Economic Studies
at BROOKINGS

Wednesday, April 30, 2014

Liquidity and the Role of the Lender of Last Resort

Martin Neil Baily
Ben Bernanke
Charles Calomiris
John C. Dugan
Darrell Duffie
Douglas J. Elliott
Mark Flannery
Randall D. Guynn
Donald Kohn
Paul H. Kupiec
Mary Miller
Paul Saltzman
Marcus Stanley
David Wessel

Liquidity is central to the stability of the financial system. A "run on the bank" can kill even sound institutions if they cannot readily find the cash to cover short-term demands. Further, scrambling to find cash can force some players to sell assets at distressed prices and this, in turn, may trigger insolvencies and failures. Traditionally, a key role of central banks has been to be a "lender of last resort" in times of crisis to prevent liquidity problems from triggering a full-fledged financial crisis, although recent regulatory changes now require banks to be more resilient to runs by holding adequate liquid reserves

On April 30, 2014, the Initiative on Business and Public Policy at Brookings hosted a day-long event addressing these topics. Many high-level experts from industry, academia, and government came together to consider key issues related to liquidity and the lender of last resort, including: the function and liquidity adequacy of banks; the liquidity coverage ratio, net stable funding ratio, and short-term wholesale funding market reform; liquidity needs in the post-crisis world; and liquidity provision for bank resolution.

A lightly-edited version of the conference proceedings follows, although some participants were not able to provide written versions of their oral remarks at the conference, so the record here is incomplete. Nevertheless, we hope you agree that there is considerable value in the resulting material.

Event Agenda and Participants

Welcome and Opening Remarks

Martin Neil Baily, Senior Fellow, Economic Studies, Bernard L. Schwartz Chair in Economic Policy Development

Lender of Last Resort: Examining the Function and Liquidity Adequacy of Banks

Moderator: David Wessel, Director, The Hutchins Center on Fiscal and Monetary Policy, Senior Fellow, Economic Studies

Panelists:
Charles Calomiris, Henry Kaufman Professor of Financial Institutions, Columbia University
Darrell Duffie, Dean Witter Distinguished Professor of Finance, Stanford University
John C. Dugan, Partner, Covington & Burling
Mark Flannery, BankAmerica Professor of Finance, University of Florida
Donald Kohn,Senior Fellow, Economic Studies

Liquidity Coverage Ratio, Net Stable Funding Ratio and Short-Term Wholesale Funding Market Reform

Moderator: Douglas J. Elliott Fellow, Economic Studies, Initiative on Business and Public Policy

Panelists:
Paul R. Ackerman*, Senior Executive Vice President and Treasurer, Wells Fargo & Company
Adam Gilbert*, Managing Director, JPMorgan Chase & Co.
Marc Saidenberg*, Principal, Ernst & Young LLP
Mark E. Van Der Weide*, Deputy Director, Division of Banking Supervision and Regulation, Board of Governors of the Fedderal Reserve System

Luncheon Keynote

Mary Miller, Under Secretary for Domestic Finance, U.S. Department of the Treasury

Liquidity Needs in The Post-Crisis World and Liquidity Provision for Bank Resolution

Moderator: Donald Kohn, Senior Fellow, Economic Studies

Panelists:
Randall D. Guynn, Partner, Davis Polk & Wardwell
Paul Saltzman, President, The Clearing House Association; Executive Vice President and General Counsel, The Clearing House Payments Company
Steven H. Strongin*, Head of Goldman Sachs Global Investment Research, Goldman Sachs
Paul H. Kupiec, Resident Scholar, American Enterprise Institute
Marcus Stanley, Policy Director, Americans for Financial Reform

Closing Keynote Address

Ben S. Bernanke, Distinguished Fellow in Residence, Economic Studies, The Brookings Institution

**Remarks not included in this volume.*

Introduction

MARTIN NEIL BAILY: The first piece of business is the following: As a nonprofit, independent, and nonpartisan organization, Brookings research, publications, and events are made possible by the generous support of a multitude of donors. Today's event is made possible in part through an unrestricted gift from the Clearing House, for which we are very grateful.

Brookings recognizes that the value it provides is in its absolute commitment to quality, independence, and impact. Activities supported by our donors reflect this commitment, and the analysis and recommendations are not determined by any donation.

Liquidity is not an inside-the-beltway issue or even an inside-Wall-Street issue because it affects all financial institutions and ultimately the whole economy.

Our speakers today have a range of views, and they are encouraged to say what they really think unconstrained by hurting anyone's feelings whether mine or Paul Saltzman's or anyone else's, and I'm sure they're going to do that. So, that's the disclaimer at the front, but we're serious about it.

Sometimes Brookings has events—we refer to these as inside-the-beltway issues—meaning they are somewhat of limited interest to the broader country. But liquidity is not an inside-the-beltway issue or even an inside-Wall-Street issue because it affects all financial institutions and ultimately the whole economy.

Unfortunately, it's not an issue that most people understand or see the full importance of. So, it's very heartening today that we have such a great group of participants and a great audience to really dig into this important topic.

When I started my career it was in macroeconomics in the 1970s, so I'm going to digress a little bit about how we ended up where we are. At that time, the real scourge was inflation, and I participated in the Brookings panel meetings with Art Okun and George Perry in those days. And there was a very vigorous debate around whether the Phillip Curve was a valid concept. There was shift towards rational expectations, the Lucas critique of the Phillips Curve and the work of Lucas and Sargent. The experience of the financial crisis makes it very hard to sustain the view that expectations are always rational.

Another facet of the shifting face of macroeconomics was rise or re-emergence of monetarism. In a discussion at Brookings recently Ben Bernanke was asked: How can people on the Fed board possibly think that hyperinflation is around the corner? And he answered that would be because we still have a monetarist view of inflation that persists to this day. This view of inflation is not one hundred percent wrong, but obviously it has not been applicable to the world we're in at the moment over the time frame of this crisis.

Another way in which macroeconomics took a wrong turn was the real business cycle set of models. We learned something from that digression, but I don't think we learned a whole lot about the kind of actual business cycles that we experience, which I believe to be largely demand determined, determined by demand fluctuations. The drop in GDP in the recent crisis was not because of a decline in productivity or productive capacity.

This is a preamble to saying that the economics profession has been wrong before and it was largely unprepared for the devastating financial crisis that we had. It is not new to say that people didn't anticipate the decline in housing prices, and the global spread of this crisis. But I'm talking about something a bit different, whether we had, within our framework of macroeconomics, an adequate understanding of how the financial sector affected the economy, led to the deep recession and, subsequently, how difficult it would be to get out of the crisis.

Don Kohn may be shifting in his seat and wanting to tell me that the Fed had a model that had a lot of finance in it, which it did. But nevertheless, I'm going to stick to that gun and say we really had a gap in our knowledge; a gap that we are still now trying to fill.

Part of the gap in knowledge that persists is the lack of a full understanding of the role of liquidity. One consequence, in turn, is that we've ended up with what some people call the whack-a-mole theory of regulation. If you see anything that looks risky, let's whack it because it might affect the whole economy.

In his great talk last night David Wessel talked about the pendulum effect. Regulation was too easy, and then we had the crisis, and the pendulum swung too far, and now regulation has become too tight. I agree with that, but one of the reasons the pendulum swung is because of a lack of ability to say here's how the financial sector works, and here are the pressure points that we need to address to make it safer. Especially, there is little understanding of how all of the new regulations will work together. The combination of different regulations will interact with each other in a way that may end up with regulatory overkill.

Turning more to the question of liquidity, we know from Walter Bagehot that the right way to deal with liquidity runs is for the Central Bank to "lend freely to solvent depository institutions against good collateral and at interest rates that are high enough to dissuade those borrowers that are not genuinely in need." In the crisis the Federal Reserve certainly did that. They lent freely to solvent institutions, arguably maybe they lent to some insolvent ones too, and the Treasury lent capital under the TARP program. In fact, the Treasury lent to the big banks whether they wanted the money or not.

This financial rescue was not popular, and Congress reacted by putting restrictions on future lending; indeed, they said never again to some lending, such as the Fed support of money market funds. Dodd-Frank also placed restrictions on the 13(3) exigent circumstances lending by the Fed. Following both the letter and the spirit of Dodd-Frank, the Fed and other regulators have now made it clear that banks are expected to provide their own liquidity and not come to the Fed for funds even in times of moderate stress. Maybe real, heavy stress is a different story, but that remains to be seen. Basically the idea now is that banks have to carry their own liquidity and not rely on the lender of last resort.

I remember hearing Barney Frank talk about some of these issues. He was giving a speech at an Urban Institute dinner, and Annette Nazareth and I were in the audience, and we were heckling him because he was going off about the need for restrictions on Fed lending. But just prior to this he had offered a lot of praise to the Fed and to the Treasury for having saved us from the crisis. So we said: They saved the country but you want to stop them from doing that ever again. (We said it more politely than that). Frank was adamant about the need for the restrictions and I think he was reflecting the sentiment in Congress, which was that Congress controls the purse strings, and so the Fed should not be able to make some types of lending without the permission of Congress. Frank said that all they had to do was get Congress' permission. How easy or hard it would be to get that permission is a real question. Arguably the rules on liquidity lending are not as tight as they look, but they are substantial, notably the requirement that banks must be able to cover 30 days under stress without having access to borrowed liquidity.

Today's conference is going to examine the liquidity issue from a number of dimensions with a lot of very distinguished panelists. It is 9:15, and I'm going to get out of the way for the first panel which is moderated by David Wessel. Thank you.

Lender of Last Resort: Examining the Function and Liquidity Adequacy of Banks

DAVID WESSEL: I'm David Wessel. I'm the director of the Hutchins Center on Fiscal and Monetary Policy here. It's good to welcome you all.

It'll be required for each of us to refer to Walter Bagehot today, for good reason. His admonition about lending in a panic that Martin referred to may be the only thing in Central Banking that hasn't changed over the last 100 years.

I always liked this quote from Bagehot: "A panic is a species of neuralgia, and according to the rules of science you must not starve it. The holders of the cash reserve, the Central Bank, must be ready to advance it most freely for the liabilities of others. They must lend to merchants, to minor bankers, to this man, and that man whenever the security is good."

We have an extraordinarily distinguished panel today. We could do a whole conference with the panelists I have the pleasure of introducing this morning.

Because my last name begins with "W", we're going to do this in reverse alphabetical order. Our first speaker will be Don Kohn, who's a colleague of mine here at Brookings, of course the former vice chairman of the Federal Reserve Board, and importantly a member of the Financial Policy Committee of the Bank of England.

