

**EQUIPPING FINANCIAL REGULATORS WITH THE  
TOOLS NECESSARY TO MONITOR SYSTEMIC RISK**

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**HEARING**  
BEFORE THE  
SUBCOMMITTEE ON  
SECURITY AND INTERNATIONAL TRADE AND  
FINANCE  
OF THE  
COMMITTEE ON  
BANKING, HOUSING, AND URBAN AFFAIRS  
UNITED STATES SENATE  
ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

ON

EXAMINING THE SYSTEMIC RISK ASPECT OF REGULATORY REFORM,  
FOCUSING ON REGULATORS' CURRENT CAPABILITIES TO COLLECT  
AND ANALYZE FINANCIAL MARKET DATA, AND ASSESSING WHAT AD-  
DITIONAL TOOLS AND RESOURCES ARE NECESSARY TO MONITOR  
AND IDENTIFY SYSTEMIC RISK

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FEBRUARY 12, 2010  
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# **EQUIPPING FINANCIAL REGULATORS WITH THE TOOLS NECESSARY TO MONITOR SYS- TEMIC RISK**

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**FRIDAY, FEBRUARY 12, 2010**

U.S. SENATE,  
SUBCOMMITTEE ON SECURITY AND INTERNATIONAL  
TRADE AND FINANCE,  
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,  
*Washington, DC.*

The Subcommittee met at 2:37 p.m. in room SD-538, Dirksen Senate Office Building, Senator Evan Bayh, Chairman of the Subcommittee, residing.

## **OPENING STATEMENT OF CHAIRMAN EVAN BAYH**

Senator BAYH. Good afternoon, everyone. I am pleased to call to order this Subcommittee for the hearing entitled “Equipping Financial Regulators with the Tools Necessary to Monitor Systemic Risk.” I want to thank my Ranking Member, Senator Corker, and Senator Reed, my friend and colleague, and their hard-working staff for requesting this hearing on an issue that may seem technical to some, but will prove critical as we work to reform and modernize our regulatory structure for the future.

I would also like to welcome and thank our able witnesses who are here today and thank our staff who have been instrumental with regard to technical aspects of this analysis. I am so happy to continue the dialog that we have already begun on how to equip our regulators to move beyond examining individual institutions and toward monitoring and managing systemic risk across our financial system.

To our witnesses that will appear on two separate panels, welcome and thank you for appearing before the Subcommittee to give an outline on regulators’ current capabilities to collect and analyze financial market data and, most importantly, what additional resources and capabilities are necessary to provide effective systemic risk regulation. I understand very well that the weather in Washington the last few days has not been ideal. As a matter of fact, some of our witnesses have been stranded here for several days. So I appreciate the dedication you have shown in making it here today, and we promise to be, accordingly, most merciful in our questioning.

Before I turn to Governor Tarullo—and, Dan, thank you again for appearing before the Subcommittee; you have been here very ably on other occasions—I would like to submit a few comments for

the record. I have a somewhat lengthy statement given the technical nature of the subject matter. I would like to submit that for the record, but will not read it. Is that all right with you, gentlemen? Very good. Hearing no objection, I will go ahead and do that.

Senator BAYH. Before introducing Governor Tarullo, first, Senator Reed, perhaps you would have some comments you would like to share.

#### **STATEMENT OF SENATOR JACK REED**

Senator REED. Very briefly, Mr. Chairman. I would like my statement submitted to the record also. I want to welcome Governor Tarullo also. I want to thank you for holding this hearing at the suggestion of Senator Corker, and this is a vital area and could, I think, be overlooked. But it is incredibly important.

What we all witnessed over the last several years is not only great market turmoil but great market uncertainty. My impression of a lot of the problems with Lehman, with Bear Stearns, with AIG is the fact that regulators and other banking institutions had no idea where their liabilities, their risks, their counterparty exposure lay, and there was no systemic way to calculate or aggregate that information. And as a result, I think the regulators were flying blind, essentially, doing the best they could, trying to work things out, but a lot of it was just sort of flying with instruments that were not working in bad weather. It was more seat-of-the-pants than systemic regulation.

So one of the things I think we have to do is create a repository of information available to regulators, available to the public with appropriate delays, so that the system is much more understandable and that, when there is a shock to the system, markets do not react out of fear, they react with some knowledge.

Thank you, Mr. Chairman.

Senator BAYH. Thank you, Senator Reed.

Now, we have on this Committee become accustomed to something we call the Corker rule, where violating—or not violating, actually a breathtaking, refreshing difference from senatorial custom, Senator Corker is known for his brevity in opening statements. But since you request the hearing today and I know this is a major priority of yours, perhaps you would have some opening comments you would like to share.

#### **STATEMENT OF SENATOR BOB CORKER**

Senator CORKER. I will be very, very brief.

Number one, thank you for having this hearing. I know it is Friday afternoon. It has been snowing, and a lot of us are trying—

Senator BAYH. We have been trying since Tuesday to have this hearing.

Senator CORKER. Right, but I thank you so much, and I want to thank Governor Tarullo for always being available and helping us think through these complex issues.

Our second panel especially, Governor Tarullo, has, I know, been holed up on hotels and hanging around for several days to cause this testimony to actually occur prior to recess. I think everybody knows we are hopefully working toward a regulatory reform bill. It is important to get this testimony into the public record so we can

potentially act upon it. So we thank you all for being here, for your ideas, and with that, Mr. Chairman, as you walk out the door, thank you so much for having this hearing. I appreciate it.

Senator REED. [Presiding.] Thank you, and on behalf of Senator Bayh and Senator Corker, let me introduce our first witness, Daniel K. Tarullo, who is a Governor of the Federal Reserve Board. He is an expert in international finance. He received his education beginning at Roxbury Latin School, and then he went on to Georgetown University, Duke University, and graduated with his law degree from Michigan. Prior to assuming his responsibilities at the Federal Reserve, he was a faculty member at the Georgetown Law School and prior to that served in the Clinton administration as Assistant Secretary of State for Economic and Business Affairs and other important responsibilities.

Again, Governor, thank you for your presence, and we look forward to your statement.

**STATEMENT OF DANIEL K. TARULLO, MEMBER, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM**

Mr. TARULLO. Thank you, Senator Reed and Senator Corker, and thank you both for your attention to a subject whose importance to financial stability is, as Senator Reed said a moment ago, often overlooked in the broader debates about reform.

Good information is crucial to the success of any form of regulation as it is to the success of any form of market activity. But many features of financial activity make the quality and timeliness of information flows even more significant for effective regulation. Most important, perhaps, is the interconnectedness of financial services firms. In few other industries do major players deal so regularly with one another, as a result of which major problems at one firm can quickly spread throughout the system.

The financial crisis revealed gaps in the data available to both Government regulators and to private analysts. It also revealed the relatively undeveloped nature of systemic or macroprudential oversight of the financial system. With this experience in mind, I believe there are two goals toward which agency and congressional action to improve data collection and analysis should be directed.

First, to ensure that supervisory agencies have access to high-quality and timely data that are organized and standardized so as to enhance their regulatory missions, including containment of systemic risk;

And, second, to make sure such data available to other Government agencies, to private analysts, to academics, in appropriately usable form so that the Congress and the public will have the benefit of multiple perspectives on potential threats to financial stability.

My written testimony details some of the initiatives at the Federal Reserve to enhance the type and quality of information available to us in support of our exercise of consolidated supervision over the Nation's largest financial holding companies. I would stress also, though, the importance of using that information to regulate more effectively.

The Special Capital Assessment we conducted last year of the Nation's 19 largest financial firms demonstrated how quantitative,

horizontal methodologies built on consistent data across firms could complement traditional supervision. It also showed the importance of having supervisory needs and knowledge determine data requirements. We are building on that experience and adding a more explicitly macro prudential dimension and developing a quantitative surveillance mechanism as a permanent part of large-firm oversight. While there is much that the Federal Reserve—and other agencies such as the SEC—can do and are doing under existing authority, I do believe we will need congressional action to achieve fully the two goals I stated a moment ago.

There are a number of specific areas in which legislative changes would be helpful. Let me briefly mention three.

First, it is very important that Government agencies have the authority to collect information from firms not subject to prudential supervision, but which may nonetheless have the potential to contribute to systemic risk. Without this ability, regulators will have a picture of the financial system that is incomplete, perhaps dangerously so.

Second, it appears to me that greater standardization of important data streams will only be achieved with a congressional prod. This objective of standardization has for years proved elusive, even though most observers agree that it is critical to identifying risks in the financial system.

Third, there will need to be some modifications to some of the constraints on information colleague by Government agencies, such as authority to share that information with foreign regulators or to release it in usable form to the public. Since privacy, proprietary information, intellectual property, reporting burden, and other important interests will be implicated in any such modifications, it is most appropriate that Congress provide guidance as to how these interests should be accommodated in a more effective system of financial data collection.

Finally, as you consider possible legislative changes in this area, I would encourage you to consider the relationship between the authorities and responsibilities associated with data collection and the substantive regulatory authorities and responsibilities entrusted to our financial agencies.

Generally speaking, regulators have the best perspective on the kind of data that will effectively advance their statutory missions. Indeed, without the authority to shape information requirements, their effectiveness in achieving these missions can be compromised. This is all the more important given the current state of knowledge of systemic risk in which there are as many questions as answers.

In these circumstances in particular, the insights gained by supervisors through their ongoing examination of large firms and of markets should be the key, though not the exclusive determinant, of new data collection efforts. This does not mean that agencies should collect only the information they believe they need.

The aim of providing independent perspectives on financial stability means that other data may be important to collect for the use of private analysts, academics, and the public. The agencies can certainly be asked to collect other forms of information that are important for independent assessments of financial stability risks.

But I think this relationship does counsel considerable symmetry between regulatory responsibility and data collection.

Thank you for your attention and, again, for having this hearing. I would be pleased to try to answer any questions you might have.

Senator REED. Well, thank you very much, Governor Tarullo.

Let me first ask the question that this need for better information is not exclusive to the United States. Could you comment on how other G-20 countries are trying to deal with this and the need for not just a national approach but an international approach?

Mr. TARULLO. Certainly, Senator. A number of other regulators and overseers around the world have already begun to address the issue of information, among them the various organs of the European Union and the United Kingdom, the Bank of England. The G-20 itself has issued a couple of recommendations that are particularly salient to this question on developing a template for reporting of information of the large internationally active financial firms.

Now, this is, of course, not an easy undertaking for any one nation much less for the world as a whole, but it is something which the Financial Stability Board has taken on as a task. There have been some preliminary discussions on how to organize the work of trying to see if we can come to agreement on a template for reporting of the largest, most globally active financial institutions. It is far too early to report progress there, Senator, but I can say that the effort has been launched.

Senator REED. Well, thank you, Governor. As you know, as we are proceeding down, and I think appropriately so, a legislative path which we hope will incorporate this systemic collection of information, I have got legislation in—and, in fact, I want to thank Dr. Mendelowitz and Professor Liechty for their assistance and help. But this is going to have to be an effort that goes beyond the United States to understand that, but I think it is important that we begin here.

Another aspect of this international question is the issue of sovereign behavior. The Greek Government now is in a very serious crisis which is rattling the markets. There also is some indication that another one of our favorite topics, derivatives and credit default swaps, have come into it. Apparently, there are reports that investment banking firms have helped them legally avoid treaty obligations under Maastricht, *et cetera*. But the long and the short of it is, do we also have to include sort of sovereign entities in terms of data collection?

Mr. TARULLO. Well, Senator, I think that one of the lessons that the international community drew from some of the sovereign debt crises of the late 1990s and the very early years of this century was that there needed to be more transparency associated with a lot of sovereign debt issuance. And the International Monetary Fund undertook to create special data dissemination standards which would provide more such information.

Generally speaking, I would distinguish between the sovereign information and private financial system firm information since we as regulators obviously have a mandate over private firms rather than certainly over sovereigns. It is relevant, though, for us in thinking about systemic risk because, to the degree that our large institutions have significant exposures to sovereigns which may

conceivably have difficulty in servicing their debt, that becomes a matter of concern for the private financial regulators as well.

Senator REED. One of the issues that repeatedly is made—points, rather than issues—is that, you know, too big to fail is the first chapter, but the second chapter is too interconnected to fail. And that raises the issue of a focal point on large institutions might miss small institutions that could cause systemic risk. In fact, you know, there is the possibility that multiple failures in small institutions could have a systemic problem.

So how do we sort of deal with that in terms of these interconnections? I mean, traditionally, it is easy for us to go to a big financial institution and say report X, Y, and Z.

Mr. TARULLO. Right.

Senator REED. How do we capture everybody, not in a pejorative sense but in a data sense?

Mr. TARULLO. Sure. So let me distinguish while trying to address both the data collection and the regulatory supervisory side.

I think with respect to data collection, there is little question, in our minds, at least, that the data collection authorities of U.S. Government agencies need to extend beyond the universe of firms which are subject to prudential or even market regulation. For the very reasons you suggest, a large number of intermediate size firms can themselves have a substantial amount of financial activity, which, although not necessarily associated with systemic risk in any one firm, in the aggregate can define an important phenomenon or trend or development in the economy as a whole. So we do think there needs to be that kind of authority in our financial regulators to gather the necessary information to round out the picture.

When it comes to supervisory or regulatory authority, the three of us, at least, have been in this room on a number of occasions talking about the choices that we have in front of us, and one of those choices is going to be how broadly to cast or to draw the perimeter of regulation. Will it be only firms that own banks? Will it be firms beyond that which are thought to be themselves systemically important? Or will it be some broader set of firms above a certain size? And I think those issues are probably going to be more difficult to resolve than the data issues, where I personally, at least, think there is little argument against the proposition that you need to gather this information.

Senator REED. Thank you.

Senator Corker.

Senator CORKER. Thank you. And, Senator, I want to thank you for raising this up. I do not think we would have met with our next panel without you having brought this forward, and I think you are actually responsible for all of this being brought to our attention. So thank you very much.

Senator REED. Thank you, Senator.

Senator CORKER. I appreciate that.

Governor, I think you are probably familiar with the National Institute of Finance, as it has been proposed, and they have discussed certainly it being done in an independent way. I think you maybe would allude more to that happening at the Fed itself. But I am wondering if you could talk to us a little bit about the pros

and cons of what you know their proposal to be from the Fed's standpoint.

Mr. TARULLO. Certainly, Senator. So this will not surprise you to hear that I think there are some advantages and disadvantages to each of the different organizational options that you would face. One such option would be the creation of a single, free-standing agency that would have overall responsibility for all the financial data collection and a good bit of the analysis.

On the other end of the spectrum would be presumably just giving more authority to a single U.S. Government—existing U.S. Government agency and saying why don't you fill in the gaps?

As I suggested in my written testimony, there is probably an option in between as well, particularly as you go forward with thinking about overall reg reform.

To the degree that a council emerges, as I think it might, as an important center for coordinating the oversight of systemic risk in the United States among all the various U.S. Government agencies, we may want to lodge some of the data responsibilities in the council as well.

