Q.1. It has been brought to my attention that Federal Reserve examiners are seeking access to board meetings of companies in the normal course of business and that this is a new practice. Could you please tell me what guidance or process the Board of Governors provides to regional examiners as to their interaction with the boards of the bank and whether regional banks have a uniform practice for their examiners with respect to this practice?

A.1. As you are aware, the Board is authorized by statute to examine and obtain information from State member banks and bank-holding companies to ensure that the companies are operated in a safe and sound manner. 12 U.S.C. §§ 248(a), 1844. Board supervisory staff meet with boards of directors or board members of regulated institutions to allow for the exchange of information and presentation of supervisors' examination findings to the institutions' boards of directors.

The Federal Reserve has a long-standing practice whereby supervisors attend an annual board meeting of a financial institution to present the Federal Reserve's annual supervisory assessment to the board of directors. This presentation is often coordinated with presentations by the Federal Deposit Insurance Corporation or the Office of the Comptroller of the Currency on their assessment of the underlying insured depository institution.

This is part of the normal interactive supervisory process, and often serves as an opportunity to ensure that the entire board of a banking organization is aware of supervisory concerns. In some cases, supervisors ask to meet separately with the independent board members (those who do not have other roles in the banking organization) in order to ensure that those directors have access to all relevant information relating to risk management and other supervisory concerns. Supervisors also meet periodically with the individual board members to discuss the firm's strategic plans and current areas of supervisory focus, often on the firm's initiative.

The Board views banking organization boards of directors as key players in ensuring the safety and soundness of banking organizations. Congress emphasized the importance of involvement by boards of directors in risk management by requiring, through the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act), that the Board of Governors adopt regulations requiring each bank-holding company with assets over $50 billion and each firm designated for Board supervision by the Financial Stability Oversight Counsel (FSOC) to establish a risk committee of the board of directors.[1] The Dodd-Frank Act requires the risk committee to be responsible for oversight of the enterprise-wide

[1] Dodd-Frank Act § 165(h).

risk management practices of the firm and to include both independent directors and at least one member with risk management experience at large, complex firms.

Meetings by supervisory staff with members of the board of directors are thus part of the cooperative, iterative communications between a supervised banking organization and its regulator and allow board members to directly gain access to supervisory insights.

RESPONSE TO WRITTEN QUESTIONS OF SENATOR SASSE FROM JEROME H. POWELL

Q.1. Mr. Weiss argued in this hearing that liquidity measures during the run-up to the 2008 financial crisis serve as an inappropriate "liquidity benchmark" because this liquidity was illusory, and more "a result of soaring financial sector leverage and an overreliance on short-term funding." If, *arguendo,* this is true, what historical era should serve as an appropriate benchmark?

A.1. The degree of liquidity in a given market will change over time as economic circumstances and market structures change. Thus, it is not clear that there is an obvious benchmark period that one could easily refer to in order to determine whether current market liquidity is either too low or too high. The Trade Reporting and Compliance Engine or "TRACE" began collecting data on corporate bond trading in 2002 and widespread electronic trading in the interdealer Treasury market began at roughly the same time. As noted by Mr. Weiss, this period is the run-up to the financial crisis. It is not clear that that period, or the current post-crisis period represent a proper benchmark.

Rather than compare current conditions to a benchmark period, it may be more appropriate to ask whether the pricing of liquidity services accurately reflects all the costs and risks of providing those services. As Mr. Weiss noted, there are good reasons to believe that this was not the case prior to the financial crisis, as it became clear during the crisis that many participants had relied on unrealistic assumptions about the stability of market volatility and funding sources in making their investment decisions. Currently, financial sector leverage and short-term funding stand at much more appropriate levels and banks have reassessed their own risk appetites to perhaps better reflect business risks, which all should lead to more pricing of market liquidity that more accurately reflects the risks involved. An assessment of market liquidity also needs to analyze whether the level of liquidity is an impediment to economic growth. This is always difficult to measure, but with robust demand for corporate and Treasury debt, there are no signs that liquidity conditions are currently inhibiting either private or Government funding or the economic recovery.

Q.2. Governor Powell testified in this hearing that "[i]t may be that liquidity has [currently] deteriorated only in certain market segments." Please describe which market segments are most likely to have experienced liquidity deterioration and why.