He'll be followed by Mark Flannery, who is the Bank of America Professor of Finance at the University of Florida, and has a title to which I aspire, Eminent Scholar Chair in Finance.

Then John Dugan of Covington and Burling, of course the former comptroller of the currency.

Darrell Duffie, who's the Dean Witter Professor of Finance at Stanford University's Business School.

And, last but not least, Charlie Calomiris, the Henry Kaufman Professor of Financial Institutions at Columbia, who is spending some time at the moment at the IMF, and who—lest you think he's pointy-headed academic, is actually the chairman of the board of a small bank here in D.C.

So, Don Kohn.

DONALD KOHN: Thanks, David, and it's pleasure to be here, and I'm looking forward to a very, very interesting day.

I'm going to focus, I guess, to some extent on Bagehot's "this man and that man." So, I will focus on lending by central banks to other than commercial banks-- that liquidity provision and the restrictions that were put on that and Dodd-Frank.

I think it's a critical function of central banks to lend to prevent or limit financial panics. Bagehot's thought was that by lending you limited the fire sale pressure on banks and other financial intermediaries, and that would limit the damage. Certainly the Federal Reserve, in 2008 and 2009, opened the discount window to a wide variety of counterparties, but I'm concerned that the restrictions that were put on 13(3) in the Dodd-Frank Act limit, and limit more than is wise, the ability of the Federal Reserve to take those actions again.

I start with the premise that nonbank financial intermediation has become and will become, will continue to be an important source of intermediation in the US economy. It certainly was important a few years ago and it's been of growing importance over the last part of the 20th century and into the 21st century. And, as we restrict bank intermediation, make it more expensive, more intermediation is likely to flow out to the nonbank sector.

The old 13(3),—the lending to individuals, partnerships, and corporations by the Federal Reserve, was already pretty restricted. We could use it to limit the damage from runs, and I think we did limit the damage from runs on nonbanks, but we couldn't prevent or forestall the panic.

The vision of the people who founded the Federal Reserve was that just having the Fed there would reassure people and you wouldn't get panics. You couldn't do that very well with banks. It was even more limited for nonbanks.

There were two restrictions in 13(3). One is that the situation had to be unusual and exigent before the Fed could make a loan. That implied a very bad situation just to open up the window. And secondly, related to that, that whoever was borrowing had to show that it couldn't get credit elsewhere. You already had to have a bad situation before you opened it up.

The new 13(3) in the Federal Reserve Act, lending to individual partnerships and corporations retains those two restrictions and adds a few more. Now, one of the restrictions it adds the Fed sought, and that was a restriction that you couldn't lend to failing institutions. The Dodd-Frank set-up another way of dealing with that.

But there were three more restrictions that you wonder whether even broadly available facilities for nonbanks won't be less effective. One, it requires the approval of the Secretary of the Treasury. Now when you get into a crisis situation, you want the Treasury along with you. But this does bring a political—the potential for a political influence and a political decision that overrides the Fed's technical decision about what's necessary.

Second point is there's a lot of emphasis there on security and assurance of repayment and collateral and the value of collateral. One of the things that Bagehot says is that the central bank should not chase collateral values down. The central bank should value the collateral as it would be valued in a normal time, otherwise you just keep adding to the problems.

A really important facility that the Federal Reserve had in the last crisis was the commercial paper facility. There was no collateral behind that initially, right? There were fees that built up reserves. I don't know whether the Fed could do the CPFF again.

And the third issue that concerns me is transparency. Anybody that borrows from the Federal Reserve, any individual, partnership, or corporation that borrows from the Federal Reserve, their name goes up to the Congress within one week. And the Federal Reserve can request that that name be held confidential, but if I were a potential borrower I don't know how I would view that.

A problem with the discount window that limits the ability of the discount window to do what it's supposed to do is stigma. People don't like to borrow from the central bank. They don't like to be seen as borrowing. They're afraid that it'll become known in the markets, and this adds now, I think, political risk to market risk.

So, I am worried that the new 13(3) would be even less effective at carrying out Bagehot's vision of what a central bank should do than the old 13(3) was. Thank you.

MARK FLANNERY: Well, I'd say thank you for inviting me, but I only have five minutes, so I can't say that. David's been very clear.

The proposed regulation related to liquidity coverage ratios derives from a notion that in 2008 there was excessive maturity or credit intermediation, and so we're trying to cut back on that. That's the notion.

I spent a lot of time thinking about capital regulation. So last week when I started looking at the liquidity regulations, I was surprised of two things. First, I was surprised that I didn't see the banks prominently saying, this is going to cut back on lending and raise the cost of lending and increase unemployment and kill jobs. And second, I was surprised that there was no pro forma Basel paper that said, don't worry, there won't be any downside to these liquidity regulations.

I couldn't find a careful cost-benefit analysis about whether, in fact, cutting down liquidity and maturity transformation in the banking system was a benefit that was worth the costs.

So, I came at this issue first by asking why we want to impose liquidity requirements on banks? And I have not yet found an answer that's anything like the answers—good, bad or indifferent—that we've seen in terms of the capital structure. But it does seem to me that people ought to think about this issue carefully.

The second issue is whether we ought to do this through quantity restrictions or price restrictions—sort of the Weitzman notion. The path seems to involve quantity restrictions. But even assuming that we want to choke off private liquidity and maturity intermediation, it's not clear to me that this isn't a rather coarse, blunt instrument that we're about to put in place with the LCR and the net stable funding ratio.

Where does this transformation happen that causes trouble? Well, it happens in the banks, the IDIs, insured depository institutions. It happens in shadow firms or securitization arrangements, the shadow system, and it happens at bank holding companies outside of the depository institution, in the nonbank subs.

Now, the first thing to think about is the banks. Why do we want to put portfolio restrictions on banks at this point when there's a discount window available to them?

Jeremy Stein, not surprisingly, gave an extraordinarily insightful speech about a year ago in Charlotte, and he said, look, if there isn't a social cost to using the discount window, then why don't we just use the discount window because that's an easy way, and that's what Bagehot said. If you read Charles Goodhart's 1990 book about central banking, he says the same thing about what the discount window is for.

I think there are some costs to using the discount window beyond stigma: a discount window loans takes collateral and thereby re-arranges the priority of claims on the borrowing bank's assets. Pledging collateral to the Fed may leave the bank's unsecured claimants worse off, which gives them more incentive to run after than before. Some people call this reaction "stigma," but it may be rational.

So, we have to think about whether we can rely on the discount window and why we're drawing the line between discount window access and self-finance in a specific place.

Now consider liquidity in shadow intermediation. If we restrict maturity and liquidity intermediation in the regulated sector, at least some of those services will be provided somewhere else. Historically, shadow banks have provided liquidity by relying (ultimately) on bank liquidity guarantees. So, maybe the thing to do is to put special liquidity requirements on liquidity guarantees to securitization if we want to cut that down in the shadow sector.

But certainly the LCR is more coarse than just trying to get at the shadow intermediation that perhaps behaved badly before the crisis.

And then finally, within the bank holding companies, the nonbank parts of the bank holding companies, that's where the 13(3) restrictions that Don was just talking about are most appropriate. And there, maybe, the liquidity ratio is appropriate for the nonbank parts of the bank holding company. There remains the question of whether pricing, as opposed to quantity restrictions, would be the way to do it.

I had one, sort of, crazy thought that I'm sure the bankers will love. If you want to get at the liquidity transformation in the nonbank parts of the bank holding companies, then change the bankruptcy law so that for information intensive assets the bankruptcy stay doesn't apply to a repo transaction. So, for treasuries it's fine, but for some people at the New York Fed are thinking about where the bankruptcy stay ought to apply and where not.

And that will be another way to address maturity and liquidity intermediation outside the banks, inside the holding companies.

So, to summarize, I'd say I've got a question about the cost-benefit analysis, I've got a question about whether the LCR and the net stable funding ratios are too broad and blunt, and finally it seems to me that the capital ratios and the liquidity ratios ought to be related to one another in the sense that if you take more liquidity risk by having a lower LCR you ought to be able to compensate with a higher capital ratio elsewhere.

So, those were some of the things that occurred to me in the last week. Thank you.

JOHN C. DUGAN: Thank you very much. It is a pleasure to be here, and I will be brief with my introduction as well.

So, I felt what I would do today is build on some of the remarks that have already been provided, but I'll start with the assumption that, I think, is implicit in everything we've talked about: That liquidity was absolutely critical to the problems that we faced in 2008, but not just with respect to the broader economy. It was the thing that potentially failing institutions didn't have enough of. The crisis was less about solvency, and more about liquidity, and so the notion that we have to have adequate government tools to deal with liquidity remains critical.

My scorecard on the liquidity tools of the government is as follows in the wake of Dodd-Frank and actions that the government has taken since then. We preserved three really important tools, we added two more, and we took away or severely restricted four others. And I'm going to go through these and then just give you a very quick take on what I think we should do in addition to that.

The three that we preserved are, first, discount window lending for depository institutions, including on an individual basis. Second, we preserved deposit insurance for depository institutions. Deposit insurance is not always thought of as a liquidity tool, but clearly it was put in place to address liquidity problems. And third, as we just talked about, we preserved some aspects of the emergency discount window lending to nondepository institutions, particularly on a program-wide basis, subject to all the restrictions that Don talked about.

These are all very powerful tools, some of which got developed in the crisis, but they all also have very significant limitations.

Then Dodd-Frank added two more liquidity tools. One is for failing large institutions. It is the Orderly Liquidation Fund, which is a source of temporary emergency liquidity used to resolve a failing, large, financial institution—a very powerful tool, and very important to resolutions under Title 2 of Dodd-Frank.

And as Martin already referred to, there are the new requirements that essentially require banks to self-insure financial institutions by holding more liquidity. Individual banks certainly didn't hold enough liquidity going into the crisis. Holding more, I think, is a good thing, but it also has potential collateral consequences that you're going to hear about later today.

And then, I think in response to the political pressures, there were four important tools that were removed or severely restricted.

One was the ability of the Treasury Department to use the Exchange Stabilization Fund to guarantee money market funds, as it did in the heat of the crisis. This use of the fund was, by the way, extremely effective, and taking away the power to use it was a little bit like the fire department putting out the fire, and people saying, you did a great job, and then outlawing the fire department. So, Dodd-Frank took away this tool, admittedly a big stretch of its power to be used in that circumstance.