The basic advantage, I think, of the single agency is what one would infer, which is you have a single group. They can take an overview. They can say let us try to prioritize, let us try to figure out where the most important unknowns are, and we will devote our activities in that direction, and we will do so in a way that we are not always stumbling over one another because we are just one agency.

Some of the costs associated with the single agency—quite apart from out-of-pocket costs, which are nontrivial, but costs in the sense of non-immediate monetary costs—would include, I think, some risk that you detach data collection from the process of supervision, the process of regulation. And I do think it is important and I think our experience over the last couple of years has borne out the importance of having those with the line responsibility for supervising and regulating being able to shape the kinds of data collection that they feel are necessary in order effectively to regulate or to supervise.

In the middle of the crisis, for example, it became apparent to some of the people at the Fed that getting information on the kinds of haircuts that were being applied to some securities repurchase agreements was a very important near-term piece of information in trying to assess where the system was at that moment.

If that capacity had been lodged in an independent agency, with some of its own priorities perhaps and having to go through a bit more of a process, there may—and I emphasize “may”—have been some delays in getting to that end.

So I think that, as with everything, there are going to be pluses and minuses. It will not surprise you to know that from a somewhat—from the perspective of 20th and Constitution, there would be concerns about losing the capacity to shape and act quickly on informational needs. But I hasten to add that here, as with systemic risk generally, I do not think anybody at the Fed believes that the Fed should be the sole or even the principal collector and analyzer of data. This has got to be a governmentwide priority.

Senator CORKER. The information that you receive now, the data, how realtime is it? And I would assume during a crisis it is very important that it is daily. And then how granular is it today?

Mr. TARULLO. So that varies considerably, Senator, from data stream to data stream, and I think the subject—let me be clear just that when some people say “realtime,” some people mean “immediate” by that; that as a trade happens, the data, the information about the trade is immediately available to regulators and possibly the public.

For most of our supervisory purposes, that kind of literally realtime data is not critical to achieving those supervisory purposes. And, of course, as you all know, true realtime data is a very expensive thing to put together. But timely, meaning in many instances daily or end-of-the-day trading, is very important for making an assessment on a regular basis as to the stability of a firm that may be under stress.

One of the things that became clear, I think, during the crisis—and for me became particularly evident during the stress tests last spring—was the substantial divergence in the capacities of firms to amass, to get a hold of their own data, to know what their own trades were, to know what their own counterparty risk exposures were.

So one of the things that we have actually been doing in the wake of the Special Capital Assessment Program is placing particular emphasis on the management information systems of the firms, requiring that they themselves be able to get a hold of the data on trades or counterparty exposures or certain kinds of instrument—certain kinds of involvement with certain kinds of instruments, because if they can get a hold of it for their own internal purposes, we will be able to get a hold of it pretty quickly.

So right now it is actually not so much a question of our telling them, “Send us something you have on a daily basis.” It is in many instances as much a matter of making sure they have the capacity to derive that information from their raw computer records and then to send it to us.

Senator CORKER. May I ask another question, Mr. Chairman?

Senator REED. Yes, sure.

Senator CORKER. You know, of course, we all tend to try to find a solution that is unique and maybe alleviates a lot of just the daily work it takes to be good regulators, right? And a lot of what happened this last time could have been prevented with the tools we had if we just maybe had been a little more effective in regulating the way that we should have and Congress overseeing the way that it should have. But there were certainly lots of issues that caused this last crisis, if you will, to unfold.

So we have had this wonderful presentation that we are going to hear next, and, you know, we envision having all this, at the end of the day, realtime type of data so we know positions throughout our country, so that regulators have the ability to know if something that is putting our country in systemic risk is occurring.

What should we be concerned about there from the standpoint of having this thing that sounds really neat and costs money, how do we prevent it from being something that really is not that useful

but is collecting a lot of data that I imagine takes place throughout this city that is not utilized?

And then, second, I would imagine that data like that collected in one place could be used for pretty nefarious purposes if it got into the wrong hands. If we actually have it and collect it, what should be our concerns in that regard?

Mr. TARULLO. OK, so with respect to your first question, I mean, I do think that the efforts of the group of academics and others who have been promoting the NIF and certainly the efforts of the National Academy of Sciences in convening that workshop have been very valuable in drawing attention to and moving the debate forward on the data needs that we really do have. And I think, Senator, just to underscore something I said earlier, the absence of data from the shadow banking system was certainly problematic in retrospect. I think that the degree to which the tightly wound, very rapid shadow banking system was channeling liquidity around the financial system and, thus, the rapidity with which it came to a screeching halt once things began to break down, is something that was at least underappreciated by even those who foresaw problems ahead.

So I do think that there is—and I do not think it is a coincidence, by the way, that some of the names I saw on the list of participants in that workshop that the NAS held were the names of scholars who have written, quite insightfully, I think, on the substantive causes of the crisis and of the way in which adverse feedback loops began when things moved into reverse. So I do think we need additional data sources.

Now, how to make sure that every dollar of governmental funds spent on this are spent most wisely and how to make sure that we do not demand a lot of private expenditures that are not going to useful purposes is the kind of question that I think we all confront all the time in any Government regulatory or data collection effort.

And I guess I would say that that is where some of the principles that we suggested in my written testimony I hope will be of some help. Keeping the regulator and supervisory agencies closely involved and, I would hope, the prime movers of these data collection efforts I think will help because whether it is the SEC or us or the CFTC, we are going to be most concerned in the first instance with achieving our statutory missions. And so for us that would be the consolidated supervision of the largest financial holding companies and also, obviously, our monetary policy and financial stability functions. That I think is one way to do it.

I think a second way would be to make sure that there is some thought about new requirements coming forward. This is why OMB has the rules they have. And as you know, we think maybe some of the Paperwork Reduction Act features need to be changed around the edges. But there is a good reason why that act exists because you do want to put the brakes on people just willy nilly saying we would like new data sources.

I think actually the council, if a council of regulators were created or the President's working group could formalize such an effort, I think it would be useful to have different agencies actually thinking about what new data sources may be important and hav-

ing a debate precisely to guard against any one maybe going a bit too far afield from its own regulatory mission.

On the protection issue, obviously there are, as I mentioned, these important interests, proprietary interests, IP interests in some cases where vendors are involved, privacy interests where individuals are involved, a little bit less, obviously, with some of the things we are talking about. We ought to continue to have those protections. But it is also the case that our country I think wants to be protected from financial instability, and my conclusion at least is that the efforts to identify potential sources of financial stress and risk throughout the economy is not something that one or even a whole group of Government agencies should be the sole actors in. I think we do need to enable analysts, private analysts, finance professors, people who have expertise but are not in the Government, to look at what is going on in the economy to offer their views to you, to us, to the American people, and let us all filter through how much of that may be well grounded and where we might disagree.

If we are going to do that, we have to figure out how to get this data into a sufficiently aggregated form so as to protect proprietary information, but to make sure that it is really useful to somebody out there who is trying to do an analysis and have some insight into what is going on in the subprime mortgage market or over-the-counter derivatives or anywhere else.

Senator REED. Well, thank you, Governor Tarullo, and you have reminded me, I have to thank also the National Academy of Sciences because we asked them to convene that meeting and I am pleased that it produced positive results in your view and other people's view, but thank you very much.

Senator CORKER. I thought maybe you were going to ask another round. If I could just ask one more question—

Senator REED. Yes, and I might have one, but go ahead. You go first.

Senator CORKER. No, go ahead. Absolutely.

Senator REED. Well, it sort of—no, why don't you go, because this is not Abbott and Costello, but you are ready.

Senator CORKER. So a number of us have been looking at speed bumps, ways for us not to be faced with resolution. We obviously, if we have resolution, want to ensure that this whole notion of too big to fail is not part of the American vocabulary. But we have had numbers of entities in recently—today, yesterday, the day before—talking about contingent capital and the ability to take unsecured debt in an institution that is moving into problem areas and converting that immediately to common equity.

I know that is a little bit off topic, but there is a lot happening. We are going on recess next week. I just wondered if you might have some comments regarding that. It is something that I think is gaining more and more attention.

Mr. TARULLO. Sure. Actually, Senator, we have been paying a good bit of attention to that in the Federal Reserve. I got together a group of Board staff and staff from some of the Reserve Banks to try to think through some of the potential options here.

So let me first begin with a little taxonomy because different people mean different things when they talk about contingent capital.

There are at least a couple of concepts here. One is a concept under which a firm would issue a specific kind of instrument which would have debt-like characteristics under normal circumstances, but by the terms of the instrument would itself have a conversion to equity when some trigger event happened.

The concept behind that tends to be the following. There is a period during which a firm may still be somewhat healthy, but is beginning to deteriorate, and if capital levels go down to a certain level there will be a loss of confidence within the markets and counterparties with respect to that firm. So if at that point the trigger means that all of a sudden there are X-billion dollars more of common equity in the firm, that might provide a reassurance and stop a slide downward, and I will come back to that in a moment.

A second concept is really one which is as much about the potential insolvency of the firm as it is stopping the slide. So some have proposed, for example, that all subordinated debt other than specified senior tranches of debt would, at some moment, which would probably be the equivalent of when you are on the verge of insolvency, convert to equity, thereby, in effect, helping to move forward what would be a resolution process under another name, because now you have way less debt on the liability side of your balance sheet and more equity.

The first is, I think, the concept that has intrigued some academics, some regulators, and, I must say, some investment bankers who probably see the opportunity to create some new forms of investment. The big issue there—there are a number of technical issues, but I think probably the biggest is what is the trigger going to be. If the trigger is supervisory discretion, you probably have an issue because everybody is going to be wondering whether the supervisor is going to pull the trigger for exogenous reasons, or when the supervisor would pull the trigger. It would create a good bit of uncertainty in the markets.

A second option is that you have the trigger tied to the capital levels of the firm. Now, that still involves some supervisory discretion, but it is within the context of an ongoing regulatory system. The problem there has been that, as you know, capital tends to be a lagging indicator of the health of a firm. Many firms, 2 months before their insolvency, looked like they were adequately capitalized, and so unless we get a quicker adjustment of capital levels, that probably wouldn't do the trick.

A third proposal is to have a market-based trigger, a trigger that might, for example, be the relationship between common equity and assets or something of the sort, or the market price of the— a lag market price of the firm related to assets, something that gets the market in as the trigger so that nobody can manipulate it in any way. The concern that one hears from a lot of people about that approach is that it can induce a kind of death spiral in the firm, whereby people begin trading against—when they see the price go to a certain level, they begin trading against it.

So my personal—and this is really personal, this is not the Board—my personal view is that all three of these approaches have significant problems. I personally just have excluded full supervisory discretion as a real option. But I think it is worth pursuing the technical challenges around both the market-based trigger and

the capital trigger and that is what we have asked our staffs to do within the Reserve Banks and the Board, to see if there is something here which can be—and this is important—which can be a less expensive form of capital for the banks. I don't want to create anything that costs more than common equity for the banks. That is kind of a feckless undertaking. But if we can figure out a way to have a capital instrument which is there in the exigent circumstances but which costs less than common equity on a normal basis for the firms, I think that is something worth pursuing.

I am sorry I was long-winded, but as you can tell, we have actually been analyzing this.

Senator REED. Thank you. It did give me time to think of a question.

[Laughter.]

Senator REED. No, just a comment, because I think Senator Corker, as always, has raised a very interesting point, and this is a comment. When push came to shove, all the varieties of capital, risk-based capital, were essentially disregarded, the stress test, the tangible capital, or am I overstating or misstating?

Mr. TARULLO. So our focus—so here is what happened, what I found so interesting during the crisis itself. During the crisis itself, private analysts, who are operating on the basis of less than full information, of course, and regulators both found themselves focused on common equity. Now, some of the market guys called it tangible common equity, but basically, it was common equity. And I think that what all of us, if we didn't already believe it, and some of us did, but if we didn't already believe it, what all of us concluded from this exercise was that common equity needed to be an even more important component of the equity of financial firms going forward.

The stress tests, the SCAP, were conducted with the assumption that—or under a set of standards that looked to the common equity levels as well as the traditional tier one levels, and I think, Senator, that regulators around the world whom we talk to in the Financial Stability Board, market analysts, and the financial institutions themselves have all converged around the proposition that common equity really and truly is far and away the most important—not the only, but the most important component of regulatory capital.

Why? Because if it is adequate, it allows the firm to continue as an ongoing institution. There are some forms of equity, tier two—excuse me, capital—tier two capital, which will be available to protect the Deposit Insurance Fund or senior creditors, but not to keep the firm going on an ongoing basis. And since I don't think any of us relish the thought of another go-around of major challenges to major financial institutions, I think we are all focused on finding the best way to maintain higher levels of common equity—when I say all of us, I don't just mean regulators. I think that is a market imperative, as well.

Senator REED. Thank you. We had a sidebar which we don't need to continue about Basel II. I think we do have to spend some time thinking hard about the rules of capital going forward. But just two quick comments about the issue at hand.

I don't want to trivialize this, but essentially, this center would be on patrol for bubbles in the economy, things that could cause, you know, not in one forum but throughout the economy, real problems. Is that too simple, or is that—

Mr. TARULLO. No, I don't think it is too simple, and if I—so if I can hearken back to a sidebar we had in a different hearing where you and I were talking about—I mentioned several times in the written and oral testimony the need for independent views of things, and this is something which I have always believed, but my conversations with you have reinforced it in this context, that no matter how good a job I think the Fed can and will do, or no matter how good a job in market regulation I think the SEC can and will do, the uncertainties around financial stability are always going to be significant because stresses and problems arise in new ways.

And so I think it is important for us to foster within the government but also outside of the government the ability of multiple agents to make a judgment on this.

Now, I guess I think that this is something which is best—within the government is best pursued in a collegial fashion, which is why the council occurred to me. I think if we are doing our analyses and the SEC is doing its and Treasury is doing its, bringing those together in council discussions and determining whether there needs to be a different kind of analysis or initiative seems to me to make a lot of sense. It may also make sense—again, responding to something you suggested to me a while ago—it may also make sense to have a council have at least a smallish staff of people who themselves are dedicated to looking at all of this and maybe doing some heterodox analyses.

So I think I am all in favor of that, and actually not all in favor of it in the sense of we wouldn't oppose it. I personally think it is an affirmative good.

Senator REED. Thank you very much.

Senator CORKER. I know we need to move on with the subject at hand. I would like for you to, in writing, maybe respond, just so we can get something on the public record, regarding how—going back to the collateral or the capital we were talking about a little while ago, using maybe a quarterly stress test that was made public, thinking through how something like that might help us. But I know we don't have time for that today.

Mr. TARULLO. OK.

Senator CORKER. We again thank you so much—

Mr. TARULLO. Happy to do it.

Senator CORKER. If you could do that in the next few days, that would be wonderful.

Mr. TARULLO. OK, Senator.

Senator CORKER. Thank you. Thank you very much, Mr. Chairman.

