THE BROOKINGS INSTITUTION

ARE WE SAFER?
A LOOK AT THE FINANCIAL SYSTEM, POST-CRISIS

FEATURING BEN BERNANKE AND
FEDERAL RESERVE GOVERNOR DANIEL TARULLO

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P R O C E E D I N G S

MR. BERNANKE: Good afternoon. On behalf of the Hutchins Center and Brookings Institution, let me welcome everybody, including those who are watching on line. I should also acknowledge and thank Glenn Hutchins who is here today.

It has been only a little more than seven years since Lehman's failure helped to trigger intensification of the global financial crisis, which in turn was a leading cause in the deepest recession in the post-war period. These events demanded a strong response by both the Government and the private sector.

The period since the crisis has indeed seen major reforms in the financial system and in financial regulation, including in the United States the passage of the Dodd-Frank bill and its implementation, the ongoing enactment of new capital and loss absorption rules agreed to in Basil, a global shift to a more systemic or macro prudential focus in financial monitoring and regulation, and under the aegis of international bodies like the Financial Stability Board, as well as U.S. regulators, new attention to critical areas not traditionally overseen by bank supervisors, including funding markets, non-bank credit intermediations, and derivatives markets.

Our goal in this event today is to look at some of the consequences of the ongoing reforms. Has new regulatory regimes satisfactorily addressed the causes of the crisis? What emerging risks are there and do we have the tools to manage those risks?

Are there areas in which regulation has gone too far in that the costs in terms of reduced credit availability or liquidity exceed the benefits of greater oversight? Has regulation actually made the system less safe in some ways?

We're going to address these themes today in the context of some specific issues and questions. We're going to begin in a moment with a discussion of the effects of new collateral rules. We will turn next to the issue of liquidity in the bond markets.

We will hear from Governor Tarullo from the Federal Reserve on shadow banking. We will end with a panel discussion on these and other issues. There will be opportunities for audience questions throughout.

Let me without further delay jump to introducing the first session. The first session is about collateral rules and their effects. The presenter is Gary Gorton of Yale University. Gary is one of the world's leading financial historians and has always been a role model for me in his ability to use history to help us understand current institutions and events. He has written several books about the crisis and about banking panics in general.

Gary is going to speak for precisely 18 minutes. (Laughter) He will be followed directly by discussion by Betsy Graseck, Managing Director at Morgan Stanley's Research Division.

Betsy has had a distinguished career in banking analysis, including time following Japanese banks for Morgan Stanley. Her B.A. from Cornell I noticed was in Japanese studies. She currently covers large cap regional banks in North America for the same company.

Without further delay, let me ask Gary to come up.

(Applause)

MR. GORTON: Wrong slides. Does this count as part of my 18 minutes? (Laughter) Now, the 18 minutes begins.

The world is different now. It has had a fundamental change which I describe as a shift from a system of immobile collateral to a system of mobile collateral, by which I mean that bank loans that used to stay on bank balance sheets until maturity were transformed into bonds, and these bonds could be used, asset-backed securities, for many purposes, including as collateral for repo, in portfolios of asset-backed commercial paper, to post as collateral for derivatives positions and so on.

When there's not enough treasuries, in fact, the private sector produces substitutes, and this has been true for at least 150 years.

What I want to do first is show you a picture of this transformation. This is a figure that shows you the components of privately produced safe debt as a percent of total safe debt. The components of privately produced safe debt as a percent of total safe debt, this is flow of funds data.

You can see that in 1952 or so, by far the dominant part of privately produced safe debt was demand deposits. What you can see is it just dropped straight down.

Instead, what is rising are these two. This one is one bucket of instruments, including money market funds, commercial paper, and this is private label securitization. Much of this went to back this.

Let me just say a couple of things about this. One thing you need to understand is this didn't start in 2000. It didn't start in 2002. It started around the end of the 1970s. It's a fundamental shift. In fact, it turns out that this was the part that everyone knew about which was regulated, and this is what came to be known as shadow banking.

SPEAKER: Speak into the mike.

MR. GORTON: Okay; sorry. If you had seen this say in 2000, you might have observed there was this transformation, which emphasizes that without the right concepts and theories, you don't know what to measure. There's nothing special about these data. This is Fed flow of funds data.

The problem is as we saw, this new system had the same problems as the old system. It was vulnerable to bank runs, and as a result, there are all sorts of reform, which for the most part is aimed at going back to a system of immobile collateral. Very comforting to go back to the 1960s when we could feel good.

That's because many of the new reforms required that collateral be posted and be stuck there. In particular, the one change that is extremely important, the most important change is the BIS' liquidity coverage ratio. The liquidity coverage ratio says in effect every dollar of repo has to be backed by a dollar of Treasuries.

Just to understand what that means, that says one kind of money, Treasuries, has to be pasted together with another kind of money, repo, private money repo has to be backed by government money Treasuries.

Treasuries have a convenience yield. You can see from this picture as the ratio of Treasuries debt to GDP goes down, the AAA corporate that Treasury spread skyrockets. We have known for quite a while that Treasuries have a convenience yield, like the last two Treasury bill auctions went off at a zero yield, so you're basically buying like a $10 billion, $10 million, $10 bill.

I want to stop and ask ourselves how should we think about this. This is this major change, the liquidity coverage ratio, how are we supposed to assess this and how are we to think about this.

Bob Lucas many years ago put forth this notion of the Lucas critique which had to do unintended consequences. Something like this. Recently, the airlines adopted a policy that you have to pay $125 each direction if you take your dog on the airplane. You have this little dog, you put it under the seat in front of you. It used to be free. Now it costs $125 each direction.

What happened was there was an exception to this rule that if your dog was an emotional support dog, then you could take it for free. You can go on the Internet, Google "emotional support dog," and you can find this doctor in New Jersey who will sell you a note, and you use that note and then your dog goes for free. Airlines are worried that they are going to have more dogs than they used to have on airplanes. (Laughter)

This is an unintended consequence of a policy that no, it's not important of a policy, but the question is how do we think about the liquidity coverage ratio.

The BIS, they tried to forecast how much extra collateral was going to be needed. There were many forecasts. They ranged from $800 billion to about 4 or $5 trillion. There was no serious, I would say, attempts to understand the unintended consequences.

I want to look at that today, and I'm going to look at that with a system that was exactly the liquidity coverage ratio, exactly. It said that national bank notes -- this one is from the National Bank of Fort Myers, Florida -- had to be backed by Treasuries. The National Banking Act came into existence in 1863 to finance the Civil War, to create a demand for Treasuries, but it had a by-product which was most noted at the time, which was it would create a national currency that would trade at an uniform price and would not be subject to banking panics. National bank notes.

The reason people had this view was because it was going to be backed by Treasuries. The problem was noted in 1913 by an economist who pointed out that there was this huge under issuance problem. It seemed as if there was an arbitrage opportunity.

Banks could buy Treasuries, take the Treasuries to the U.S. Treasury, get their notes, and then lend out the notes. The returns on the Treasuries they deposited would accrue to the banks, just like in repo. The deposit is Treasury's, but you get the return and you get the money you can lend out.

In the subsequent 100 years, economists calculated these so-called arbitrage profits, and in some cases, they claimed they were infinite. In fact, what happened was if you take into account two things, that Treasuries have a convenience yield and you shouldn't be calculating the average profit but the marginal profit, it turns out there is not really a puzzle.

Banks did not want to use all their Treasuries to bank national bank notes. There was a shortage of national bank notes. One way to interpret that is Treasuries had another use because of the convenience yield, and the ratio of 1:1 was just out of thin air. It's like the BIS. Their 1:1 ratio has no empirical support at all.

What happened during the national banking era? Well, as Treasuries to GDP dropped, which is the black line, the ratio of bank notes to demand deposits rose -- also dropped. Most demand deposits dropped, so demand deposits grew.

You can see if the correlation is .96, what is happening is as Treasuries became scarce and banks did not want to use all of them to back national bank notes, a shadow banking system arose. Demand deposits. At the time, that's the puzzle in the late 19th Century. Economists were writing articles with titles like "Are Checks Money." There were surveys done by the Comptroller of the Currency, by the National Monetary Commission, in an attempt to find out the extent of use of checks in transactions.

The result of this liquidity coverage ratio during the national banking era was exactly there was this rise of the shadow banking system. It's a little hard thinking now looking back, thinking how could these people not have understood that checks were money. Well, they really didn't. (Laughter)

Bray Hammond wrote a Pulitzer Prize winning book in banking, the importance of deposits was not realized by most economists until after 1900. Well, not quite. Here's Russell Leffingwell, Assistant Secretary of Treasury. All these people who believed in the quantity theory of money choose to call bank deposits "money," but bank deposits are not money.

There was this fundamental confusion about what demand deposits actually were and why they had grown to such an extent. Meanwhile, there are five major banking panics during this period. These banking panics are situations where people want to get the cash, the national bank notes, in exchange for their checking accounts.

It's not as if you couldn't observe there was a problem with checks. We saw this repeatedly. The problem is people didn't know what to do about it. Partly, it was this conceptual confusion. The bankers by the late 1880s lobbied heavily to have what they called an "asset-backed system," by which they meant the national bank notes would be backed by portfolios of loans, not by Treasuries. We had seen that system in that free banking era, and that also had banking panics.

This, I want to emphasize, is an exact parallel. I used to hear this much more often than I do now, but one response is things are different now. I spent 25 years researching banking crises. If I had a nickel for every time I heard "things are different now," I'd be retired, living in a mansion somewhere.

I think there are two points. One is when you have such a significant change as a liquidity coverage ratio, I don't think you're allowed to just shrug off the Lucas critique. I just don't think that's acceptable behavior. I think it's not only with the liquidity coverage ratio but there are other examples in history that are quite close to other policy issues.

This one happens to be exact. The liquidity coverage ratio and the national banking system are exactly the same. When you paste two kinds of money together, public money and private money, it's going to cause a shadow banking system to arise.

Let me add that the horizon to think about here, your horizon should have gotten longer because of the crisis, yet I've noticed bank regulators in particular, their horizon is about a year maybe. This rise in demand deposits happened over 50 years. The first figure I showed you about the development of the shadow banking system happened over roughly 40 years. The horizon here is a lot longer than you normally think about.

Over some period of time, we can expect the banking system, the global financial system, to morph somehow. A lot of people are spending a lot of time thinking about how to do that. That is going to be something that happens slowly relative to how most people think about things changing.

This was a system that basically failed, the national banking system, and eventually we got deposit insurance over the objections of economists. I think we're going to have the same problems. We're going to have unintended consequences of another shadow banking system, and like the national banking era, despite what people think, I think they are a little bit over confident in understanding the conceptual issues about repo and short term bank debt in general.

I think there is a very strong lesson from history here, and I would say I guess those who ignore history are entitled to repeat it. (Laughter) (Applause)

MS. GRASECK: Thank you very much, Gary. Thanks everybody for inviting me to be here to discuss my views on not only Gary's comments but just generally as it relates to the topic that we have today on whether or not the system is safer.

I am a U.S. large cap bank analyst at Morgan Stanley covering Large Cap Banks Equity Research Department. I have been doing that since 2002. As a result, I have been doing it during the crisis and post-crisis period.

I did just want to say, because I haven't had the opportunity to do so in person, thank you very much to Dr. Bernanke, because from where I sat trying to estimate the value of banks and their earnings during that period, I greatly appreciated all the work and effort that you had to endure.

I'd also like to highlight that what I'm going to be speaking about today are my views, they are my own. They are not attributable to Morgan Stanley. My answer to the question is yes, I do think the regulations that we have in place since the crisis have made the system safer.

That said, I do have a couple of comments that I would like to talk about in relation to Professor Gorton's piece. Two parts, one, what I agree with, and second, what I would like to add to it.

First, on what I agree with. Three key pieces. One, the liquidity coverage ratio in my opinion does reduce the velocity of bank balance sheets. Two, Treasury yields, I do think reflect a convenience yield, and three, all other things equal at the margin, the liquidity coverage ratio should incent banks to take some riskier assets. This isn't all bad, it's just I am in agreement with Professor Gorton on that.

Just to elaborate a little bit, why does the LCR reduce the velocity of bank balance sheets? This is basically because of what the LCR requires banks to do is hold high quality lower yielding assets today to offset the risk of deposit outflows, credit line drawdown's, or derivative counterparty deterioration, things like that, in a stress scenario.

What you are being asked to do as a bank is increase your holdings of really Treasuries, RMBS, too, but really Treasuries today to offset the potential of a stress environment in the future. It happened, right, because banks are holding eight times more Treasuries than they did pre-crisis.

Second, I do think Treasuries reflect a convenience yield. In the LCR ratio, Treasuries are at least 20 percent more valuable to a bank than the next best thing, RMBS. Of course, reserves at the Fed are also as equal. In fact, you could argue maybe a little more valuable than Treasuries. Relative to RMBS and other kinds of securities, Treasuries are at least 20 percent more valuable.

This is a good a bank wants, and as a result, you do have a special status for Treasuries, all other things equal, the curve would be flatter than it would be otherwise.

Third, at the margin, the liquidity coverage ratio should drive banks to put on riskier investments, all other things equal. I want to make sure I'm like very consistent with all other things equal.

If you have a bank today that's earning its cost of capital, which I would argue is about 10 to 11 percent, I know there has been some discussion out there that it's less. I totally disagree with that, and a lot of investors I speak with do as well. Ten to 11 percent is the cost of equity. You can look it up on Bloomberg.

If you are generating a 10 or 11 percent equity, return on equity right now today, you're just delivering the cost of equity the shareholders want, what does that mean? That means that now you have a new rule, which is the LCR ratio. Suddenly, you have to allocate a little bit more towards Treasuries. They are lower yielding than what you're making in return on other assets that you have, like loans, for example.

As a result, if you want to keep that return on equity equal to what your cost of equity is, then you are going to have to barbell it, right. You're going to go out a little bit more on the duration risk or a little bit more on the credit risk to get that same ROE that you were, that shareholders are looking for. Remember, banks and bank managements do have shareholders that they must address and must report to. That is a legal requirement, Board of Directors' thing, for example.

Banks will have to invest in riskier assets. Look, you could come back to me and say well, wait, what if a bank is earning 15 percent today and they're only having to earn 10 to 11, so can't they reduce their return on equity and get safe at the same time? The short answer is yes. That's why I want to be clear in saying all other things equal, that's what it would imply.

I wanted to add a couple of things to Professor Gorton's note as well. In our opinion -- this comes from speaking with some other folks in our organization, and we did put out a paper on liquidity back at the beginning of this year with many of my colleagues cross border as well as in other departments within Morgan Stanley. I kind of draw on that for some of my comments I want to make.

There are a couple of other things I want to highlight in addition to what Professor Gorton said from some of the rules and regulations and some of the upcoming rules and regulations that we don't have out yet. We do see four additional sources of demand for Treasuries, so it's not just LCR which is making Treasuries a greater good or a more valuable good for banks.

Number one, implementation of interbank derivative bank clearing. Number two, TLAC, which is total loss absorbing capital rules. Three, money market fund reform, and four, higher rates. Why do all these things drive more demand for Treasuries?

Let me take you through it briefly. One, implementation of interbank derivatives clearing. Starting in September of 2016, which is a little less than a year from now, dealers will be required to clear derivatives that they trade with other dealers. That will require them, the dealers, to post high quality collateral at the clearing house, and Treasuries are chief among them. Several tens of billions of dollars of incremental demand for Treasuries coming.

Second, TLAC rules, total loss absorbing capital rules require banks to issue incremental senior debt, and the idea here is to have enough debt waiting in the wings in the event there was a resolution event -- that's probably the wrong word -- an event where you needed to bail in incremental equity, so you have to have more debt in order to have enough potential equity, that is what I kind of call it.

So, all things equal, that will also drive an increase in Treasuries because if you think about a management team today, you're balancing your risk weighted assets, how risky are your assets, you have some lower risk assets, some higher risk assets, and if you have to issue debt, now you have to keep that balance aligned between the risky assets and the less risky assets.

As a result, you will see another tens of billions of dollars of demand for Treasuries. You might be sitting here saying who cares about tens of billions of dollars, is that really, a marginal buyer of size, for me to worry about Treasury demand.

Let's get to number three, which is money market fund reform. Money market fund reform is kicking off -- it's already kicked off -- it is going into effect in October 2016, so a little less than a year from now, and one of the key things with money market fund reform is you have to decide as an investor today do I want a stable NAV or do I want floating.

If I want a stable, I have to invest in government bonds. Right now today, there is $2.7 trillion of money market funds, 1.2 is currently in government's, 1.4 is what we call "prime," so non-government, and we expect some of that is going to be flowing into government, so we expect retail, which is half a trillion of prime money market funds, that not all those people actually want floating NAV. They might want stable.

You will see some incremental demand for Treasuries, and maybe that's a little bit more incremental than the first two.

Then you have higher rates which comes with some risk if there's any impact of higher risk on your flow of deposits, because with LCR, one of the things you have to do as a bank is say to yourself, well, what's the potential risk for an outflow of operating/non-operating deposits. Not to get too technical here, but if you assume wrong, you might have to buy some more Treasuries to make up for that.

I think one of the things that all of this that I went through indicated is there are other rules besides the LCR that are going to force an increase in demand for Treasuries. There are also rules with multiple competing interests, I should say, and you can see that with the money market fund reform as well as the LCR. There is some competing interest there. You can see it in the common equity Tier 1 ratio versus the SLR ratio versus the LCR ratio.

We have a few new rules coming as well, like the fundamental review of the trading book. Potentially, I hear it's coming. I don't know exactly. The minimum requirement for the CCAR ratio for GSIFs, is that going to move up or not.