A.2. As discussed in my the testimony, it is important first to note that observable measures of overall liquidity in fixed-income markets do not point to any deterioration. Measured bid-ask spreads in the interdealer market for on-the-run Treasury bonds have been stable in recent years, while estimated price impacts of trading are at levels comparable to those in 2005.[1] Observable measures such as the spread between on- and off-the-run Treasury securities do not show any trend change in liquidity between the two market segments since the financial crisis. In corporate bond markets, estimated bid-ask spreads have declined and estimated price impacts are lower than in the early 2000s, indicating that, if anything, liquidity may have improved.[2]

However, at the same time, we must recognize that our ability to measure market liquidity is imperfect. We have less data on dealer-to-customer trading in Treasury markets than in the interdealer market, and, given the nature of the corporate bond market, estimates of liquidity are based on transactions rather than on direct observations of quotes to buy or sell these bonds. Changes in market structure have also meant that participants now must break up their larger trades and employ complicated strategies in order to avoid moving prices. Accurately measuring the effect of trading on prices, perhaps the most fundamental gauge of market liquidity, can be quite difficult in such an environment.

With this in mind, it is difficult to identify specific market segments in which liquidity may have deteriorated with a great degree of confidence. As the testimony noted, there is some evidence that liquidity has deteriorated for the lowest-rated corporate bonds. Although work by staff at the Federal Reserve Bank of New York have found that estimated price impacts of trading have declined across all issue sizes in this market, they also find some weak evidence that price impacts may have increased for bonds rated CC or lower.[3] This evidence is suggestive, but far from conclusive. Some industry participants have also pointed to a bifurcation in corporate bond markets, with smaller, less-traded bonds suffering from a deterioration in liquidity. We have not found evidence that supports these claims but are continuing to investigate this issue and trends in market liquidity more generally.

To the extent that liquidity has deteriorated in some less liquid corporate bond segments, there could be several explanations. As my testimony noted, these segments may rely heavily on intermediation by dealers, and dealers have scaled back their capital commitments and inventories in corporate bonds since the financial crisis.[4] Investors, particularly mutual funds and other asset managers that now comprise a larger share of the market, may also prefer to concentrate trading in more liquid segments. To the extent this was the case, it would lead to decline in liquidity in less frequently traded segments of the market.

[1] See Tobias Adrian, Michael Fleming, Daniel Stackman, and Erik Vogt, *Has U.S. Treasury Market Liquidity Deteriorated?,* Liberty Street Economics (blog), August 17, 2015.

[2] See Bruce Mizrach, "Analysis of Corporate Bond Liquidity," Financial Industry Regulatory Authority (FINRA), Office of the Chief Economist Research Note, December 2015.

[3] See Tobias Adrian, Michael Fleming, Erik Vogt, and Zachary Wojtowicz, *Further Analysis of Corporate Bond Market Liquidity,* Liberty Street Economics (blog), February 10, 2016.

[4] See Hendrik Bessembinder, Stacey E. Jacobsen, William F. Maxwell, and Kumar Venkataraman, *Capital Commitment and Illiquidity in Corporate Bonds,* Social Science Research Network (SSRN), March 21, 2016.

Q.3. Please provide a list of upcoming new rules or regulations either from your agency, or others that you are aware of, that may have a material impact on liquidity in the fixed-income markets.

A.3. It is not easy to predict ahead of time which rules either may affect fixed-income market liquidity or may be perceived to affect fixed-income market liquidity in light of the inherent uncertainties in measuring market liquidity. At the same time, some market participants have claimed that the Net Stable Funding Ratio rule recently proposed by the U.S. banking agencies may have an impact on fixed-income market liquidity. The U.S. banking agencies assessed the potential impact of the proposed rule and expect the benefits to outweigh the costs. The agencies have asked for public comment on the impact of the proposed rule on firms and on the broader economy, and staff will be analyzing comments and impact data carefully as we move forward. The Board takes steps to help ensure that each of its financial regulations achieves its intended outcome at least cost to market liquidity and other beneficial aspects of economic activity.

Q.4. Governor Powell said that "some reduction in market liquidity is a cost worth paying in helping to make the overall financial system significantly safer." Is there also a risk that reducing liquidity in the marketplace also makes the marketplace unsafe? If so, how should regulators discern the difference between an unsafe reduction in liquidity and a safe reduction in liquidity?

A.4. A central insight that was revealed during the financial crisis is that liquidity provision is a risk-bearing activity that can result in significant losses during a period of financial stress. Post-crisis regulatory reform efforts have focused in ensuring that the risks if liquidity provision are appropriately accounted for in the context of capital and liquidity regulation. Regulation that penalizes liquidity provision by ascribing to it a degree of risk that is not commensurate with the actual risks incurred could lead to an unnecessary reduction in liquidity provision that would not be warranted by market fundamentals such as supply-demand dynamics. Accordingly, the Federal Reserve is committed to assessing the impact of post-crisis reform legislation on an ongoing basis to assess whether enhanced capital and liquidity regulations treat liquidity provision in a manner consistent with the risks incurred by the provision of such services.