Senator REED. Thank you, and I will call the second panel forward. Thank you all, gentlemen. Let me introduce the second panel.

First, Dr. Allan I. Mendelowitz. Dr. Mendelowitz is a Washington-based economist and housing finance expert. He is the co-founder of the Committee to Establish the National Institute of Fi-

nance and the former Chairman and member of the Board of Directors at the Federal Housing Finance Board, where he served two terms. Thank you for your assistance on this issue, Doctor. Thank you very much.

Our next witness is Professor John C. Liechty. Professor Liechty is the Associate Professor of Marketing and Statistics at the Smeal College of Business at Pennsylvania State University. He is also the co-founder of the Committee to Establish the National Institute of Finance. Thank you very much, Professor.

We are also joined by Professor Robert Engle. Professor Engle is the Michael R. Merlino Professor of Finance at the New York University's Stern School of Business. Professor Engle was awarded a Nobel Prize for Economics in 2003, along with his colleague at the time, I presume, Dr. Granger at the University of California at San Diego.

Our final witness is Stephen C. Horne. Mr. Horne is currently the Vice President for Master Data Management and Integration Services for Dow Jones Business and Relationship Intelligence. He specializes in data integration and analysis of large quantities of disparate data from thousands of sources and the improvement of marketing productivity from the resulting information. Thank you very much, Steve, for returning.

Dr. Mendelowitz, please.

**STATEMENT OF ALLAN I. MENDELOWITZ, FOUNDING MEMBER,  
THE COMMITTEE TO ESTABLISH THE NATIONAL INSTITUTE  
OF FINANCE**

Mr. MENDELOWITZ. Thank you, Mr. Chairman. Thank you, Senator Corker. I am really very pleased to be here today as a representative of the Committee to establish the National Institute of Finance and to bring the recommendations and findings of that committee.

The Committee to Establish the National Institute of Finance is an extraordinarily unique group, based on my three-and-a-half decades of experience in Washington. I have actually never seen anything like it. It is a committee that has raised no money. It is a committee that represents no vested interests. It is a committee where no single member has any personal financial interest in the outcome of our recommendations. It is a committee where we have covered our expenses, what they are, out of our own pockets, and because we never organized as a 501(c)(3), we don't even get the tax benefits associated with those expenditures.

What it is, is it is a group of extraordinarily talented and, in many cases, very distinguished members, all brought together by the commonly shared view that the Federal Government and the regulatory communities lack the data and lack the research capability to effectively monitor and regulate systemic risk, and for that matter, to effectively monitor and regulate financial institutions and markets.

We have come together to propose a solution to that inadequacy in the Federal Government's capability and that solution is the National Institute of Finance. And we view the National Institute of Finance as addressing the weaknesses, both respect to data and research and analytical capability, and I can't stress the importance

of the research and analytical capability enough. A lot of time was spent with the earlier panel discussing data and there was far less mention of the analytical capability.

The reality is, we do not have a particularly good understanding of how financial markets work because we have never had the kind of sustained research effort that would yield those insights. Despite the fact that there are research departments at large financial institutions, there is a lot of good research being done by very talented people in academia, there are research departments in the regulatory agencies, but at the end of the day, the research efforts never had access to the appropriate data or to the sustained funding to do the kind of work that would provide the analytical tools needed by regulators given the challenges that we face today.

And that is why in our proposal for the National Institute of Finance we would have two key components: One, the Federal Financial Data Center; and the second, a Federal Financial Research and Analysis Center. We think the structure of the institute should be set up in a way that ensures that it can, in fact, play its key role.

It would be, as we indicated, an independent agency, ideally. It would be an independent voice on issues of financial risk, regulation, and policy. It would be independent for several reasons. One, it hopefully would be free from political influence.

Second, it would be free from having to investigate its own decisions and actions. As long as the institute is not a regulatory agency, it is untainted by the fact that if it were investigating itself, it would be given an impossible challenge and an impossible task if you are looking for really truly independent, high-quality assessments of what is going on.

Third, the institute would be self-funded, and it would be self-funded for a couple of important reasons. One, fairness. It is our understanding, based upon the research that we have seen and the discussions we have held that adapting the common data standards associated with the Federal Financial Data Center would produce a significant reduction in operating costs on the part of financial institutions. Because it would get this benefit, it is only fair that some small share of those savings would be used to fund the operations of the institute.

Second, given the burdens placed on the taxpayer and the taxpayers in this most recent crisis, it is not appropriate that taxpayers should be asked to pay for the monitoring of an industry which has already imposed a tremendous burden on the taxpayers.

And third, there are certain benefits in the ability to compensate staff and attract folks that go with being funded with non-appropriated funds that would make it more competitive.

All of this is critical and it, of course, would yield multiple benefits. It would yield substantial benefits in terms of improving the efficiency and effectiveness of financial regulation. It would reduce the likelihood of a future systemic event. It would make U.S. markets safer and more competitive. It would reduce the operating expenses of financial institutions. And the kind of standardized data that would be required would go a long way toward addressing one of the problems that Governor Tarullo mentioned when he commented on how he was surprised to find out that financial institu-

tions actually didn't have a good handle on what their own exposures were and they didn't have ready access to that kind of data.

Last, I just want to say how pleased we are that we learned last week that Senator Reed introduced S. 3005, the National Institute of Finance Act of 2010. That Act is structured in a way that creates a National Institute of Finance along the lines that we think would be essential to making it effective and we were really very appreciative to see that legislative measure.

That concludes my oral comments and I will be happy to answer any questions you or the Committee may have.

Senator REED. Thank you very much, Doctor.

Professor Liechty, please.

**STATEMENT OF JOHN C. LIECHTY, ASSOCIATE PROFESSOR OF MARKETING AND STATISTICS, SMEAL COLLEGE OF BUSINESS, PENN STATE UNIVERSITY, AND FOUNDING MEMBER, THE COMMITTEE TO ESTABLISH THE NATIONAL INSTITUTE OF FINANCE**

Mr. LIECHTY. Thank you, Mr. Chairman, Senator Corker. I appreciate the opportunity to be here and to again also speak about or on behalf of the Committee to Establish the National Institute of Finance.

I would like to just give a little history. The Committee to Establish the National Institute of Finance started a little over a year ago at a workshop that was jointly sponsored by the Office of the Comptroller of the Currency and the National Institute of Statistical Sciences. As an academic and a professional statistician, I was really interested in the topic of the workshop, which is exploring statistical issues in financial risk and in bank regulation. I consult with some of the big investment banks, specifically helping them with issues related to modeling and valuing many of these complicated credit derivative securities that played a part in the recent crisis and I was hoping that the workshop would focus on systemic risk. But it was primarily focused on Basel I and Basel II and assessing the safety and soundness of individual institutions.

And focusing on the safety and soundness of individual institutions is important, but that in and of itself will not ensure the safety and soundness of our financial system. In some ways, this approach is similar to ensuring that a group of cars going on a freeway or around a racetrack are all individually safe and sound, but then ignoring the larger dynamics of the traffic, for example, whether the cars are bunched together, they are observing safe stopping rules, or going too fast as a collective group.

Now, because there was a broad collection of regulators, academics, and practitioners at this workshop, I asked a very simple question in my mind. Does anybody have the data necessary to monitor and measure systemic risk? And the informal consensus I got from that workshop is the same consensus I have heard over and over again as we have gone forward with this effort. The regulators do not have the correct data, and in addition, to get the data they need, it will probably require additional legislation.

Now, I spent the bulk of my professional career developing methods and systems to go from data to information and I know that just collecting data is not enough. We have to have the appropriate

analytic tools if we are going to turn that data into the useful information to be able to really monitor and measure systemic risk, and it will not only take more than data collection, it will take more than just building the models itself. In my view, in some sense, it is a fundamental scientific problem, that we have to put forward fundamental research efforts in order to be able to understand the frameworks, be able to frame the metrics, be able to get the models in place and then know what data we need.

In some sense, I echo the finding that came from the National Academy of Sciences workshop which was that we really don't actually know all the data and we are not going to know until we have an iterative process, which is the fundamental part of the research process.

Let me illustrate with an analogy from the weather, which is very appropriate given our last couple of days. This focuses on hurricanes. When the financial crisis of 2008 hit, the regulators and policymakers charged with keeping our financial system safe were taken by surprise. Although there were some indications of uncertainty, this financial storm hit with the same unexpected suddenness as the New England Hurricane of 1938. The Martha's Vineyard Gazette noted at that time, this tragedy was not the loss of nearly 10,000 homes and businesses along that shore. It was the psychic destruction of summer for an entire generation.

Earlier hurricanes had brought structural responses from the U.S. Government. The Weather Bureau was formed in 1870 under President Ulysses S. Grant with a mandate to gather data on the weather and provide warnings of approaching storms. Even though the Weather Bureau was in place, it was not able to offer any warnings for the Category 4 hurricane that hit Galveston, Texas, September 8, 1900, and it only offered a few hours of warning for the hurricane that hit Miami September 18, 1929.

By 1938, the Weather Bureau had better models, it had better data, but as the New York Times observed regarding that hurricane, the Weather Bureau experts and the general public never saw it coming. I would ask, are our regulators and policymakers any better equipped today than the Weather Bureau of 1938?

In 1970, President Richard Nixon created the National Oceanic and Atmospheric Administration, NOAA, with the mandate to do three things. One, collect data to document natural variability and support predictive models. Two, to develop new analytic and forecasting tools. And three, to conduct essential long-term research to underlie these models.

Now, NOAA's current real-time data collection and analysis infrastructure is very impressive. It is significant. It continues to bring substantial benefits to our society. But they were made possible mainly through and largely through the research efforts of NOAA.

At this point, I would like to offer an observation and a question. Clearly, I put forward to you that our financial markets are at least as important and as complicated as the weather. If that is the case, why don't we have the equivalent of NOAA for the financial markets?

When it comes to safeguarding our system, our goal should be bold, our expectations realistic, and our dedication to the task sub-

stantial. Although it will take time, the benefits will far outweigh the cost, just as they have done for hurricanes.

This concludes my oral remarks. I would be open to any questions you might have. Thank you.

Senator REED. Thank you very much, Professor.

Professor Engle, please.

**STATEMENT OF ROBERT ENGLE, PROFESSOR OF FINANCE,  
STERN SCHOOL OF BUSINESS, NEW YORK UNIVERSITY**

Mr. ENGLE. Thank you. It is a great pleasure to be here today. I appreciate the invitation from the Committee. Mr. Chairman, Mr. Corker, Mr. Reed, it is a pleasure to be here.

I am here because I recently co-authored a report of the National Research Council that summarized a workshop on Technical Capabilities Needed for the Regulation of Systemic Risk. The Research Council is the operating arm of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine, all chartered by Congress to advise the Government on matters of science and technology. The workshop and its report were sponsored by the Sloan Foundation and were actually in response to a letter from Senator Reed. After I summarize our report, I would like to give you some personal opinions on the National Institute of Finance and the questions that were in the call.

Our 1-day workshop, summarized, came to the following set of conclusions, I think.

First of all, we were all convinced that with better data and better analytical tools, the problems of reducing systemic risk were actually solvable. Research necessary to accomplish this goal is already underway in both academic and regulatory settings, but it is now being carried out with purely market-based data and, therefore, does not have access to the full range of information that would be needed to make these models as accurate as possible.

Additional data collection across asset classes with counterparty, position, collateral, and valuation information would be extremely helpful. Nevertheless, it was clear at the meeting that many participants were unsure exactly how great this—what data would ultimately be needed. There is an important question that keeps coming up: whether the total range of everything that you can think of is required or there is a subset that could be required, and how would you select the subset of data that is really needed.

The first step in this process would be the standardization and classification particularly of the OTC contracts, and this would be, I think, a substantial benefit to the industry as well as to the regulators if this could be accomplished, and it is one of the goals of the NIF.

But even more important, as Allan said just a moment ago, than the data are the models, because data alone will not tell us about risk, it will not tell us about liquidity, it will not tell us about bubbles and other features which are necessary in order to understand the risks that face our financial system. And so the analysis is extremely important as well.

So that concludes my brief summary of the meeting the National Research Council had. The full summary I would ask be attached to the record.

Senator REED. Without objection.

Mr. ENGLE. Now let me say a few other things in my remaining time. Data gathered by supervisory agencies is already being used in attempts to try to calculate and evaluate systemic risk. This data, however, is often available on an as-asked basis. In other words, it does not flow regularly to the agencies. They need to request it from the agencies they supervise, and this gives them only a partial picture, in any case.

There is additional data within clearinghouses that is available to regulators, but, again, regulators cannot get this on a regular basis, and there is difficulty with sharing it across regulators.

The same thing is true of risk reports. Risk reports are reported by financial institutions on a daily basis, but these, of course, discuss the risks of the firm, not the risks of the system, and do not have important kinds of counterparty information that we would really want to us the networks of risks across the system.

So, in summary, regulators do have a substantial amount of information available, but it is not on a systematic basis, and it cannot easily be shared across regulatory agencies.

Let me make just a couple more points on more general topics.

It seems to me there is a question of the independence of the National Institute of Finance. I am a supporter of the proposal for the National Institute of Finance. The idea that it is an independent organization is important because it needs to be insulated from pressures from corporations and from Government. However, this independence could also be achieved if it were housed, I believe, within regulatory agencies who were already independent in that same sense. There could be substantial cost savings from such a location of NIF.

The international effects of this are extremely important, and the location of the National Institute of Finance would necessarily—it would be very important that it be able to collaborate and share data and analytical tools with sister agencies around the globe; otherwise, we only see a partial picture of this financial system.

Then one final comment. The security of the data is extremely important to preserve, but I think—and I think that an ultimate goal would be to make as much of this data in a delayed and aggregated form available to the public as possible. Transparency in financial markets is a great supplement to regulation. It is cheaper, and it may be more effective in many ways than much of the regulation we consider, and so an ultimate goal, I think of the National Institute of Finance would be to disseminate as much of this information as possible, and that would require congressional guidance.

Thank you.

Senator REED. Thank you very much, Professor Engle.

Mr. Horne, please.

**STATEMENT OF STEPHEN C. HORNE, VICE PRESIDENT, MASTER DATA MANAGEMENT AND INTEGRATION SERVICES, DOW JONES & COMPANY**

Mr. HORNE. Thank you. Thank you, Senator Reed, Senator Corker. Thank you this afternoon for spending time with us. My name is Steve Horne. I am Vice President of Master Data Management for Dow Jones, as Senator Reed introduced me earlier. I have spent

over 30 years building very complex databases and transforming highly complicated data into usable information.

I have testified many times over the last year on the impact of the financial meltdown and the need for comprehensive analytic databases designed to capture the appropriate realtime information necessary to prevent waste, fraud, and abuse of the IPSEA Act—and “realtime” I think was discussed earlier—including those of the TARP program to ensure that the American taxpayer’s money is being used as intended.