These are all very important rules that I do think has made the system safer. We do have to understand there is some competing tendencies there, competing goals, I should say, within these rules, and it can force unusual outcomes, for example, in the case where JPM recently decided to reduce its non-operating deposits to try to reduce its buffer and help out its SLR.

I say unusual, and maybe it was an intended consequence, I don't know obviously. I say unusual because bank managements don't come to work every day looking to shrink, right? They come to work every day looking to grow, to drive profit for their shareholders, to do well with their clients, to give back to their communities, so it's unusual to want to shrink, but that was a consequence of the rules that have been put in so far.

What I wanted to just end on was a comment around where those deposits went. Some of those non-operating deposits, yes, went to smaller banks. They don't always have the right products to serve. Some of them went to money market funds. Some of them went to Treasuries. Professor Gorton's comments about how you had a zero yield in Treasuries recently at a recent auction, I think, was in part because you have banks saying we really need to be careful about how much in deposits we take on to our balance sheet.

Rules kind of driving a push of economic and financial activity towards shadow. You know, it could be an intended consequence, but it is something that is happening right now here today. Thank you for your time. (Applause)

MR. BERNANKE: Thank you, thanks, both. Let me just start and ask Gary, did you have anything you wanted to say in response?

MR. GORTON: No, I pretty much agree with all that.

MR. BERNANKE: Okay.

MR. GORTON: There are sources of demand for Treasuries.

MR. BERNANKE: I'm going to ask a couple of questions and then I'm going to open it up. Let me start with you, Gary. I've known you for a long time, so I know what you're getting at here. (Laughter) The whole point of your talk is essentially agnosticism; right? You're saying when you make a regime change, other things are going to happen and it's really hard to understand what they might be.

I think it might be worth speculating a little bit on the kinds of things that might happen that we should be looking out for. For example, an analogy to your historical example, you can imagine if checking accounts backed by a repo, bank repo backed by Treasuries, the two are not economically efficient, you might have, for example, more repo moving into shadow banking backed by credit securitization's, for example, or alternatively, some substitute for repo with a similar structure.

Is that the kind of thing that you're thinking about or is there another example?

MR. GORTON: No, that's the kind of thing. It's some form of short term debt that's going to be backed by some form of privately produced collateral. I would also emphasize that in both the national banking period and the development of the shadow banking period, this happens over a long period of time, and because it happens over a long period of time, I think we tend to get sort of lulled to sleep. We don't actually know where to look. I think we know where to look now. The question is are we going to know where to look in 20 years.

The other thing is I do think this conceptual confusion is very important. The national banking era, there were very smart people, and they were confused about checks. I think the confusion about repo, for example, contributed to this idea that we don't have to worry about the development of another shadow banking system.

MR. BERNANKE: So, I guess to follow up, is this a council of despair? You said earlier that deposit insurance was implemented, which clearly is a regime change. You sounded a little bit more favorable about that particular change. Given that we were very unhappy about the way the system was working in 2007, we had to do something, how would we think about the right regime change?

MR. GROTON: I don't want to be too much of a pessimist, but I would point out that both the national banking era and deposit insurance were almost accidents of history. These were not by intelligent design. Economists opposed deposit insurance, the national banking industry financed the civil war.

I think it is an intellectual problem, an educational problem to get to the point where we can as a society implement changes that I think would be for the better. The problem is banking crises don't happen often enough for us to really get momentum on that.

For example, I thought one of the most important things that we should have gotten out of the crisis was a new system of measurement, not replacing things, but adding to it.

I wrote this paper with Meyer and Murphy, and at the time I said to these guys, this is going to be the most important paper we ever write. I thought we would be able to get that because during the Great Depression is when we got national income accounting started, right? I was sort of hoping for that. We didn't even get that.

I think there is a sense of over confidence about the reforms that we have adopted, and I think the fact that things change so gradually is very dangerous for us. I'm not optimistic.

DR. BERNANKE: Humility is always good to have.

Betsy, you were talking about how the LCR would push banks into riskier investments. In principle, assuming the constraint on the capital requirements, the risk weighted assets, and stress tests, assuming that's the case, in principle, and obviously the risk weights might not be right and so on, but in principle, wouldn't that solve the problem, because you need more capital for the riskier investments?

MS. GRASECK: Yes, that's accurate, but you also are trying to triangulate to a certain outcome, and as a result, if your RWA is your binding constraint, you have a little bit less wiggle room than if it's your SLRs, your binding constraint.

To your point, it depends on which one is your binding constraint. Institutions migrate between them. At the same time -- I guess that's part of the challenge with the all the different rules, at the same time they are trying to triangulate as a goal to at least earn their cost of equity.

MR. BERNANKE: Okay. Let me open it up. Steve?

MR. JACADI: Thanks very much. I guess I'm here to provide the Basel response. (Laughter) I'm Steve Jacadi from Brandeis International Business School.

First of all, I think when we were designing the LCR, we thought about it more as a reserve requirement analog than a backing for demand deposits the way you said. It's important to keep in mind that the rate of backing is far below one. For standard retail deposits, it is three percent. That really does reduce the amount that you need.

I think it is also important to keep in mind that we wanted to try to make sure central banks were the lenders of last resort for commercial banks, not the lenders of first resort for those banks.

A lot of what we have seen has been intended, and the reductions in ROE of banks that has come from this, that's what we were hoping for. Of course, I can't remember being more upset than the day one of the largest bankers, the CEO of one of the largest banks in the world stood up in 2010 and said I'm going to get an ROE of 13 percent for my bank. Well, this is ridiculous. The whole point here is to drive ROEs down into the realm where you have safer institutions.

I will also say that I think there's plenty of Treasuries out there. Reserves count for high quality liquid assets, Treasuries count for high quality liquid assets, and in jurisdictions where there aren't enough of either one of those, then central bank credit lines count for high quality liquid assets.

Finally, I'll just say that Treasuries as a fraction of total assets in the banking system in the U.S. today is below where it was in about 2005. It did go down, but it's way lower than it has been in the past.

I agree that we have to worry about unintended consequences, but it seems to me the idea of liquidity regulation is something that we need, and we just have to figure out how to do it properly.

MR. GORTON: This paper was written for the BIS annual conference, so I've heard from many BIS officials and so on, and they all say the same thing, like you. (Laughter)

I think you are kind of missing a few points. One is that the Lucas critique is a serious thing. I have an exact parallel, it didn't work out well. So, quibbling over the numbers is not the point, right? I think you have to do better than that. I was told by the head of the BIS -- he said, oh, we had to do something.

MS. GRASECK: Just to make one quick comment. 13 percent, I don't know if you're referring to JPM with their ROTCE goal, but their ROE is only 10. A lot of bank managements speak to the ROTC, either return on tangible equity, but in fact the shareholders are buying the total equity.

MR. JACADI: What if it's seven?

MS. GAESECK: Too low.

MR. JACADI: Too low from what?

MS. GRASECK: Too low for shareholders. Look, if I am a bank investor and I am going to recommend a bank stock to my CIO, I'm not just competing with banks historically over time. I'm competing right now today with whatever investment opportunities are out there in the marketplace. It's 10 to 11 percent.

MR. BERNANKE: Steve, you don't get to decide, you know, what banks earn. You get to decide where banking is. Is it in shadow banking or commercial banking. That's the decision you make. All these regulations, that is what you determine. You just determine where the banking system is.

MR. JACADI: What's the ROE, do you know, on utilities?

MS. GAESECK: The ROE is a little bit lower, but importantly, their yield is much higher, and one comment I would like to highlight is that there are three basic kinds of stock investors. There's value, growth, and yield. You don't really want banks to be value stocks, do you?

MR. JACADI: I was asking the question about utilities having a lower ROE.

MS. GAESECK: Well, but they also come with a very high yield. When we are not able to invest in bank stocks because the crisis is over, there is not as much value out there, and the yield is not there, utilities have four, five, six percent yields. A yield investor wants an S&P plus 100 basis points at least. We are only yielding 2-2.5. You are basically forcing management teams to listen to growth investors.

I'm not sure that's necessarily what you are looking for as a regulator. I would think what you are looking for as a regulator is to have a shareholder base that is going to support the safety and soundness objectives of all the rules and regs, which really is your yield investor who is looking for a stable, solid, slow book value growth, consistent dividend as well. That's where a 30 percent payout ratio is a little low for that.

QUESTIONER: Hi, with Financial News. (Inaudible) Things in Britain or Europe. (Inaudible) Thanks.

MR. GORTON: I didn't understand the question.

SPEAKER: Gary talked about the European banks.

MR. GORTON: They are subject to the LCR also, so to that extent, yes.

Real quick, you mentioned bank reserves. Does the BIS have a view on how big the Fed's balance sheet or a central bank's balance sheet should be?

MR. JACADI: No.

MR. GROTON: In principle, that's relevant to the supply of safe --

MR. JACADI: I will tell you that in the discussions of the LCR, there was a lot of discussion about -- which I think you were involved in -- about the technical aspects of the interactions between operational monetary policy and the liquidity coverage ratio.

There the discussion was there may have to be more reserves in the system, and that would be fine. My own view as I said is I think of these as like reserve requirements, so in the same way a reserve requirement can drive deposits out of the banking system because of the costs -- I agree with you, Gary, on that point.

It was possible that high quality liquid asset shortages could restrict the size of the commercial banking system, and you had to be careful about that, and you didn't want that to happen.

My proposal at that point was what we should do was adopt the Australian process, which is to have basically an elastic supply of high quality liquid assets provided as an off balance sheet item for central banks, and the price of those would create actually another policy instrument. That's a sort of slightly different discussion.

MR. GORTON: It is related. I think you're right. The thing is in the period when we had deposit insurance protecting most of the privately produced debt, the central bank didn't have to worry about the quality of the bank collateral, right, it was a bank examination issue and so on.

In this new system, the quality of the collateral out there matters a lot. Open market operations which trade one kind of money, Treasuries, for another kind of money, cash, has an impact on the extent to which there are Treasuries out there.

I think implicitly and you can correct me on this, but I think the reverse repo program is eventually going to have to be the way the central bank can worry about whether there is enough high quality collateral out there by changing that rate.

The question is, is that going to interrupt with sort of normal monetary policy, and I think there is no more normal monetary policy. There is just no going back.

QUESTIONER: Thanks. (Inaudible) Plantation International. With regard to the high use of Treasury and notes to back up collateral for loans, don't you get into a chicken and egg situation where you really turn the banks into a public institution when they keep getting backed up by public money rather than just private money?

MR. GROTON: The private money is the short term debt that banks are going to issue, which has to be backed by Treasuries. If banks don't want to use all their Treasuries for that purpose, then we're going to see short term debt appear somewhere else. That is sort of the issue. Again, I would say it's an issue over say 40 years, not next year.

I would say one other thing about this demand for safe assets, because we both mentioned the Treasury auction. I think one reason there is no inflation is because everybody wants to buy safe assets, there is no money multiplier. We're stuck in this world where everybody wants Treasuries, they bid on Treasuries.

QUESTIONER: Ted Murphy from CRS. Just a quick piece of bank history trivia that might play into whether or not things are in banking or shadow banking. I believe the Bank of England had a monopoly on banking issued by Parliament, and then in the rise of deposit funded banks in the 1800s, the Bank of England tried to enforce its monopoly and Parliament said, no, you're a bank, they are deposit taking institutions.

Where I'm going with that is to accept your premise that we change the rules in what we are calling the regulations, and if we start thinking who else and how else could someone who is not what we are calling a bank today fund the same kinds of activities that you're bringing up, that we need to think about, in the shadow banking systems.

Someone in 1835 in England could have imagined someone can fund the kinds of things the Bank of England does by accepting deposits, and then think oh, we need to do things with deposit regulation.

You are bringing up a good point, what kinds of things can we anticipate, who could arrange a set of contracts similar to what you are bringing up.

MR. GROTON: I think it is very difficult to anticipate it. Again, I think it's a matter of horizon. Again, we didn't do anything about measurement. Right now, I think everybody is kind of over confident, but that's because they have a short horizon. Who knows? They could issue dollar denominated bearer instruments in China. Who knows?

QUESTIONER: Bobby Testrone, just a citizen. To each of the speakers, what should the lay person in the United States who is concerned about the effects of the last recession and the issues that you have been discussing, what should he or she be thinking about relative to what government and the private sector should be doing to prevent another disaster about the one we have just been through.

MR. GROTON: I don't want to be too pessimistic again. (Laughter) Let me tell you some American history. By the way, you don't have to say just a citizen, a citizen is good enough. (Laughter)

Financial crises are the norm in the United States and in other market economies. The period that was very unusual in the United States was from 1934 to 2007. That was the unusual period. It's harder to explain that than to explain crises.

In all these crises, the same thing happened. You have a crisis, you get this massive blow back against bankers, some legislation is passed, and 7 to 10 years later, there is another big crisis.

It takes a while, I think because of the infrequency for ideas to kind of seep into consciousness. Deposit insurance, we had tried in some states before the U.S. Civil War. Some states tried it in the early 1900s. It was a state level. It became a sort of populous mandate before deposit insurance was passed.

I think ideas for reform just take a while before they sink in. I proposed some things about reform, but that is what we observe. Somehow, I just don't see this time as being any different. We pass some stuff, maybe some of it is good, it doesn't address the fundamental problem. We're kind of confused, off we go, and there will be another crisis. (Laughter)

I think the other point of view is the one Steve was pushing, which is this time is different, and we don't pay attention to history, right?

MR. BERNANKE: I think the summary is if you modify a complicated system, you have to move careful or there are unintended consequences.

Any last words?

MS. GRASECK: I think we have done a great job. (Laughter)

MR. BERNANKE: Excellent. We will stop here. Thank you. (Applause) David?

MR. WESSEL: Good afternoon. I'm David Wessel. I'm Director of the Hutchins Center on Fiscal and Monetary Policy here at Brookings, and I want to add my welcome to Ben Bernanke. If I had heard Gary speak before we had framed this event, I would have framed it as how can we make sure that no Yale professors will stand up here in 2115 and say how could they have been so stupid back in 2015.

That's my new goal, to help identify those things that we are doing today that the next generation will derive as stupid. I think we should avoid those.

One of the big changes in the financial system as a result of the crisis has been some changes in the way the Treasury bond market works, and there have been frequent assertions that there is less liquidity in the bond market, and that will lead to the unintended consequences of the sort that Gary Gorton has been warning us about.

We are going to turn to that now. We are very fortunate to have a presentation by Darrel Duffie, who I learned by reading his bio started his career in civil engineering and then moved to financial engineering. Darrel has been teaching at Stanford Business School since 1984, and we are particularly grateful for him joining us here today because he's actually on sabbatical in Switzerland, and made a trip here just for this event, for which we are very grateful.

He will be followed by two discussants. One is Victoria Ivashina, who has been teaching MBA's finance at the Harvard Business School since 2006. The other is Nellie Liang, who has been at the Fed since 1986, and was designated by Ben Bernanke to make sure that we never have another financial crisis. Do I have it right? (Laughter)

That's not quite how the job description reads, but she's now the Director of Financial Stability Policy at the Fed, which is an innovation meant to help us so that we don't at least get smashed in the face by something we didn't see coming.

I want to make one point here. The Federal Reserve ethics lawyers are very strict, and I promised them that at no time would Ben Bernanke be on the stage at the same time as Nellie Liang and Dan Tarullo, so I have never worked for the Federal Reserve, I never will work for the Federal Reserve, and I never intend to seek an ethics opinion from the Federal Reserve, so I'm free to do that.

We're going to start with Darrel Duffie for 18 minutes, and then Nellie and Victoria will come up, and as we did before, we will have a little discussion and invite you to join us. Darrel?

MR. DUFFIE: Thanks very much, David. It's good to see you all again. So I'm not quite as pessimistic as Gary. I do think we've done something to improve financial stability, but the question is -- and there has been a constant drumbeat of questions -- has that changed bond market liquidity in a significant way. So if you follow the *Financial Times* or *Bloomberg*, or even more popular press like *New York Times*, it's just almost every day that there's something. Often, of course, it's a bank that says the regulations have gone too far, bond market liquidity has been very severely impaired, but even others have said so.

What I'd like to do is take everyone through a tour of how that might happen and whether there's evidence that it has happened. So, first of all, how it might have happened, I'll just go briefly through the list of possible channels by which changes in regulation might have caused a deterioration of a change at least in bond market liquidity. The first one is sometimes called agency intermediation, which means that when a bank is subjected to higher capital requirements -- and I work for a bank broker-dealer and therefore I'm subjected to those capital requirements. Gary calls me and says he wants to sell a $50 million corporate bond position. Before the new capital requirements I might have said sure, here's my bid and ask. Now I'm more likely to say than I was before, hang on a second, Gary, I'm going to go look for buyers for your position, and I'll act as an agent effectively for your trade. And when I get a buyer, maybe David, I'll get $10 million, then I'll look for buyers for the other $40 million, and over the next few days we'll work down your order. So that's called agency intermediation. That's one way that Gary might get less immediacy for his trade demands than before.

Another way that it might happen is that central counterparties can come into play. So this time if I have long and short swap positions of say $100 million with two different counterparties, that's a lot of regulatory capital. One way I might deal with that problem is to take the long position, send it to a central counterparty, take the short position and send it to the same central counterparty; the long cancels against the short and now I don't have a large position against which I need to hold regulatory capital. So there's going to be more incentive to move positions into CCPs. And that's already happened in the swap market and there is a lot of movement in the United States to have that happen in the bond market as well, particularly for repos.