The second curtailed power, which I think has not gotten as much attention as it deserves, is the FDIC's systemic risk exception power to provide assistance to open institutions that are, in some way, connected to a bank. This was a tool that was added in FDICIA a long time ago when I was a on the staff of the Senate Banking Committee and then at the Treasury Department. That power was stretched and massaged in ways that proved extremely powerful during the crisis. In particular, this was the source of authority for the temporary liquidity guarantee program that allowed the government to guarantee the balance sheet and issuance of new debt by financial institutions in concert with similar actions taken by governments around the world. It was a tremendously powerful stabilization tool that proved very successful and, by the way, very profitable to the FDIC. Congress essentially took away that power to guarantee bank obligations by requiring Congressional approval for any specific use of that authority.

> My scorecard on the liquidity tools of the government is as follows in the wake of Dodd-Frank and actions that the government has taken since then. We preserved three really important tools, we added two more, and we took away or severely restricted four others.

The third big cutback is what Don was referring to as the restrictions on emergency lending to nondepository institutions. One aspect of this he didn't focus on, I believe, is that it's going to be much more difficult even if you satisfy all the restrictions that he pointed out, to lend on an individual basis to a company even if it has severe problems.

And then finally, there is one cutback of power to address liquidity problems that arises not from Dodd-Frank, but from the government's enforcement actions against banks—and it's really an important effective cutback that maybe hasn't gotten the attention it's deserved. That is, one of the tools that supervisors have traditionally used to address a problem with a big institution that's having a liquidity problem is to encourage a stronger institution to voluntarily buy the weaker institution and, if necessary, to use government assistance to facilitate that kind of transaction.

Getting a strong firm to buy a weak firm is going to be very difficult to do in the future because of all of the strings attached and the penalties and enforcement actions that have been taken with respect to the legacy assets of firms that acquired weaker institutions during the crisis. I just don't think such transactions will happen again, or they will only happen if the government provides broad open-ended guarantees about future losses—and it's hard to imagine the government being able to provide that type of guarantee.

So, that, I think, is my basic scorecard. And my take, just three quick points, I think there are some things where they went too far, and there are three things that ought to be either restored or added.

The first is the temporary liquidity guarantee program; the ability, in a crisis, to guarantee new debt issued by financial institutions. I would restore the ability to do that without Congressional approval. I think there's a pretty broad consensus on that point.

Second, like Don, I am very nervous about the cutback on emergency powers to use the discount window to lend to non-depository institutions, particularly the prohibition on lending to an individual firm. I recognize the controversy and the problems associated with providing emergency lending to nonbanking firms in a crisis, but it worked.

We don't know what the future will bring. And I can assure you in the height of the crisis in 2008 people did not know what exactly was going on or how to deal with the problems we faced. So we used every tool at our disposal. We twisted some things and expanded them more broadly, and it was really important to address some unknown things and unanticipated things that happened. And I think we have to have some of that "break-the-glass authority" to deal with problems in the future, including the ability to make discount window loans to individual nonbanking firms.

Having said that, I think it's an open question whether the Fed by itself should be called on to do that because it's so controversial politically you may need to have the involvement of the White House, even if it brings in the politics we've been talking about, just because it's such a political kind of decision.

And then lastly, the point I'll leave you with is this: I believe that the runs on the financial system that started the crisis in 2008 did not emanate from the traditional side of the banking system, but instead emanated from the broker-dealers and investment banking firms that were not, at that time, as connected to the banking system as they are now.

There is still vulnerability arising from the short-term wholesale funding of broker dealers, including those affiliated with depository institutions. We don't have an adequate tool to deal directly with the run vulnerability these firms present. As a result, I think there should be serious consideration given to providing broker-dealers access to the kind of government liquidity that is provided to banks.

I know that's quite controversial and that it's an expansion of the reach of the discount window, but I think if the government had that ability, it would be in a better position to deal with a truly problematic broker dealer that was about to fail. And it would allow such a firm to fail in a more orderly manner because healthier broker dealers would be in a position where the problems from an individual firm's failure wouldn't necessarily spread to them because they would have access to such temporary liquidity from the government.

But such new access to liquidity should come with a price. There would be regulatory restrictions that would need to be proposed. But it's a part of the system that, I think, needs addressing. Thank you.

DARRELL DUFFIE: Good morning. Thanks, David.

Before I got up here, I thought I might be the only one that was going to grip the third rail of financial regulation and suggest that 13(3) should be extended to nonbanks, individual nonbanks.

13(3) extends to broad coverage of areas of the financial system. That would include, for example, the Primary Dealer Credit Facility But like Don and John who came before me, I'm going to grip that rail and I'm going to talk about why I think 13(3) overly limits the ability of the Fed to provide liquidity to individual nonbanks.

And I'm going to focus my remarks on the securities and derivatives markets, particularly nonbank broker dealers. I will ask the question: What is it about emergency lending that should not apply to these firms? Are they systemic? Surely they are. Could they fail from an absence of liquidity? Yes. So, why wouldn't we extend 13(3) to individual nonbanks?

The situation that we have today puts the Fed in a very difficult position in the event of a systemic liquidity crisis of an individual nonbank. The Fed would, at least if it reads 13(3) as I read it, need to sit on its hands until that systemic crisis spreads to a number of nonbanks that are suffering from a similar liquidity problem.

There is a specific instance under Dodd-Frank in which a nonbank could be given emergency liquidity. That's the provision for financial market infrastructure. Under the Clearing Supervision Act, the Fed can step in for a central clearing party, for example, and provide emergency liquidity under section 806(b), but only under very limited circumstances, including the contingency that all private market sources of liquidity have been exhausted. Given how quickly things can happen, that might not be quick enough.

Let me return to broker dealers. Yes, they are systemic. The United States, among all national economies, surely would recognize that securities and derivatives markets are systemically important. The United States has far more provision of credit and other risk transfer through these markets than any other major country. So, it's ironic that the United States is limiting 13(3) from directly addressing those sources of liquidity risk.

Let me consider the arguments that have sometimes been made against providing emergency liquidity.

One of them is that macro or micro prudential regulation will take care of this problem, so we don't need lending of last resort outside of the regulated banking system. Well, that certainly didn't apply before the last financial crisis. Macro and micro pru didn't work very well. The Securities and Exchange Commission does a good job in many areas, but I don't think you would say that the regulation of broker dealers was a high point.

Systemically important nonbank firms can now be designated by the Financial Stability Oversight Council for some degree of supervision, but the primary responsibility rests with the Securities and Exchange Commission. I hope they do a very good job, but I wouldn't want to rule out the possibility that one of those could get into trouble.

The other argument that's often made is moral hazard. In my view, macro and micro prudential regulation are the best defense against the moral hazard problem. You force shareholders, through capital and liquidity requirements, to bear the costs of avoiding a liquidity crisis. I don't believe that avoiding moral hazard, on its own, is an effective tool in mitigating the likelihood that a firm will get into trouble.

The metaphor that comes to mind is whether you would be willing to send your teenagers offshore in a sailing boat without life jackets --- here the life jackets is the emergency liquidity from the Fed --- with the idea that if they don't have life jackets then they'll probably be quite safe because they're going to hug the shore and avoid getting into trouble. I wouldn't do that. I would require the life jackets.

In the current environment, we are seeing a significant amount of credit provision outside of the regulated banking system in the United States. Just a couple of days ago, I noticed that Jeffries, a broker dealer, managed to beat Morgan Stanley for a very large leveraged loan. I wouldn't be surprised if we see a number of nonbank-affiliated broker dealers become more systemically important, and at some point be a source of concern.

We shouldn't be thinking of lending of last resort as something other than what is to be used in the contingency that one of these firms gets into liquidity trouble.

I'll leave it there. Thank you.

CHARLES CALOMIRIS: Thanks for inviting me. I'm happy to start off with some basic ideas and look forward to the discussion.

I want to start somewhere where my colleagues didn't start, which is defining what a liquidity crisis is. And I want to emphasize that this past one, like every other one, is always an insolvency risk crisis. There has never been a liquidity crisis that did not emerge endogenously as a result of substantial increases in insolvency risk that drove the funding liquidity problems, that is, the inability of intermediaries to roll over the short-term debts.

The canonical Diamond and Dybvig (1983) model of bank runs, or any other conception of exogenously spurred liquidity crises—that is, a model in which shocks to liquidity that are causa sui rather than the result of increased insolvency risk—are models still looking for an example. And this last crisis certainly was not such an example.

What happened, of course, is that from roughly April 2006, when bank holding companies and other intermediaries hit their peak of their market value of equity relative to their market value of assets, that ratio declined until it reached very low levels for many of the largest banks by September 2008. For example, Citibank's ratio of market value of equity relative to market value of assets was thirteen percent in April 2006. By September 2008, it was about two percent, which is at or near the insolvency point given the put-option value of too big to fail protection and deposit insurance. In other words, Lehman was a match lit in a tinder box of insolvency risk.

Liquidity crises are, and always have been, insolvency risk crises. And, of course, the obvious error made by regulators and politicians was not reacting to this more than two year decline in the creditworthiness of many large financial institutions—a decline that was clearly visible and which was known by the market—until it was too late. As people saw the signals of danger increasing related to large exposures of these institutions over time, we finally got to the breaking point in September.

The insolvency risk problem for debts, which for derivatives contracts implies a counterparty risk problem, eventually produced a funding illiquidity problem.

What are the implications? Well, obviously, as Mark Flannery already pointed out, although I say it a little bit less nicely, the separation of liquidity and capital standards under the new Basel III system is idiotic. They are two different ways to affect insolvency risk, and insolvency risk is the whole game.

What's needed is a framework that considers coherently how cash and capital trade off in prudential regulation; in what sense are they substitutes and what are the limits to that substitution between liquidity—that is cash assets on your balance sheet—and capital on your balance sheet? Florian Heider, Marie Hoerova and I have written a paper outlining some theoretical ideas about that question. We show that, from the standpoint of insolvency risk management, cash is extremely useful.

Liquidity crises are, and always have been, insolvency risk crises.

First of all, unlike book equity, it's not an accounting fiction. Cash at the central bank represent true economic value that can be called upon and paid out at any time. So, it's extremely useful because it's really a buffer you can rely on. And secondly, compared to book equity, it has some highly desirable consequences for risk management.

So far, we've diagnosed the problem underlying illiquidity risk and pointed out that liquidity regulation's main advantages within prudential regulation are special advantages of asset liquidity requirements for limiting insolvency problems. I now want to address a basic question. As the other panelists have pointed out, Dodd-Frank has limited Fed and government interventions to address illiquidity crises. Is the absence now of the potential use of blanket guarantees of debt or recapitalization schemes orchestrated by the Fed (like Bear Stearns) going to be a problem?