Legislation that would create such a database has been introduced by Senator Warner—it is S. 910—with a companion bill that has already passed the House, H.R. 1242, by a vote of 421–0. These bills have been strongly endorsed by organizations such as the U.S. Chamber of Commerce, OMB Watch, and the Center for Democracy in Technology.

Using the same basic infrastructure of the database that would be created under the legislation that I have described, we at Dow Jones have identified over 400 leading indicators that, when used together, can identify potential systemic risk within the financial system, but also, I want to add, many other parts of the economy, which expands upon what our esteemed presenters have presented today. And the challenge is to combine this disparate data into a structured database to be able to make informed decisions and judgments about the risks that are inherent to the system.

Systemic breakdowns that impact individual geographic markets in this country are caused by a combination of factors, including unemployment, bankruptcy, foreclosures, commercial real estate failure, and other factors. For example, in Las Vegas, a huge influx of different socioeconomic groups moved into this market in the past 10 years. One of these groups is retirees. And when the financial meltdown occurred, these Americans were mostly living on fixed incomes: savings, retirement investments, and their Social Security. They bought retirement homes either with cash or with mortgages that were smaller than many, but they still incurred new debt. Over the last 3 years, the income from their retirement accounts went negative. They have had to dip into principal as the only way for them to gain cash.

As the foreclosures generally grew around them, the retirees saw the value of their homes decrease in half as well. Those who had mortgages were now upside down, those who did not saw the major investment they had spent a lifetime building dwindle in value.

Now, these senior citizens face a much more difficult situation. With a major portion of their principal gone, they cannot afford to live on their fixed income and now may have to go back to work. In Las Vegas, 16-percent unemployment does not bode well for anybody looking for a job. If they own their home, new mortgages are very difficult to get. Reverse mortgages are not an option because of the reduced availability of these programs. And the combination of these factors shows the market for retirees in Las Vegas is in systemic failure right now. So I am expanding upon the concept of systemic failure to talk about the markets as well as the financial systems that support those markets.

The example of this process is known in statistical terminology as the “Compounding Effects of Multiple Indices.” If we can inte-

grate this data into an actionable database, regulators can quickly implement surgical solutions that will apply the appropriate programs and/or funds to the most serious problems.

The database can be applied for potential systemic failure of the commercial real estate market that has been highlighted by the Congressional Oversight Board report that was issued just 2 days ago. And, in addition, we are currently observing markets in North Carolina and Tennessee that are at risk of systemic failure. If the proposed database were in place, the Government would be in a better position to confirm, quantify, and tackle these problems proactively.

Unfortunately, the data is in disparate systems that cannot talk to each other. The value of the database that is proposed in S. 910 is in its ability to combine and analyze this data to predict and prevent systemic risk. The transformation of this data into actionable information is neither easy nor inexpensive. However, the implementation of the proposed database will save significant taxpayer dollars in three ways: first, through more efficient targeting of resources and serving the areas of greatest need; second, by enabling the Government to ensure that the appropriate actions are taken before systemic failure occurs; and, third, by helping prevent waste, fraud, and abuse of taxpayer's money.

The database proposed should not create additional security concerns. The security methodologies under the IPISA Act and the contractual controls for the use of commercial data are sufficient to protect this information. In addition, language included in H.R. 1242 that passed the House provides for even greater protections for non-public data.

The system being proposed is designed to expand to cover global data. Although some of the data from overseas may not be accessible due to laws of specific countries, other international data is in better shape than our own and can be built into accurate analytic systems because of the early adoption of XBRL technology by many countries.

In summary, the data and technology exist today to equip financial regulators with the tools necessary to monitor systemic risk. The only thing lacking is Government action to make it happen.

I want to thank you again, Senator Reed and Senator Corker, for your time and attention, and I am happy to answer any questions you may have.

Senator REED. Thank you very much, Mr. Horne. Thank you all, gentlemen, for excellent testimony, and let me begin with the comments you made, Dr. Mendelowitz.

It is very difficult to review objectively your own decisions and actions. I think that is a very strong rule in every type of human endeavor, and particularly in these endeavors. And that argues, I think, strenuously for some type of independent agency. You can also factor in that there are particular cultures in agencies that obscure—illuminate and obscure analysis of data.

Again, I wonder if you might comment on this issue of independence, and I would ask all you gentlemen to do so. Could you please turn your microphone on?

Mr. MENDELOWITZ. Yes. I have got it. I am a little rusty on this. It has been a while since I have been in this hearing room as a witness.

Senator, you have highlighted—there are handfuls of critical things associated with the NIF proposal, and independence is one of those absolutely essential ones. If someone has the control over the purse of the NIF, they are not independent. If the NIF were to have to investigate its own actions, it certainly could not be unbiased. And so we feel very strongly that this is absolutely an essential component, and no matter how and where the institute is placed or structured, unless it has those absolutely essential independent safeguards, it cannot be effective.

It is one of the reasons why we proposed that the Director of the NIF be a Presidential appointee, Senate confirmation, with a fixed term so that he or she would not serve at the pleasure of the President.

And it is interesting because not only is this independence critical with respect to backward-looking on past decisions, it is actually also critical sort of going forward. One of the reasons why our proposal includes the fact that the NIF would not have any regulatory authority, except to set data standards and compel the provision of data, is the fact that if the NIF not only had to do the analysis and then act on the analysis, its ability to report clearly its findings would be compromised.

The example I like to give is a provision in law that I was involved with a number of years ago which requires the Treasury Department to make an annual report to the Congress on foreign countries that manipulate their exchange rates for trade advantage. Now, those of us who at one time or another have followed this issue know that over the years a number of different countries have clearly manipulated their currencies for trade advantage. There is ample evidence. The most obvious example currently is the value of the Chinese RMB. And despite all the evidence that has been there, I do not believe the Treasury Department has ever been able to conclude in a report to Congress that any country was manipulating its exchange rate for foreign currency advantage.

With the case of systemic regulation, I have to say that if a systemic regulator took the data and analysis and used it correctly and acted appropriately, that regulator would only be subject to criticism, because if he is successful, if she is successful, we would never see the next systemic event because it would have been prevented. But the actions of the regulator definitely will have taken some profits away from someone and slowed down the good times.

If a systemic regulator—if the NIF had regulatory responsibilities, they would reach conclusions, the time would come to present the conclusions publicly, and I could just hear the sort of wheels turning in the minds of the Director, and he or she might say, “Gee, I do not know. If we release this, I act on it, I am going to get a lot of criticism. Let us wait a little while and see what happens.”

So the answer is whether you are looking backward, whether you are looking forward, whether you are looking at budget issues, whether you are looking at the position of the Director of the insti-

tute, this issue of independence is central and critical to the ability of the institute to do its job.

Senator REED. Thank you. Your comments sort of—there is a relationship with CBO that has a degree of independence from us that sometimes we appreciate and sometimes we disparage.

[Laughter.]

Senator REED. But I believe that Director is appointed for a term of 5 years.

Mr. MENDELOWITZ. Five years.

Senator REED. And serves independent of us. They have proven that the last few months rather aggressively.

I wonder if anyone else has a comment on independence. Professor?

Mr. LIECHTY. I would be happy to. I will echo what Allan has said, what Dr. Mendelowitz has said, about in the importance in terms of political pressures that the institute is able to act in a way that it feels is in the best interest for the country. I have five reasons for being here: Joseph, Jacob, Sam, Matt, and Tom, my five boys. I want them to have a safe, secure financial system that gives them the same opportunity as I had when they grow up and get into the real world and start providing for a family.

I think you need to have somebody who has the ability to speak the truth in the middle of a crisis or in the buildup to a crisis and can have the protection. There are really two roles that you think about in terms of systemic regulation. One is advisory, seeing and understanding the risks, and then speaking about them. The second one is the actual regulatory implementation, the different actions you might take in terms of how capital requirements—or how the institutions themselves are regulated. And I think it is very important to separate those two, and making the National Institute of Finance independent would do that.

A second point that you want to consider in terms of why you want to keep the National Institute of Finance independent and why you want to also have somebody of high stature involved who is a Presidential appointee, who is going to be able to serve not at the will of the President but for a fixed term, is that if there is a crisis, again, that does happen and the National Institute of Finance is in place, all eyes will turn to the National Institute of Finance. And it needs to have absolute credibility. It needs in some sense to be like the National Oceanic and Atmospheric Administration. When it speaks, it is not speaking because it has some political agenda or because it has to worry about whether its budget is going to be cut or not cut. It is speaking because it is trying to serve the best interests of the Nation.

Senator REED. I want to invite the other panelists to comment also, but one other factor that I think strikes me is that it goes to your point about surprise, and I thought the analogy with the hurricane of 1938 was—I will borrow it. It seems very compelling. But part of this was this was never seriously discussed at a national level—“this” meaning the growing housing bubble, the national characteristics of it, the growing derivatives trade from a notional value of X to 200X. And as a result, it sort of got lost in the shuffle, and I think one of the purposes of having an agency like this is to get critical topics on the agenda of Congress and the regulators.

Then it is our responsibility. But if you do not have an authoritative institution supported by data doing that, then the problem I think you will have is that the next time it will be something different. It will not be a housing bubble and subprime mortgages. It will be something we are not even thinking about, and it will come up. Regulators will talk about it. I am sure the Fed debated internally about the housing bubble. I am sure that the OCC and everybody did. But it never broke through because there was no one tasked with saying this is a serious systemic risk or should be considered at least at this juncture as such. So that is my two bits on the point.

Dr. Engle, please, and then Mr. Horne.

Mr. ENGLE. Well, I was just going to say I think an independent NIF would be very effective, but I think it could also be effective if it is within a systemic regulator, housed within a systemic regulator, because a systemic regulator has exactly the same target, has the same goals that you have both phrased, and it would, therefore, give more of a tool for understanding which data series need to be examined, which institutions can be ignored for the moment and would have to be studied later. Without having that being decided by the NIF itself, who would not—since it is responding to multiple regulatory inputs but no authority, would not actually be able to coordinate those decisions.

Senator REED. Thank you.

Dr. Horne?

Mr. HORNE. Thank you, Senator.

Senator REED. Go ahead.

Mr. HORNE. I appreciate it. Well, I think the words come to my mind, and it is probably words you have been hearing often over the past few months in particular, and those are the words “moral dilemma.” And I think this is what it is all about, and, again, my esteemed panelists here have brought up the concept of what I think is a moral dilemma.

You know, if you are inside of an agency whose job is both to support the financial markets in terms of being directly involved in assisting them in growing and expanding and at the same time regulate them, there is a moral dilemma. If you are inside of an institution whose goal is to make as much profit as possible and at the same time you want to stick within regulatory bounds, you have a moral dilemma.

So the issue that we have—and I can only speak for my company—is our goal is if we do not get the data right, we are dead in the water because people will stop buying our data. So our moral dilemma is getting the facts correct, and there is no dilemma. We either get it right or we get it wrong. And if we get it wrong, we are not in business very long.

So part of the issue that I have is that I do believe that there is a need for an independent agency inside of the Government to deal with these issues without having to face the moral dilemma. I believe that there are issues that have to be faced by Congress, and it is going to take a little while for that to gel and come together. In the meanwhile, I do not think you can go and continue moving forward with the state of the economy as it is and the current what I call systemic bubbles that are occurring all across the

country to continue to occur without having the information necessary to at least in the short term provide information above where you currently are today. And you are in very many cases at a point of stone chisels and knives, I might say, from a data standpoint, turning it into information in comparison to where the commercial market is and the commercial sector is in terms of managing their own information, although I have to say many of these companies, as was mentioned earlier, that I know of personally—because I worked with them in building some of these systems or trying to build some of these systems—are now all of a sudden spending hundreds of million dollars revamping their own internal risk management and analytic systems, including probably all of the top 20 banking and investment firm organizations, have incredible plans moving forward for building their own infrastructures, which in the long run the Government actions relative to what should be done in terms of capturing this data will probably improve their capabilities and, therefore, improve the trade of information and exchange between the two parties.

But, again, I think you have a long-run situation where you need to get away from the moral dilemma. I think you have a short-run situation which is you have got to get the information in the hands of the people who can do something about it sooner rather than later, because there are other bubbles on the horizon that could pop, and unless you know that they are happening, unless you understand them, unless you address them, and unless you spend less money than just throwing it at the whole market, you spend it at the appropriate places, you are going to have greater pushback from the taxpayer in terms of being able to have the tools in your possession to be able to do the things that you want to do.

Senator REED. Thank you. Senator Corker.

Senator CORKER. Thank you, Mr. Chairman, and I thank each of you for outstanding testimony. There is something very appealing about the presentation which is—and we thank you for spending so much time in our personal office talking about it. I know Senator Reed feels the same way, I am sure. And then there is a piece of it that is almost kind of an eerie feeling. On the other hand, it is sort of the chaos of the market system and the companies you are talking about, Mr. Horne, investing that money to figure out ways of getting a tenth—just a little tenth of a point off, and they are taking advantage of anomalies that exist to make money, and I mean that in a positive way, OK? And then, on the other hand, we are talking about Professor Liechty creating models, if you will. You talk a little bit about NOAA, and NOAA is an interesting analogy except that NOAA is sort of talking about what is going to happen with the weather, and there is nothing you can do about it. I mean, it is just going to happen.

On the other hand, you are talking about setting up models to keep anomalies or huge systemic risk occurrences from happening, and I guess how do you, when you are designing these models, keep yourself from sort of interfering from this chaos that can be positive or actually sort of creating self-fulfilling prophecies in some ways by virtue of the modeling that you set up?

Mr. LIECHTY. That is an excellent question. It really is, because it comes to the heart of—this analogy does break down when you

start thinking about the financial system because it is not a bunch of pressure systems and equations that you can model. It is just much more complicated than that. It is a game, really, is what you are thinking about, a very large-scale game.

And I think if you borrow from the general scientific tradition, the first thing that you try to do in science is understand and explain. The second thing you try to do is predict. And then, finally, you see if you can have any level of control. It is kind of this progressive improvement that happens in your ability to gain scientific knowledge and understanding about a system.

I am not sure how far we can go in terms of that path. I really—I am not certain because we haven't gone down that path in the research sense. But I think there are a lot of things you can borrow because it is a game, and if we begin to study it from a number of different perspectives and build a competing set of models.

I want to just kind of echo what Governor Tarullo said and what Professor Engle said, is that you really do want—even to have this independent, you do want to have multiple people contributing to it. You can take, for example, kind of the hurricane modeling approach. There is not one model that is used to model hurricanes. When they start looking at hurricanes, they use a collection of competing models that then give them a multiple set of perspectives about how that hurricane is approaching and the impact.

Now, would we potentially impact—I mean, would the National Institute of Finance or a systemic regulator potentially impact the path of the economy if they interceded in certain ways? That is a very hard question for me to answer. I am not sure. But I do believe that we can start to find answers to those kind of questions if we set up this kind of analysis. And we can at least, if we do no more than we do with the weather and begin to understand when there are really serious risks, when we learn how to potentially prepare ourselves better for those type of events that are occurring, then I think we will have made important progress in this arena.