Q.5. Governor Powell testified at this hearing that "there is some evidence [that] liquidity in lower rated bonds has deteriorated." What are potential negative economic effects of this deterioration, including for newer companies, and smaller- to medium-sized firms?

A.5. As noted in the response to question 2, it is difficult to identify specific market segments in which liquidity may have deteriorated with a great degree of confidence, however, my testimony did note that there is some evidence that liquidity has deteriorated for the lowest-rated corporate bonds. Although work by staff at the Federal Reserve Bank of New York has found that estimated price impacts of trading have declined across all issue sizes in this market, they also find some weak evidence that price impacts may have increased for bonds rated CC or lower.[5]

This evidence is suggestive, but far from conclusive, that if liquidity has indeed declined in these market segments, there could eventually be a negative impact on primary issuance for lower rated firms if the decline was large enough. However, we do not see evidence of this. Corporate bond issuance has been strong over the post-crisis period, both in the investment grade and high-yield segments. While there was some decline in issuance in the second half of 2015 and the first months of 2016, issuance declined only moderately from very high levels. This decline appears to have been linked more to a pull-back in risk sentiment over this period rather than to any decline in market liquidity. More recently, issuance has shown signs of picking back up as risk sentiment has improved.

Q.6. Governor Powell testified at this hearing that "questions about whether liquidity and fixed-income markets has broadly deteriorated are very difficult to answer definitively." Governor Powell also testified that "these regulations [that have been imposed since the 2008 financial crisis] are new and we should be willing to adjust them as we learn."

- **a.** What process is in place or should be in place at the financial regulatory agencies to understand the impact of these new rules and regulations on liquidity?
- **b.** Given the importance of liquidity in the marketplace and the admitted uncertainty surrounding this issue, is there merit to considering delaying the imposition of new financial rules and regulations, to facilitate a broader examination of the cumulative impact of these new rules and regulations on liquidity in the marketplace?

A.6. The Federal Reserve is committed to analyzing liquidity conditions across a wide array of financial markets as market liquidity is important for the conduct of monetary policy, the health of the financial system and financial stability. Federal Reserve staff regularly assess and monitor liquidity conditions on an ongoing basis for all of the reasons previously cited. Moreover, the Federal Reserve in conjunction with the Federal Deposit Insurance Corporation, Office of the Comptroller of the Currency, Securities and Exchange Commission and Commodity Futures Trading Commission regularly submit a report on fixed-income market liquidity to the House Financial Services Committee as a result of Chairman Jeb Hensarling's request to regularly monitor fixed-income market liquidity and any potential effects that the Volcker rule may have on market liquidity. It is expected that these efforts will continue and that new efforts to understand the state of market liquidity and the effect of financial regulation on market liquidity will continue to evolve over time as the regulations mature and any effects become easier to measure overtime.

While the effects of financial regulation on market liquidity are uncertain, there is less uncertainty around the idea that post-crisis

[5] See Tobias Adrian, Michael Fleming, Erik Vogt, and Zachary Wojtowicz, *Further Analysis of Corporate Bond Market Liquidity,* Liberty Street Economics (blog), February 10, 2016.

reform measures are needed to address significant shortcomings in the regulatory regime that were revealed during the financial crisis. Accordingly, halting financial reform risks continued exposure to shortcomings that are relatively well-documented and understood, while any benefits on market liquidity are uncertain. This is not to say, however, that market liquidity should not be an important consideration in the design and implementation of financial regulation. Rather, in the designing of financial regulation, steps should be taken to ensure that regulation does not unduly suppress market liquidity or other beneficial aspects of economic activity. As these regulations are implemented, regulators should assess whether regulations should be modified to better manage any identified tradeoff between the principal goals of regulation, that is, enhanced capital or liquidity, and market liquidity.

RESPONSES TO WRITTEN QUESTIONS OF SENATOR TOOMEY FROM ANTONIO WEISS

Q.1. You argued before the Committee that pre-crisis levels are a "poor benchmark for liquidity." But, if you examine the post-crisis period, there is a consistent decrease in liquidity. As an example, dealer balance sheets of corporate credit and securitized products have declined approximately 30 percent. Some analysts expect it to decline further by another 5 percent to 15 percent. Spreads in many fixed-income products have widened and turnover has declined, which is further evidence of a less liquid market.

- Do you still maintain that liquidity has not declined during the post-crisis period?
- If so, could you please indicate those data points you find relevant to tracking liquidity levels which indicate no change in the post-crisis period?