The next thing that might happen is that the bonds won't be handled by banks at all, they'll be handled by all-to-all trading on electronic trading platforms like Brokertec, Market Access, Bloomberg, Tradeweb, where ultimate investor meets ultimate investor directly and anonymously in a central limit order book. So the banks are basically being disintermediated by that. In the bond market there's a lot of that in treasuries, not so much in the corporate bond market, but it is growing from a low base.

Another thing that it might do is to shift from -- and this is reflecting something that Betsy said -- it might shift from intermediating low risk products where my profit margins can't be high enough to overcome the regulatory capital, to higher risk products. And Ben alluded to the fact that if you have risk weighted capital that's appropriate then that should be a problem, however we have -- and Ben alluded to that as well -- an addition capital requirement called the supplementary leverage ratio which doesn't distinguish between high risk and low risk assets. And I'll get on in a few minutes to whether or not there may be implications there.

And then a potential is that -- and again this is reminiscent of what Gary said -- there could be some shadow bank intermediation. Or maybe we should call it shadow broker-dealer intermediation, where a broker-dealer that's not affiliated with the bank, and therefore is not subjected to these new financial stability requirements could step in. And that could be a good thing because it's farther from the core of the financial system, or it might be a bad thing if it's not well regulated.

My overall message, the usual measures of liquidity look pretty darn good considering how much change there's been in this last round of financial reform. That is in my view we've gotten a lot of financial stability and so far there's not that much sign of serious problems with bond market liquidity. I'll give you one or two exceptions to that, but overall it's kind of surprising that we've done as well as we have considering all the changes that have been made. Now the whole story is still playing out, because as everyone knows it won't be long before interest rate policy at the central banks starts to normalize. We'll see more bond market volatility that has good effects and bad effect. A good effect is when there's more changes in prices people have more reasons to trade and liquidity will improve from just simply more reasons to trade; there will be more activity in markets. The bad effect is we'll find out whether with all of these changes the market can handle some of the sudden rushes for exits that are going to occur as people who are used to holding bonds that traded very low yields to trading bonds whose yields are jumping around a lot more.

Here comes my quick tour of what we're actually seeing in bond market liquidity. Except for a short period during the financial crisis, remarkably stable, low, bid ask spreads in the treasury market across all of the main benchmark issues, the two years, the five years, and then ten years. By the way, that spike is interesting because it says when shocks occur shouldn't think of treasuries as immune from changes in liquidity. And that is important because if liquidity in treasuries goes down a major shock could mean that treasuries won't be the same kind of liquid safe haven that they've always been felt to be in the past.

What about price impacts, meaning how much does the price of treasuries change when there is a sudden trade? It varies a lot over time. It's not obviously much worse than it's been in the past; it's a little bit higher now. And there has been a lot made of the recent increases in price impact, but I wouldn't say this is a disaster.

Where do we see potential problems with bond market liquidity? Well, turnover is generally down, both in the treasuries market, the corporate market, the municipal bond market, the number of bonds going through the market on a given day, as a fraction of the outstanding supply of those bonds is dramatically I would say lower. I'll give you some examples in a minute. What that means is that if you have to get a very large position through the market you're going to have to be more patient.

What else do we see that might be a concern? The derivatives markets that are used to hedge bond markets are changing significantly. The one that I would like to single out is the single name credit default swap market, not a highly popular security for in the narrative of the financial crisis, but nevertheless an important way to handle risk in corporate bond markets. That market is really suffering in terms of the amount of activity that is occurring. It is getting less useful as a source of hedging for the corporate bond market and as a source of price discovery.

And the one that I promised to come back to that's being impinged upon by the supplementary leverage ratio is the treasury repo market, where I'll give you an example. Treasury market turnover is significantly down, and the amount of repo trading of treasuries between dealers is very substantially down. This is from a slide prepared by Antoine Martin of the Federal Reserve Bank of New York, which by the way has done a lot of good work on bond market liquidity over the last month. Go see their website and the liberty street blog. So why is this happening? Again because treasury repo -- let's say I have $100 million treasury repo position, this is a fully collateralized, over collateralized by U.S. treasuries, it's a very safe position. But the amount of regulatory capital I would have to apply to that position is exactly the same as if it were a real estate loan. Because of that I'd rather make real estate loans because they have a winder profit margin, so I'm declining to use my balance sheet to provide intermediation to the repo market. Another way to look at that is if you tried to borrow money using treasuries as collateral for one month you're now going to pay a higher interest rate than you would if you borrowed as a bank in the unsecured borrowing market, about 10 basis points -- I looked at it yesterday. Let me repeat that because it's quite a remarkable change. Again, if you want to enter the repo market and borrow money collateralized by treasuries you're going to pay a higher interest rate than a bank would pay if it borrowed without any collateral. And you might ask how is that possible? It's partly because the repo trades have to leap onto bank balance sheets to arbitrage that difference, and the banks don't want to have those trades come onto their balance sheets, at least not nearly as much as they did.

Treasury futures trade sizes are down. Why is that? It's a lot of these changes are related to the fact that as broker-dealers affiliated with banks pull back somewhat from the market, the best bids and offers are being done by high frequency traders on electronic platforms, whether it's at the Chicago Mercantile Exchange or at inter dealer-broker platforms like BrokerTec. About 80 percent it was suggested of trades recently in BrokerTec are high frequency, and that's the largest limit order book market for treasuries.

What about the corporate bond market? Again, the story is quite benign with respect to bid ask spreads. The market looks quite good in terms of how much it cost you to trade small sizes. But trade sizes are down. So the tendency to try to push a large position through the market in a short time that we had before the financial crisis has changed to one in which we want to put smaller positions in order to get better price execution. By the way, this is not necessarily a sign that there's too little liquidity, it may be the case that there was too much liquidity before the financial crisis. It's also the case that this is not all induced by financial reform. There was already, well before the financial crisis, a movement towards high frequency trading, all-to-all trading in the treasuries market, and an increased price transparency in markets through things called trace, or trade reporting, post trade price reporting, that caused dealers to earn less profits in this market and provide less of their balance sheet to trading these bonds. So this is a -- there are more trends at work here. And again I already mentioned monetary policy. The turnover in the corporate and municipal bond market is down quite substantially. Again this is the fraction of the outstanding supply that goes through the market on a given day. This is a sign that if you have all-to-all trading, that is there's many competitors for your trade on a bond trading platform, then your costs go down, bid ask spreads narrow, and dealer profit margins go down at the same time. What does that mean? That dealers are going to be less anxious, try to earn profits by participating in this market than they were before. So they're going to provide less liquidity to the market. That's not necessarily a bad thing, but it's just a sign that the market depth is probably not going to be what it was once before.

I already mentioned the decline in the single name CDS market. I'm going to move beyond that and turn to my last issue which one of the concerns that's been raised about the reduced balance sheets of the broker-dealers, the bank affiliated broker-dealers in the bond market. Where do the bonds go and what are the implications for that? This chart illustrates that where a broker-dealer is affiliated with banks, were building up large positions before the financial crisis, the new bonds coming into the market are more and more being held by bond funds, ETFs, and mutual funds that own treasuries, corporate bonds, emerging market bonds and the like. Some have suggested that that's a source of financial instability because when there is a rush for the exits by mutual fund investors who is going to catch these falling bonds? Will that cause let's say a fire sale or someone to topple over? I'm actually much more sanguine about that possibility than others, but it is a possibility to keep one's eye on. This is net monthly cash inflows to bond funds, and you can see at certain times, like during a so called taper tantrum, you get very large flows out of bond funds in a very short period of time. This slide is from the joint staff report on the U.S. treasury market showing that again volatility of flows in and out of bond funds is much higher recently than it was before. Again, when these big flows occur will that cause a problem. The mutual funds themselves are not levered investors. Their investors may suffer some additional volatility in the value of their investments, the market value of their positions may go down quickly and they may lose money if they try to sell immediately before the prices recover from the price impacts. But I myself am much, as I said, more sanguine about the likelihood that this would generate a financial crisis. Who after all is going to -- as I indicated on this narrative -- who after all is going to fail in terms of a systemically important financial institution? Not the banks, because the whole point of this exercise is that the banks are now much safer, they're not in the firing line, they're not large holders of these bonds. If you wanted to look for a potentially vulnerable victim of a fire sale in this market where would you look? Maybe asset managers, but I don't think so. They themselves are not the investors and they have a very wide diversified set of clientele doing a wide range of trading strategies. Maybe the alternative asset managers, like hedge funds.

Now, that's a place where I would tend to focus a little bit more attention because they are large levered investors, the number of extremely large hedge funds has grown dramatically. There are advantages to limited partners for getting out of those hedge funds quickly when they see trouble coming. And the portfolio managers that are the experts handling those positions, once they see that they're employer is having difficulty would themselves have an incentive to move. So that's a potential source of financial instability that I think we could pay more attention to.

There has been increased focus by regulators on other large financial institutions like insurance firms that have exposure to changes in fixed income markets. And we may hear more about that later today I hope. And Betsy already mentioned what's happening in the money market space, and I think that's something that's also playing out.

So overall conclusion, it's too early to say. I'll just finish there. Thank you. (Applause)

MS. IVASHINA: Okay, so my slides aren't here. (Laughter) So let me just start this. I think that in the big picture Darrell is absolutely right in that it's too early to draw conclusions. The evidence that we have is not sufficient for us to start worrying, which is not to say that we have evidence that leads us that we should not worry, right. And there were many changes, structural changes out there and so it's very hard to connect specific things. It's very hard to say dealers hold less inventory and therefore that is a cause of liquidity. Actually there is a long list, and Darrell pointed it out, that leads to the fact that liquidity had changed. And so it's a natural place to start here is to say let's measure the liquidity. So Darrell took you through the tour of let's look at the liquidity and let's think about whether the average behaviors of average liquidity in the past few years indicative of something that we should worry about.

So a good place to start here is treasuries, and so there we can go over several measures. First we can look at transaction cost, we can look at turnover, we can look at the depth of the market, we can look at the transaction size, we can look at the price impact. And on some measures there is no impact, or at least not if you plot it on the magnitude as compared to 2008. And so on other measures, but on the most measures, I think the conclusion is the fact that there are spikes and they are large spikes, not magnitude of 2008, but they are rare. And even if we look at the events of October 2013 there is a big spike, but it quickly disappears and so everything settles down. So that's on the side of treasuries. So we have a very rich insight into liquidity on treasuries.

Then we go into corporate bonds. And the corporate bonds, the picture is very similar. So there we start with the measures of liquidity less and so we -- because the market starts to get more liquid, and so transaction costs we still can measure it quite accurately, at least for corporate bonds as a general market. And so on the transaction cost nothing happening much. There are no declining, but see outstanding increase, so not that much. Transaction size is declining. So that's the evidence that we have. Overall the magnitudes are not that dramatic. There are spikes, but they are rare and they disappear very quickly. So that's the evidence.

Now the point that I want to raise is the fact that that's great, but we are measuring it where we can as opposed to wherever we would like to. And not to say that I don't have an answer, nobody can measure what they would like to measure, so we are just looking at what we have. And so the first point is that we would like measure risk. And when we're looking at the average liquidity, it's not an indicator for what will happen, if there is a tail risk. If the dramatic drop is liquidity is possible or not. And Darrell raised the point -- and that was the second point that he did toward the end of his presentation -- that thinking about market structure, and asking yourself question as who exactly will fail -- because it's not the mutual funds -- who exactly will fail and what forces escalate this entire broad financial stability crisis. That's where we should be thinking, the way we should be thinking about it.

Now the other point is that if you -- what should be exactly be measuring. So treasuries is one of the most liquid asset classes, it's a $13 billion market. It's much more liquid than the corporate bonds. It's less dependent on warehousing. It's a money like security that was brought up in the first section. And so then when we think about can we extrapolate from treasuries and the corporate bonds -- not quite.

Another point is that in the corporate bonds actually there are many other buckets. And corporate bonds is this catch all category, but there are this security -- there is very little (inaudible) there and so I'd say even at the highest level, investment grate high yield bonds and leverage bonds, which is a form of bond, very close to bonds, have very different liquidity. So I want to add to Darrell's presentation, also note these dramatically different conclusions, bring in an asset class (inaudible) within this range of fixed income that stands out by being on the opposite extreme of the treasuries. So treasuries run most liquid. If you're going to look at the spectrum of the fixed income, leveraged loans is something that is extremely liquid. Now it has loans in the name which is why it's often left out of the conversation, but actually it's a syndicated loan, it's a high yield often rated product that is originated by banks but held by institutions. And so this much less standardized than bonds. So I need to communicate points that otherwise would have been communicated on the slides. So bonds are even less standardized than bonds. If you want a space for reaching for yield, loans will be the idea where you can reach for yield because the contracts suggest extremely long and there are many ways of making the contract loser and get an extra yield or something your borrower will understand. It's much less liquid than bonds. Forget treasuries, it's much less liquid than bonds. It takes 10 days in the best case scenario to settle your transaction. Now it is a variable rate product as opposed to a bond, and so in terms of monetary policy it will be reacting to different things. But here are a few things to mention. Another reason why it might be left out of conversations (inaudible) compared to corporate bonds leveraged loans, high yield loans sold to institutional investors are relatively small. All that said it's a nearly $2 trillion market. And if you look at the post crisis issuance of high yield bonds versus high yield loans, actually high yield loans was much higher almost every single quarter. And it is not surprising that it's in the high yield loan space, that the mutual funds -- the same points have been brought in before. So one of the concerns is that there was a large growth in high yield mutual funds. And it's in the loan space, in the high yield loan space. That's where it grew the most. So it goes from $20 billion to what' it speak to, nearly $170 billion. So it grew eight times. And so it's in a rich area for thinking about what will happen if the mutual funds start to redeem.

And another observation, so Darrell showed you the flows in and out of treasury mutual funds in and out of corporate bond mutual funds. But now we see clean -- add precision to that and specifically zoom on this asset class, leveraged loans. The flows actually, they started to deteriorate in 2014. Of course in November 2014 is -- October and November 2014 is a big event in this market that's also hit the bottom. Now I wish I could show it to you, but that's a market where the mutual fund space grew five times, but it also been declining most dramatically, and it's been declining for six quarters by now, which I think this is a nice space to think about (inaudible) what -- if -- if those mutual funds will run what will be the consequences. Because we don't observe that one quarter it's oops, it's all bad, oops, it's all okay. So here you several quarters of bad environment for mutual funds and several quarters -- so withdrawal from mutual funds. Which to me leads to think that if this would be run that would be an indication of -- if this would be an environment prone to runs this would be an indication by now that something would show up.

Now on the left -- so going back to liquidity, we started with we can measure liquidity for treasuries, well corporate bonds very similar conclusions if you look at as a bucket, but the graphs that Darrell was showing in his tour actually were I think annual frequency. And one of the conclusions about liquidity post crisis is that it's very short -- that the volatility is actually much higher in the shorter horizons. So for treasuries for example, the (inaudible) volatility, the spikes are much higher. And so if we zoom in on what happens to liquidity in this segment, in the leveraged loan market, you observe that actually there is a spike in 2014 exactly where we expected, but it doesn't disappear afterward. It comes down, but then for the past half a year it's been going up. So the cost on trading in the leveraged loan market is going up. In parallel these observations that I made that mutual funds actually continue withdrawing. Turnover is a drop in the third quarter of 2015 in 10 percent, a drop in second quarter in 2015 is 3 percent, so there is a continuous decline and turnover. But all in all this is a relatively gradual deterioration which is not something that we envision as a run.

Now the final point is a point that Darrell raised. So we have to ask ourselves though given that this liquidity observations do -- what is the -- who exactly would fail? What are accelerating forces that would lead us to hit the bottom? Think about 2008. In the leveraged loan index, late 2007 trading in 95s, exactly where we are right now, and then in the fall of 2008 it falls to 60 from that level, so from 90s it goes to 60. So what could bring us from this 90s area to 60s? And so there you need to ask yourself what is the composition of this -- I would say who holds these loans. An important bucket to identify here are threefold. One is CLOs, collateralized loan obligations, the second one is of course mutual funds, which had grown in this market, and the third one is banks. Now banks actually have been shrinking a lot. And this is resulting partly from a new macro prudential pressure from the fed because under the new leveraged loan guidance, this is precisely the asset class that gets targeted and banks they are very cautious on how much engagements they have in that layer. So banks have little on their balance sheet even though they are the ones who drives the market. The CLOs, much bigger share, mutual funds also increased. What compressed? So I name the three things. Well, the things that compressed is hedge funds, which is what Darrell said. Look for the leverage. You need leverage structures. And actually what squeezed out in the market was the leverage structures. There are some other agents, but they do not have leverage as a structure. And so to bring you from 90s to 60s you need to indentify the accelerating force. And the starting point is mutual funds, but you also need an extra layer as to who will be forced to sell off on this market.

Now I need to point out that CLOs and mutual funds, as well as these new structures that emerged as it took place of the hedge funds, they are all driven. So only the banks are regulated, CLOs there is risk retention rule, but this is largely shadow banking. And so these are all market level disciplines. And I am going to bring back Gary's point, in that we are disillusioned that these things will -- we should be under the illusions that these things will evolve very gradually. And we should keep an eye on monitoring liquidity with understanding that by looking at the average liquidity we are not assessing the tail risk, and we should keep an eye on the structures of the market and the understanding of those market structures are market driven and they can deteriorate over medium horizon.

Thank you very much. (Applause)

MS. LIANG: Let me start by saying thank you for the invitation to be here today and I have to start by saying these are my views and not those of the Federal Reserve Board or its staff.

So I'm going to start also like Victoria, where I largely agree with Darrell's assessment on market liquidity. Changes are occurring, effects are still playing out. Moreover if there were some dips in market liquidity where even this less liquidity could amplify risks, it may be coming at the benefit of a more stable financial system.