The case against the view that it's a problem argues that in the presence of sufficient capital and cash requirements, perhaps these other interventions aren't necessary. There is a lot to this argument. I have lots of ideas about how we could improve the regulatory environment to make capital and cash standards sufficient and reliable so that we would never permit the trend declines in equity ratios that I mentioned before—where we allowed Citibank's market value of equity ratio to fall from thirteen percent to two percent. That, to me, was the basic mistake, and it is avoidable.

But ultimately, despite that fact, I'm going to come out in agreement with the other panelists that the existing powers of the Fed and Dodd-Frank resolution are inadequate for dealing with systemic problems. More generally, I'm skeptical of the Bagehot Rule approach. First of all, Bagehot's Rule as an historical description of Bank of England policy is a myth. The Bank of England didn't adhere to Bagehot's Rule.

In fact, no central banks have ever relied entirely on Bagehot's Rule. For example, the resolution of the Barings Crisis in 1890 by the Bank of England was done through credit guarantees, not through collateralized lending. The resolution of the Mexican Crisis of 1908 also was done through a, kind of, interesting, complex, credit guarantee approach.

Central banks haven't really relied on collateralized lending as their main tool of alleviating crisis risk throughout history. So, we have this misconception that Bagehot's Rule is enough. It probably isn't. And we also have some pretty good examples from history that tell us that other kinds of interventions can be very useful. I would point out that in the 1930s the use of preferred stock purchases through the Reconstruction and Finance Corporation was a pretty good means of addressing the problem of under-capitalized banks.

So, my view, which echoes what previous people said, is that it would be desirable to specify in advance some credible policy response that would avoid ad hoc and delayed responses to very large shocks. What exactly that should be isn't so clear.

What role should the central bank have in this? My own view is not much. This should be done through—as the RFC was for example—some entity other than the central bank. I think the consequences of fiscal support channeled through the central bank, especially the politicization of the central bank, which we're living with right now, are not desirable.

In summary, first of all, liquidity regulation has to be about insolvency risk because liquidity crises always are about insolvency risk. Second, cash does have some unique prudential advantages as a regulatory tool, and we want to take those seriously. Unfortunately, I'm not hearing much in the liquidity regulation debate about the unique advantages of requiring cash assets (as opposed to limiting the liquidity risk of liabilities). And then finally I am cognizant of the fact that, despite progress on prudential regulation, it's likely not to be enough. Even if we substantially improved prudential regulation, we should recognize the possibility of a future intervention, and think through and credibly codify now how that intervention would occur. Thank you.

Liquidity Coverage Ratio, Net Stable Funding Ratio, and Short-Term Wholesale Funding Market Reform

DOUGLAS J. ELLIOTT: What we are going to be focused on in Panel Two is that while there's broad agreement that we need the Fed or other central banks as lender of last resort, I think there's also quite broad agreement that we don't want the lender of last resort function to be used all that often. Therefore, we need to make sure that banks and, perhaps, other important financial institutions, maintain sufficient liquidity. So this Panel will focus on the rules intended to ensure that there is adequate liquidity at the banks.

We have a great Panel of experts to explain and debate these issues. You have bios in each of your packets, so I'll only very briefly introduce each one.

The lender-of-last-resort function is intended to protect against runs, but we do want banks to handle most of the liquidity needs by themselves.

I'll go through a few introductory slides, and then we'll start with Mark E. Van Der Weide. He is a Deputy Director in the Division of Banking Supervision and Regulation at the Fed. He will be followed by Marc Saidenberg, who is Principal in Ernst & Young's Financial Services Office. He was previously at the Fed for 15 years. Paul Ackerman will follow. He is Treasurer of Wells Fargo, a small bank you may have heard of. And finally, we'll end with Adam Gilbert, who is a Managing Director at JPMorgan, who focuses on regulatory policy.

Thank you, to each of the panelists for joining us. I'm going to just briefly introduce the topic, and then we'll bring the panelists up on the stage and have them go through one by one from the podium.

It's pretty clear at this point, particularly after the financial crisis, that liquidity does matter. Banks have always been vulnerable to runs, because they make multiyear loans which are illiquid, and they do it using deposit funding. As banks have expanded their activities, and as non-banks have joined in to similar types of activities, it's expanded beyond just that narrow issue, but you still have long-term loans or other important assets, funded by short-term funding.

The lender-of-last-resort function is intended to protect against runs, but we do want banks to handle most of the liquidity needs by themselves, because we don't want the lender-of-last-resort function being called on very much, and we want to reduce the problems that are caused by fire sales prior to the lender of last resort stepping in.

It's also clear that banks were too illiquid prior to the last financial crisis. Liquidity regulation was really pretty loose, and there was no equivalent of the Basel capital standards, which created more quantitative globally agreed standards. Liquidity seemed abundant and it felt like it would always be abundant, that there had been a sea change from earlier years, and banks, therefore, you can argue, reasonably, decided not to increase their expenses in order to improve their liquidity.

Liquidity does cost money. You either give up some investment income by shortening your assets, or you pay more for your liabilities in order to get longer term liabilities, since there's usually a normal yield curve where longer-term assets and liabilities have higher yields than short-term ones. So to deal with the illiquidity problems that we have observed, certain new liquidity rules are being put in place and they've been foreshadowed a bit on the first Panel, but I just wanted to touch on them for those of you who haven't followed this as closely.

There's a liquidity coverage ratio or LCR which is part of the Basel III Agreement. That's the global agreement on capital liquidity standards; that will be effective as of 2015. There's also something called the net stable funding ratio, and I'll tell you more about these two, that's also part of Basel III and comes into effect in 2018.

In addition, there are liquidity stress tests, akin to the capital stress test that we have now, that the regulators are applying, and in general there's going to be more careful liquidity supervision in addition to these quantitative tests.

So the liquidity coverage ratio, as I view it, is a stylized stress test. You basically postulate a 30-day period of intense liquidity pressures in the financial markets, and then the quantitative formulas have you try to estimate whether banks would have enough cash to last through the 30 days. So you assume that on the one side funding sources will dry up to some extent, so some of your deposits, and even more of your wholesale funding, will go away, and that the assets you were planning to sell to raise cash, won't be worth as much in a crisis, so that you'll have a haircut to their values.

On the other side, we assume that there will be more needs for cash than in normal times. Corporations will come and draw down on their credit lines, for example. And so the idea is, you need to have at least 100 percent of the required funding in order to pass this. So the LCR is the stylized stress test, it looks at an emergency situation. The net stable funding ratio is intended to tackle a somewhat different issue.

The NSFR is intended to deal with longer-term structural issues where, maybe, some banks have relied too much on short-term funding for their long-term assets, and have created a situation in which problems could occur. So there you look at the available stable funding, you essentially say things like deposits from retail customers are pretty stable so you want to treat them as pretty valuable, on the other hand, some other sources are likely to go away to some extent, so you give them a lesser credit.

And on the other side, you'll look at what portions of the credit lines might be drawn down. You look at haircuts on securities. So, again, a little bit like the LCR, but it's trying to look on a longer-term basis for that. So those are—LCR and NSFR are terms you are going to be hearing in this panel.

Luncheon Keynote

BAILY: We are very privileged to welcome Mary Miller, the Under Secretary for Domestic Finance. Mary serves as the U.S. Department of the Treasury's Under Secretary for Domestic Finance. In that position she's responsible for developing and coordinating Treasury's policies and guidance in the areas of financial and institutions, federal debt financing, financial regulation, and capital markets. Previously she served as the Assistant Secretary for Financial Markets.

Prior to joining the Treasury, Miller spent 26 years working for T. Rowe Price where she was the Director of Fixed Income Division and a member of the firm's Management Committee. She earned her B.A. from Cornell and then MCRP from the University of North Carolina at Chapel Hill. She also is a chartered financial analyst designation.

And just to go off the page a little bit, I think everybody that I run into has said what a great person Mary is, how knowledgeable and how sharp, and it's a great privilege that we have her in the Treasury and an even greater privilege that she's here to talk to us today. Mary Miller.

(Applause)

MARY MILLER: Thank you so much for the introduction and of course the opportunity to come and talk about this important topic today. So, since the 2008 financial crisis there has been, rightly so, a great deal of focus on ensuring that banks have significantly more capital and higher quality capital; however, in the midst of a crisis—in the moment—liquidity can be even more important. Modern central banks are designed to provide banks with access to liquidity in a crisis. That is the essence of their lender-of-last-resort function.

The Basel III Reforms will require banks to significantly increase their liquidity buffers with the liquidity coverage ratio and net stable funding ratio. These reforms should decrease reliance on central bank liquidity but may require other trade-offs.

As I understand it, the panels this morning largely focused on the debate over who should be the primary provider of liquidity in a crisis; that is, the degree to which firms should be required to self-insure by holding large liquidity buffers versus relying on the central bank's lender-of-last-resort function.

Rather than reprise those debates I thought I would talk about financial market liquidity. Of course, banks and other financial institutions are intimately connected to financial markets, but focusing on market liquidity can help us think through a series of other questions. I don't necessarily have the answers to these questions, but I thought they were important ones to ask as we consider the issue of liquidity broadly.

Let me start with the definition of liquidity in a financial context. Liquidity is a measure of the ability and ease with which assets can be converted to cash. Further definition might address the ability to sell without driving down the price. I should probably add here that I spent my years before Treasury working as a fixed-income asset manager and a consumer of market liquidity. Having weathered many difficult market downturns over 25 years, both interest rate and credit driven, nothing compared to the financial crisis of 2008.

I'm going to just diverge for a moment and talk about a particular experience I remember from the Fall of 2008 which was a day when we needed to raise cash in a portfolio, and we attempted to sell a block of $10 million of a household-name corporate bond, highly rated. I think it was AA-plus. So, we did what we usually did. We went to the Bloomberg screen, and we put the bond out for competitive bid to 30 brokers. Within moments we had the answer. We had one bid, and that one bid was 10 points below the market valuation of the security that we were attempting to sell.

So, that had rather important ramifications because we held lots of bonds that looked like this bond, and if we trade that bond 10 points below the market valuation that sort of resets the pricing of everything you have in your portfolio.

So, what did we do? We didn't trade the bond. We said, you know, we asked for 30 bids. We got one. That's not really a market. We turned to some electronic trading platforms. We put the block of bonds out for bid, and over a period of a day or two we sold the block at our market value. So that raised a lot of questions in my mind about, what is market liquidity? How do you ascertain prices? How do you execute in environments like this? And importantly, it was teaching me the difference between credit impaired assets and liquidity impaired assets, and I'd never worked through a market where we had quite as much difficulty in terms of sourcing liquidity.