Senator CORKER. If you are setting up models, though, to try to ensure that a systemic risk does not occur and information is being made public, do you not automatically in some ways affect the economy or affect at least financial markets? I mean, how can you not do that if that information is being made public? It seems that is self-evident that that is going to occur.

Mr. LIECHTY. Well, I think that for the large—when people approach the financial markets, they typically approach from the statistical perspective. Even though it is a whole bunch of individual agents interacting with each other, it is too complicated typically to really model effectively. There are some folks at Los Alamos and there is a really big simulation study over in Tokyo. I know there are IBMs involved with where they are trying to do Asian-based modeling. But typically, you have to sit back and look at aggregate summaries and model it from that perspective.

Now, we have a lot of information that is already about the financial markets that is widely disseminated and we would be talking about adding additional information on top of that.

I think where you start to begin to have problems or people begin to influence is if you have people all doing the same type of behav-

iors, so lots of people are making mortgage-backed securities and securitizing them and selling them off to pension fund, and there are lots of similar behaviors happening and then a shock comes through and everybody has to respond in a similar fashion. Then, in some sense, the model collapses down to a much simpler system because everyone is forced into a corner in the way they are going to have to behave.

For the most part, I think giving more information and trying to model it is not going to have an impact, because I don't know that anybody is going to really have the ability to nudge the system one way or another. But what you hope you will find is when the system gets to a point where there, in essence, are bubbles that could be collapsing and what might trigger those bubbles, how you respond to that is going to be very carefully thought about, and is going to have to be very carefully thought about by the systemic regulator and the other regulators when they have that information. Do they want to talk to banks quietly? Do they want to make a public announcement? These are things that you are going to have to think very carefully about, and I am not prepared to lay the guidelines out right now.

Senator CORKER. So you are not really thinking about creating a world full of elevator music or anything. We would still have some degree of chaos in the marketplace.

Mr. LIECHTY. Yes, sir. It would be very complicated.

Senator CORKER. OK. Professor Engle, it sounds like you want to respond to this, and you are welcome to do that, but you also mentioned about making information available. Just for laymen like myself that obviously are at a whole different level as far as mathematic modeling and all that, what would be—for other Senators who might be tuned in, staffs or whatever—what would be the first three pieces of public information you think that might come out of an institute like this that would be helpful for people to know?

Mr. ENGLE. Well, I think what I was going to say before is also related to this. The systemic regulator is going to have to use the incentives in the marketplace to achieve his goals. He is not going to be able to just legislate one thing or another, and our use of capital standards, capital controls, are ways of trying to nudge the institutions to take less risk or change their behavior in one way or another. Systemic taxes are very much designed to encourage institutions who have systemic risk to avoid the taxes by shedding the systemic risk if you can define and devise the systemic tax in exactly that way.

The reason I think that making data public is useful is quite easily seen in the OTC derivatives market, where every time you enter a contract, you have a counterparty. And this counterparty has a risk that they will not perform. If the derivative turns out to have the value you want it to, then your counterparty may not perform.

So we have to consider there being these extra risks, and it is very hard to assess the risk that your counterparty is going to be there if you don't know very much about what the counterparty is doing. So if we had more information on the health of counterparties, in other words, how much exposure they had to these same kinds of contracts, then the prices of the same deal with two dif-

ferent counterparties might not be the same. There would be a risk premium and you could decide whether you wanted to take the weak counterparty or the strong counterparty and you would get a different price in those contracts.

That way, you would understand what risks you were taking and the weak counterparties would not be able to amass big positions. The poster child for this example is AIG, who, of course, wrote lots of credit default swaps but didn't have enough capital behind it, and investment bankers and final users bought a great deal of these contracts and insurance products without recognizing that actually they should have gotten a big discount on getting them because they weren't really so likely to pay off because AIG had such a big position.

So if you could make public information on a basis which said, for each counterparty, how exposed is this counterparty—how many positions does this counterparty have maybe a week ago on these kinds of contracts? This would give the market a way of evaluating the risk that they were taking with each counterparty. I think it would also encourage trades to move toward exchanges or centralized counterparty where you might not have to produce this information.

So I think that the transparency has a dual role in this case. It would encourage the migration of products to centralized clearing, which is something that we think would reduce systemic risk, and it would allow investors to understand the risks and price the risks they are taking better and thereby both of these would reduce systemic risk.

Senator CORKER. Professor Liechty, I have two more questions.

Senator REED. Go right ahead.

Senator CORKER. Professor Liechty, how long would it take—you know, we talked a little bit about this in the office, but let us say something like this became law in the summer of 2010. How long would it take before an entity like this was at least providing some of the basic information, not data, but information that would be useful to someone who is looking at systemic risk or other prudential regulators?

Mr. LIECHTY. Sure. I am not an expert in this, but I have spoken to a number of folks who built up large institutions and teams of this nature. It does speak to the fact that you really want this institution to be an institution of very high stature. You want very high-quality individuals in this. To the extent you can build a world-class institution, it works in favor, I think, of all of us in the economy.

The way you would start out, of course, is you would take existing data that is in the marketplace that you can find, pull together many of the ways that Steve is talking about, and augment that potentially with other types of reports you could require from the banks that would be fairly straightforward. I believe within 18 months to 2 years, you would be able to put together some preliminary, rudimentary maps of the entire system. You would be able to start seeing things like aggregation, some of the really simple low-hanging fruit. Everybody is heading in the same way in a trade, or someone has got outstanding positions that are really too large for that institution, like the AIG example.

You would then, I believe, move yourself toward integrating counterparty information that is in the repositories, DTCC and the other clearinghouses, and I would see this being multi-stage, multi-year. So you would have a focus initially as to what can you get from the existing data and what science do we need and models do we need to build from that. You might be able to borrow from existing models and augment those. And then you will have another path, in my view, that would be doing longer-term, more sustained research.

I would imagine that it would probably take somewhere, 6 to 8 years, in that timeframe, to see yourself walk all the way up to the full vision that we would see with a National Institute of Finance where you have a very fine-grained view of the entire counterparty network and be able to do large-scale simulations to understand how different types of shocks to the economy might work through that network and where the critical points of that network are and how they might have cascading failures or where you might see liquidity crises occur.

But I would envision within 8, potentially 10 years, you would see a fully functioning institute, and certainly along the line you would see some very valuable information come out within shorter timeframes.

Senator CORKER. Thank you very much, and go ahead, Mr. Horne.

Mr. HORNE. Yes, Senator, if I may add, I think the difference between what we are talking about here is mostly the fact that the NIF, I think—and again, this is my opinion, I am not going to speak on their behalf—but they are really talking about building a very structured approach toward managing risk, standing back and building models that can take all different sorts of views and all sorts of different looks at this problem and over periods of time be able to ascertain how to best approach these problems from an academic and regulatory approach.

What we are trying to do, which is a little different, in the short-term and hopefully becomes a foundation or platform for what eventually the NIF is trying to do, and I don't know if the two pieces will ultimately fit together, but I do believe that we are extensible where that is a possibility, is that the data that is available right now today is capable of being integrated into a platform where regulators can start looking at the governance rules that are in place today and start figuring out, just as compensation analysts do, just as people who have to deal with the same problems.

If you think about a compensation analyst inside of a large corporation, you have a huge sales force that is saying, OK, I am going to try to break every rule I possibly can so I can make the most money I possibly can, and I am not concerned about profit because it is not built into my compensation. Well, some portion of their compensation ends up having profit built into it. Then they say, well, wait a minute. I am not responsible for all the mechanisms that drive my product, so therefore maybe I shouldn't be responsible for profit. So you start getting into all these different types of analogies of how you should compensate people and how you should incent people to move forward.

Well, the same issue is true in the financial markets. This moral dilemma that I brought up earlier is the same problem. You brought up the issue to Professor Engle about the fact, well, couldn't you—or to Professor Liechty—couldn't you actually influence what these markets do? And what I am thinking is it would be better to use the nearer-term, the shorter-term data that we are talking about now to try to help with some of the governance and regulatory rules to get people on the same path and same direction, and possibly those are things looking at specific pieces of law today that, you know, may be in conflict with systemic risk.

The uptick law, for example, and I don't know how familiar you all are, but with shorting issues out there, you know, that could be a major driver of systemic risk. As a weighted value in a model, if you were to take that out and put that in, you may find that right off the bat, there is a factor there that maybe should be re-considered relative to law.

And what I am saying is from a governance perspective, if you have the information in the short-term to be able to do some of these things, then these models become incredibly valuable over time because they start really showing the dynamics and the inter-connections and all the points of potential failure that can exist within the market.

But in the near term, you have got to use some of the information that can be converted out of the data to figure out how to manage. And I am not talking about big government. I am not a big believer in big government. I am a believer in better government and better governance. And what I believe we have got right now is a lot of broad-stroke rules that don't allow for the surgical precision of attacking the problems where they exist. And with this information, you would have the ability to do so, and that is the difference between what we have today and what we could have.

And by going through this process of cutting out certain things that make no sense whatsoever and maybe putting some governance back into the process, we could be on the same page so that the institutions and the government and the taxpayer are not facing the moral dilemma with each other.

Senator CORKER. I noticed Professor Mendelowitz.

Mr. MENDELOWITZ. Thank you. I really would like to go back to one of the issues you raised a few minutes back about interfering in the market. We rely on markets, in this case financial markets, to allocate capital because they do it efficiently, and we know from history when other societies have tried to rely on command and control systems to do those kind of functions, they failed miserably.

But for financial markets or any other kind of market to do its job, which is to allocate scarce resources efficiently, there have to be a number of conditions met that make it possible for the markets to do that, and as you well know, if they are not present, the markets can't.

The challenge in financial markets is that it is clear, and this recent crisis is the most glaring example of it, financial markets are prone to the financial equivalent of sudden cardiac arrest, and I would like to take credit for that, but it wasn't my analogy. It was a professor at MIT who came up with it. And that government

intervention was needed to deal with this equivalent of sudden cardiac arrest.

Now, maybe extending the analogy is a bit much, but there was a time when if you suffered sudden cardiac arrest, there wasn't much the medical profession could do for you. Then we moved to a stage where there are some sort of dramatic interventions at the point of a heart attack. Until now we are at the situation where you stave off sudden cardiac arrest with long-term care. You take statins to lower cholesterol and vulnerability. You are more careful about what you eat. You exercise, a little bit healthier lifestyle. And you, in effect, are able to reduce the risk of the sudden cardiac arrest.

What we are talking about with what the NIF can contribute is, in fact, the sort of financial market equivalent of a healthier lifestyle, to preserve the efficiencies that you get out of the financial markets.

Senator CORKER. Thank you very much. I know I have gone on for a long time and I am sure you have a number of questions.

Senator REED. I don't. If you have additional questions, Bob, go ahead, please.

Senator CORKER. I have lots of questions. We spent a great deal of time with each of you and I have gotten a chance to know you, and I am sure that Courtney and Michael and Arlene and others will be talking with you over the course of the next week or so.

I would ask, Mr. Horne, you mentioned you were looking at housing in North Carolina and Tennessee. I don't know for what reason. Maybe to purchase, I hope.

[Laughter.]

Senator CORKER. But I wondered if you would tell me why and what you found. I wouldn't be a good Senator from Tennessee if I didn't ask.

Mr. HORNE. Well, I appreciate that, and I am sorry that I didn't put it into the rest of my speech, but I thought just putting it out there would bring a question about it.

We look at leading indicators, and part of the issue that we have is that we have to look at these leading indicators today manually because they are in separate pieces of—or separate systems. So we look at the housing systems that we have access to and we have virtually every parcel of land in the country identified. And we know those that are in foreclosure. We know those that are underwater relative to the mortgages. And we understand those that are delinquent on their mortgage payments.

One of the key ratios in North Carolina and Tennessee that are leading indicators to us is the 90-day delinquency rate on mortgage payments. Relative to the peers—although across the country, if you look at the chart, States like Nevada, Arizona, Florida have huge market viability from a—or market problems, market viability issues from being upside down in their mortgages. In Nevada, for example, seven out of ten homes are in negative value relative to the mortgages that exist for those properties.

In Tennessee and in North Carolina, you are right around the national average. You are about 33 percent of the homes in your State and in North Carolina are right around the national average. But relative to your peers, the 90-day delinquency rate over the

last 3 months has increased dramatically, OK. So that shows me that there is a leading indicator out there that says that people are not able to pay their mortgages. So I start with that one.

Then I look at plant closings and failures and shifts in unemployment. Now, it doesn't mean the unemployment rolls immediately go up, but it shows me as a leading indicator that there is going to be a possibility that the unemployment rolls are going to go up. So I start looking at that as a leading indicator to unemployment.

Then I look at bankruptcy and I start looking in the retail sector, in particular. And I think you heard from the Congressional Oversight Panel, or at least if you were able to read any of the report, that commercial failure particularly in the retail sector is up, and that is also a leading indicator of the potential of people not having available cash because they are either temporarily or potentially for long-term unemployed and therefore start becoming delinquent on bills such as their mortgages.

We don't have the database built yet, so I can't just run a model and 20 seconds later come up with every county or every Congressional district in the State of Tennessee and tell you exactly what the combination of those factors in that model would tell us in terms of the potential for systemic risk or failure of any of those given markets. But I can tell you from leading indicators that these are pieces of information that are telling me that there are potentials for problems out there, and particularly the 90-day delinquency risk factor, which is one of the ones that we weight relatively heavily relative to some of the other factors, is a leading indicator that is telling us people are having a difficult time paying their bills.

And so that is why I bring that up and that is why I say in those two States, because relative to other States who are in the same range of being underwater on their properties, don't have the same delinquency rate problems that those two States are currently facing.

Senator CORKER. Well, thank you. I almost wish I didn't ask, but thank you.

[Laughter.]

Mr. HORNE. I am sorry.

Senator CORKER. I will say this, though. That example, I think, Senator Reed—first of all, I want to thank you again for your leadership on this and trying to figure out a solution on the derivatives side. I think, though, that answer, irrespective of the not-good news that is relayed there, is an indication of some of the kinds of data that one might generate and could, in fact, be useful, even though I know you are looking at different types of financial instruments. I appreciate that explanation and I thank you so much for your generosity of time, Senator.

Senator REED. Certainly, Senator. Thank you for your leadership on this and so many other issues involved in banking and other challenges facing the country.

I don't want to ask any more questions about specific localities, Mr. Horne.

[Laughter.]

Senator REED. I don't mean to be disrespectful, but given your access to all this data, when did you and your colleagues first get the sense that there was a national housing problem?

Mr. HORNE. I have known that there has been a national housing problem since the first time that our partners—we have over 900 data partners that we work with. One of our largest data partners is First American CoreLogic, which is the largest collector of deed, tax, and mortgage roll property information in the country. So when I started analyzing their data and combining it with Dow Jones information about the individual market segments and the tremendous volumes—I mean, we collect terabytes and terabytes of information—and start looking at the various factors that we call trigger events—these are things that occur that show an action taking place that is either positive or potentially adverse actions—we saw this occurring, frankly, before 2007. We actually saw the bubble before the bubble and could tell some of these things were starting to happen.