Since I agree I'm just going to try to add to the discussion a bit today and bring some additional points by focusing in particular on the interactions of dealer market making and the increased role of investment funds or asset management.

To emphasize a few points up front I would say first there have been important structural changes in fixed income markets that preceded the crisis. In the corporate bond market, the TRACE system which Darrell mentioned, the trade reporting and compliance system was introduced in 2002, required timely disclosures in 2005. And then we've had the growth of proprietary automated trading in some markets which had started in equities in FX and have now moved to parts of the treasury market. And these kinds of developments have definitely removed the sort of the information advantages that dealers have always had. Since the crisis dealer market making has been reduced and I would argue both because of their own risk management practices and from regulations and intended consequence. Low returns, low interest rates may also be a factor. And then finally in addition the increased -- since the crisis, the growth of credit provided by mutual funds has grown substantially, which I will show you. In principal this shift in credit intermediation is stability enhancing. These entities are much less levered. However, there seems to be concerns that they may face spikes and redemptions and combined with market liquidity could amplify price declines.

So I'll start with two slides here which I will use to show that the financial sector is more resilient. Gary may say I'm being shortsighted, but let me just point to this. This is credit market debt as a share of GDP and it's shown by the type of financial intermediary that's providing the credit. The dark blue at the bottom are banks as a share of GDP, that's been steady for decades starting in the 60s. Insurance companies right above that, and pension funds, also pretty stable. And then in pink you can see that's the

GSE. So that started to become a big part of the system in the 2000s. At the same time as the GSEs then I would call the areas between the light blue and orange as shadow banking. This includes your finance companies, your broker-dealers, your asset backed securitizations, your money market funds, et cetera. And these grew rapidly since the mid-80s, but especially in the lead up to the crisis. These have contracted sharply. And then finally, yellow is the growth of the mutual funds since the crisis. And since the crisis it's really the only group that's been gaining share.

Second slide is just a different way to think about the system, which is the whole financial system relies a lot less on short-term wholesale funding than it used to. This is a chart of aggregate short-term bonds which includes repo, sec lending, money market funds, CP, et cetera. It's lower in the years just preceding the crisis. The recent rise is the expiration of the transaction account guarantee, the insured deposits up to 250. So again, in principal, financial stability would be enhanced when risk shifts from credit, shifts from firms that are more leveraged and more stable funding.

So turning a little bit closer to market liquidity, this is another change in the system. These are dealers and this is positions in different kinds of debt securities. The right hand side dealers are holding fewer securities in inventory. This is what the press picks up quite a bit. They make it -- suggest that that means if they hold less inventory they are doing less market making. This is in aggregate. And you can see in the past few years it has fallen. But on a net position, it's a little lower. It's back to levels around 2007. On the right hand side of this chart here is just to kind of illustrate there's a lot going on behind that aggregate positions. Corporate debt inventories, the red line, has been about flat for the last few years, maybe shaded down a little bit. And the recent declines have really been in treasuries, and that's the black line. And there's a pretty significant negative correlation between these two since dealers use treasuries to fund their corporate positions.

Perhaps the more interesting point here is we don't tend to view that these net positions are a very good indicator of dealers' willingness to make markets. You can look at the positions in 2007 and 2008, large positions would argue that this did not at all signify a greater willingness to make markets once prices started to fall. So I think we have this unresolved issue, which is you can have high inventories perhaps with a high leverage, or you could have low inventories and low leverage, and which ones will generate more market making is still an open question.

And then here, we'll go through this quickly. This is just two indicators of the market liquidity in the corporate bond market. I'll make two points here. First, this market has never been very liquid. It's probably not liquid now, it wasn't liquid before. That's like a key point. If you look at bid ask spreads, that's like 100 basis points, you know, versus treasuries which are like 2 or 3. So they're pretty high. And then their share of trades that are greater than $1 million, $10 or $20 million. This is from the TRACE system.

I guess the second point is these trends don't show any correlation in the changes with net positions of corporate bonds. So one possibility for why market participants seem to be quite concerned, and it's this possibility that you could get a spike in the demand for liquidity, and dealers are not going to be able to provide that liquidity. That's what is the concern. So here I would say we do have growth of mutual funds, clearly sharp rise. The right hand chart shows the high -- I'm going to focus on high yield bonds because those are not that liquid -- high yield bond market size has been growing pretty rapidly over the past few years. The bond mutual funds, that blue line, have grown also. And as a share they've picked up because they're growing quite a bit faster. Mutual funds though have been around for a long time. You know, in 1940 -- for 75 years they haven't notably contributed to systemic risk, but they are becoming a bit more specialized and they are becoming bigger players in these less liquid markets. And that seems to be generating some concerns.

So a couple of areas why bonds might cause problems. And the SEC is looking at this as well as the Financial Stability Oversight Council, what was a very simple intermediation chain has gotten a little bit more complex. First is this move to less liquid assets, so there is a fundamental mismatch between the on demand redemption of mutual funds and the kinds of securities that they're holding. There is also a first mover problem in the way the U.S. mutual funds are structured. Funds mutualize the cost of asset liquidations and so costs -- these costs are borne largely by the remaining shareholders. So combined with liquidity mismatch this creates an incentive for investors to get out ahead of the other. This is your kind of run, although you wouldn't kind of put it in the same category as a run like a bank run kind of thing, like a (inaudible) big run. So nonetheless these could amplify the effects of redemptions in greater asset sales. And then the potential of those mutual funds and reduced liquidity could certainly amplify any kind of credit cycle.

So I just wanted to wrap up by just mentioning a couple of things that the SEC is working on. So the SEC is taking a fresh look at the fund industry. The 1940 Act was 75 years ago. Liquidity risk management is one of five initiatives. So the proposal they issued in September tries to address a couple of important things that I highlighted. One is, how did they do liquidity risk when management when the fund is investing in illiquid assets, and two, can it help to remove this first mover advantage. So there's a number of things to do on liquidity risk management. They are asking funds to report assets by liquidity buckets and disclose more frequently, they are asking for three day liquid asset minimums -- Gary will hate this (laughing) -- this will be you have to hold at least three days, board oversight of liquidity risk management programs, and greater disclosure. There is also an option for swing pricing, which is a feature of mutual funds that is adopted in Europe where a fund can anticipate in large outflows the effect on the net asset values. So you can swing down of you're expecting large redemptions. It's been adopted in other places so it's possible here. And so more broadly, besides this illiquid assets mutual fund, intermediation has gotten more complex. Funds can use derivatives and they engage in sec lending. These are two ways that are just kind of leverage returns. And so the SEC is planning proposals on stress testing and the leverage. The Financial Stability Oversight Council is also reviewing these issues. In practice it's possible that any regulations aimed at individual funds may not be sufficient for systemic risk. For example, would they capture correlation risk versus idiosyncratic risk, or would stress testing of funds capture that. You're likely to have redemptions at multiple funds, not just at one fund.

So I think the goal for these financial stability reviews is to assess the structure of the intermediary, not to regulate asset prices or moderate asset prices. And it will be a work in progress for the next year or so.

Thank you.

MR. WESSEL: (Off mic) for that and I apologize to Victoria. So her slides will be on the Hutchins Center website at Brookings.edu. And I personally will mail a full color copy of her slides to anyone who is desperate to have the slides. Thank you for being such a good trooper.

I'm always a little bit overwhelmed by these discussions because on one hand you hear the industry saying that these guys in Washington and Basel and they're mostly guys, don't know what they're doing. Gary has got it exactly right, they don't really understand how the markets work and they are going to make things worse when we have another crisis. And on the other side, you have people saying some of the complaints of the industry give me a headache. They're saying that we can't do everything we could do before the crisis. And then you say to them yes, that was the point. We didn't want you to do all that stuff, we didn't want so much leverage. We didn't think that anybody being able to trade anything any moment was necessarily good for the society. So we're caught in this tension. And I want to tease out a little bit about how that fits in this conversation.

So in our attempt to get a diversity of views on the stage we didn't represent the people in the industry who are most worried. And so I'm going to try and channel as best as I can understand is the industry argument. And I think what they're saying is you all are too complacent. That we haven't tested anything yet. We've had an extraordinary period of very low interest rates that we know is abnormal, and we've had a couple of minor shocks, but what makes you so confident that if there was something that happened and there was a big spike in prices in the bond market, that some big bank would actually come in and be willing to buy them, which is what we need to keep the system stable. What makes you so sure?

MR. DUFFIE: Thanks, David. Well, I think my last remark was it's too early to tell. I think that is a risk. On the other hand a lot of people on the buy side would say well they never came in big to supply liquidity to the market during a stress period. Of course it's all relative. If they have the ability to supply some significant amount of liquidity that's good. But I do think it's too early to tell. We may have some air pockets. The question though is when it happens, and it probably will, how will that shock get transmitted to create financial instability? And I think you heard both Victoria and Nellie say look to the bond funds, or look to the leveraged loan funds to see they're not going to fail, the banks are not going to fail, who's in the next tier?

MR. WESSEL: So is that a good thing? That we've moved the risk to the leveraged loan funds and the bond funds because they're less systemic? Is that basically the argument?

MS. IVASHINA: Well, Darrell in his slides -- I don't know if it made it to the final version -- had this point about who exactly would fail. And mutual funds cannot fail by definition and so you can kind of have -- needs a chain of accelerating forces. So I do agree that moving off the balance of the banks. An important point. And just to echo Darrell's point about this starting argument about the banks coming in and providing liquidity into the market. That's not what we have seen during the past crisis and there is actually a piece of research, micro data, from Bundesbank in Germany where they actually look at who's buying what and they illustrate the fact that there is not much rollover bank as a provider of liquidity in that (inaudible)

MR. WESSEL: Right. So we don't have worry not doing it in the future because they didn't do it in the past? But let me just push you a little bit on this mutual fund thing. A mutual fund doesn't have to fail to cause a problem. If we have, as Nellie pointed out, lots of mutual funds who have similar portfolios and they all try and sell at once, and it turns out some of their stuff is illiquid so they sell all the liquid stuff at once, then you could get the fire sale bad dynamic that we know is a problem. So it's not good enough to say a mutual fund can't fail.

MS. LIANG: So I think you raised the point about whether the mutual fund could amplify any kind of price decline, and I think this mismatch and the first mover advantage has that potential. So having regulators look at that and try to fix that seems like very on point.

I think the other thing to mention is there are going to be bond losses. People will take losses. Prices are going to fall. So I think you want to make sure your intermediaries, the funds or whatever kind of institution, don't amplify those and make them become a bigger problem. If it's just a liquidity issue it could mean -- so it takes me three days to execute a trade versus one day. If it doesn't actually permanently alter the prices it's not as much of an issue.

MR. WESSEL: Right. Well, the whole purpose of finance is to mobilize savings so that we can have investment and live happily ever after.

Darrell, what would you be looking for to see whether all this liquidity in the bond market was a bigger problem than you suspect? What would be the warning signs that would tell you that it might be too early to tell, but it's not too early to worry?

MR. DUFFIE: I mentioned already the reduction in the repo market. That's a clear danger sign in terms of liquidity. I don't think it's a financial stability problem per se. I think you should look to costs of issues debt because we've been talking about the secondary market where already issued debt is traded, but why does liquidity matter? Well, in part it matters because when the United States government wants to roll over its debt it wants to get a nice low interest, and if secondary markets are illiquid the United States government, therefore all of us in the room mostly, are going to pay higher taxes to cover that debt. That's important. And then you already raised the point of could there be down the road somewhere a shock to the market, sufficiently large, with insufficient liquidity to absorb it that somehow propagates to other players. Now we haven't yet got the end of that story.

MR. WESSEL: And there isn't any sign, is there Victoria, that corporations, or at least investment grade corporations are running into higher transaction costs to sell debt are they? Because they're selling a lot of it.

MS. IVASHINA: And the same is true for the high yield segment because the shortage in mutual funds that we observed was last eight quarters or so was offset by presence of CLO issuance while --

MR. WESSEL: Collateralized loan obligations, yeah.

MS. IVASHINA: Yes, collateralized loan obligations.

MR. WESSEL: Let me ask one final question before we turn -- so I think that one reason people worry is they recognize that we could have a big reaction when the fed starts raising rates. If not the first time then when the markets conclude that rates are going to go up a lot faster and it could be a very disruptive event. And if it's going to be disruptive, it seems like one place it might be disruptive is the bond market. Do any of you have any concerns that we're too much extrapolating from this period of tranquility now and that we'll look back a year or two now and say like well that wasn't the representative period?

MR. DUFFIE: Well, as I mentioned that might actually improve liquidity because there's going to be more reasons to rebalance your positions, more trade, more turnover. And it's not as though as we haven't had time to prepare it. The Fed has been telling us for quite some time (laughter), get ready, we're going to start doing this soon.

MR. WESSEL: Right. The only volatility was the day they said they might do it and didn't, right?

MR. DUFFIE: I think as some of the emerging markets governments have said, let's get on with it and see how it works out.

MR. WESSEL: Okay. I'm sure they'll have some questions. Phil Suttle here.

MR. SUTTLE: Thanks, David. Phil Suttle from Tudor Investment Corporation. Actually one observation up front, August '07 didn't -- closure or the closing the gates by mutual fund in France, actually kind of wasn't that first domino in the whole crisis. So the idea that mutual funds can't have systemic implications strikes me as a little odd.

But my question is really partly based on Nellie's slide on the growth in the post crisis period and the growth of the ETF market. Because I think when we think about concerns that we have about market structure and how it could go wrong, you know, it typically comes from a market where you have illiquid assets backed in some sense by a promise to deliver instant liquidity. And that seems to be the ETF market in a nutshell. And we saw some of this in August this year when -- I can't remember the exact data, but something in the first 15 minutes of trading, the SPX, which is the most liquid ETF, was trading at something like a 20 percent discount on the line. For just a little while, but it was enough to really scare people. So I wondered if Nellie in particular, but the other participants had some thoughts on whether it's really the ETF market we should be most concerned about?

MS. LIANG: So in August that particular incident was an equity ETF which was related to the late opening of the NYSC and the quoting of stocks. So I think it was China over the weekend, futures were down before the NYSC opens, and so then there are standard procedures for how you open stocks. And so many stocks, maybe like 800 or 1000 didn't open on time. So ETFs couldn't quote the underlying stock prices. And so there were some big, big gaps in there. I didn't hear -- so that was the issue and I think that is something that could be remedied. They could not allow ETFs to trade until the underlying stocks were also trading. That could address that.

I didn't hear issues in terms of bond market ETFs which I think some people have raised more questions about. So it is a liquidity issue, but the stock markets have practices in place where they know how to open and close stocks. These things with big price moves, I don't think we took a big lesson from the liquidity yet, but it was something to watch.

MR. WESSEL: Anil.

MR. KASHYAP: Anil Kashyap, University of Chicago. I guess I have a hard time getting this to a financial stability story, but having pressed people in the markets I think the story goes a little bit like this, which is the high frequency trading has meant that the bid ask spreads now don't mean what they used to because the trade sizes have fallen so much that we don't really know that if somebody had to put through a big trade what it would mean. So a lot of the calm indicators are untested. So I think the best story for financial stability would be let's suppose something happens late in the day where you get one of these big spikes because somebody has to put through a big trade, and then you see movements that are very, very large and a bunch of closing prices get quoted in the middle of one of these flash crashes, does that strike me as super likely? I don't know, but I think the thing to keep our eye on is when we get back to more normal trade sizes -- or whether we ever will -- if we never do then I guess you're only going to find out when the tide goes out as to how this all works.

MR. WESSEL: One on the aisle here. Pete Kyle. Pete, raise your hand.

MR. KYLE: Hi, I'm Pete Kyle from the University of Maryland. You presented some information from a pessimistic standpoint, and when I look at it I see optimism. So you talk about declining --

MR. DUFFIE: Thank you. (Laughter)

MR. KYLE: -- trading volume and bonds, but yet the rise of mutual funds and ETFs -- and I don't know whether your volume statistics included not only net redemptions from mutual funds, but all the gross redemptions from mutual funds. That should probably be factored in when thinking about how much volume there really is in terms of change of ownership in bond markets, and similarly of ETFs. You talked about banks making less money off of their dealing activities and having less repo position. Well, making less money off of their dealing activities means their customers have more money in their pockets. That to me is good. The banks having less leverage on their balance sheets, well, look at the picture we saw of the bank's long corporates and short treasuries, the massive quantities leading onto the financial crisis. And then when the financial crisis hit they had to de-lever. So they got crushed not only on liquidating their bond markets, but they also got crushed on liquidating their treasuries which were skyrocketing in value at that time. So it seems to me that things are probably much better than you say. And that if we do see what looked like a run on mutual funds, what we should expect to have happen is for spreads to widen, bond prices will fall, market will clear, the companies that issued high interest rate debt will have a chance to buy it back at even higher rates, and that's the way markets are supposed to work.

MR. WESSEL: Any comment?

MR. DUFFIE: I'll take a quick shot at that. I was already the optimist relative to Gary (laughter) so things are looking even better as you go down through the audience.

I think some of what you said is true, because we're taking some of the action away from the core payments and settlement system where a lot of it doesn't need to be. I could be in the asset management industry, far away from banks and not impair them.

One of the things, though, you said can be taken two ways. When the banks make less money somebody else is making more money. Well, yes and no. Nellie mentioned the idea that now that the market is more transparent banks bid ask spreads are narrowed, they're not going to make as much money and their customers are probably going to have less trading costs. On the other hand, the prices they are charging for a service and some of this reduction in bank revenues is a reduction in the amount of services supplied. So turnover down for example. So there might be less -- this is what liquidity -- it might be more costly to move positions through or it might take you longer to do that because of this. And as I said, this is a tradeoff I'm happy to make, but we just need to be aware of where it's going.