So, back to liquidity. I think there are different ways to think about liquidity, and the ways that recent developments and financial regulation and market practices are evolving. First, we can talk about the liquidity of financial instruments. Which instruments have the properties to be readily converted to cash? Regulators have gone a long way to defining this through the liquidity coverage ratio, risk-weighted assets, and standards for suitable collateral.

This raises the related question of whether there are enough liquid securities in the market. Some rudimentary work that we and others have done suggest that supply will not be a significant constraint. A little more on that later.

Second, we could consider the liquidity of the institutions that make up the market. Here again, financial regulation has gone a long way towards imposing new requirements on banks addressing capital, liquidity, and leverage. The aim is for institutions to have enough capital and liquidity to be able to weather financial market turmoil. As a practical matter, the liquidity of a financial institution will be at least partially dependent on the liquidity of the instruments it holds and the liquidity of the market for those instruments during periods of economic stress. While regulators have gone some distance towards addressing liquidity concerns for financial instruments and financial institutions, it would be important going forward to continue to focus on the role of market liquidity.

This raises another set of important questions such as how should we measure market liquidity, and how can we be sure it will not evaporate when it's most needed? As I mentioned before, there are many measures of market liquidity. In the context of reducing liquidity risk the important thing is that liquidity assessments of financial instruments and the institutions which hold them must be dynamic and as real-time as possible.

An analysis of market liquidity will be key. Liquidity stress tests should consider the particular properties of individual instruments and the likely market dynamics that will prevail in stressful situations. We know that illiquid markets can increase volatility, raising the likelihood of a destabilizing cycle where firms seek to raise liquidity in the market but are forced to do so at large discounts thus impairing the firm's capital positions and exacerbating their liquidity problems.

Over the past couple years market participants have raised concerns about the potential lack of liquidity in certain markets, particularly the corporate bond market as a result of significantly reduced dealer inventories in response to changing risk appetite, evolving business models, and regulatory reforms. Dealer inventories are down by some measures as much as 80 percent compared to pre-crisis levels.

I would note that corporate bond markets have shown strong resilience over the last several years with record debt issuance, narrowing credit spreads, and steady inflows into corporate bond funds. But the concern is whether liquidity will evaporate in rising interest rate and weaker credit markets.

So, the depth and durability of market liquidity does bear directly on some of the central questions being debated on the other panels today. It also bears mentioning that concerns about market liquidity are relevant to the range of assets permitted to count toward liquidity buffers or serve as collateral. On the one hand, it's important to ensure that only the safest assets with the most reliably liquid markets are being looked to as the potential source of liquidity in times of stress. On the other hand, if all firms are forced to hold the same narrow set of assets, the selling that ensues when all firms attempt to raise liquidity could destabilize those markets. Striking the right balance will be important.

Finally I'd like to address developments that may impact the demand for and availability of safe liquid assets as well as several structural changes in the marketplace that may have implications for market liquidity.

In addition to the new regulatory requirements which will require banks to hold higher levels of liquid assets, increased demand is also being driven by increased central clearing and the associated posting of collateral and margin with the central counterparty, and new margin requirements for un-cleared swaps.

By some estimates global reforms will require financial institutions to hold several trillion dollars in additional safe assets compared to pre-crisis levels, but overall the supply of high-quality liquid assets is still enormous. According to a recent analysis by the Bank for International Settlements, the available supply is many times the expected demand for collateral.

It will be important going forward, however, to look closely at the sources of that collateral and assess the ability to match supply and demand. This may become more important as regulations take effect, requiring institutions to hold large amounts of safe assets, and as some sources of liquidity such as central bank asset-purchase programs are wound down.

As a natural consequence of positive economic trends the supply of safe liquid assets is likely to shrink in coming years. For example, governments in most developed countries will be reducing their issuance of sovereign bonds as deficits continue to shrink. In the United States alone, the annual increase in marketable U.S. government debt outstanding is expected to shrink from $1.1 trillion as recently as 2012 to $620 billion in issuance this year, a decline of almost 50 percent.

Increased demand for safe assets was one of the factors that led Treasury to develop floating-rate notes, the first new product issued by Treasury in 17 years. In conversations with market participants it became clear to us that there was real demand for a term security that reset its interest rate on a regular basis and would therefore trade with relative principal stability. Issuance is still relatively small—we just began these auctions in January—but early results have confirmed that demand for such an instrument is indeed significant.

I was recently approached by a fixed-income portfolio manager who asked me whether I was worried about the lack of liquidity in corporate bond markets. I replied that of course I was worried, but I was even more worried that he was asking me about it.

Another potential policy development that will have bearing on this question of where market participants will source liquidity in the future is the reverse repo program currently being tested by the Federal Reserve. It's possible that market participants will look to the Reverse Repurchase Program as a substitute source for safe assets. Some commentators have noted this feature of the program arguing that it would help expand the supply of a potentially scarce resource. It's important to note however that assets borrowed under the RRP, at least as currently structured, are not permitted to be re-hypothecated. Accordingly those assets would not be available for use as margin or collateral, for example.

Several structural changes are underway that are changing the way market participants interact and the nature of financial intermediation. For example, there has been a broad shift away from unsecured financing to secured-financing arrangements such as repo and securities lending. There has also been a trend towards increased electronic trading and increased use of central clearing. These evolutions in market structure are broadly positive, but as always it will be important to closely monitor these developments and the changes that they themselves bring.

No one wants to run a real-time stress test of market liquidity, but if we have to I think there are now some important mitigants to the conditions we faced in 2008, including less leverage at banks, which decreases the potential volume of sales and more central clearing with important counterparty protections.

The sudden rise in interest rates last summer provided a mini-stress test, if you will, of the market's ability to absorb an interest rate shock. Overall, the markets appear to have proven resilient in the face of the bond market sell-off. According to a recent IOSCO Report, smaller trade sizes and increased reliance on electronic trading helped to fill the void left by reduced dealer inventories.

I'd like to close my remarks with an anecdote that sums up several of the issues that I've touched on today and is an example of the kind of liquidity issue I think we should consider. I was recently approached by a fixed-income portfolio manager who asked me whether I was worried about the lack of liquidity in corporate bond markets. I replied that of course I was worried, but I was even more worried that he was asking me about it. I told him that he should be worried about promising to provide daily liquidity to his fund's investors if he believes the assets underlying the fund are not all that liquid. While there is an obligation on the part of policy makers to consider the impact of our actions on market liquidity, it's equally incumbent on market participants to pay close attention to liquidity and to take account of the changing environment.

Thank you so much for your attention.

Liquidity Needs in the Post-Crisis World and Liquidity Provision for Bank Resolution

KOHN: Our third panel is entitled: Liquidity needs in the post-crisis world and liquidity provision for bank resolution. Some of our panelists will deal with the liquidity provision for bank resolutions. Others may be drawing together some of the other issues that we've heard—we've heard earlier today. We have another terrific panel—in this case, I'm going to go in alphabetical order—not reverse alphabetical order. So, Randy Guynn is partner at Davis Polk—he's head of their financial institutions work there. Paul Kupiec, resident scholar at AEI, former FDIC, former Federal Reserve. Paul Saltzman, who, everyone knows, is the Clearing House Association President. Marcus Stanley—there he is—policy director for Americans for Financial Reform, and Steve Strongin, head of Goldman Sachs Research, Equity Research, and former Chicago Fed. So, Randy, do you want to head it up, start it now?

RANDALL D. GUYNN: What I'm going to talk about is the distinction between capital and liquidity—and more importantly, the role of lenders of last resort—in the context of the rapid and orderly resolution of a U.S. global systemically important banking group, or G-SIB, that has failed or is in danger of failing. I'll actually spend most of my time framing the issue, but once that's been done, it will be pretty easy to see both the need and the appropriate role for lenders of last resort in this context.

As almost all of you know, the FDIC has developed a strategy that it calls the single point of entry resolution strategy, or SPOE, for resolving U.S. G- SIBs that fail or are in danger of failing. In less than two years, it's been widely endorsed in the U.S. and around the world as the solution, or at least the most promising solution, to the too-big-to-fail problem. On the screen is a highly stylized and simplified picture of a U.S. G-SIB. –It has a parent and three subsidiaries. I'll use it as a prop for illustrating the distinction between capital and liquidity, and the role of lenders of last resort, in an SPOE resolution.

The SPOE strategy has four distinct features. First, the parent company is put into a receivership or a bankruptcy proceeding. Second, the parent's resources are used as a source of strength for its operating subsidiaries by pushing losses at the operating subsidiary level up to the parent level.

Third, the operating subsidiaries are kept open and operating and out of their own insolvency proceedings. And fourth, the long-term unsecured debt at the top-tier parent is structurally subordinated to the short-term debt at the operating company level. In other words, long-term unsecured debt acts as a type of buffer or debt shield between the short- term debt and losses, thus reducing the incentive of short-term creditors to run during a financial crisis, and reducing the need for liquidity, at the same time.

The success of the SPOE strategy depends, however, on the top-tier parent of a U.S. G-SIB, having sufficient loss-absorbing resources on both the right and left sides of its balance sheet. Both the Fed and the Financial Stability Board recognize this need, and are currently working on minimum loss-absorbing resources requirements. The FSB refers to these requirements as internal and external GLAC—or gone concern loss-absorbing capacity.

The top-tier parent needs enough equity, long-term unsecured debt, and other capital structure liabilities on the right side of its balance sheet to re-capitalize the parent. This is what the FSB refers to as external GLAC. An undercapitalized or insolvent parent is recapitalized in an SPOE by the formation of a new company, called a bridge financial company, and the transfer of all of the assets of the failed parent, including its operating subsidiaries, to the bridge. All of the parent's equity, long-term unsecured debt and other capital structure liabilities are left behind in the receivership or bankruptcy estate. Because the bridge financial company starts out with all the assets of the failed parent, but none of its capital structure liabilities, the bridge is not only solvent, but even super-well capitalized.

But that's only the recapitalization at the parent level, and the right side of its balance sheet. The parent also needs enough assets on the left side of its balance sheet—some of which the FSB refers to as internal GLAC—to recapitalize any of its operating subsidiaries that may need recapitalizing in an SPOE situation.

It's extremely important at this point to make a distinction between capital and liquidity. Assets need to have real and measurable value to provide capital. They do not need to be liquid to do so. Both liquid and illiquid assets count as capital. So, when we talk about the holding company, or the operating subsidiaries being recapitalized, that doesn't mean that they are fully liquified.