A.1. Despite repeated claims to the contrary, there is no compelling evidence of a broad-based deterioration in liquidity. Market participants point to a number of measures as proxies for liquidity, including bid-ask spreads, trading volume, market depth, and the price impact of trades. Most of these traditional measures of liquidity across U.S. fixed-income sectors are well within historical levels.

Bid-ask spreads for U.S. Treasury securities have remained tight, and spreads for corporate bonds are consistent with or below recent historical levels. Turnover has declined in some markets, but is not a good proxy for liquidity. For example, turnover may increase during periods of high volatility, such as October 15, 2014, a day with especially high turnover. In corporate bonds, volumes have increased, but the strength in issuance, especially among many new issuers whose bonds don't trade frequently, has resulted in lower turnover. Finally, while some have cited the decline in dealer inventories, this is a poor measure of liquidity. Inventories represent a very small percent of the total corporate credit market, even prior to the crisis, and despite claims that inventories serve as a shock absorber, historically dealers have decreased their positions during periods of stress and potentially contributed to sell-offs.

Q.2. I have read research that suggests, in light of the record corporate debt issuance of late, that the need for liquidity has never been greater but we are in an environment when there is diminished capacity to provide that liquidity due to a widespread reduction of dealer market making.

- Is it possible that some of these problems are being masked at the moment by exceptionally accommodative monetary policy and a reach for yield by many investors?
- If the Fed were to actually move forward on a defined path of policy normalization, whereby interest rates would substantially rise, do you believe that there is sufficient liquidity to maintain orderly markets?

A.2. Fixed-income markets have been influenced by a number of both secular and cyclical factors, including electronification, a changing mix of participants, record-breaking issuance, changing dealer business models, economic cycles, and monetary policy. Emerging from a period of historically low interest rates and low volatility could result in an increase in volatility, consistent with historical experiences. Price movements, even significant ones, in response to changes in economic and policy outlooks are not necessarily a result of illiquidity. For example, the so called "taper tantrum" in 2013, in which long-term interest rates increased over 100 basis points, saw significant price movements but no obvious breakdown in market functioning. Treasury is focused on understanding the transitions that are underway and anticipating the contours of the new environment.

Q.3. It appears that there remains a strong difference of opinion on whether liquidity impairment is an unintended consequence of recent financial regulations. Given the state of the debate, it seems as though data points being used to argue both sides of the argument are worthy of further investigation. Other jurisdictions, like the European Union, are establishing formal review mechanisms designed to evaluate the impact of financial regulatory measures on markets and the broader economy.

- Would you be willing to conduct a formal and holistic review of the impact financial regulation is having on U.S. capital markets, analogous to that being performed under the EU's "call for evidence?"

A.3. Reforms adopted following the financial crisis have created a stronger, more resilient financial system. However, neither market participants nor policymakers can afford to become complacent. Treasury continues its work analyzing developments in financial markets and market structures, including those related to policy developments. For example, Treasury is engaged in the official sector's most comprehensive review of the Treasury market since 1998. In 2015, Treasury, together with the Federal Reserve Board, the Federal Reserve Bank of New York, the CFTC and the SEC, issued the Joint Staff Report on the events of October 15, 2014. Earlier this year, Treasury issued a request for information on the evolution of Treasury market structure and has recently reviewed the public comments received. We are also working with FSOC-member agencies to identify and address potential risks to financial stability arising from changing market structures and shifts in the composition of market participants. The FSOC also recently released a study on the economic impact of possible financial services regulatory limitations intended to reduce risks to financial stability.

RESPONSES TO WRITTEN QUESTIONS OF SENATOR SASSE FROM ANTONIO WEISS

Q.1. Mr. Weiss argued in this hearing that liquidity measures during the run up to the 2008 financial crisis serve as an inappropriate "liquidity benchmark" because this liquidity was illusory, and more "a result of soaring financial sector leverage and an over-reliance on short-term funding." If, *arguendo,* this is true, what historical era should serve as an appropriate benchmark?

A.1. There is no standard. definition of liquidity that encompasses all the variables that matter across products and investor categories. Market participants point to a number of measures as proxies for liquidity, including bid-ask spreads, trading volume, market depth, and the price impact of trades, each of which may be influenced by the changes in market structure that inevitably occur over time. Similarly, given the changing nature of market structure and other secular and cyclical factors, there is no one historical period that can serve as a perfect benchmark to assess liquidity conditions. We attempt, where possible, to analyze market developments over a sufficiently long time period that multiple points in financial and economic cycles are represented. For example, many of the charts referenced in my testimony present data as far back as 2005, and in some cases as far back as 2002. In many cases, however, a lack of available or consistent data constrains the ability of policymakers and market participants to conduct that kind of analysis.