MR. WESSEL: Steve, last point.

MR. CECCHETTI: Thanks. Steve Cecchetti, Brandeis International Business School. I have two quick points. First of all, I just want to point out that what you just said, Darrell, is again an intended consequence, which is the idea is that the low cost of bank balance sheets, the low cost that banks had for having their balance sheets large, was effectively subsidizing trading in a lot of these markets. That subsidy has now at least been somewhat removed and so we have to decide how we feel about the fact that the costs have now gone up. But we might ask whether or not having stronger institutions means that if the cost of trading does skyrocket, they will be strong and have capital ready that they will be willing to devote to now a higher return activity. The question is whether they'll have the infrastructure for that.

I have a separate question though about market structure. The U.S. Treasury issues 300 and some securities. Large corporate issuers issue many, many more. And forget about leveraged loan issuance, okay, but I have some numbers here. Like JP Morgan issues 671, Bank of America 1066, Goldman Sachs 1783, separate bonds. Can we do something? It seems to me that that's a prescription for illiquidity and a prescription for problems in bond mutual funds if they start holding this stuff. Is there something that we can do to improve the standardization of corporate bonds and make that market more liquid that direction, through a structural change?

MS. LIANG: I'll comment, one first comment. The corporations seem very uninterested in that proposition. (Laughter) So, you know, it does get raised with them and there are some that have benchmark issues, but in general they like the flexibility. They have certain investors they like, they want to be able to offer them what they want when they want it. So it has been raised. A few companies do do this. The UK reopens their Gilts, the U.S. does not. So that seems like a possibility to think about.

MR. WESSEL: Well, I think this is a good place to take a break. And thank you for the opportunity to tell you that during the coffee break you can buy either Ben Bernanke's book or a little book that we've published at the Hutchins Center called The $13 Trillion Question, in which John Cochrane makes exactly the point that Steve says, and why is the Treasury creating all this arbitrage opportunity for the bond market. Why don't they issue perpetuals and take some of the rents back from the dealers for the benefit of the taxpayers.

We're going to take a break of about 10 minutes, so we'll get back here at say 3:35 to hear from Dan Tarullo. Those who may have questions for Darrell or the other speakers, we'll have a little panel at the end and we'll have more time for questions. So thank you all. Come back in 10 minutes.

(Applause)

(Recess)

MR. WESSEL: We're waiting for everybody to return their seats, and we can go to the next event, the next chapter here. It's my great pleasure to be able to introduce Dan Tarullo, who of course is the Governor of the Federal Reserve. He served since Barak Obama appointed him in January 2009. I've known Dan for a long time, but I never actually read that stuff they put on Wikipedia about you. Nothing embarrassing, don't worry. I'm sure it's been edited by the Fed Public Affairs staff, and the Ethics lawyers.

Governor Tarullo is probably unique among Fed Governors, at least in my experience, that he actually got a Master's in English at Duke before he succumb to law school. He went to law school. And of course, those of us who have been in Washington for a long time know that he spent a great deal time as an advisor to Ted Kennedy in the days when stuff actually got done in Congress.

But since, he played out that string, and then he worked in the Clinton administration, but it turns out you can't get anything done in the White House either, so when had the opportunity to basically write his own ticket, he chose, to the surprise of many of his peers, to go on the Federal Reserve Board, which is not where lawyers usually find themselves.

But Dan has become really the Chief Overseer of the banking system at the Federal Reserve. He defined his ambitions in a *New York Times* piece I found, "That the regulatory and supervisory reforms we undertake will significantly reduce the incidence and severity of financial crises," which seems to me a pretty worthy goal.

You missed this earlier. Gary Gorton has given us a new goal, is that, "Don’t do things that people 100 years from now will say; how could they have been so stupid?"

But another of Dan's accomplishments is, there's a very small set of people who command the respect of both Elizabeth Warren and Larry Summers, and Dan is in that small set. Dan Tarullo? (Applause)

MR. TARULLO: Thank you, David. So, the topic David assigned me to, for this session I guess, was Shadow Banking, and I know you’ve been moving around a bit around various topics, asking the question of: Are we safer now? But that is where I'm going to try to focus my remarks.

The financial crisis highlighted two major vulnerabilities in our financial system. First, of course, was the magnitude of the too-big-to-fail problem, and second was the size and fragility of what was called the shadow banking system, and the extent to which shadow banking activities, not subject to prudential regulation, were integrated with the regulated banking sector.

In the intervening years, much has been done to address too-big-to-fail. With regard to shadow banking concerns, the specific forums related to mortgage lending that linked the regulated and unregulated sectors, such as the notorious SIVs, collapsed during the crisis. Changes in capital, accounting, and other regulatory standards make these arrangements very unlikely to reappear. Moreover, the kind of very large non-bank financial firms, whose failure deepened the crisis, are now subject to consolidated prudential regulation and supervision.

So, in a quite direct sense, the answer to the question posed by this conference, of whether we are safer than before the crisis, is easy to answer in the affirmative. Of course "safer" does not necessarily mean safe enough. With respect to the largest banks, we continue to pursue the aim of promoting orderly resolution through evaluation of their resolution plans and through the long-term debt requirement that we proposed a few weeks ago.

In addition, the banking agencies will be proposing a net stable funding ratio rule, aimed at assuring adequate medium-term liquidity over the course of the next few months. And the Federal Reserve is currently engaged in a review of its annual stress testing and capital planning exercises, one goal of which is to reflect better the range of risks confronted by these institutions.

With respect to shadow banking, the circumstances are somewhat different, while the specific pre-crisis linkages to the regulated sector have been removed or are now better regulated, the possibility of other connections remains. More generally, risks to financial stability may arise anew from activities mostly or completely outside the ambit for prudentially regulated firms. Shadow banking is not a single, identifiable system, but a constantly changing and largely unrelated set of intermediation activities pursued by very different types of financial market actors.

Indeed, the very rigor of post-crisis reforms to prudential regulation may create new opportunities for such activities. The aphoristic warning to avoid too much emphasis on fighting the last war, since wholly new risks may have arisen, seems particularly applicable in this area.

Yet there is simultaneously the opposite danger that the regulatory response to shadow banking will be too broad and too uni-dimensional. Indeed, the very term "shadow banking" tilts in that direction. This afternoon, I will try to navigate -- excuse me -- to identify some of the circumstances that could help navigate between the perils of under-appreciating the risks to financial stability arising from, and the costs from overreacting to, new forms of non-bank financial intermediation.

Along the way I will make a few points. One is that, analytically, it is essential to disaggregate the various activities that fall under the loose term, shadow banking, and to assess the risks and benefits they present on a discrete basis.

A second is that notwithstanding the manifold nature of non-bank intermediation, it still remains useful to identify the relationship of specific activities to the prudentially regulated sector.

A third is that institutional considerations will be important in defining the potential, and actual, regulatory responses to non-bank intermediation.

As you've probably inferred already, I have some misgivings about the continued use of the term shadow banking as a shorthand for various forms of non-bank financial intermediation that may need a regulatory response. The term conjures up a picture of lending and borrowing that resembles activity associated with, but not conducted by, commercial banks which is in itself, both over- and under-inclusive of actual risks to financial stability. Before elaborating on this point, though, let me review how the phrase does capture well the activities that played such a large part in precipitating and exacerbating the financial crisis.

Prior 2007, large banks provided credit and liquidity support, whether explicit or implicit, for a range of intermediation activities, including finance companies, non-bank mortgage lenders, structured investment vehicles, and asset-backed commercial paper conduits. All of these entities engaged in maturity and liquidity transformation, frequently accompanied with significant leverage, many created, through securitization or otherwise, assets that were viewed as cash equivalents; safe, short-term, and liquid.

That is, at least in normal times, they were seen as comparable to demand deposits created by the traditional banking sector. Thus, what we might refer to as the prototypical form of shadow banking presented the kind of risk associated with traditional banking prior to the creation of deposit insurance, that of destabilizing short-term creditor runs that may lead to defaults and asset fire sales.

Bank sponsorship contributed to the illusion that the shadow bank short-term liabilities were virtually as good as cash. Large banks also relied on short-term wholesale funding provided by the shadow banking sector as a source of cheap financing. Then, questions arose about the quality of the mortgage loans and other assets underlying the liabilities of SIVs and asset-backed commercial paper conduits and, simultaneously, about the continued willingness and capacity of their sponsors to support them.

Suddenly, asset-backed commercial paper was no longer seen as a cash equivalent, and a run ensued. Large investment banks also experienced dramatic runs on their short-term, secured wholesale funding.

As noted earlier, some key elements of pre-crisis shadow banking such as SIVs have vanished, and some key actors of that earlier period have been brought within the bounds of prudential regulation. Today, the shadow banking sector is smaller and the traditional banking sector is more resilient. Nonetheless, abundant global liquidity continues to seek out safe assets, and some financial market participants will continue to accept maturity and liquidity mismatches in order to earn incrementally higher yields.

The risks associated with short-term wholesale funding in particular have more receded than disappeared. Accordingly, the prototype of the precarious shadow banking model can generate new variants that should command regulatory attention. Before returning to this issue, though, I want to speak more directly to why and perhaps, more importantly, how we should analyze the risks and benefits associated with specific forms of non-bank financial intermediation.

Switching from a focus on shadow banking to a consideration of the varieties of non-bank intermediation reinforces the importance of assessing specific risks, rather than merely categorizing activities as either shadow banking or something else. In this way, the potential over-inclusiveness for financial stability purposes of the tag "shadow banking" can be better avoided. Even non-bank intermediaries that engage in lending to consumers or small businesses are not monolithic, insofar as the sources of their funding, and thus attendant run risks--may differ markedly.

On the other hand, financial stability risks are not limited to entities or activities that seem to replicate the kind of lending conventionally associated with commercial banks. This is where the potential under-inclusiveness of the shadow banking category arises. Here again, though, it is important not to leap to the conclusion that where some risks do exist, they should be addressed in a uniform manner.

For example, to take that contemporary point of discussion, some classes of asset managers, such as bond funds that hold relatively illiquid assets while offering their investors the right to withdraw funds on very short notice, may pose redemption risks. But intermediaries such as many conventional mutual funds do not pose bank-like risks, since they generally at least are not leveraged. So, if further analysis supports the conclusion that redemption risks are real, the optimal regulatory response would surely not be one that treats all asset managers as quasi-banks that need to have capital and similar bank regulatory constraints.

An emphasis on actual risks can also lead to the conclusion that some non-bank financial entities or activities do not pose material threats to financial stability at all. I'm going to mention pension funds now, and you may wonder why I'm mentioning pension funds, and the reason is that in, at least, some efforts by some observers to begin getting their arms around what they call shadow banking, pension funds have been mentioned. But while they are surely an important form of intermediation and if, over time, they do not have assets sufficient to meet their promises to plan participants, hardship will undoubtedly follow, and that’s whether because they have been underfunded in the traditional sense or because they have lost money through ill-considered investments.

And if enough pension plans fell short of expectations, there might be macroeconomic consequences. And if they provide short-term funding in order to increase returns on the assets they need to keep liquid, they might contribute to the risks assumed by other kinds of intermediaries. But, in themselves, they are unlikely to pose financial stability risks, but I think similar reasoning would apply to traditional insurance activities.

Now, even as the risks associated with specific forms of non-bank intermediation are evaluated, it's important also to bear in mind the specific economic benefits of those activities. Non-bank intermediaries can increase the diversity of the economy's capital providers. To take a historical example; the creation and eventual proliferation of equity mutual funds offered a variety of savings options to American households for which ownership of a diversified portfolio of equities is either practically burdensome or financially impossible. This development posed a challenge for the liability side of banks' balance sheets, as households reduce the share of their savings in traditional bank deposits. But it is hard to argue that this challenge would have merited limiting, for example, the availability of mutual funds.

Non-bank intermediaries can also provide credit to borrowers that are underserved or unserved by traditional banks. It could be argued that one example of such non-bank activity is online marketplace lending that uses new sources of data, and new technologies to lower the fixed costs of making credit decisions, rendering lending to some individuals and small businesses more cost-effective.

Of course, it matters a great deal whether this competition to traditional banks arises because risks are genuinely lower or useful new products have been created, on the one hand, or because well-grounded prudential or consumer regulations have been successfully avoided, on the other.

A key implication of the fact that the activities often grouped under the heading shadow banking are not monolithic is that the level of a particular activity is less important than the degree of vulnerability that it creates. Not all of what some would call shadow banking activity represents a market failure that creates excessive risk, and so it would be wrong to assume that all shadow banking ought to be regulated to safeguard financial stability.

This view is now incorporated into the Global Shadow Banking Monitoring Report which is done annually by the Financial Stability Board. The 2015 report which has just been issued, begins by including all activities that could arguably fall within the category of shadow banking, but then proceeds to classify these activities by economic function and then by risks. The result or the conclusion is, about a 70 percent decrease in the amount of intermediation that would otherwise captured by the broader definition.

So, in assessing whether regulation is appropriate for specific forms of non-bank intermediation requires a balancing of the resulting increase in socially beneficial credit, capital, or savings options against any associated increase in risks to the safety and stability of the financial system. And here I think, in doing this balancing, the chief relevant factors to consider would be the extent of reliance on maturity or liquidity transformation, the creation of cash equivalent assets, the use of leverage, and the degree of interconnection with the traditional banking sector.

When growth in non-bank intermediation reflects a migration of traditional banking activities to less-regulated entities, a number of similar considerations are relevant to an evaluation of the costs and benefits of the migration and the potential need for a regulatory response. Here, where the activity is probably quite bank-like, I am going to revert to the use of the term shadow bank.

First, to what extent does the activity, as practiced by shadow banks, entail reliance on leverage or on maturity or liquidity transformation that could lead to a bank-like creditor run dynamic? Bank regulation is primarily aimed at preventing the occurrence of such destabilizing runs, or minimizing their ill effects, and so the need for bank-like regulation is greater in the presence of material run risk.

Second, are banks still informally or indirectly at risk despite the migration to non-bank entities? This could be the case if banks sponsor the shadow banks and implicitly or explicitly provide them with a liquidity backstop or credit support, and it would call for greater regulatory attention either to the shadow banks conducting the activity, or to the Banks' connection with those shadow banks.

Third, is the activity at issue primarily migrating out of the most systemic banks, the global systemically important banking organizations, or G-SIBs, or out of smaller banks? Migration of activity out of GSIBs might on net be beneficial for financial stability because it would leave the GSIBs less systemic, even if the activity migrates to less-regulated shadow banks, though here, I would caution that an especially careful analysis would be needed before reaching this conclusion.

In this regard, I would note that one way to limit the growth of shadow banking that simply arbitrages bank regulation is to make sure that the regulated sector itself is not unnecessarily burdened. This aim lies behind our efforts at the Fed to tailor-banking regulation by reference to the risks posed to the economy and the financial system by banks of varying sizes, scopes, and business activities.

In addition, it suggests a couple of considerations for evaluating specific forms of shadow banking. Here, though, the relevance of these considerations is for determining whether to adjust banking regulation, as much as it is for determining whether regulation of the shadow banks would be warranted. One such consideration is whether the activity is high-risk, and whether banks have a good track record in addressing the attendant risks. Migration may be of less concern where banks historically have done a poor job of managing the risks of the activity in question.

Another salient consideration is whether the activity at issue has significant synergies with core banking activities. If so, then regulation which incentivizes migration out of the traditional banking sector could damage the efficiency of banks and increase their vulnerability.

While I've spent quite a bit of time, giving sense that the specific risk and costs associated with a particular form of non-bank intermediation, need to be assessed on a particularized basis. I should say that I also believe that the greatest risks to financial stability are the funding runs and asset fire sales associated with reliance on short-term wholesale funding. If there is one lesson to be drawn from the financial crisis, it is that the rapid withdrawal of funding by short-term credit providers can lead to systemic problems as consequential as those associated with classic runs on traditional banks.

The total amount of short-term wholesale funding within the financial system is lower today than immediately before the crisis. The volumes are still large relative to the size of the financial system. Nearly half of the liabilities of broker-dealers, for example, consist of short-term wholesale funding, a level that is nearly the same as it was during the crisis. Now, numerous regulatory reforms have addressed the use of short-term wholesale funding by prudentially regulated institutions.

The Board has finalized the liquidity coverage ratio, is developing the Net Stable Funding Ratio, as I mentioned earlier, to diminish large banks' vulnerability to abrupt changes in short-term wholesale markets. Our annual Comprehensive Liquidity Analysis and Review provides an opportunity for supervisors to assess and, where necessary, to contain risks, require changes to the specific funding practices of large banking organizations.

Finally, in order to increase the resilience of firms that continue to use significant amounts of such funding, we have incorporated a measure of a firm's reliance on short-term wholesale funding into the calibration of both the capital surcharge for the GSIBs and our proposed long-term debt requirement for those firms.

But these measures, applicable as they are only to prudentially-regulated banking organizations, do nothing to address the risks of short-term wholesale funding by non-bank intermediaries. Indeed, these constraints imposed on banking organizations may prompt more short-term wholesale funding to migrate outside the regulated sector. In the past, bank backstops were generally needed for shadow banks to obtain substantial amounts of such funding.

But I think it not so far-fetched to think that, with time and sufficient economic incentive, the financial, technological, and regulatory barriers to the disintermediation of prudentially-regulated banking firms could be overcome. Indeed, we have observed some investment funds exploring the possibility of disintermediating dealers by lending cash against securities collateral to other market participants. While it would be inadvisable to apply bank-style regulation to all entities that make use of short-term wholesale funding, a degree of consistent regulatory treatment is desirable to address bank-like risks in the shadow banking sector and to forestall regulatory arbitrage.