The problem, again, is this is macro data. When they roll it up and look at it, they usually look at it within the housing market, within the specific segment of the database that they have, and we haven't brought it together with our unemployment findings, with our bankruptcy findings, with our commercial real estate information to separate it from the residential real estate information. And this disaggregation of information in these individual silos prevent us from being able to do, except through very extensive manual efforts, the ability to bring this data together in a way so we actually can build real models on the symbiosis, the systemic issues that are occurring between all these different factors in the marketplace.

The systemic issues that occur within an institution and institutions, which I think we are talking about here, between the majors, the Citicorps, the JPMorgans, the AIGs, are extensive and we understand that they are very complex and the counterparty risks there are very difficult to track, particularly if you don't have access to all of the other pieces of information.

Now, we have large amounts of information regarding derivative data, regarding all sorts of different kinds of financial instruments, but it is only segments of the market. We don't have all of it because not all of it is available, even in public or private data. So part of the issue here is the investment that needs to be done to actually build the database.

Senator REED. Well, I don't—we have taken a great deal of your time and it has been extremely valuable, so thank you. But I don't sense there is a mutually exclusive sort of agenda here. I think we are talking about the same thing, which is building in the short term an information gathering and an analytical capability that will help us, but in the longer term, getting to the point where it is just not prediction, there might be even some treatment involved, which is the point you made.

Dr. Mendelowitz, a final point.

Mr. MENDELOWITZ. Yes, Senator. This discussion about the housing bubble, I think, gives us an insight into what the need for the NIF is. While Steve said back in 2007 he saw it, those of you—but basically 5 years ago, I started predicting a major credit event in

the housing sector that was going to push the economy into the worst recession since the Second World War, and it was really just based upon looking at relatively small data sets that went to what was happening to housing prices, what was happening to household income, and what was happening on the delinquency and default rate on mortgages, all of which was readily available data.

So it was easy to predict a major credit event in housing and it was easy to predict, because of the widespread nature of home ownership, that this was going to lead to a recession that was going to be driven by falling consumption. That was the easy piece of it.

Now we are saying the fact the Fed didn't see it, because they were using the standard monetarist model, and if you can't see something with the monetarist model, you don't see it.

But what I didn't see and couldn't see and couldn't understand was how what was happening in the housing sector was going to lead to the collapse in the financial sector. And it is the kind of data that we are talking about the NIF collecting that would provide that insight, and there is no substitute for that. There is no alternative. There is no shortcut. Because at the end of the day, you have to know where the concentrations of risks are and you have to know what the nature of the intertwined network of financial firms and their obligations are, because it is the combination of concentrations of risk and the exposure of the network that can produce a domino effect of multiple failures that creates a systemic risk.

And so it is one thing to see a macroeconomic crisis tied to something like housing. It is something entirely different—the data needs are entirely different when it comes to understanding the systemic risk that flows from those concentrations of risk.

Senator REED. I want to thank you all for excellent testimony, thought provoking, and also for your advancing this issue. I think we leave here with, one, we need better data. We need better analysis. And if we don't achieve it in the next several months, the bubbles that might be out there percolating, if that is the right term, will once again catch us by surprise and we shouldn't let that happen. But thank you all very, very much. Thank you.

Mr. MENDELOWITZ. Thank you.

Mr. HORNE. Thank you, Senator.

Senator REED. The hearing is adjourned.

[Whereupon, at 4:33 p.m., the hearing was adjourned.]

**PREPARED STATEMENT OF CHAIRMAN EVAN BAYH****Pre-Opening Remarks**

Good morning. I am pleased to call to order this Subcommittee for a hearing entitled "Equipping Financial Regulators with the Tools Necessary to Monitor Systemic Risk." I want to thank the Ranking Member, Senator Corker, and his staff, for requesting this hearing on an issue that may seem technical to some, but will prove critical as we work to reform and modernize our regulatory structure for the future.

I would also like to welcome and thank Senator Jack Reed. He has been instrumental on the technical and analytic aspects of systemic risk regulation, specifically on the proposal of a National Institute of Finance. I am happy to continue the dialog he has already begun on how we equip our regulators to move beyond examining individual institutions and toward monitoring and managing systemic risk across our financial system.

To our witnesses that will appear on two separate panels, welcome and thank you for appearing before the subcommittee to give an outline on regulators' current capabilities to collect and analyze financial market data; and most importantly, what additional resources and capabilities are necessary to provide effective systemic risk regulation. I understand that the weather in Washington the last few days has not been ideal, so I appreciate the dedication you have all show in making it here today.

Before we turn to Governor Tarullo, I would like to make a few remarks on why this issue is essential to the safety and soundness of our financial system moving forward.

**Opening Statement**

Over a year ago, our country experienced a financial crisis that exposed the complexity and interconnectedness of our financial system and markets. The globalization of financial services and the increasing size and intricacy of major market players enabled the buildup and transferring of risk that was not fully recognized or understood by our regulators, or, in some cases, by the institutions themselves. These vulnerabilities made it clear to policymakers here in Washington that our financial system, as whole, needs its own overseer. As a result, systemic risk regulation has become a central part of our efforts to modernize our financial regulatory system.

Creating a new regulatory structure to monitor systemic risk is no easy task. My colleagues here in the Banking Committee, including Chairman Dodd, Senators Corker, Reed and Warner have been working diligently to determine what tools and technical capabilities may be necessary for the regulation of systemic financial risk. To that end, the National Research Council held a workshop in November at the request of Senator Reed to identify the major technical challenges to building that capacity. While it is clear that our regulatory system currently lacks the technical resources to monitor and manage risk with sufficient sophistication and comprehensiveness, we should figure out what capabilities our regulators currently have. That involves assessing what data and analytical tools are currently available to regulators to collect real-time, consistent market data. We have Governor Tarullo here to discuss what data and analytical methodologies prudential regulators currently have in place to see real-time financial market data and how our current financial regulators collaborate in aggregating and analyzing data.

Next, we can focus on the biggest challenge of this exercise—determining what further capabilities are necessary, as well as identifying the barriers and challenges to meeting the goals of systemic risk regulation. This involves much more than aggregating information, but making sure we are filling the information gaps, asking the right questions, and putting that information into the broader context of the risk dynamics in the system. Currently, risk analysis has developed solely to manage firm-specific risks. That approach needs to evolve beyond the individual institution, and work to include the complex interaction and linkages amongst the system to assemble a holistic perspective.

In debating the capabilities needed, the next obvious question centers on developing the right infrastructure for the enhanced data aggregation, mathematical modeling and all the other issues that go into systemic risk regulation.

An idea that has the support of six Nobel Laureates, including Professor Engle who is on our second panel this afternoon, is the creation of a National Institute of Finance. Supported by the Committee to Establish the National Institute of Finance, this proposal urges the creation of an independent institute to collect and standardize the reporting of financial market data, as well as develop tools for measuring and monitoring systemic risk. On February 4th, my colleague Senator Reed introduced legislation to create such an institute. We have some of the found-

ers of that Committee with us today to outline what they envision in the creation of an independent NIF.

I am also open to other ideas, including whether or not a separate additional agency is necessary or if these new technical capabilities can be housed in an existing independent Federal agency, such as the Federal Reserve. I look forward to hearing our witnesses' perspective on this issue, as well.

Lastly, in a discussion on systemic risk and data aggregation, we would be remiss to ignore the international implications to our domestic systemic risk regulation. As I've said before, we live in an interconnected global economy, and as we've seen, that means interconnected global problems. Vulnerabilities and gaps in financial markets abroad, can impact us here at home. A key element of this discussion should focus on how we encourage global financial market reporting, aggregating and analytic capabilities, as well as identifying any legal or legislative barriers to international data sharing.

Ultimately, all of us here know our country cannot afford another financial crisis that will have a devastating impact on household wealth, unemployment and our economy, at large. While seemingly technical in nature, these issues are critical to our national interest and necessary to strengthen and provide credibility to our financial system. I look forward to working with my colleagues to ensure these issues are addressed in our comprehensive regulatory reform bill.

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### PREPARED STATEMENT OF DANIEL K. TARULLO

MEMBER, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

FEBRUARY 12, 2010

Chairman Bayh, Ranking Member Corker, and other members of the Committee, thank you for inviting me to testify today. I also want to thank all of you for taking the time to explore a subject that is easily overlooked in the public debate around financial reform, but that will be central to ensuring a more stable financial system in the future.

The recent financial crisis revealed important gaps in data collection and systematic analysis of institutions and markets. Remedies to fill those gaps are critical for monitoring systemic risk and for enhanced supervision of systemically important financial institutions, which are in turn necessary to decrease the chances of such a serious crisis occurring in the future. The Federal Reserve believes that the goals of agency action and legislative change should be (1) to ensure that supervisory agencies have access to high-quality and timely data that are organized and standardized so as to enhance their regulatory missions, and (2) to make such data available in appropriately usable form to other government agencies and private analysts so that they can conduct their own analyses and raise their own concerns about financial trends and developments.

In my testimony this morning I will first review the data collection and analysis activities of the Federal Reserve that are relevant to systemic risk monitoring and explain why we believe additional data should be collected by regulatory authorities with responsibility for financial stability. Next I will set forth some principles that we believe should guide efforts to achieve the two goals I have just noted. Finally, I will describe current impediments to these goals and suggest some factors for the Congress to consider as it evaluates potential legislation to improve the monitoring and containment of systemic risk.

#### **The Federal Reserve and Macro-Prudential Supervision**

The Federal Reserve has considerable experience in data collection and reporting in connection with its regulation and supervision of financial institutions, monetary policy deliberations, and lender-of-last-resort responsibilities. The Federal Reserve has made large investments in quantitative and qualitative analysis of the U.S. economy, financial markets, and financial institutions. The Federal Reserve also has recently initiated some new data collection and analytical efforts as it has responded to the crisis and in anticipation of new financial and economic developments.

For supervision of the largest institutions, new quantitative efforts have been started to better measure counterparty credit risk and interconnectedness, market risk sensitivities, and funding and liquidity. The focus of these efforts is not only on risks to individual firms, but also on concentrations of risk that may arise through common exposures or sensitivity to common shocks. For example, additional loan-level data on bank exposures to syndicated corporate loans are now being collected in a systematic manner that will allow for more timely and consistent measurement of individual bank and systemic exposures to these sectors. In addition, detailed data obtained from firms' risk-management systems allow supervisors to ex-

amine concentration risk and interconnectedness. Specifically, supervisors are aggregating, where possible, the banks' largest exposures to other banks, nonbank financial institutions, and corporate borrowers, which could be used to reveal large exposures to individual borrowers that the banks have in common or to assess the credit impact of a failure of a large bank on other large banks. Additional time and experience with these data will allow us to assess the approach's ability to signal adverse events, and together they will be a critical input to designing a more robust and consistent reporting system.

Furthermore, we are collecting data on banks' trading and securitization risk exposures as part of an ongoing, internationally coordinated effort to improve regulatory capital standards in these areas. Moreover, analysis of liquidity risk now incorporates more explicitly the possibility of marketwide shocks to liquidity. This effort also is an example of the importance of context and the need to understand the firms' internal risk models and risk-management systems in designing data collection requirements. Data that only capture a set of positions would not be sufficient since positions would not incorporate behavioral assumptions about firms, based on information about firms' business models and practices.

The Federal Reserve's responsibilities for monetary policy are also relevant for systemic risk monitoring. Systemic risk involves the potential for financial crises to result in substantial adverse effects on economic activity. As the nation's central bank, the Federal Reserve assesses and forecasts the U.S. and global economies using a wide variety of data and analytical tools, some based on specific sectors and others on large-scale models. In the wake of the crisis, research has been expanded to better understand the channels from the financial sector to the real economy. For example, building on lessons from the recent crisis, the Federal Reserve added questions to the Survey of Professional Forecasters to elicit from private-sector forecasters their subjective probabilities of forecasts of key macroeconomic variables, which provides to us, and to the public, better assessments of the likelihood of severe macroeconomic outcomes.

The Federal Reserve has made substantial investments in data and analytical staff for financial market monitoring. Each day, the Trading Desk at the Federal Reserve Bank of New York analyzes and internally distributes reports on market developments, focusing on those markets where prices and volumes are changing rapidly, where news or policy is having a major effect, or where there are special policy concerns. Those analyses begin with quantitative data, supplemented with information obtained through conversations with market participants and reviews of other analyses available in the market. Over the past few years, the Desk has worked closely with our research staff in developing new quantitative tools and new data sources.

This ongoing monitoring requires continual evaluation of new data sources and analytical tools to develop new data as new markets and practices develop. For example, information on market volumes and prices can be collected from new trading platforms and brokers, data on instruments such as credit default swaps, or CDS, are provided by vendors or market participants, and fresh insights are gained from new methods of extracting information from options data. In some cases, publication of data by the private sector may be mandated by legislation (such as, potentially, trade data from over-the-counter derivatives trade repositories); in other cases, the Federal Reserve or other government agencies or regulators require or encourage the gathering and publication of data.

Our experiences with supervision, monetary policy, and financial market monitoring suggest that market data gathering and market oversight responsibilities must continuously inform one another. In addition, efforts to identify stresses in the system are not a matter of running a single model or focusing on a single risk. Rather, it is the assembly of many types of analysis in a systematic fashion. The Supervisory Capital Assessment Program (SCAP) for large financial institutions—popularly known as the “stress test” when it was conducted early last year—illustrates the importance of combining analysis by credit experts, forecasts and scenario design by macroeconomists, and hands-on judgments by supervisors in assessing the financial condition and potential vulnerabilities of large financial institutions.

While considerable steps have been made in the wake of the financial crisis, the Federal Reserve intends to do a good deal more. The Federal Reserve also will continue to strengthen and expand its supervisory capabilities with a macroprudential approach by drawing on its considerable data reporting, gathering, and analytical capabilities across many disciplines. In the areas in which we are collecting data through the supervisory process on measures of interlinkages and common exposures among the largest financial firms we supervise, we are developing new analytical tools that may lead us to change our information requests from supervised firms. The Federal Reserve is exploring how to develop analytically sophisticated

measures of leverage and better measures of maturity transformation from information that we can collect from the supervised firms in the supervisory process and from other available data and analysis. We envision developing a robust set of key indicators of emerging risk concentrations and market stresses that would both supplement existing supervisory techniques and assist in the early identification of early trends that may have systemic significance and bear further inquiry. This kind of approach will require data that are produced more frequently than the often quarterly data gathered in regulatory reports, although not necessarily real-time or intraday, and reported soon after the fact, without the current, often long, reporting lags. These efforts will need to actively seek international cooperation as financial firms increasingly operate globally.