Now, assuming that a U.S. G-SIB has sufficient internal and external GLAC, an SPOE strategy can quickly separate a U.S. G-SIB into a good bank and a bad bank. The good bank is the super-capitalized bridge financial company and its newly acquired operating subsidiaries that have been recapitalized by down-streaming the assets from the bridge to the operating subsidiaries that are in need. The bad bank is the failed parent and its liabilities left behind in the receivership or bankruptcy. So that's the framework of SPOE.

Now, we get to the role of lenders of last resort in an SPOE resolution. The bridge and its newly acquired operating subsidiaries are now recapitalized—that's why I refer to them as the good bank. But SPOE will not be successful unless the good bank has access to sufficient liquidity. If the market has sufficient confidence in the capital value of the good bank, the good bank should be able to transform its illiquid assets into cash by pledging the illiquid assets to the market in return for cash, such as through a debtor-in-possession, or DIP, facility—but only if the market is operating normally.

If the market is dysfunctional, even good banks may not be able to get enough liquidity from the private sector. That is why we have the discount window for good insured banks and for the uninsured U.S. branches of good foreign banks during a financial crisis.

If the market is dysfunctional, even good banks may not be able to get enough liquidity from the private sector. That is why we have the discount window for good insured banks and for the uninsured U.S. branches of good foreign banks during a financial crisis.

But the bridge financial companies are not insured banks or even uninsured U.S. branches of foreign banks, or otherwise eligible for the discount window, even if they're super-capitalized uninsured good banks. Who will be the lender of last resort for them?

If the answer is no one, then we may be faced with the same Hobson's choice between taxpayer-funded bailouts and a fire-sale liquidation of an indisputably well-capitalized good bank. We know from decades of experience how that dilemma will be resolved—bailouts will be inevitable. No responsible decision maker—no matter how committed he or she is to the free market or avoiding moral hazard—will risk forcing the public to eat out of tin cans or live in shanty towns.

The Orderly Liquidation Fund will function as the lender of last resort in a Title II proceeding. The FDIC has said that it will only use this lender of last resort authority in accordance with the rules established by Bagehot—that is, they'll only provide liquidity to entities that are solvent, will do so only on a fully secured basis, and will do so only at above market interest rates.

The Fed could function as the lender of last resort in an SPOE under the Bankruptcy Code, but the conditions imposed on section 13(3) of the Federal Reserve Act by the Dodd Frank Act creates enormous uncertainly about whether Section 13(3) will be available to a good bank in an SPOE strategy under the Bankruptcy Code.

So, in conclusion, if we think that it would be useful for the Bankruptcy Code to be a viable alternative to Title II, —and I think it would be—then we need a clear lender of last resort that can provide liquidity to an indisputably good bank in an SPOE strategy under the Bankruptcy Code.

PAUL H. KUPIEC: I want to first thank the organizers for inviting me. It's quite an honor to be here among all these smart people, and I'll try to keep up with the rest of you. So, in this session, I had to decide what to talk about, and that was a tough thing. Liquidity is a big area, but what I decided to do—first, is speak about the costs of the current rules.

I think that current hard wired liquidity rules are really an expensive thing for the economy. I mean, basically, the LCR says that every bank, every day, must be prepared to meet a 30 day run. Okay, so every bank has to self-insure for a 30 day run. NSFR says you have to be prepared to have a very tough year, where assets roll off and liabilities are matched for an entire year, so everybody has to self-insure for a really bad time. All the large banks.

You have a whole lot of liquidity locked up to meet the rules. I don't see how this can't but restrict bank credit and push intermediation out of the system, and many of the people up here earlier today said that. So what I think is, in this post-crisis world that Don told us to talk about—in the new world, when we move forward—I think we need a market for systemic liquidity. I will say that this is my idea of a market for systemic liquidity, but after talking to Darrell Duffie at lunch, he thinks that some other folks have similar ideas and I'll track those down and give them credit, but right now, I can only tell you what I've been thinking the last few days.

So, I think the Federal Reserve should, in the future, figure out how to sell systemic liquidity options. If the system needs liquidity to avoid a crisis, the Fed is going to have to provide it. They're the only ones who can liquefy things, and so why not get paid to provide liquidity insurance ahead of time, and the proceeds can go back to the taxpayers. And so I'm thinking of something that I would call a systemic liquidity option, and it would work something like this. And do I have all the details down—absolutely not. But here's sort of the big picture.

Once a month, the Fed would auction one month options that would allow a holder to repo collateral overnight with the Fed. The Fed would set the haircut and the repo rate on specific collateral—specific types of collateral. They could offer a series of haircuts. The haircuts should normally be larger than the market haircut, but perhaps they might offer options with a slightly larger haircut, maybe a medium-sized additional haircut over the market, and maybe a larger one.

And, the contract should cover the collateral that's typically used in the market, and they would take bids from dealer banks. And in my world, they would take bids from shadow banks—firms in the industry that may not be qualified under today's rules, so we might have to work on that a little bit. But they take bids from the dealer banks and other qualified firms who would bid on the option premium and a quantity of these repo options they wanted. The Fed would decide how much insurance they want to issue, just like they did in some of the past auctions during the crisis and the auction would set the premium purchasers pay the Fed. The repo holder—the institution that buys the repo, would have the right to post the collateral with the Fed overnight for as many nights as it wanted in the option active month. So, it could be one night, it could be many nights. And whoever buys these repos could resell them, so there'd be a secondary market in these liquidity options, partially used options, so there'd be a real market, I guess, for "used" options.

Anyway, in primary and secondary markets-- there would be this trading, and the secondary market prices would allow the Fed to monitor liquidity constraints in the repo market in real time. One of the big problems in the last crisis was, the Fed didn't really know what was going on into the repo market until it was a real problem. And, with these kinds of options trading, you would be seeing daily dealer quotes, secondary quotes on what these liquidity options were trading for, and the Fed could reopen option sales if they wanted to, or thought it necessary.

And once these options were in place and issued every month, they would provide a form of liquidity insurance. I would envision that the Fed would not dominate the market, it would price optioned so that, at issuance, the haircut was larger than the going market haircut; in other words, the option would be out of the money. B but if the market got into trouble, and Fed needed to use this instrument to provide liquidity, it could easily adjust the haircut, so that it would be at the market – the Fed could make the market, by just adjusting the terms of the option. Just an idea.

To incent investors to buy these options, you'd have to adjust the liquidity regulations. You'd have to adjust the LCR and the NSFR so that you would get credit for these liquidity options. Right now, in the LCR, for example, there's a whole bunch of collateral that gets a 50 percent haircut or a 15 percent haircut, and banks can only use only 40 percent of the high quality assets to satisfy the requirements. If you owned one of these options—these overnight options, well, you'd be able to use that collateral, you know, at the haircutted value in the option. You would have bought the right to use the central bank credit. You would have paid for it ahead of time. The Fed would get a fee for it.

So, why does this help the economy? Well, not all of the large institutions will have to fully self-insure each and every day. So, the liquidity risks are pooled in the market and we need fewer assets tied up for insurance. If we created the appropriate regulatory incentives for non-financial banking institutions, they would buy these things too, and use these things too. So, it's really a market-based substitute for something like Jeremy Stein's Uniform Regulatory Haircut Rule, where he wants to expand the Fed's authority so it can regulate haircuts throughout the financial system. Why don't we introduce a market that somehow gives us information back in real time, and we get paid for this insurance, since we're going to have to provide liquidity in the end it anyway. It is an alternative solution to Gary Gorton's idea to make money funds limited purpose banks. So, I'm going to stop there, since I'm out of time. Thank you.

PAUL SALTZMAN: Hello, everyone. I want to thank Doug and Martin for a great conference. The level of discourse has been fantastic, and thank you all for paying attention. There are benefits to going later in the program. You get to comment on the panelists that are preceding you, which I'm going to spend my five minutes doing. The negative is that many of the people that have preceded you have already stolen your points. So, I'm just going to be very brief and perhaps save the remainder of my time for the panel discussion.

I do want to comment on Charlie Calomiris' point. I do think it's worth belaboring a little bit—this notion that liquidity risk is a manifestation of insolvency risk. I do think the consequence of Charlie's observation is that capital is the solution to all problems, which is a paradigm that really needs to be questioned. I think, as we heard earlier, capital functions as a regulatory panacea too often and we need to rethink that. So I was pleased to hear that Mary was focusing on market liquidity. Too often we're focused on the resiliency of intermediaries, and not focused enough on the resiliency of markets.

I do think it's a little late to be questioning the fundamental premise underlying bank liquidity regulation. The fact of the matter is, the Liquidity Coverage Ratio and the Net Stable Funding Ratio are here to stay, whether we like it or not, and I think we need to learn to live with it. I would say that one forgotten paradigm is that the marketplace often accelerates the implementation of rules and regulations. And if you listen to bank investor calls—bank disclosures—they're already talking about compliance with LCR and Net Stable Funding Ratio parameters, so, again, although I would welcome this sort of fundamental review of the costs and benefits, I do think we need to understand and appreciate that we are going to live in a world where we do have very prescriptive bank regulation of liquidity.

However, there are a couple of issues in the bank liquidity space that haven't been mentioned, which I would just bring to your attention. Number one, we haven't really talked about the disclosure impacts of bank liquidity regulation, and whether or not disclosure creates a self-fulfilling prophecy. Banks need to disclose where they are in terms of LCR coverage. If they drop below a certain level of LCR coverage, do these disclosure obligations create the very sort of self-fulfilling bank runs that we were trying to avoid?

The other problem that the industry is very concerned about is that there's no credit for mitigation. It kind of assumes a cliff effect—it assumes that all of a sudden, JPMorgan's level one assets just go poof, and there won't be management actions to reduce the balance sheet or de-risk. I think that potentially leads to the over-insurance that we were talking about before. And then lastly, again, something that might be a little more self-evident to those in the industry is, just like CCAR has become the binding constraint for capital adequacy, superseding the Basel and U.S. capital rules, I think it's pretty self-evident that CLAR and liquidity stress testing will rapidly become the binding constraint for liquidity. So, it's nice to talk about all the prescriptive rules, and so forth, but I think it's highly likely that the Fed will propose a CLAR-type framework on liquidity.

In addition, we were talking about how difficult it is to distinguish between classic theories of lender of last resort liquidity provision to solvent institutions. I do think it's important to appreciate that one of the benefits of CCAR, of CLAR, of capital regulation, of liquidity regulation, at least with respect to the banking industry, is that it probably enhances the ability of the central bank to make those difficult determinations. They now have a plethora of data about what bank balance sheets will look like under various stress circumstances, so that difficult determination as to whether you're lending for credit impaired assets or liquidity impaired assets might be a little easier, so I would offer that for discussion a little later.