Q.2. Governor Powell testified in this hearing that "[i]t may be that liquidity has [currently] deteriorated only in certain market segments." Please describe which market segments are most likely to have experienced liquidity deterioration and why.

A.2. Despite repeated claims to the contrary, there is no compelling evidence of a broad-based deterioration in liquidity. In fact, most traditional measures of liquidity across U.S. fixed-income sectors are well within historical levels. Market participants point to a number of measures as proxies for liquidity, including bid-ask spreads, trading volume, market depth, and the price impact of trades. Each of these measures captures some aspect of liquidity, but none is comprehensive.

Q.3. Please provide a list of upcoming new rules or regulations either from your agency, or others that you are aware of, that may have a material impact on liquidity in the fixed-income markets.

A.3. The only remaining rule which Treasury is responsible for implementing is the QFC recordkeeping rule.

Q.4. Governor Powell said that "some reduction in market liquidity is a cost worth paying in helping to make the overall financial system significantly safer." Is there also a risk that reducing liquidity in the marketplace also makes the marketplace unsafe? If so, how should regulators discern the difference between an unsafe reduction in liquidity and a safe reduction in liquidity?

A.4. Post-crisis financial reform has made the financial system safer and more resilient. Financial reform has created more resilient financial intermediaries, more stable funding profiles, and sounder market structures, providing the foundation for deep, liquid, and resilient capital markets.

Q.5. Governor Powell testified at this hearing that "there is some evidence [that] liquidity in lower rated bonds has deteriorated." What are potential negative economic effects of this deterioration, including for newer companies, and smaller- to medium-sized firms?

A.5. While there have been anecdotal reports of periods during which liquidity conditions have been challenging, the market for lower-rated bonds has always been less liquid than many markets and Treasury's analysis of the available data has not shown convincing broad-based evidence of deterioration. In addition, primary markets for fixed-income issuance in the United States have performed exceptionally well for the past several years, with corporate bond issuance reaching record levels over the past 4 years. In particular, while most newer and smaller- to medium-sized firms have traditionally not issued bonds, some first time and smaller issuers have been able to leverage the strong market conditions in recent years to issue bonds and raise funds for their businesses.

Q.6. Governor Powell testified at this hearing that "questions about whether liquidity and fixed-income markets has broadly deteriorated are very difficult to answer definitively." Governor Powell also testified that "these regulations [that have been imposed since the 2008 financial crisis] are new and we should be willing to adjust them as we learn."

- **a.** What process are in place or should be in place at the financial regulatory agencies to understand the impact of these new rules and regulations on liquidity?
- **b.** Given the importance of liquidity in the marketplace and the admitted uncertainty surrounding this issue, is there merit to considering delaying the imposition of new financial rules and regulations, to facilitate a broader examination of the cumulative impact of these new rules and regulations on liquidity in the marketplace?

A.6. Reforms adopted following the financial crisis have created a stronger, more resilient financial system. At the same time, our financial markets continue to evolve in response to a variety of factors and forces. For instance, advancements in technology, and the associated growth in high-speed electronic trading, have contributed to changes in intermediation and the provision of liquidity in many financial markets. Treasury has been engaged, and will continue to be engaged, in rigorous, data-driven analysis of financial markets and market structures, and Treasury staff has published some of its analysis as blog posts available on the Treasury website. Treasury's analysis of conditions in the U.S. Treasury market suggests that liquidity is consistent with historical levels.

More broadly, Treasury is engaged in the official sector's most comprehensive review of the Treasury market since 1998. In 2015, Treasury, together with the Federal Reserve Board, the Federal Reserve Bank of New York, the CFTC and the SEC, issued the Joint Staff Report on the events of October 15, 2014. Earlier this year, Treasury issued a request for information on the evolution of Treasury market structure and has recently reviewed the public comments received. In July, the SEC published for comment a proposed rule from the Financial Industry Regulatory Authority that would require its member brokers and dealers to report Treasury cash market transactions to a centralized repository, giving the official sector better access to Treasury market transaction data. In addition, Treasury, CFTC, SEC, and the Federal Reserve Board signed a memorandum of understanding that permits sharing of information on U.S. Treasury cash and related derivative markets among the agencies, which facilitates analysis across the interest rate complex. We are also working with FSOC-member agencies to identify and address potential risks to financial stability arising from changing market structures and shifts in the composition of market participants.