#### **The Potential Benefits of Additional Data**

Improved data are essential for monitoring systemic risk and for implementing a macroprudential approach to supervision. The financial crisis highlighted the existence of interlinkages across financial institutions and between financial institutions and markets. Credit risks were amplified by leverage and the high degree of maturity transformation, especially outside of traditional commercial banking institutions. Moreover, supervision traditionally has tended to focus on the validity of regulated firms' private risk-management systems, which did not easily allow comparisons and aggregation across firms.

One key feature of the recent crisis was the heavy reliance on short-term sources of funds to purchase long-term assets, which led to a poor match between the maturity structure of the firms' assets and liabilities. Such maturity transformation is inherently fragile and leaves institutions and entire markets susceptible to runs. Indeed, a regulatory, supervisory, and insurance framework was created during the Great Depression to counter this problem at depository institutions. However, in recent years a significant amount of maturity transformation took place outside the traditional banking system—in the so-called shadow banking system—through the use of commercial paper, repurchase agreements, and other instruments. Our ability to monitor the size and extent of maturity transformation has been hampered by the lack of high-quality and consistent data on these activities. Better data on the sources and uses of maturity transformation outside of supervised banking organizations would greatly aid macroprudential supervision and systemic risk regulation.

Another feature of the recent crisis was the extensive use of leverage, often in conjunction with maturity transformation. The consequences of this combination were dramatic. When doubts arose about the quality of the assets on shadow banking system balance sheets, a classic adverse feedback loop ensued in which lenders were increasingly unwilling to roll over the short-term debt that was used as funding. Liquidity-constrained institutions were forced to sell assets at increasingly distressed prices, which accelerated margin calls for leveraged actors and amplified mark-to-market losses for all holders of the assets, including regulated firms. Here, too, government regulators and supervisors had insufficient data to determine the degree and location of leverage in the financial system.

More generally, the crisis revealed that regulators, supervisors, and market participants could not fully measure the extent to which financial institutions and markets were linked. A critical lesson from this crisis is that supervisors and investors need to be able to more quickly evaluate the potential effects, for example, of the possible failure of a specific institution on other large firms through counterparty credit channels; financial markets; payment, clearing, and settlement arrangements; and reliance on common sources of short-term funding.

A better system of data collection and aggregation would have manifold benefits, particularly if the data are shared appropriately among financial regulators and with a systemic risk council if one is created. It would enable regulators and a council to assess and compare risks across firms, markets, and products. It would improve risk management by firms themselves by requiring standardized and efficient collection of relevant financial information. It also would enhance the ability of the government to wind down systemically important firms in a prompt and orderly fashion by providing policymakers a clearer view of the potential impacts of different resolution options on the broader financial system.

Additional benefits would result from making data public to the degree consistent with protecting firm-specific proprietary and supervisory information. Investors and analysts would have a more complete picture of individual firms' strengths and vulnerabilities, thereby contributing to better market discipline. Other government agencies, academics, and additional interested parties would be able to conduct their own analyses of financial system developments and identify possible emerging stresses and risks in financial markets.

One area in which better information is particularly important is the web of connections among financial institutions through channels such as interbank lending, securities lending, repurchase agreements, and derivatives contracts. Regulators also need more and better data on the links among institutions through third-party sponsors, liquidity providers, credit-support providers, and market makers. Knowledge of such network linkages is a necessary first step to improve analysis of how shocks to institutions and markets can propagate through the financial system.

#### **Principles for Developing a System of Effective Data and Analytical Tools**

Moving from the recognition of the need for more data to an efficient data system is not an easy task. Data collection entails costs in collection, organization, and utilization for government agencies, reporting market participants, and other interested parties. Tradeoffs may need to be faced where, for example, a particular type of information would be very costly to collect and would have only limited benefits. The Internet and other applications of information technologies have made us all too aware of the potential for information overload, a circumstance in which relevant information is theoretically available, but the time and expense of retrieving it or transforming it into a usable form make it unhelpful in practical terms. Collection of more data just for its own sake also can raise systemic costs associated with moral hazard if investors view data collection from certain firms, products, and markets as suggesting implicit support. It is thus particularly worth emphasizing the importance of having data available readily and in a form that is appropriate for the uses to which it will be put. With these considerations in mind, we have derived a number of guiding principles for a system of new data and analytical tools for effectively supervising large institutions and monitoring systemic risk.

First, the priorities for new data efforts should be determined by the nature of regulatory and supervisory missions. In particular, the data need to be sufficiently timely and to cover a sufficient range of financial institutions, markets, instruments, and transactions to support effective systemic risk monitoring and macroprudential supervision, as well as traditional safety-and-soundness regulation. The events of the past few years have painfully demonstrated that regulators, financial institutions, and investors lacked ready access to data that would have allowed them to fully assess the value of complex securities, understand counterparty risks, or identify concentrations of exposures.

The data needed for systemic risk monitoring and supervision are not necessarily “real-time” market data—information about trades and transactions that can be reported at high frequency when the events occur—but certainly data would need to be “timely.” What is considered to be “timely” will depend on its purpose, and decisions about how timely the data should be should not ignore the costs of collecting and making the data usable. For many supervisory needs, real-time data would be impractical to collect and analyze in a meaningful way and unnecessary. For example, while supervisors may indeed need to be able to quickly value the balance sheets of systemically important financial institutions, very frequent updates as transactions occur and market prices change could lead to more volatility in values than fundamental conditions would indicate and would be extraordinarily expensive to provide and maintain. Certainly, real-time data could be needed for regulators responsible for monitoring market functioning, and daily data would be helpful to measure end-of-day payment settlements and risk positions among the largest firms. But for supervising market participants, real-time market data could require enormous investments by regulators, institutions, and investors in order to be usable while yielding little net benefit. As policymakers consider redesign of a system of data collection, the goal should be data that are timely and best suited to the mission at hand.

A second principle is that data collection be user-driven. That is, data on particular markets and institutions should be collected whenever possible by the regulators who ultimately are responsible for the safety and soundness of the institutions or for the functioning of those markets. Regulators with supervisory responsibilities for particular financial firms and markets are more likely to understand the relevance of particular forms of standardized data for risk management and supervisory oversight. For example, supervisors regularly evaluate the ability of individual firms’ own risk measures, such as internal ratings for loans, and of liquidity and counterparty credit risks, to signal potential problems. As a result, these supervisors have the expertise needed to develop new reporting requirements that would be standardized across firms and could be aggregated.

Third, greater standardization of data than exists today is required. Standardized reporting to regulators in a way that allows aggregation for effective monitoring and analysis is imperative. In addition, the data collection effort itself should encourage the use of common reporting systems across institutions, markets, and investors,

which would generally enhance efficiency and transparency. Even seemingly simple changes, such as requiring the use of a standardized unique identifier for institutions (or instruments), would make surveillance and reporting substantially more efficient.

Fourth, the data collected and the associated reporting standards and protocols should enable better risk management by the institutions themselves and foster greater market discipline by investors. Currently, because the underlying data in firms' risk-management systems are incomplete or are maintained in nonstandardized proprietary formats, compiling industry-wide data on counterparty credit risk or common exposures is a challenge for both firms and supervisors. Further, institutions and investors cannot easily construct fairly basic measures of common risks across firms because they may not disclose sufficient information. In some cases, such as disclosure of characteristics of underlying mortgages in a securitized pool, more complete and interoperable data collection systems could enhance market discipline by allowing investors to better assess the risks of the securities without compromising proprietary information of the lending institution.

Fifth, data collection must be nimble, flexible, and statistically coherent. With the rapid pace of financial innovation, a risky new asset class can grow from a minor issue to a significant threat faster than government agencies have traditionally been able to revise reporting requirements. For example, collateralized debt obligations based on asset-backed securities grew from a specialized niche product to the largest source of funding for asset-backed securities in just a few years. Regulators, then, should have the authority to collect information promptly when needed, even when such collections would require responses from a broad range of institutions or markets, some of which may not be regulated or supervised. In addition, processes for information collection must meet high standards for reliability, coherence, and representativeness.

Sixth, data collection and aggregation by regulatory agencies must be accompanied by a process for making the data available to as great a degree as possible to fellow regulators, other government entities, and the public. There will, of course, be a need to protect proprietary and supervisory information, particularly where specific firm-based data are at issue. But the presumption should be in favor of making information widely available.

Finally, any data collection and analysis effort must be attentive to its international dimensions and must seek appropriate participation from regulators in other nations, especially those with major financial centers. Financial activities and risk exposures are increasingly globalized. A system without a common detailed taxonomy for securities and counterparties and comparable requirements for reporting across countries would make assembling a meaningful picture of the exposures of global institutions very difficult. Efforts to improve data collection are already under way in the European Union, by the Bank of England and the Financial Services Authority, and the European Central Bank, which has expressed support for developing a unified international system of taxonomy and reporting. The Financial Stability Board, at the request of the G-20, is initiating an international effort to develop a common reporting template and a process to share information on common exposures and linkages between systemically important global financial institutions.

#### **Barriers to Effective Data Collection for Analysis**

Legislation will be needed to improve the ability of regulatory agencies to collect the necessary data to support effective supervision and systemic risk monitoring. Restrictions designed to balance the costs and benefits of data collection and analysis have not kept pace with rapid changes in the financial system. The financial system is likely to continue to change rapidly, and both regulators and market participants need the capacity to keep pace.

Regulators have been hampered by a lack of authority to collect and analyze information from unregulated entities. But the recent financial crisis illustrated that substantial risks from leverage and maturity transformation were outside of regulated financial firms. In addition, much of the Federal Reserve's collection of data is based on voluntary participation. For example, survey data on lending terms and standards at commercial banks, lending by finance companies, and transactions in the commercial paper market rely on the cooperation of the surveyed entities. Moreover, as we have suggested, the data collection authority of financial regulators over the firms they supervise should be expanded to encompass macroprudential considerations. The ability of regulators to collect information should similarly be expanded to include the ability to gather market data necessary for monitoring systemic risks. Doing so would better enable regulators to monitor and assess potential systemic risks arising directly from the firms or markets under their supervision or

from the interaction of these firms or markets with other components of the financial system.

The Paperwork Reduction Act also can at times impede timely and robust data collection. The act generally requires that public notice be provided, and approval of the Office of Management and Budget (OMB) be obtained, before any information requirement is applied to more than nine entities. Over the years, the act's requirement for OMB approval for information collection activity involving more than nine entities has discouraged agencies from undertaking many initiatives and can delay the collection of important information in a financial crisis. For example, even a series of informal meetings with more than nine entities designed to learn about emerging developments in markets may be subject to the requirements of the act. While the principle of minimizing the burdens imposed on private parties is an important one, the Congress should consider amending the act to allow the financial supervisory agencies to obtain the data necessary for financial stability in a timely manner when needed. One proposed action would be to increase the number of entities from which information can be collected without triggering the act; another would be to permit special data requests of the systemically important institutions could be conducted more quickly and flexibly.

The global nature of capital markets seriously limits the extent to which one country acting alone can organize information on financial markets. Many large institutions have foreign subsidiaries that take financial positions in coordination with the parent. Accordingly, strong cooperative arrangements among domestic and foreign authorities, supported by an appropriate statutory framework, are needed to enable appropriate sharing of information among relevant authorities. Strong cooperation will not be a panacea, however, as legal and other restrictions on data sharing differ from one jurisdiction to the next, and it is unlikely that all such restrictions can be overcome. But cooperation and legislation to facilitate sharing with foreign authorities appears to be the best available strategy.

Significant practical barriers also exist that can, at times, limit the quality of data collection and analysis available to support effective supervision and regulation, which include barriers to sharing data that arise from policies designed to protect privacy. For example, some private-sector databases and bank's loan books include firms' tax identification (ID) numbers as identifiers. Mapping those ID numbers into various characteristics, such as broad geographic location or taxable income measures, can be important for effective analysis and can be done in a way that does not threaten privacy. However, as a practical matter, a firm may have multiple ID numbers or they may have changed, but the Internal Revenue Service usually cannot share the information needed to validate a match between the firm and the ID number, even under arrangements designed to protect the confidentiality of the taxpayer information obtained.

In addition, a significant amount of financial information is collected by private-sector vendors seeking to profit from the sale of data. These vendors have invested in expertise and in the quality of data in order to meet the needs of their customers, and the Federal Reserve is a purchaser of some of these data. However, vendors often place strong limitations on the sharing of such data with anyone, including among Federal agencies, and on the manner in which such data may be used. They also create systems with private identifiers for securities and firms or proprietary formats that do not make it easy to link with other systems. Surely it is important that voluntary contributors of data be able to protect their interests, and that the investments and intellectual property of firms be protected. But the net effect has been a noncompatible web of data that is much less useful, and much more expensive, to both the private and the public sector, than it might otherwise be.

Protecting privacy and private-sector property rights clearly are important policy objectives; they are important considerations in the Federal Reserve's current data collection and safeguarding. Protecting the economy from systemic risk and promoting the safety and soundness of financial institutions also are important public objectives. The key issue is whether the current set of rules appropriately balances these interests. In light of the importance of the various interests involved, the Congress should consider initiating a process through which the parties of interest may exchange views and develop potential policy options for the Congress's consideration.

#### **Organization Structure for Data Collection and Developing Analytical Tools**

In addition to balancing the costs and benefits of enhanced data and analytical tools, the Congress must determine the appropriate organizational form for data collection and development of analytical tools. Budget costs, production efficiencies, and the costs of separating data collection and analysis from decisionmaking are im-

portant considerations. Any proposed form of organization should facilitate effective data sharing. It also should increase the availability of data, including aggregated supervisory data as appropriate, to market participants and experts so that they can serve the useful role of providing independent perspectives on risks in the financial system.

The current arrangement, in which different agencies collect and analyze data, cooperating in cases where a consensus exists among them, can certainly be improved. The most desirable feature of collection and analysis under the existing setup is that it satisfies the principle that data collection and analysis should serve the end users, the regulatory agencies. Each of the existing agencies collects some data from entities it regulates or supervises, using its expertise to decide what to collect under its existing authorities and how to analyze it. Moreover, the agencies seek to achieve cost efficiencies and to reduce burdens on the private sector by cooperating in some data collection. An example is the Consolidated Reports of Condition and Income, or Call Reports, collected by the bank regulatory agencies from both national and state-chartered commercial banks. The content of the reporting forms is coordinated by the Federal Financial Institutions Examination Council, which includes representatives of both state and Federal bank regulatory agencies.

A standalone independent data collection and analysis agency might be more nimble than the current setup because it would not have to reach consensus with other agencies. It might also have the advantage of fostering an overall assessment of financial data needs for all governmental purposes.

However, there would also be some substantial disadvantages to running comprehensive financial data collection through a separate independent agency established for this purpose. A new agency would entail additional budget costs because the agency would likely need to replicate many of the activities of the regulatory agencies in order to determine what data are needed. More importantly, because it would not be involved directly in supervision or market monitoring, such an agency would be hampered in its ability to understand the types of information needed to effectively monitor systemic risks and conduct macroprudential supervision. Data collection and analysis are not done in a vacuum; an agency's duties will inevitably reflect the priorities, experience, and interests of the collecting entity. Even regular arms-length consultations among agencies might not be effective, because detailed appreciation of the regulatory context within which financial activities that generate data and risks is needed. The separation of data collection and regulation could also dilute accountability if supervisors did not have authority to shape the form and scope of reporting requirements by regulated entities in accordance with supervisory needs.