The Board has advocated for international measures to forestall the development of highly volatile funding structures outside the regulated sector. And consistent with this position, we will be developing a regulation that would establish minimum haircuts for securities financing transactions on a market-wide basis, rather than just for specific classes of market participants.

These securities financing transactions, or SFTs, include repo, reverse repo, securities lending and securities margin lending, transactions that are the lifeblood of many kinds of shadow banks. Now, SFTs are a key component of the healthy functioning of the securities market, but, in the absence of sensible regulation, they also carry the potential for prompting the fire sale dynamic described earlier. While the haircuts and other conditions associated with securities financing transactions today are considerably more conservative than during the period leading up to the crisis, there is good reason to believe that this conservatism could be eroded as economic conditions continue to improve and credit growth accelerates.

A system of numerical haircut floors for SFTs would require any entity that wants to borrow against a security to post a minimum amount of excess margin to its lender, with the amount varying depending on the asset class of the collateral. Like the minimum margin requirements that U.S. regulators have imposed on derivatives contracts, numerical floors for SFT haircuts would serve as a mechanism for limiting the build-up of leverage in the financial system, and for mitigating the risk to financial stability posed by pro-cyclical margin calls during times of financial stress.

Now I'm going to shift to my last few remarks to what I've termed institutional Considerations, because while the analytics of shadow banking, or non-bank intermediation, more generally, lean towards a case-by-case balancing of risks and economic benefits. The actual way in which these activities could be regulated, depends of course on the structure of institutional realities. There are a lot of issues that probably are worth consideration, but in the interest of time today, I'm only going to mention two.

The first is the issue of what form of regulation is appropriate once analysis suggests that a response is needed? By authorizing the FSOC to designate non-banks as systemically important institutions, Dodd-Frank fills the gap that existed in the pre-crisis period, when firms like Bear Stearns, Lehman and AIG largely escaped the perimeter of prudential regulation.

Designation by FSOC places firms under the regulation and supervision of the Federal Reserve Board. Important as the designation authority is that preclude the

Lehmans or AIGs of the future though, it is almost surely not the optimal regulatory approach for most activities that can be characterized as shadow banking, or that are conducted by non-bank intermediaries so as to raise financial stability concerns. The vast majority of firms engaged in such activities will not satisfy the statutory test for designation.

And in any case, it is unclear that at least some of the statutory prudential requirements for designated firms would be necessary or appropriate in dealing with the risks to financial stability posed by the activities of such firms. In many instances, and I think especially where funding vulnerabilities are at the heart of a business model, it is the activity itself that needs to be regulated in some way, whether there are a few large firms involved or many smaller ones involved.

A tool that might be better targeted to actual risks, while avoiding unnecessary bank-like regulation would be what I have previously termed prudential market regulation, that is a policy framework that builds on the traditional investor-protection and market-functioning aims of market regulation by incorporating a system-wide financial stability perspective. This approach would take into account such considerations as system-wide demands on liquidity during stress periods, and correlated risks that could exacerbate liquidity, redemption, or fire sale pressures.

The specific policies associated with prudential market regulation might be transaction-specific or apply to certain kinds of business models. One example of such a measure is the SFT minimum haircut that I mentioned earlier. Generally, though, prudential market regulation would be a tool more available to market regulators, since it would apply to activities on a market or transactional basis.

In her important speech last year, Securities and Exchange Commission Chair, Mary Jo White, provided a roadmap for just such a regulatory approach for the asset management industry. And as many of your probably know, the SEC has since begun to develop that approach.

The second institutional issue that flagged this afternoon, is the question of which regulators would make the assessment and policy tradeoffs that I contemplate in addressing financial stability risks associated with non-bank financial intermediation? Now, the natural answer would be the regulator with authority to act. And this may well be the best answer from a policy perspective as well, but it does raise some potential issues.

For example, if regulators with responsibility for one sector believe that the failure of regulators with responsibility for another sector to act on financial stability concerns is creating debilitating disadvantages for firms in the first sector, they might be tempted to relax regulation on their firms, even though they might agree that the best outcome would be to retain their regulation while having the other sectors subject to some constraints as well.

And in fact, I don't think this is a purely abstract for hypothetical possibility, because it seems to me not a pretty good description of what happened in banking for a good part of the three decades beginning in the mid-1970s, when the banking agencies pursued a variety of deregulatory measures, at least in part because they believed that the franchise value of commercial banking was being eroded by various capital market activities that were not subject to appropriate prudential requirements.

I'm going to conclude now by saying, the Financial Stability Board study, to which I referred earlier, notes among many other things, that the growth of shadow banking in the United States in recent years has been relatively modest. With the regulated financial sector so much more resilient than in pre-crisis days, the financial system as a whole is obviously safer. Moreover, much of the innovation occurring in lending and payments arenas today carries the promise of genuinely increased efficiency, and does not appear to be just an arbitrage against the stronger post-crisis regulatory regime.

But if history is any guide, the grace period we are now experiencing will not last forever. New forms of intermediation may carry new risks, or older forms may acquire new risks as they expand and adapt to new circumstances. If we are to pursue, what I think is the analytically attractive policy of case-by-case assessments that permits healthy forms of non-bank intermediation while protecting the financial system, then financial regulators will need to develop effective and supple mechanisms for what I have termed prudential market regulation. Thank you very much. (Applause)

MR. WESSEL: Thank you very much for that Governor Tarullo. I'm going to as a couple of questions and then let the audience have a crack at you.

MR. TARULLO: That’s a little (crosstalk).

MR. WESSEL: I'm not a reporter anymore; you don’t have to worry about this of course. I think a caricature of the argument one hears is, okay, we had a crisis, they created a lot of regulation on the banks, that led a lot of activities to migrate to the shadow banking system, so now they are going to try and regulate the hell out of the shadow banking system, and this is ever-ending recipe for more and more regulation, always trying to layer on, and it will either collapse of its own weight, or will have unwelcome effects on the supply of credit in the economy. So, what do you say to those people? I know that’s not your view, but what do you say to them?

MR. TARULLO: Well, look, I think there is -- I think there could be a risk of that, and one of the reasons why I want to get away from the use of the term shadow banking is it tends -- anybody could pass the term carefully, but when observing some of the early discussions of shadow banking among those official sector people, you did see that tendency to sort of say, we've got to get everything that involves intermediation. We have to get our arms around everything that involves intermediation with maturity transformation.

You know, what I tried to do, David, in those prepared remarks was to admittedly conceptual rather than an applied way, tried to identify some of the factors that we should be looking to on a fairly rigorous fashion, in deciding which activities actually do pose risks. And do you know, I think one of the reasons for the grace period, what I referred to as the grace period, is because so much of the pre-crisis shadow banking or non-bank financial intermediation, was actually connected to the both levered banks generally, and particularly the largest banks.

That, because a stop has more or less has been put to that through the Bank's own changes in orientation and through regulation, there's probably a period during which there's not a shadow banking, or non-bank intermediation opportunity to fill in immediately, but that’s what I think could change over time. And I think we just need to be aware of that on the one hand, while on the other saying, not everything that intermediates is a problem. Not everything that intermediates with maturity transformation is a problem.

One, I think really needs to ask -- to develop that kind of analytic framework, and ask the question of somebody, back to the institutional issues, you need to ask the question, are there real risks being posed here, because there's always -- Those who are competitors will see risks, those who have a particular mandate may be a little inclined to see a risk because it pushes them forward, and that’s why I think these institutional questions are important to get enough information, enough analysis, but critical thinking will (crosstalk).

MR. WESSEL: Let me ask you about that institutional thinking. So, if we are going to have a system where we are going to do sophisticated activity-by-activity assessment, it seems to me that current -- Too much liquidity here? It seems to me that the current setup is particularly ill-suited for that. A variety of agencies, different mandates, an FSOC that isn't clear, that has authority, some people have financial stability mandate some don't. It doesn't seem like that's well suited for the world in which you are --

MR. TARULLO: So, I think it really is early days, and if you look at the FSOC reports over the last few years, I think you will find actually a quite thoughtful assessment of some things that might be thought of as potential financial stability risks. I would say -- I mean this is a little bit of Fed patting on the back, but I think within the Fed we do have now a pretty sophisticated effort to think through potential financial stability risk. And I think it's not just sophisticated, but I think it's pretty -- there's a lot of self-critical activity as well, you know, and led by Nellie's division, the Office of Financial Stability, but really including other divisions as well.

And I would say that my own experience has been that in discussions with my counterparts and other agencies, we *de facto* our doing that kind of assessment. So, I guess I would say that in the absence of a short -- a list of clearly-problematic areas that clearly require action, and we are sitting here saying, why isn't anybody acting? I think that we are getting time to develop the kinds of interactions that would allow this sort of assessment when the time comes to make it.

But having said, you know, as many people observe there are advantages and disadvantages to a relatively decentralized regulatory system. You avoid having any one agency with dominating authority over all areas, but it does mean that by diffusing authority, you need to get sometimes more people on board before you can act.

MR. WESSEL: Let me ask you one more question. So we are in a very unusual time when, because the Fed has been holding rates so low, the usual safe assets pay very little return; in our discussion earlier, with Treasury options at zero rate. So, is it possible that people who reach for yield are not so much taking credit risks, but are taking liquidity risk, in the -- I don't have a better word for shadow banking, in some aspects of the shadow banking and how do you think of that? And particularly, how does that interplay when you think about using forward guidance in monetary policy? Like, are you creating your own problem?

MR. TARULLO: With the Fed Bank creating a problem how?

MR. WESSEL: By encouraging people to take more and more liquidity risk to get yield, because if they don't they are never going to get a decent yield on the short term.

MR. TARULLO: Oh, I see. I don't think there's any question, but that in a period of, sustained period of low interest rates, that there is going to be reach for yield. I mean, it's just a fact of life, and there's a reason why accommodation, as a policy, is kept in place, but there are obviously some downsides to that, and one of them is the reach for yield.

I think that the issue of the forward guidance, I guess I can -- and I see what you are saying about that, I think it's one of the many reasons why I, at least was more comfortable shifting away from calendar-based or explicit forward guidance towards something that -- I'm not going to use the term data-dependent -- I'm going to say, outlook-dependent, are outlook-driven. But again, in specific circumstances, where you are at the zero lower bound there may be a very good reason to use forward guidance as one of your available tools, and you just have to recognize that, again, there will be downsides.

MR. WESSEL: Yes. Yes.

MR. TARULLO: I mean every policy action that anybody ever takes, has merits and it has some downsides associated with it. So, the fact that a monetary policy action, or a regulatory action, creates a downside, or a shortcoming, is not a reason for that's a bad policy action. And indeed I would say that some of the forward-guidance pursued by the Fed and some other central banks in the sort of nadir of the crisis and the recession, was a well-considered tool to be used under those circumstances; whether one wants to use it in more normal circumstances, entirely different questions.

MR. WESSEL: Let's take a few questions. I think maybe to be efficient I'm going to ask for a couple and then we'll let Governor Tarullo respond. That gentleman there with the beard in the middle, followed by the gentleman with the beard in the back.

MR. TARULLO: We can see the selection criteria.

MR. WESSEL: Yes, definitely.

MR. COPLIN: The beard is a leftover from Halloween.

MR. WESSEL: Tell us who you are.

MR. COPLIN: My name is Nathan Coplin, New Rules for Global Finance, based here in D.C. I kind of want to come back to the point that Governor Tarullo raised about the migration of activity or entities out of GSIBs, and whether that's actually beneficial, and then come back to the question about, do we understand who is in the shadow banking system. I also agree it's not a great term but because we don't know, that's why the shadow word came up. So, I mean, how do we approach that, and also could you speak on one of the main initiatives coming from the Financial Stability Board, the legal entity identifier, and will that be a prerequisite for kind of addressing that issue or not?

MR. WESSEL: Let me just take another one.

MR. TARULLO: Oh, yes. I'm sorry.

MR. WESSEL: Take one in the back.

MR. TARULLO: I've got to use my memory now.

MR. WESSEL: I took notes, so I'll make up the question.

MR. TARULLO: All right.

MR. HELTMAN: John Heltman, American Banker. I have a question, it's not really related to shadow banking, per se, but --

QUESTIONER: You might not get an answer then, but okay.

MR. HELTMAN: But regulatory reform more generally, and Dodd-Frank, one of the initiatives was the creation of Vice Chairman for Regulatory Affairs, it seemed to be at the cornerstone of the reform and yet, the position remains unfilled. Governor Tarullo, you've been effectively acting in that capacity. I'm just curious why that position remains unfilled? Do you want it? Do you not --

MR. TARULLO: So, let me get Nathan's question first. You know, I'm glad you asked that because I should have been -- I was thinking as I read the speech, that I should have been more clear that what I was doing in laying out those factors, that series of questions, was not a sort of *sub rosa*, alluding to current issues or current issues or current problems, or current non-bank intermediation activities that fit each of those questions.

It really was an effort to distil from pre-crisis experience going back some ways, a set of questions or criteria which one could ask as a particular form of activity came before us. And you'll note that I qualify that one on the GSIBs by saying, I thought we needed to be particularly careful, or cautious, in doing that analysis.

The reason I thought we needed to particularly careful about it, you know, it's got this premise where if you reduce the systemic footprint of a GSIB, that's kind of presumptively a good thing, and in isolation that probably is kind of presumptively a good thing, but the fact that it migrates to the unregulated sector may carry with it costs that exceed those that would be associated with it continuing to be conducted within even the largest banks in the regulated sector, precisely because there are regulators watching what happens.

MR. WESSEL: What kind of activity are you talking about there?

MR. TARULLO: That's why I wanted to be --

MR. WESSEL: You don't want to say?

MR. TARULLO: I don't want to --

MR. WESSEL: Okay.

MR. TARULLO: Because I don't want to suggest that there is something in particular.

MR. WESSEL: Okay. Legal entity?

MR. TARULLO: On legal entity, yes, legal entity is -- I think legal entity really is an important --

MR. WESSEL: Define what it is first.

MR. TARULLO: Oh, the legal entity identifier is just an effort basically to get a standardized system throughout the world, of identifying counterparties in financial transactions and that, among many other things, will allow the aggregation of data with more of a sense of who is exposed to whom, either within financial institutions or across financial systems.

It could well help with shadow banking insofar as you ask yourself the question, hmm, what other intermediaries who are actually getting a lot of their funding from the regulated sector? And thus, in a sense, the regulated sector is taking on some of the risks of the unregulated sector. But it actually, it has intents and uses far more general than that.

MR. WESSEL: And do you want to take that?

MR. TARULLO: Who?

MR. WESSEL: Why haven't you appointed yourself the Vice Chairman yet?

MR. TARULLO: You've got to ask the administration, you can't ask me.

MR. WESSEL: Let's take a couple more, if we have them; the woman standing in the blue?

MR. TARULLO: Without a beard.

MR. WESSEL: That will be it, yeah?

MR. TARULLO: Without a beard, I said, not with --

MR. WESSEL: Oh, without a beard. Sorry.

MS. MILLER: Rena Miller with Congressional Research Service. I'm just curious. To what degree are you concerned about overseas activities through affiliates, kind of escaping the mesh of various regulations, whether it's market-based, on derivatives, or whether it's entity based, in practical as well as sort of legal terms?

MR. TARULLO: All right. Good question and we need to -- I think there we need to distinguish between the regulated firms that are regulated, and regulations that are applicable to activities. So, with respect to firms, I'd say two things, one, the reason we have consolidated regulations and supervision, is precisely because of what has been learned about the potential for problems arising in the overseas activities of a firm, and this is BCCI. That's sort of the poster child for that.

When you have consolidated regulation, you, for example, with respect to capital, you have a consolidated balance sheet that looks at all the assets and that constructs leverage ratios and risk-weighted capital ratios, and in our case does stress testing against that entire balance sheet. Now, I don't think anybody would believe that we at the Fed and the OCC and the FDIC, have as granular a window -- a window onto what's going on in other markets that is nearly as detailed as the one we have in our own markets, but that's where, among other things, supervisory cooperation comes in.

So, for us, for example, the Bank of England is an incredibly important *de locator* because all of our large broker-dealers and our large commercial banks have substantial London operations. So we require, on a consolidated basis, capital be developed and you see the counterparty risk across the whole firm on the one hand, and on the other hand we have the advantage both of the fact that those firms have to separately chartered in the U.K. and meet capital and liquidity requirements there. But also, that we hear from the PRA which is part of the Bank of England, as indeed they hear from us on their banks here.

Now with respect to activities, with respect to activities, it's obviously a different potential issue, and there, I think, you sort of have to make a judgment as to whether -- You know, if the activity is abroad, theoretically it's not affecting your financial markets, so if you are not capturing it as part of your firm oversight, because you are not particularly worried about the actor, just the act. Then you might say, well it doesn't matter if we don't have a window onto it.

If you are worried about the actor, presumably you should be regulating the firm. If you are worried about arbitrage or unfair competition, then you really need to be moving toward some sort of international framework that creates at least workably convergent regulation which, for example, is what we've done with over-the-counter derivatives, you know, looking for a common margining practices there.

It's part of what animated the initiative on securities financing transactions. You know, why did we want to extend that framework to SFTs between non-bank actors, which today account for a very small proportion of activity? Well the reason is because it would be so easily arbitrageable, you know, it could move very quickly, so you want to have a convergent set of regulations in place.

So the policy decision there basically is, if it's outside of your market, and it's not by a regulated presumptive -- you might think, well, this is not really of concern to us, it's someone else's financial stability, unless you are worried that this is just part of a big arbitrage action, and if things are easily arbitrageable, it pushes you toward some sort of international framework.