Another thing that I'll talk about, which I suspect will mix it up a little bit on the panel, is it's terribly disconcerting how the political dynamic has redefined lender of last resort liquidity as somehow being a bailout. Central bank liquidity and the Bagehot functions that have been around for 200 years are getting re-characterized as a bailout, and it's very important that we not conflate those two concepts. They are very, very different.

And then lastly, I'll just say, it's also interesting how very little discussion has been had about the impact of all this liquidity regulation on monetary policy, and maybe Don, we can talk a little bit about that on the panel. Is the discount window an anachronism at this point? You know, central banks do often impact liquidity for money supply purposes, and it's not just about providing liquidity to the system, so it'd be interesting to mix that up. So, with that, I'll just stop and turn it over to my fellow panelist, thank you.

MARCUS STANLEY: I'm Marcus Stanley, the policy director of Americans for Financial Reform. We're a coalition of public interest groups working for stronger reform of the financial system, and it's often my role at these kinds of events to say the things that none of the other panelists say. I'm going to start out by doing exactly that, and say that I really don't believe that Dodd Frank has restricted lender of last resort liquidity assistance, and that it may even have increased it. It's changed it, that's certainly true, but it may even have increased it.

> What the Fed did with its lending authority in 2007 through 2009 was really historically unprecedented. It pushed the boundaries of 13(3).

And I take it that John Dugan took on this issue before I came, but you can see three of his new limitations there on the left side. FDIC Debt Guarantee now requires congressional approval, that tool is still there but it now requires fast track approval. The exchange stabilization fund cannot be used to backstop money market funds, though it can be used to backstop other things, interestingly. And of course, there is now a restriction on emergency lending to individual institutions. But against these three new limitations, we have three new avenues for liquidity assistance that I think are pretty important avenues.

One is discount window access for financial market utilities, which could become quite important, especially as more and more swaps get moved to central counter parties. Second, we have the Treasury line of credit through the Orderly Liquidation Fund for failing financial institutions. Third, I think that there hasn't been enough attention paid to the significance of the way the Dodd Frank Act, even though it takes away, 13(3) lending to individual institutions, really gives statutory ratification to so called broad based 13(3) programs targeted at multiple institutions.

What the Fed did with its lending authority in 2007 through 2009 was really historically unprecedented. It pushed the boundaries of 13(3). Most of the money that went out in that period wasn't to individual institutions, it was through a whole alphabet soup of different facilities that supported broad markets. But those facilities were often dominated in their use by very narrow set of institutions. Two, three four, maybe not two, but three, four, five different institutions. And that is—now there's something that can be read as explicit statutory permission for that kind of assistance.

And, this impression is strengthened when you look at the actual Federal Reserve rules, the policies and procedures for 13(3) lending, which came out a couple of months ago. There's really almost no specific restrictions there. There's no restriction on the duration of program use, how long you could be dependent on these programs, there's no realistic solvency check for users of the program. There's no definition of broad based beyond not being a single company, and there's no specification of Bagehot-type penalty rates for use of the program.

Now it is generally secured lending, it is lending against collateral, but there's a circularity there, in that the value of the collateral may depend on the availability of 13(3) emergency lending. If you're supporting a market, then, you know, that collateral is fine when the market is supported, but it starts to become difficult to withdraw that support.

Now, in terms of single point of entry resolution, we've already had some discussion. The commitment in single point of entry seems to be to keep the subsidiaries open. That's going to be very demanding of liquidity to do that. To give one example the largest private sector debtor and possession loan in history is 8 billion. For the largest global banks, they have about three to four hundred billion in short term liquidity needs, so you look at the gap between eight billion and three, four hundred billion—that's a big liquidity hole.

The Treasury line of credit, you know, the Orderly Liquidity Fund is secured by the value of the company—90 percent of the value of the company, but once again, we have something of this circularity problem. The value of the company is dependent on the availability of liquidity, then it becomes difficult to extract yourself out of that liquidity without losses. And there are provisions to repay the losses—any losses that are incurred to the Orderly Liquidation Fund, but there is an effectively unlimited period to do that. -The initial period is five years but that period is infinitely extendable at regulatory discretion, in terms of the repayment period.

So there's potentially serious exposure there, and I just wanted to end with, I think, an apropos quote from Ben Bernanke, from the Open Market Committee transcripts that were recently released, in which he says that the idea way to deal with moral hazard is to have a well-developed structure in place before the crisis, that gives clarity on the terms and conditions for the use of lender of last resort support. And I don't really think we're there yet. I'm not going to tar lender of last resort support in saying it's always a bailout—there's a long tradition, but I think the structure and limits on it are critical, and I don't really see that structure and limits there in the combination of SPOE and the 13(3) emergency lending authority, at least not yet.

Closing Keynote

BEN S. BERNANKE: Let me start with my thanks to Brookings and to Martin Baily and Doug Elliott for organizing a conference on a topic that is esoteric but also very important. We hope it doesn't become important again in the near future, but it's always possible and we need to understand it.

What I thought I'd do in these short remarks is talk a little bit about the Federal Reserve as a lender of last resort, our experience in the crisis, and implications of that for financial regulation going forward.

Now, I thought it would be worthwhile to step back a little bit—there are a lot of historians here—and talk a little bit about financial crises in general. A good way to do that, instead of talking about the crisis of 2007, is to look back a century to the Panic of 1907, known as the "rich man's panic," the last crisis before the creation of the Federal Reserve. It was in fact the panic that helped to motivate the creation of the Federal Reserve in 1913. Convenient for our purposes today is that the 1907 panic followed what I see to be the standard sequencing of 19th century financial panics.

It is useful to think of panics s having five stages. The first stage I call *losses*, meaning that macroeconomic or microeconomic factors are creating significant losses to some important financial institutions. In the case of 1907, on the macroeconomic side a recession had already begun in May of 1907. The crisis itself—the panic—took place in October. There's a very spooky tendency for panics to take place in October, but in those days there was a good reason for it. Without a central bank to smooth out interest rates over the year, interest rates tended to spike in the fall when there was a demand for credit to pay for the harvest and transport of crops, and that created more pressure in money markets.

At the micro level in 1907, there was a famous and very colorful attempt by a number of speculators to corner the stock of the United Copper Company, a corner which failed and which led to significant losses to these particular individuals who, unfortunately, from the point of view of the economy, were closely associated with a number of banks and trust companies in New York. News of this event created fears of significant losses potentially associated with these folks at those companies. That led to the second stage of most financial panics, which is *runs*. At the time, of course, there was no deposit insurance. So, given the fears of losses, there were runs both on the banks and on the trusts as depositors pulled out their money.

Now, interestingly, the trusts were sort of the shadow banks of the time. They were less regulated, and they were somewhat more speculative in their investments, and they were not as much part of the club as the regular commercial banks were. The clearinghouse for the banks in New York temporarily shut down the banks, and J.P. Morgan—the individual, not the company—and his colleagues looked at the banks and said that they were strong. They provided support as necessary, on conditions that included the resignation of one of the speculators in the attempted stock corner from the presidency of one of the banks. That helped restore confidence in the banks, and the banks reopened; the runs on the banks stopped. But the runs on the trust companies, which J.P. Morgan initially didn't deign to intervene in, continued, and on October 22nd, the largest of these shadow banks, Knickerbocker Trust, failed. That triggered a new round of runs on the trust companies.

The third stage of a panic is *fire sales*. As companies come under pressure, as they lose their short-term funding, they begin to dump assets in order to raise cash. In the case of Knickerbocker Trust, they were calling stock loans, for example, and that in turn created pressure on the stock market, which dropped very sharply, and other asset prices came down as banks and trust companies trying to raise liquidity were dumping assets on the market.

The fourth stage of a panic is *contagion*, in which the stress spreads to other financial institutions. Contagion occurs both through asset price declines, the result of fire sales, which worsens the financial conditions of other firms, and through the interconnections between firms that are in trouble and other firms that are their counterparties and their creditors. The contagion spreads from, in this case, the Knickerbocker Trust to other trusts and back to the banks, which, remember, J.P. Morgan and his friends initially had stabilized.

So, the crisis intensified again, leading to the fifth stage of a panic, which is the broader *economic impact*. As was the case of a number of 19th century banking panics, the 1907 panic had a significant impact on transactions, on credit, on normal business operations. There was a serious effect not only locally but also nationally, as a significant recession went on into the middle of the subsequent year.

Now, as you probably know, J.P. Morgan and his friends,, including Benjamin Strong who later would become the first real leader of the Federal Reserve as president of the Federal Reserve Bank of New York, decided that enough was enough and that they needed to address the trust problem as well. So they became a private lender of last resort. They lent cash to firms in need of short-term funding, and they took additional steps also. They issued guarantees to reassure the public. They helped strengthen firms that needed strengthening. And they promoted disclosure of firms' financial conditions. They put information out so that people would regain confidence, and collectively they were able to stop that crisis. So, it was an interesting illustration of the main points of a financial crisis.

Of course, from our point of view it's very interesting because it led to the founding of the Fed in 1913 as Congress contemplated the problems inherent with having a private group of individuals essentially function as a central bank in the economy.

Now, the original mission of the Fed was to be a lender of last resort. I sometimes say that, after the recent crisis, the Fed has gone back to its roots. (In 1913,they did talk about smoothing interest rates, elastic currency, and so on but they didn't really talk about what we would think of as monetary policy.) Implicitly, the philosophy of the founders of the Fed was Bagehot's idea of lending freely at a penalty rate; in a panic, there's a hunger for cash, and the central bank can provide that cash against collateral and in that way calm the panic.

By the way, just a couple of comments on that, because I'm going to come back to the Bagehot principle in the context of the Fed. "Lending freely"—we understand what that means. Lend to this man and that man, as Bagehot said. But what do you lend against? And I think the spirit of lending freely is that you should lend against a broad range of assets, and you can't lend strictly on fire sale prices either—the very lowest prices—because if you do you're not really helping anything, because the firms under pressure can always get the fire sale prices in the market. So, there's a sense in which the Bagehot principle says that you should lend at a price that may be something closer to what a normal market would produce for that asset. How do you determine that? I'll come back to that.

Another part of that phrase which gets a lot of attention and I think is not fully understood is the "at a penalty rate" part, and the general view of people is that well, what Bagehot was saying was that you should lend at a high rate to eliminate moral hazard so that only the people who really "needed" the money would come and take it. I don't think that that's an entirely accurate characterization of what Bagehot meant or how we should think about it. At least one of the things Bagehot was concerned about was the fact that in his day the money supply was constrained by the gold standard and the central bank could not create an indefinite amount of money. So, a higher rate was just a way of discouraging a domestic run on banks from turning into a run on the currency if there was fear that the gold standard was not being maintained. So, that was an important concern.