MR. WESSEL: Can I ask one final question? You had this nice phrase in your speech about, we are undoubtedly safer, but are we safe enough. When you look across all the things we've done, how do you answer that question?

MR. TARULLO: The concept of safety and financial stability I think necessarily needs to be dynamic, David, and so, you know, as we sit here today, and as Nellie does her quarterly briefings of the Board, it feels obviously and substantially safer than a decade ago but, you know, the very nature of financial markets is one of a lot of adaptation, one of a fair amount of arbitrage, a fair amount of innovation.

And so the reason I ask that question about safer is, and why my conclusion said, we've got to push towards what I call those more supple analytic and institutional mechanisms, is precisely because the moment where you tell yourself, hey, we are safe enough is when the problems are going to start to arise. And you don't even have to go down a Minsky-like road, you might want to, but you don't have to go down that road in order to think that that is where you are going to start the (crosstalk).

MR. WESSEL: Okay. So we can never answer the question, yes, we are safe enough, because that would be self-defeating?

MR. TARULLO: Yes. I think that's -- that doesn't mean you always need more regulation at a particular moment in time, but I think the analytic and regulatory processes always need to be aware of what's changing in markets.

MR. WESSEL: Okay. Please join me thanking Governor Tarullo for his time. (Applause) And to comply with (inaudible) regulations, you'd have to move that way so that Bernanke can come up this. And can I ask Darrell and Anil, and Gary to come up and join me for final conversation? Thank you very much, Dan.

MR. TARULLO: Sure.

MR. WESSEL: All right, Gorton has special permission to leave at 4:45 so we can -- 5:15.

(Recess)

MR. WESSEL: So, maybe I can start, Dr. Bernanke, by asking you about the question that Governor Tarullo posed in his speech. So I don't think there is going to be any argument up here that we are safer, but where do you worry that we are, if at all, gone too far? We've made ourselves so safe that it's hurting the economy, and are there places where you think really need to pay more attention to minimize the risk of future financial crisis?

MR. BERNANKE: Well, just reiterate, I think we are a lot safer, and I think what's important is that, as Dan was talking about, is that the regulatory system now has adaptive mechanisms that it didn't have before. So, if a new type of firm arises that has a new kind of charter for some reason, or a new set of activities there exists mechanisms for evaluating the systemic risk associated with it, and potentially regulating either the firm or the activities.

An example of that -- well many examples, the FSOC is one example, but I think the living will process, for example, where the Fed and the FDIC are evaluating the structure and the resolvability of large institutions, with a process in place that over time will move towards the situation where either of those firms are resolvable, or they are simplified, or some other change is made. The point is that the potential for addressing dynamic change is in the system.

I don't have any -- on the question of risk, I'll just make one comment, which is that one of the things that Nellie does in her office there, her office asks two kinds of questions. The first kind of question is; is there an area where asset prices are somehow wrong in some fundamental sense, or where activity is risky in some sense? That's the first question. Can we identify problem areas?

But then the second question could be summarized as: So what? Suppose that there is a housing problem, but the question is, if house prices decline by 30 percent what are the implications for the financial system, for the economy, it's those two parts that we need to look at. I think we should ask Nellie the question because she's been doing the work every day. I don't know of any area that is posing an immediate risk to the U.S. economy, but I'm glad that the office and others around the regulatory system are doing constant monitoring of those areas, and thinking about the consequences if, in fact, some price or some risk materialize.

MR. WESSEL: And let's say, God forbid, we have another big financial crisis, are you at all concerned that the changes that have been by Dodd-Frank and others to the Fed's ability to act in a crisis will prevent a future Federal Reserve from doing what you did? Or is that just something that, worrywarts?

MR. BERNANKE: Well, I hope that we wouldn't have to do -- The Fed wouldn't have to do what we did. I think the --

MR. WESSEL: You won't know until -- According to Gary (Inaudible).

MR. BERNANKE: That's right, well that would be good. Dodd-Frank has in it, what I thought of as a bargain, a deal. And the deal was that there would be further restrictions on the Fed's lending authority, for example. The Fed cannot lend to an individual firm to prevent it from failing. It has to get permission of the Treasury Secretary; there is -- also new rules about disclosure of who is borrowing, so there are some added restrictions.

Importantly, the ability to lend in a programmatic way across a class of borrowers is preserved, and I think that's very important. So there were some restrictions placed, but in exchange for that, there were new authorities granted particularly in the framework of the liquidation authority, which provides a much more systematic way, both to put a firm, you know, out of its misery, so to speak, and at the same doing it in a way that preserves financial stability.

So, I think that bargain, you know, remains to be seen. We never know for sure, but I was willing to -- personally, I was willing to accept that bargain because I thought that overall it did some important things, including not only making the system safer, but also making the reaction to a financial crisis more legitimate, more democratic, because now the Congress has laid out a set of rules and now there is a process that's being developed.

I think all that is probably an improvement, I do worry about some confusions about the Fed is the lender of last resort authority, I think it's absolutely essential that the Fed remain able to lend to broad classes of borrowers in the event of a financial crisis, and the inability to do that, I think would be a very serious problem.

MR. WESSEL: I'm going to introduce Anil Kashyap from the University of Chicago Booth School, who has partnered with us in a couple events. And Professor Kashyap, I wonder if you could pick up where Dr. Bernanke left off? So, have we done things that are going to make it harder for the Fed to save us from another catastrophe? And how do we even know how to think about that?

MR. KASHYAP: Well, yes, certainly we've done some things. I think, to step back and think about what the narrative for Dodd-Frank was. Almost all of narrative for Dodd-Frank was too big to fail. Almost everything Governor Tarullo said, which I agreed with fully, was about there were runs, and all these nefarious ways in which maturity transformation was taking place, that collapsed under stress.

Now, if that's the diagnosis, and that's mine, you wouldn't have organized Dodd-Frank the same way as you have. Whatever you want to call the shadow banking stuff, the stub of that, the collapse would have been front and center, and if you check through the boxes and you ask yourself, how well did we do on tri-party repo only because of the New York Fed?

Asset by commercial paper, well it's gone, but there was nothing in Dodd-Frank. Broker-dealer funding model, not so well attended to; derivatives, some central clearing, some improvement on margining, still not so great, repo markets talked about that a lot, just bilateral repo and securities lending, again, not central to the -- to what Dodd-Frank was about. So, I don't think Dodd-Frank aimed its canon in the right direction. Now it sprayed a lot of stuff out there like a scud missile and hit all kinds of things, sometimes that work but I think the combination of that and the dial back on 13(3) leaves me feeling not nearly as safe as we need to be.

MR. WESSEL: And you were telling me earlier about some experience you heard that the regional Fed banks had with the kind of little war game thing?

MR. KASHYAP: For people that are interested in this, if you want to have a scary scenario. The Boston Fed had a very nice conference on whether or not the Fed should have a third mandate for financial stability, about a month ago, and in the run up to that there was study that was commissioned, that was put together by staff of several reserve banks, that's New York and Boston mostly.

And it was a tabletop, that's Fed speak for war game scenario that went a little bit like this. We are in 2016, we are seeing that we've hit 2 percent inflation, growth look pretty good, the unemployment rate is stabilized at the NAIRU, but the commercial real estate market is taking off, and most of the funding is coming through securitizations and not through the banking system.

And then you look at the tools that Dodd-Frank provides, and it's pretty sobering. There's no direct way to clamp down on the shadow banking activities that are being used to finance this boom. Many of the things that the Fed would have to do require long leads, advance notice of proposed rulemaking, then comment after comment after comment. And then eventually you can do something that's indirect. And so I think that's a pretty scary scenario.

And, by the way, it ignores all the questions of political legitimacy. We don't know what would happen if the Fed or anybody in the U.S. Government try to clamp down on housing lending. I don't think we've laid the groundwork to do something like that. It took 20 years to get inflation targeting through, with massive determination, and we haven't invested in using these other tools. So you can get that working paper right off the Boston Fed's website, and it's got Tabletop in the title, and I encourage everybody to have a look.

MR. WESSEL: Professor Gorton, it turns out you are not the only worrywart on the panel.

MR. GORTON: I think I have a little bit of optimism on this though.

MR. WESSEL: Okay, good. Well, go ahead.

MR. GORTON: I think one thing that did come out of the crisis which I think was really great is the stress test. I just think as tool going forward and becoming more sophisticated, the stress test is fantastic. But one of the reasons it's fantastic is that most of the regulation has written down rules for banks to follow, especially risk-related assets, and as soon as you specify rules, they are instantly gamed.

The stress test moved the discretion back to the regulators, which is the way it used to be in period where we didn't have any problems, but I like the fact that the discretion is in the hand of the regulators. They don't tell the banks to model, and I have a lot of confidence that these models, these stress tests can be increasingly sophisticated. I mean, the onsite examination, you know, it's just no good.

MR. WESSEL: So, you like the stress test for the very reason that the bank hates them?

MR. GORTON: Yes.

MR. BERNANKE: But Gary, we don't stress test insurance companies; there is all kind of stuff happening when there is no stress test.

MR. GORTON: Well, that's true.

MR. WESSEL: But we can fix that?

MR. GORTON: I'm not saying it's a panacea, I'm saying it's really good thing that came out of the crisis.

MR. WESSEL: Let me ask you. So, what you taught us is that -- and Dr. Bernanke has written about this as well, is that one way to understand the crisis, it's we had the run. It wasn't on the banks because we have deposit insurance. It was on all the other institution that had short-term liabilities. Are we well positioned to avoid the bad effects of a run on those markets? Have we done there or is that -- or not?

MR. GORTON: When you think about that, right, you have -- the repo market is short-term debt that's backed, say, mortgage-backed security. So you can look at this transaction and do one of two things. You can beat up on repo, or you can say, privately-produced collateral, securitization, it's not regulated or overseen by anyone. So why don't we focus on trying to get some oversight of the privately-produced collateral, because we don't know how much repo there should be.

So I think we went about this, you know, the wrong way, and I think -- I was at a conference at the Bank of France called: How do We Revitalize Securitization? And, you know, I think that is a pretty big problem, but that was the other road we could have taken. And I think that's the road, I would have taken.

MR. WESSEL: Do you want to weigh in on any of this, or do you want to help me answer the question of, what do we need so we are closer to being safe or not? Your choice.

MR. DUFFIE: It's part of the same conversation -- I mean, let's talk about repo. Anil and Gary already mentioned it. The foundations of the infrastructure for the repo-market are not sound, still they have improved a lot, but there's a lot more to do. When a very large fraction, say, half the repo market is cleared in commercial bank deposits, when international standards are that it should be cleared in Central Bank money, or at worst in the money of a bank, whose only purpose is to perform that utility function. So that's one issue.

Another one, Governor Tarullo alluded to the idea that we can use new information systems like LEI, Legal Entity Identifier, to better map the risk flows in the financial system. I still think we have a relatively -- a better visibility within the banking system, but outside of the banking system if we were to map those risk flows better, we could do better. The foreign exchange derivatives markets could have been treated with the Dodd-Frank statute, but the United States decided, the Treasury Department decided to exempt the FX market from that treatment.

There's a lot of ongoing work on the failure resolution of financial market infrastructure and I think a lot more could be done there. There's no operating manual yet for what to do, for a central counterparty, one of these big, new central counterparties created by Dodd-Frank were to be unable to meet its obligations.

MR. WSSEL: You mean the clearinghouse itself?

MR. DUFFIE: The clearinghouse, right. And have the principles, those are agreed on, but as far as if it happened today, where is the checklist, and who do you call and who do you send to do what, and under what conditions do you interfere with the recovery plan of that clearinghouse? That's still all to be worked out. So there's plenty of work ahead, there's lots of full employment for those in offices like Nellie's office for the next 5 to 10 years.

MR. WESSEL: Nellie, you are the hero of this whole conversation, right, yeah?

MS. LIANG: You can (off mic).

MR. WESSEL: You realize that human capital is denominated in financial stability. Can you just explain a little bit about what you meant about -- what you are worried about in the repurchase market, the repo market? What's the problem that’s unaddressed?

MR. DUFFIE: Okay. So I'm not suggesting this is an impending disaster, but it's just by design when a multipurpose, risk-taking financial institution, like either of the two clearing banks, Bank of New York and Mellon and JPMorgan Chase, we depend on the viability of the deposits in those banks for purposes of settlement of a very, very large financing transaction, securities financing transaction called overnight repo.

So if, for example, even if the primary dealers are all fine, and the cash lenders are all fine, if for some unrelated reason operational credit risk, something else entirely, people said, wow, I don't think I want to get my cash today, in deposits of that particular bank, they wouldn't rollover those loans. And then all the people that depend on getting financing, operationally, have nowhere to go.

You can't actually pull out all the plugs at one place, and plug them in at another place on short notice. So if that were, you know, a standalone utility, to use a metaphor, with a kind of stainless steel thick-walled tubing, and no place for those pipes to get corroded by other activities, that would meet international standards set up by the CPMI.

MR. WESSEL: Is that where that is?

MR. BERNANKE: Possibly, I mean you can always come up with all kinds of scenarios, I guess, but I guess I would make just two comments going back. I agree with the comment that repo and short-term funding was a big issue, but just two comments. One is that there has been a lot of progress, there's no question, now we don't have the investment banks, independent investment banks, we are completely financed by short-term money, short funding.

The repo market has been improved in a lot of ways, in terms of -- including operational improvements. So there has been significant improvement there, but also as Governor Tarullo was talking about, there is now a very different approach, which is the so-called macro-prudential approach, which in this context means that it's not somebody else's problem, there are people including people at the Fed who are trying to look at these systemic issues, and as the Governor was saying I think that the tools, the regulatory tools are in place to address these things over time, but they are complicated problems, and it takes time to implement everything.

It would be a different thing, if there was a building problem, and nobody had responsibility for it, and nobody had any way to address it, I don't think that's really the case. Now, are there -- you know, financial regulation is a very complex matter, and supervision can fail and so on, but I do think that we have a more dynamic system now in terms of the ability to address the changes and the innovations in the system, better than we had before.

MR. WESSEL: Professor Kashyap mentioned something that Dad Cohen has mentioned, Former Vice Chair of the Fed, which is, we know that in the past that housing and real estate is often somewhat involved in the financial crisis, and among the many tools that we gave the Federal Reserve and other regulatory agencies, we did not include any kind of way that set loans to value ratios, or debt to income ratios, to limit lending to mortgages, which they have it in the U.K.

So two questions then; one is, is that something we should do, and we would be better off if we had that? And secondly it seems to me it raises the really interesting point about, even if you know the right thing to do, the politics of some of these things, is extremely treacherous, and given everything you went through during the crisis, you would think that your successors would pause because there were some real consequences, to the things of doing something as unpopular as saying, we are making too many mortgages.

MR. BERNANKE: Well the macro-prudential policies come in two flavors. They come in the short-term, countercyclical targeted flavor, and they come in the sort of, through the cycle, systemic, vulnerability flavor. So, the first one is what you are talking about is that we determine house prices are too high, and we put on some kind of capital requirement, or some kind of down-payment -- By the way, capital requirement would be a little more subtle and more indirect, than the down-payment requirement.

But those two raise problems, it raise problems with democratic, but those raise problems, it raise problem with democratic legitimacy, and conferring with Congress, and also just the problem that in practice it's hard to identify these kinds of things. So, in the U.S., for both political reasons, and maybe even for more fundamental reasons, we have focused so far, at least, on so-called through the cycle or systemic macro-prudential policies, we try to increase the resilience in the system to any kind of shock, wherever it might come from. An example of that would be the big increase in capital, and the stress-testing which is a way of -- The thing about stress-testing, the flexibility of stress-testing says if you are concerned about CRE, commercial real estate, you can stress test, specifically on that risk.

So, I agree that, you know, it will be interesting to see how the U.K. and Canada and Asia, with some of these different responsive, short-term, macro-prudential policies, it will be interesting to see how they work, we'll learn from that. Whether the U.S. will ever adopt it, I'm not sure, but a pretty good substitute for that, is just making sure the overall system is very resilient.

MR. WESSEL: Okay. I'm going to turn to questions. Victoria or Betsy, do you want to weigh in on anything? You don't have to. I mean, that that's pretty worked out.

MS. GRASECK: Oh, sure.

MR. WESSEL: Okay. We can wait for the mic.

MS. GRASECK: Two questions, one is on the degree of work on these -- viewed as systemically important institutions globally. In the sense that we have an area for the U.S., it's more advanced than what we have seen in Europe, which is still, yet again, way more advanced by Asia, parts of Asia, at least, parts of Asia with big banks. So, I'm wondering what the next steps are, or is it important to have next steps with regard to aligning these major geographies, is that important, yes or no? And in particular I'm thinking about things like, at one point the risk-weighted assets, density was going to be homogenized across these different geographies, and I'm not sure if that's a pipe dream, or if it's a possibility.

And then the second is more of a micro question. I get the sense we care really today about systemic risk, but what are the implications for some of the, quote/unquote, "shadow" activities, that are probably not systemic today, but are a major C change from what we've had in the past, or unregulated because you are talking about institutions that are at a state level, that might not be captured in these discussions? Do we care about them? At what point is the tipping point to care about them?

MR. WESSEL: Do you want to try?

MR. BERNANKE: Sure. And international corporations, there's different levels, and Governor Tarullo talked about it, and you have supervisory cooperation, you have regulatory agreement, the Basel, and the Basel standards of course are the minimum standards, and the U.S. is chosen to be tougher on some dimensions, which has caused some benefits. And the benefit is you have a stronger system, and that that's a positive.

And then there is the coordination on the resolution, which is something that the international bodies are looking at. I hesitate to give any impressions, speaking of the Fed, obviously since I'm no longer there, but when I was there, we were doing a certain amount of work with, particularly the Bank of England, and a few other -- the ECB and a few other institutions, where, the bulk of activity for most of the key multinational that are at least headquartered in the U.S., is in two or three other major financial centers. And so working with them, gives you a pretty good purchase on what's happening in that institution.

But that is -- and this is what the tabletop was about -- was trying to work with other regulators around the world. I don't want to get too far into the technicalities, but a single point of entry, for example, which avoids actual bankruptcy in many cases, except maybe at the holding company level, is one way to minimize all the legal complexities involved once bankruptcy is declared and it triggers off into other provisions.

On shadow banking, again, I would reiterate that there are two questions, what can go wrong, and what is the implication of that for the stability of the overall system, and that would be the litmus test, trying to think about what the implications are of some scenario, and how much it endangers political institutions, critical markets, and the broader economy, and that’s an assessment that, once again, Nellie and her team are always working on.

MR. KASHYAP: I mean, I think we would be in a much better place if the suggestion by Governor Tarullo was close to being operational, which is once we identified an activity that was a problem, we had a way of chasing it. So, the thing that Betsy was suggesting, that something small, but we know it's dangerous from the start, it's very different because then you'd have a motive for going after it, and you try to chase it around if it migrates from one place to another.

But we are -- I think everybody is on board with this activity-based view of let's figure out what's dangerous and deal with that and not worry about institutions but worry about activities, but a regulatory system is just almost ideally positioned not to be able to that, because we have all these 10 regulators that all have their turf, and their mandates that are different, and so on, so I'm not too optimistic on that.

MR. WESSEL: the gentleman there, stand up, if you would, so they can find you. And remember to tell us who you are.

QUESTIONER: I'm Mon Singh, as a citizen. But here is my question.

MR. WESSEL: Put the mic a little closer to your mouth.

QUESTIONER: With regard to Anil Kashyap, alluding to the 13(3) with the Fed, and if you look at what's happened, and a lot of focus on SIVs, it's very likely that some of the market plumbing will crack and it will show up in the non-banking or shadow banking. Now, from a taxpayer perspective, isn't there anything in the Fed or the regulator's mindset that ultimately we will have to bail out some place, and we have put all the ammunition at the SIVs.

I mean, look what Professor Duffie just mentioned, that since about April 2009, we have been struggling with the CCP mandate, and now we are struggling with the recovery of CCPs, at the same time, we are thinking about putting repos also as a utility. So at the end of the day, it looks like under the rubric of shadow banking or utility, we may end up, because of a section of 13(3), bailing out part of the financial system which will not be a bank, but is most likely going to be some place in the system.

And I think, unlike a bank where there is a depository part where the taxpayer has a vested interest, in the non-bank, you don't have a deposit part, so it can't be X on the rational for the lender of last resort for non-banks be such that it is much more difficult for the taxpayer money to be used in the non-banking side.

MR. WESSEL: Do you want to take a stab at that, and you can reinterpret the question, the one you want to answer?

MR. DUFFIE: Well, I'm not a legal expert, but my reading of Dodd-Frank says that in Title VIII, the Fed does have the ability to provide liquidity to financial market infrastructure under certain conditions. And given that, and I think that's appropriate, given they are now systemically important.

Given that, I'm not as, I guess as concerned as you are about that particular point, it is true that I am concerned as, I guess, as Anil mentioned, that 13(3) doesn’t -- is proscribed now from allowing the Fed to provide liquidity to an individual non-bank, whether or not its failure would cause a financial crisis or not, there could be some of those in the financial system. But I don't think the financial market infrastructure that you mentioned falls into that camp.

MR. WESSEL: And you can't lend in the lender of last resort to a non --

MR. BERNANKE: No -- Yes, you can. You could set up a program for, say, all broker-dealers or something like that, but can't --

MR. WESSEL: I see. Lend to a specific firm.

MR. BERNANKE: -- lend to a specific -- yes, to a specific firm. But of course in that instance, if there is not a systemic problem across the class of firms, then you do have the resolution mechanism.

MR. WESSEL: Right. Right. The gentleman on the aisle here?

QUESTIONER: Surgei Kuster, Financial News to (inaudible). My question is about Glass-Steagall. Was it a mistake to rebuild the '90s and the Clinton? And if yes, should it be reinstated now to prevent crisis?

MR. WESSEL: Anybody want to take the Glass-Steagall? Professor Kashyap, was it --

QUESTIONER: That’s better, Gorton.

MR. WESSEL: Professor Gorton, who wants to do the Glass-Steagall event? I could do it too, but.

MR. GORTON: I think, you know, I think the market repealed Glass-Steagall, one of the things you have to keep in mind is that financial systems like phones, you know, change. Now we used to not have Apple phones, iPhones, so the world changes, and that happens in the financial industry, so I don’t think there's this -- I don't think there is any real sort of going back to that. I mean, the banks are all commercial banks now, so I don't think that's -- you know, it wasn't that somebody repealed it and something happened. Stuff happened, and then they finally repealed it. So I think it's sort of a red herring and all this.

MR. WESSEL: I think the one exception of it is maybe Citi wouldn't have gotten so big if they hadn't thought Glass-Steagall was going to be repealed.

MR. GORTON: Maybe, yes.

MR. WESSEL: Why do you think this Glass-Steagall thing had become such a political flag -- like the Cold War thing?

MR. BERNANKE: It's a Cold War, it's a symbol, but you know I'm really puzzled by it, because if you look at the crisis, if you look at all the companies that had problems. Commercial banks lost money making loans, and investment banks lost money, and the securities markets, and Glass-Steagall was pretty irrelevant to that. The only thing Glass-Steagall would have done, it would have prevented the acquisition of some of those investment banks by banks which would actually, in the event would have been destabilizing.

MR. WESSEL: And, Gary, do you think Glass-Steagall was justified when they passed it in the '30s?

MR. GORTON: Well, the academic evidence on that suggested that there was no real justification for it. I mean, I think the compelling reasons --

MR. BERNANKE: It wasn't at all a systemic thing, it was all about conflict of interest, it wasn't based on systemic considerations.

MR. KASHYAP: Can I go for it, David, I mean, I just -- since you want people to be snarky.

MR. WESSEL: I never said that.

MR. KASHYAP: It was understood.

MR. WESSEL: Projections -- projections here.

MR. KASHYAP: But I think, you know, the amount of time that was wasted on the Volcker Ruler, just sucked the life out of so much more productive financial regulation, and that's the same symbol, let's go back to the way it was, which is completely ill-conceived, it would fail to be implemented in any reasonable way for all the reasons that the critics had from the beginning, and we wasted hundreds of thousands of man-hours on that.

That's proof that people who have this, just mysticism and yearning for something simpler, and you can't put it back in the bottle. That's a much more serious thing in Glass-Steagall. Volcker continues to waste time, and doesn't make the system much safer.

MR. WESSEL: A ringing endorsement of democracy here.

QUESTIONER: Yeah?

MR. WESSEL: Is there somebody who wants to ask a question who hasn't already? Yes, well, you have already but you can ask.

QUESTIONER: It's Phil Simons from Tudor. It's just too tempting not to ask the question, in the light of what you all just said. So what do you think of the Bank of England, or the U.K.'s approach to ring-fencing? Is that equally dumb, stupid, or is that an enlightened way of coming at it?

MR. WESSEL: Do you want to define ring-fencing for people?

MR. DUFFIE: I can define it, I'm not sure I have the answer to the question.

MR. WESSEL: Good, then you don't have to answer the question you get your -- you plan it like that?

MR. DUFFIE: The idea is that if a bank that's operating in multiple countries were to have difficulties, then each national government may say, well, finding good, let's -- to try to save this bank by resolving it, at a single point of entry, and open for business tomorrow. But if it doesn’t work, our local depositors and creditors, may lose money, and that won't be popular here at home, and we are not sure that they are actually going to carry it off, so let's just prevent any capital from moving, any capital or liquidity from moving from our borders to another country that might help get this bank resolved. Now, again, as to the answer to your specific question, I think I'd like to punt it to one of my colleagues on the --

MR. KASHYAP: I'll take a crack at this. The Bank of England -- Well, the Vickers Commission suggested that the payment system essentially should be a public utility that was going to be super robust, and that there would be a casino outside of the boundary that could continue to operate. Now, I always had trouble with that, because the parts of the, you know, the U.S. system that failed was the casino, and it blew back into -- there wouldn’t have been a fence high enough to protect the payment system.

So I never understood the logic for why they went that way. On the other hand, because they’ve consolidated all the responsibility and authority into the Bank of England now, the Bank of England will be held accountable, and if they can see a storm brewing, they will have every conceivable tool to try to deal with it. They made a political decision, that the bank just signed on to the Vickers Report and said, we think this is a reasonable first step. They may rule today over that, but I don’t see the logic for why you say you can carve out one part of a system and make it super safe and robust with much confidence.

MR. WESSEL: Okay. I think the woman from the CRS had a question? And then there's one in the back.

MS. MILLER: Hi. Rena Miller from CRS. My question is on money market funds and something in Nellie Liang's presentation about, you know, there's a first-mover advantage to leaving the mutual fund in the time of stress, and there is a lot of hope put on the SEC approach with floating asset value, and maybe, you know, better disclosures which have, in the past, not always, you know, been that robust to really work, particularly for retail investors, would be the solution.

I'm just wondering, sort of point blank, have any of you thought that the next crisis or a couple crises down the road that we are really looking at something more like an FDIC or a SIPC type backing, you know, to prevent people from running, because ultimately it's a psychological game of getting people not to run. Or the twist on that is if anyone is, you know, either red or the Piketty book on *Capital*, if we are waiting for another, you know, crisis, or another crisis, and we are in a realm of widening disparities, he predicts social unrest, people may discount that. What do you think of that, and the role of mutual funds and pension funds?

MR. WESSEL: Let's start with the money market fund thing. I mean, we tried this once, we had after-the-fact insurance with the money market funds, have we -- Do we have another sort of problem here?

MR. DUFFIE: It's a mixed solution in the United States, just to back up a little bit. The proposals by the SEC were to do one of two things. Number one, stop pretending that you can redeem shares at a dollar a piece when they might fluctuate a dollar that just is going to insider run; the other alternative that was held out, is to put some capital behind that promise, or move to government-only money funds.

The industry is migrating, and I think Nellie may have alluded to this, or maybe it was Betsy who alluded to this. The industry is migrating towards the government-only solution, not entirely, but significantly because a lot of investors want the ability to get instant liquidity at a predictable price. Are we better off? We are better off that we were when we had a $300 billion run during the financial crisis. We are not going to get what you suggested, it's just not in the political equation, and it might not even be appropriate to get the government to stand behind it.

When that happened during the crisis, because it was a massive run, the Secretary of Treasury, Geithner, wrote a letter to Congress saying, I promise that I won't guarantee money funds again, or that the Treasury will not guarantee money funds again. This was a very exigent circumstance. And I think that that promise is going to very likely have to be kept and maybe even in a relatively extreme situation.

MR. WESSEL: Gary Gorton? If there is so much demand for safe, short-term liquid assets, we know how to make safe, long-term liquid assets, right? The Treasury could sell more T-Bills; the Fed could even sell them. Are we doing something stupid here by not providing more safe assets to the financial system, so they don’t go to money market funds and the private sector to produce riskier ones?

MR. GORTON: If you look at the fraction of safe assets to total assets, and you look at that, and then you divide the safe assets the government and privately produced, it's, since 1952, it's predominantly been privately produced. So, I think, you know, if you are going to issue that much Treasury, you know, you are going to have a pretty big interest bill every month for the government.

MR. WESSEL: No, I mean, you could do more bills and less bonds, or something like that?

MR. GORTON: I think the problem is that you have some inherent features of a market economy. One inherent feature is that there's maturity transformation. This is not a choice this is fact. You want to eat lunch every day, but it takes two years to make a submarine. That’s how to think of the whole economy. Now the submarine has to --

MR. WESSEL: Not the sandwich.

MR. GORTON: Yes. I mean the submarine has to be financed, right, so if it's mostly short-term debt that's financing here, or a part of it, you know, I don't see how you can get all the investment you want by just using Treasuries, which would be overwhelming way too much to have to be issued.

MR. WESSEL: The question in the back, and then I have a final one, and we'll close. Thank you, Brenda.

MR. BRAZELL: My name David Brazil. I'm sitting here listening. I was wondering if there can be -- are we safer is -- or can we be too safe, is my question I guess. Because I'm sitting here listening, we have a monetary crisis, and after the crisis there are new rules that are put in place, and we have everyone telling us, we've now solved that problem and we should be safe now. And of course we are really not, because people take actions to get around those rules, or whatever.

And that leads to a new crisis, and because of whatever more hazards have been established because of the old rules. Can we be too safe, in a sense? We are just -- All we are doing here is exacerbating the instability in the system by trying to put more government security around ourselves. And it went to the discussion you just had now, just because we have demand liquidity, should we necessarily be providing all that?

MR. GORTON: You'll want to keep in mind that we have observed banking systems that have long periods without crises. I mean, we went through a long period without a crisis; Canada has gone through an even longer period without a crisis. So, it's possible to design regulations so that you get a long period without a crisis. You know, so we pass all these laws and new regulations, and so on, the question is, is that going to deliver this 50-year period for us. That's what we don't know. But I don't think -- You know, it's not like we are just piling on more and more regulations which is causing the problem. I mean, it may cause the shadow banking system to appear somewhere else, but we can get long periods of tranquility.

MR. WESSEL: So, I think there's two ways to frame this question, one is a kind of Minsk notion that if you have too much stability and too much calm, that leads people to take risks and then you end up with more about --

MR. GORTON: Okay. So, we know that, from looking at emerging markets anyway, that if you don't -- Let me put it this way. Do you want a 1,000 years of no crisis, but you've repressed financial and intermediation to a point where you've lowered the growth rate, you know, by 3 percentage points? Or, do you want to have a very vibrant period, but you get a big financial crisis every 50 years? The study of Latin America suggests you want the latter, right.

You know, as you were suggesting, getting rid of crises completely is way too repressive. And some people have argued that the period in the U.S. from 1934 to 2007 was a repressive period for banks. I don't know about that view, but that is the argument that some make. So I think the problem is, from a policy point of view, we don't exactly know how to design policy to, you know, even think about these tradeoffs.

We don't know that everything we've adopted means we are not going to have a crisis for 50 years, and we will have one that's good. We have no idea.

MR. WESSEL: I think another way to ask the question, and let me ask the three of you to comment on that and then we'll close; is I want to be sure that we have done what we can to minimize the risks of much more frequent crises than carries every 50 years. But I also want an economy where there's abundant credit to finance investment, and we can have maximum possible employment and price stability and growth, and live happily ever after.

So, when we look -- When someone who is not as familiar with all the details as you all are, looks at the balance, how do you judge whether we've done too much to reduce the risk of crises at cost of sacrificing growth, or not?

MR. KASHYAP: My colleague Doug Diamond says, "Figure out where there's going to be a crisis, follow the short-term debt." And I think that's right, and I think crises, modern crises are at least as much about the liquidity side of it as the credit creation. So there are many ways to deliver enough credit to sustain the growth that you want. Where it gets -- Where it gets really dangerous is where this short-term stuff that can be pulled quickly, that's supporting the credit, and I think if we started with that, those eyes on the problem, we'd be just watching different things.

I also want to endorse what Gary said, about redoing our measurement, super-important to be able to work across countries and just see standards. There is no widely-accepted definition, the wholesale funding across the world, unbelievable seven years later, but it hasn't happened. That makes it hard to follow the short-term debt.

MR. WESSEL: Professor Duffie?

MR. DUFFIE: Well, I recall what Lloyd Blankfein was asked when -- whether the Dodd-Frank Act was good enough, and he said, "If I had to take it or leave it, I'd take." I mean clearly, I think we are way further ahead now, than we were seven or eight years ago, in terms of financial stability. But as everybody has suggested, there is a laundry list of things that need to be done, and are -- that need to be improved.

Governor Tarullo said, and you quoted him, you can't be safe -- he didn't say it literally, we are never safe enough, but he said, he asked the question, "Are we safe enough?" And when he answered your question he said: the system is always changing, and we always need to keep following -- as Anil said -- where the short-term debt goes, where the financial fragilities are. The job is never done.

MR. WESSEL: Do you think there's a risk that we've gone too far and it's hurting economic growth? Or do you think that's just fine.

MR. BERNANKE: I'm reminded of the Chinese President who was asked what he thought of the French Revolution, and he said, it was too soon to tell. I think that, of course, only the Congress would say, you know, the risk of financial crisis is too low. You know, an economist might say something like that, and we would understand what that meant -- don't quote me -- but I actually don't think that -- I mean, we just saw this enormous cost, I mean this huge cost, and there's not any evidence. You know, we can see some problems in the mortgage market and some, but we don't see any huge increase in the cost of credit or problems with the availability of credit.

So, so far I don't see the evidence that overall in terms of systemic performance that we've gone too far. Now, certainly not every direction is equally profitable, and I agree with Anil about the importance of short-term funding. I think that progress has been made there, and the tools of this -- get more progress, but too big to fail was important too, and for political as well as economic reasons. So both of those things were important but, again, it would take an awful big hit to credit cost to offset the huge economic damage done by the crisis we just had a few years ago. Okay?

MR. WESSEL: With that, please join me in thanking the Panel. (Applause) And I want to thank a very patient audience. I don't think I've ever done an event at Brookings that went this long, that there were so many chairs filled at the end. Now that must be a tribute to this Panel.

If you could look at your feet, and if there are cups or papers there, pick them up and put in the recycling, we'd appreciate it. And all this will be -- the video and all the slides will be on our website, if not today, then tomorrow. Thank you, all.

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