I would also argue that if the penalty rate is higher than the rate prevailing in markets in the panic, it's not going to do much good. So I would argue that an appropriate concept of the penalty rate is a rate that is higher than normal but may be lower than the fear-driven rate that we're seeing in the panic.

Looking back, and even in the middle of the crisis, I think we recognize that the 2007-2009 crisis essentially met the five criteria, the five stages of the classic financial panic.

Let me come back now to the more recent crisis and talk about it in the context of these general principles. Looking back, and even in the middle of the crisis, I think we recognize that the 2007-2009 crisis essentially met the five criteria, the five stages of the classic financial panic.

First, losses and macroeconomic stresses: There were losses on subprime mortgage lending and other types of real estate lending. And all of those things were generating losses of unknown magnitude at a wide range of financial institutions.

Second, runs: Not runs by retail depositors of course but in this case runs by wholesale funding, including repos, commercial paper, and other short-term funding that was uninsured and pulling back from borrowers in the crisis.

Third, fire sales: There was a lot of pressure downward on asset prices as companies dumped assets that they couldn't finance, and that created an additional pressure on other companies.

That led to the fourth stage, which was contagion. A combination of the depressed asset prices, the interconnections among firms, and the opacity surrounding the balance sheets of firms meant that confidence fell very severely even in firms that were in no danger of insolvency for at the moment.

And then, finally, of course, the broad economic effects, which we all know about and are still trying to address.

I think a fair question would be: Well, if this was such a standard crisis, why didn't we recognize it sooner? And there are several answers—not excuses necessarily but explanations, if you will.

One has to do with the first principle, which is that a panic is set off when people believe that there are significant losses to financial institutions—not just any losses but losses to critical financial institutions. And early in the crisis the general view was that even though house prices might be coming down quite a bit this was not, in kind, all that different from the tech bubble bursting. The view was that there would be a loss of paper wealth that would affect consumer spending and slow the economy. But neither we—the regulators—nor the banks themselves appreciated the extent of their exposure to mortgage losses. As late as 2008, when we asked the banks what would happen if house prices dropped 30 percent, they all said it would be manageable. So, it took a while to figure out that the banks were as exposed as they turned out to be to these losses. That was one thing that we were slow to see.

The other thing we were slow to recognize was that the nature of runs had changed. They weren't depositor runs, like in *A Wonderful Life*. Instead, it was an invisible run of repos and commercial paper and so on, shortening their maturity, raising their rates, and ultimately even pulling back from firms. So, it took time to see the basic principles of a financial panic taking place in a different institutional context.

Now, the Fed and other central banks know what to do in a financial panic—and the first thing is act as a lender of last resort, and that's the first thing we did in August 2007. Both the Fed and the ECB were aggressive in putting out cash.

But there were some important concerns. The first was that the changes in the financial system had left our legal authorities behind. The Fed was created to lend to banks through the discount window. But of course, the maturity transformation process was now taking place through all different kinds of financial institutions, and as a result the Fed had to use its 13(3) authority to lend to money market funds, to primary dealers, to support the markets for asset-backed securities and commercial paper, in other words, to expand the basic principle of lender of last resort to a much broader set of firms and markets.

The other problem, one I don't think Bagehot talks about enough—I'm not sure, maybe an expert here can tell me—is the problem of stigma, which is a very significant problem. It was a problem early on in trying to get banks to take money from the discount window, particularly if you set the discount rate high above market rates. If the discount rate is set high then firms are very reluctant to take cash, because they're afraid of being identified as weak. And that would, of course, be counterproductive from their point of view.

Now, we actually did a number of things to try to address stigma, and I think there are some pretty useful approaches there. For example, the Term Auction Facility, the TAF, auctioned discount window money to banks. Because it was an auction process, the price would be whatever was necessary to get banks to take it, and if none were willing to take it, then the price would be low and people would say, "Well, it's just a good economic decision to take this money."

Moreover, the TAF didn't put out the money immediately. There was a delay between winning the bid, winning the auction, and when the money was put out. So, that reduced the sense that the bank was desperately reaching for cash. It was just an economic transaction.

So, there are various things that we did to try to address the stigma. And, broadly, I would say that ultimately the response fit very well in the pattern of J.P. Morgan. It was a lender-of-last-resort activity. It was followed, though, by guarantees, by recapitalization, by disclosures, all the same steps that worked in 19th century financial panics.

There are a couple of other issues I guess I would just mention briefly. One has to do with the rescues of AIG, Bear Stearns, et cetera. I think those are very different. Those, in our minds, were not standard Bagehot-type activities. Those were ad hoc responses to a particular problem, which was that the United States did not have at the time a mechanism for unwinding a large financial firm in a way that was safe for the broader financial system. And as a result, the Fed used various lending authorities to try to prevent the failure of firms—addressing moral hazard as best we could by, for example, trying to arrange it so the equity holders lost most of their value. But I wouldn't call that a Bagehot activity. I think it was really a different thing. It was an ad hoc response to a lack of a necessary authority. We are now, with the Dodd-Frank Act, moving in the direction of having that authority.

The other thing I would comment on about this whole period is that frequently in discussing lender-of-last-resort activity, people talk about the distinction between illiquid and insolvent firms. I think there are clearly illiquid firms that you can identify as being illiquid and there are clearly insolvent firms that you can identify as being insolvent, but in a crisis there is a lot of gray area in the middle. And the problem is that, if a firm is insolvent at current market prices, if those are fire sale prices, then there's a question about whether it's an illiquidity issue in the general market or whether it's really a genuine case of insolvency.

Of course, as you know, there was a very extensive regulatory response to the crisis. Let me just talk about two things that are relevant to our discussion today. One is the changes in the lender-of-last-resort authorities, and the other is liquidity regulation.

On lender-of-last-resort authorities—the discount window remains in place. The Fed's discount window was not changed fundamentally by Dodd-Frank, but there were new disclosure requirements—and I'll come back to that.

On 13(3), the emergency lending authority, there were some changes made. First, and very importantly, 13(3) can only be invoked for a broad-based program lending to a class of firms or a class of market participants. It cannot be used any more to address the problems of a single firm. That was a very important change. Secondly, use of 13(3) requires approval of the Treasury Secretary. Third, there are tougher credit restrictions. In the crisis, the criterion was secured to the satisfaction of the Reserve Bank, and now there's a tougher criterion for whether or not the loan is creditworthy. And, finally, tougher disclosure rules have been added.

Now, what does this all do? I think that some of these changes are positive—for example, the restriction to broad-based lending programs. I think as long as that comes with a way to deal with failing financially critical firms, then eliminating the use of 13(3) in that context is good. It takes the Fed out of the business of weekend emergencies. And of course Dodd-Frank includes the Orderly Liquidation Authority, which is a way to wind down a financial firm in a safer way, and I think a lot of progress has been made on putting that OLA authority into practice.

But I think, as I mentioned before, the use of the lending authority to try to prevent disorderly collapses of firms was not genuine LOLR in my opinion—lender of last resort—and I'm glad to see that those two authorities are broken apart.

The approval of the Treasury Secretary I think is basically okay, for democratic reasons and because, generally speaking, the Treasury Secretary and the Fed Chairman see pretty much eye to eye at trying to prevent the financial system from collapsing. I found that out in a number of contexts. (Laughter)

Now, there are a couple of other things. The other rules, though, I think are kind of two-sided. So, there's the tougher repayment standard and there's tougher disclosure. Both of these things are very understandable from the point of view of taxpayer responsibility, accountability, democracy, governance, et cetera. But they do potentially raise some concerns about the use of these authorities in the next crisis.

I mentioned that the distinction between insolvency and illiquidity in a crisis is not always so clear, and sometimes judgments have to be made. And if the standard of repayment is so tough that the central bank is afraid to make loans in a panic, that would be, of course, unfortunate.

Likewise, under the disclosure requirements, again, totally understandable from the perspective of governance and accountability, but we already have pretty significant stigma problems, and of course the more quickly and more actively these loans are disclosed, the worse those problems are going to be.

Let me be clear—I'm not saying these are mistakes or they're problems. There are, obviously, good reasons for these changes, but there are some potential downsides to the disclosure and to credit restrictions.

The other new regulatory area is the imposition of liquidity requirements on a number of different firms. We saw in the crisis that the lender-of-last-resort privilege was extended very broadly in the economy--wherever there's maturity transformation. And in order for that to be consistent with not creating too much moral hazard, there's got to be, of course, prudential requirements for liquidity. You have already discussed that aspect of Basel III in this meeting. I think one of the most important innovations in Basel III, besides strengthening capital requirements, is the addition of various liquidity requirements. I would just point out is that the Basel liquidity rules are only part of what's happening in terms of liquidity regulation. There are a number of other ways in which liquidity is going to be overseen. For example, the bank stress tests that the Fed conducts are going to have a liquidity component as well as a capital component. The Fed is discussing capital surcharges for firms that rely too much on short-term unsecured funding. Margin collateral requirements are being increased quite considerably, so that of course is a liquidity requirement. And on the supply side-- the sources of liquidity--regulation of money market funds, and repo is under discussion. It will be very important to try to reduce the risk of a run or a panic from the supply side. And, finally, liquidity regulation of financial market utilities, like exchanges and central counterparties, is also very extensive.

So, one of the really major changes in financial regulation coming out of the crisis is recognition that the lender-of-last-resort power or privilege has been extended very broadly, and that requires a lot of actions to make sure that that privilege doesn't result in firms relying on lender-of-last resort facilities and making inadequate provisions for liquidity.

Many tough questions there. For example, how do you treat your collateral that you hold at the central bank? Does that count as liquidity? That's been a big source of contention in the debate. Another question is, do firms always have to hold the liquidity, or are they allowed to draw it down? If they're not allowed to draw it down, do you have what's called the last-taxi-at-the-railroad-station problem? The rule that says there always has to be one taxi at the railroad station means that, of course, the second one is really the last one, et cetera. By the same token, the requirement that liquidity always has to be above a certain level basically means that you don't have any liquidity at all, because you can't use the liquidity that you have.

So, there are a lot of issues there to be resolved. But I think that this is the place to end. The crisis has brought back liquidity and lender-of-last-resort concerns in a very big way, and it's going to affect both the activities of central banks and a wide range of financial regulations.

Thank you.