An alternative organizational approach would be available if the Congress creates a council of financial regulators to monitor systemic risks and help coordinate responses to emerging threats, such as that contemplated in a number of legislative proposals. Under this approach, the supervisory and regulatory agencies would maintain most data collection and analysis, with some enhanced authority along the lines I have suggested. Coordination would be committed to the council, which could also have authority to establish information collection requirements beyond those conducted by its member agencies when necessary to monitor systemic risk.

This approach might achieve the benefits of the current arrangement and the proposed independent agency, while avoiding their drawbacks. The council would be directed to seek to resolve conflicts among the agencies in a way that would preserve nimbleness, and it could recommend that an agency develop new types of data, but it would leave the details of data collection and analysis to the agencies that are closest to the relevant firms and markets. And while this council of financial supervisors could act independently if needed to collect information necessary to monitor the potential buildup of systemic risk, it would benefit directly from the knowledge and experience of the financial supervisors and regulators represented on the council. The council could also have access to the data collected by all its agencies and, depending on the staffing decisions, could either coordinate or conduct systemic risk analyses.

### **Conclusion**

Let me close by thanking you once again for your attention to the important topic of ensuring the availability of the information necessary to monitor emergent systemic risks and establish effective macroprudential supervisory oversight. As you know, these tasks will not be easy. However, without a well-designed infrastructure of useful and timely data and improved analytical tools—which would be expected to continue to evolve over time—these tasks will only be more difficult. We look forward to continued discussion of these issues and to a development of a shared agen-

da for improving our information sources. I would be happy to answer any questions you might have.

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**PREPARED STATEMENT OF ALLAN I. MENDELOWITZ, Ph.D**  
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**PREPARED STATEMENT OF JOHN C. LIECHTY**  
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 THE NATIONAL INSTITUTE OF FINANCE

FEBRUARY 12, 2010

**Providing Financial Regulators with the Data and Tools Needed to  
 Safeguard Our Financial System**

Mr. Chairman and Member of the Subcommittee:

We thank you for the opportunity to appear before you on behalf of the Committee to Establish the National Institute of Finance (CE-NIF). The primary objective of the CE-NIF is to seek the passage of legislation to create a National Institute of Finance (NIF). In our testimony today we would like to provide the reasons why we see this as an urgent national need and the role we see for the proposed National Institute of Finance in strengthening the government's ability to effectively regulate financial institutions and markets and to respond to the challenges of systemic risk.

The CE-NIF is unique. We are a volunteer group of concerned citizens brought together by a common view that the Federal Government and its financial regulators lack the necessary data and analytical capability to effectively monitor and respond to systemic risk and to effectively regulate financial firms and markets. The members of the CE-NIF consist of individuals from academia, the regulatory agencies, and the financial community. We have raised no money to support our effort, we represent no vested interests, and we have paid what few expenses we have incurred out of our own pockets. We share what we believe to be a legislative objective that is critical to the long-term well-being and prosperity of our nation.

***Lessons of the Credit Crisis: Critical Weaknesses in Financial Regulation  
 Were Revealed***

**Government Officials Lacked the Data To Understand**

**The Consequences of Alternative Options**

The events of the most recent financial crisis have laid bare the dire consequences that can flow from poorly understood and ineffectively regulated financial institutions and markets. In response to the crisis, a lot of attention has been paid to how to strengthen the legal authorities and organizational structure of the financial regulatory community. Unfortunately, far less attention has been paid to what data and analytical capability is needed to enable regulators to use those new powers effectively. Data and analytics are not the stuff of headlines and stump speeches; however, when they are deficient, they are the Achilles' heel of financial regulation. Unfortunately, we have ample evidence that the recent crisis was due in part to a lack of appropriate data and analytic tools. A review of key events from the recent crisis makes this point very clear.

When Lehman Brothers tottered on the brink of bankruptcy in September, 2008 government officials were faced with a choice between two stark alternatives: save Lehman Brothers and signal to the markets and other large and highly interconnected financial institutions that they could count on an implicit government safety net, irrespective of how risky their financial excesses might be; or let this large and important investment bank go under—reaffirming to the market that there are consequences to risky business practices—but run the risk of setting off a cascade of bankruptcies and market disruptions.

Forced to make a quick decision, officials let Lehman go under, a decision that sparked a horrifying downward spiral of the financial markets and the economy. That decision was based, in part, on the belief at Treasury that participants in the financial markets had been aware of the problems at Lehman for a number of

months and had ample time to prepare by limiting their exposure.<sup>1</sup> Officials did not have access to the types of information that would have given them a better picture of how interconnected firms and the broader markets were to Lehman's fate. The day after the failure, the Reserve Fund—a \$64.8 billion money market fund—'broke the buck' because of its exposure to Lehman. That is, its assets were no longer sufficient to support a \$1.00 value for the price of its shares. This sparked a massive run on the \$3.5 trillion money market industry and, because of the important role that the money market funds play in providing liquidity in the commercial paper market (a market for providing short-term corporate loans) the \$2.2 trillion commercial paper market froze. When the broader economy was no longer able to access funding and credit, the crisis had become systemic.

Whether the government could have done a better job of responding to that challenge or foreseen the catastrophic fallout of the Lehman decision is an open question. The point that is clear, however, is that at this critical moment in time they did not have the data needed to fully understand the counterparty relationships linking Lehman to the system, nor did they have in place the capacity to analyze such data to form a clear picture of the consequences of the alternatives they faced. Simply put, at this critical juncture, government officials were flying blind.

Unfortunately, this lack of data was representative of the problems the government faced in understanding what was going on across the breadth of the market. At the very same time that Secretary of the Treasury was grappling with the problems at Lehman, he learned for the first time the extent of the problems at AIG caused by the excessively large concentration of Credit Default Swaps (CDSs) on the books of AIG's Financial Products unit. AIG had written \$441 billion in CDSs—linked to Private Label Mortgage Backed Securities (PLMBSs). Those PLMBSs were rapidly becoming the 'Toxic Assets' of this crisis and falling in value, sharply increasing the value of AIG's obligation to make good on those CDSs. Officials were apprised of the scale of the problem, but they faced two key problems that were evaporating trust in the market: the growing uncertainty over how to value these CDS and the fact that they had no way of understanding the Domino risks, i.e. the risk that the failure of one firm (AIG) would cause a cascade of failures throughout the system. Facing these uncertainties, government officials felt they had no choice but to provide massive government assistance to prevent AIG from failing.

In addition to being an essential component of measuring and monitoring systemic risk, having or not having comprehensive counterparty data has important forensic consequences, as well. Bernie Madoff ran the largest and most damaging Ponzi scheme in history. He reported consistently high earnings based on a purported complex trading strategy that made ample use of derivative transactions. He was able to perpetrate this very long running fraud, in part, because officials did not have good data on the network of counterparties to derivative transactions. Madoff's consistently high reported earnings raised questions among a few in the financial community, and although the SEC investigated several times they found nothing amiss. If they would have had access to data on the counterparty network for derivative transactions the outcome of those investigations could have been very different because Madoff's reported derivatives trades were, of course, fictitious. A simple check of the counterparty data would have revealed that no one reported being on the other side of Madoff's trades, and that they had to be fictitious. That evidence would have confirmed the fraud.

#### **Critical Components of Effective Regulation Were "Outsourced"**

The extent to which the government lacked the necessary data and analytical capability to effectively regulate financial institutions and markets was hidden from view in some cases because of the extent to which the government has in effect outsourced critical regulatory capabilities.

Some of that outsourcing enabled the creation of the toxic assets that became a central part of the crisis. When these private label subprime mortgage backed securities were initially issued, large tranches were rated triple-A or double-A by private rating agencies. Rating these securities and advising issuers on how to qualify for the desired rates was a large and profitable business for the rating agencies. These rating received the blessing of the financial regulators and that made it easy for investment and commercial banks to sell many ultimately troubled assets to highly regulated financial firms (such as insured depositories, insurance companies, pension funds, Federal Home Loan Banks, Fannie Mae and Freddie Mac).

<sup>1</sup>"The view at Treasury . . . was that Lehman's management had been given abundant time to resolve their situation by raising additional capital or selling off the firm, and market participants were aware of this and had time to prepare." Phillip L. Swagel—Assistant Secretary for Economic Policy at the U.S. Treasury during crisis—Brookings Papers March, 2009.

Comptroller of the Currency John Dugan in a speech in 2008 alluded to this outsourcing of responsibilities to the rating agencies. "In a world of risk-based supervision," he said, "supervisors pay proportionally more attention to the instruments that appear to present the greatest risk, which typically does not include triple-A-rated securities." In other words, the regulators were relying on the rating agencies to determine what "appear(s) to present the greatest risk."

The transformation of these assets from triple-A rated to Toxic Assets started when rising delinquencies and defaults in the underlying subprime mortgages forced the rating agencies to downgrade many of those securities. Those downgrades raised questions in the market about the credit quality of a whole range of structured investment products. However, in many, if not most, cases market participants lacked the ability to see through these complicated structured financial products to the underlying collateral and only a handful of market participants had the sophistication to allow them to independently assess their value and inherent riskiness.

When the financial markets crashed and the major surviving financial firms teetered on the brink the Federal Government had to determine whether these firms were adequately capitalized. However, neither the Treasury nor the regulatory agencies were able to make such determinations completely on their own because they lacked the necessary data and analytical capacity to do so. The government turned to the banks themselves to do the assessments. Although the bank's systems were not designed to anticipate domino risks and deal with the lack of market liquidity, they were the best that was available. The Treasury posited a few economic stress scenarios and instructed the regulated banks to assess how they would fare under those scenarios. The banks were then to report the results of their analyses back to the Treasury and their regulators.

It is an ironic twist that the regulators had to rely on the same models that were employed to manage banks' exposure to risk during the run-up to the crisis in order to perform this analysis. Of course, banks should have the capability to perform such analysis; it is part and parcel of competent corporate management and governance. However, this crisis demonstrates the importance of having a regulatory community that is capable of generating independent assessments of the credit quality of a security or the safety and soundness of a bank, market or the financial system that they regulate.

#### **Systemic Risk: the Whole is Greater Than the Sum of the Parts**

The capital markets exist to move capital from less efficient uses to more efficient uses. The capacity of the markets to intermediate risk and provide for these flows of capital was seriously threatened in the recent crisis, and there are several alternative ways of trying to prevent another crisis that are being looked at. One prevailing line of thinking is that systemic risk can be managed by identifying a relatively small number of systemically important institutions and regulating them especially well. There are critical conceptual errors in this thinking. When it comes to systemic risk, the whole is greater than the sum of the parts. Even if there were no large, systemically important institutions, there would still be the risk of systemic failure. A couple of representative examples follow, along with the identification of the type of data needed to monitor and respond to systemic risk related to these examples.

Systemic risk may arise as a consequence of the way financial firms are tightly linked to one another by multiple complex contractual relationships. For example, when LTCM teetered on the brink of failure in 1998 the government organized a group of large financial institutions to step in and provide sufficient capital to prevent that failure. One investment bank, whose exposure to LTCM was about \$100 million, was asked to contribute more than \$150 million to support LTCM. As a narrowly defined business proposition it does not make much sense to put \$150 million at risk to try to protect an exposure of \$100 million. This was especially true when that institution could have withstood the loss of the \$100 million without impacting its ability to continue operating. Why did they do it? Although a \$100 million loss would not have caused that firm's failure, they did not know how exposed their other major trading partners were to LTCM. If one or more of their major counterparties failed as a result of their exposure to LTCM, they could have been dragged down as well. Financial regulators need detailed counterparty data to monitor the domino risks that comes from connectedness.

Systemic risk may arise from excessively large concentrations of risk on the books of a financial institution or a group of firms. Concentrations in and of themselves are not necessarily a systemic risk. However, the interplay between concentrations and connectedness can create systemic risk. In this crisis the best example was the dangerously large concentration of CDSs on the books of AIG's Financial Products unit. Investors in Private Label Mortgage Backed Securities (PLMBS) turned to the

CDS market to lower the credit risk of their investments. Issuers of PLMBS entered into CDS transactions to raise the credit ratings of the securities they were issuing. AIG aggregated that market-wide risk on their balance sheet by writing \$441 billion of CDS contracts against the risk of loss associated in those PLMBS, without hedging that risk or having sufficient assets in reserve to cover the losses that developed. To stave off the consequences of a failure to those already fragile firms doing business with AIG, the Federal Government committed to put almost \$200 billion in capital into AIG. Financial regulators need market-wide position data to monitor the buildup of systemic risk that may flow from such concentrations.

#### **What We Do Know About the Next Systemic Financial Crises**

No matter how much we improve the government's ability to understand and remediate systemic risk, that risk cannot be reduced to zero. Therefore, we must prepare for the next financial crises. And, in that regard, there are several things that we do know:

- The first is that while there may be some similarities with previous crises and lessons to be learned from them, the cause of tomorrow's crisis will likely be different than yesterday's crisis.
- The second is that you cannot prepare for tomorrow's crisis by simply collecting the data and building the models you needed to understand yesterday's crisis. You must cast a broader net.
- The third is that when a new crisis begins to unfold it will be too late to try to collect the additional data, build the analytics, and undertake the research needed to make better regulatory and policy decisions. Policy makers and regulators will be stuck using the data and the analytics that they have at hand to try to develop the best policy response.

#### ***The National Institute of Finance: An Essential Response***

Most of the debate related to regulatory reform has focused on altering the regulatory organizational structure and providing regulators with new legal authorities. Very little attention has focused on providing the capacities (data, analytic tools and sustained research) needed to be able to measure and monitor systemic risk and correct the current deficiencies in regulatory capabilities. In order to address these weaknesses we propose the creation of a National Institute of Finance (NIF). The NIF would have the mandate to collect the data and develop the analytic tools needed to measure and understand systemic risk, and to strengthen the government's ability to effectively regulate financial institutions and markets. In addition, the NIF would provide a common resource for the entire regulatory community and the Congress.

#### **Key Components and Authorities**

The NIF would be an independent resource supporting the financial regulatory agencies. It would not be a regulatory agency itself. The only regulatory authority it would have would be to provide reference data, set data reporting standards, and compel the provision of data. The NIF would have two key organizational components: the Federal Financial Data Center (Data Center) and the Federal Financial Research and Analysis Center (Research Center). The Research Center would have the responsibility to build analytics, and sponsor and perform research. Last, the NIF would be funded by a direct assessment on the firms required to report to it.

**The Data Center** will collect and manage transaction and position data for (1) U.S. based entities (including for example, banks, broker-dealers, hedge funds, insurance companies, investment advisors, private equity funds and other highly leveraged financial entities) and their affiliates; and (2) U.S.-based financial transactions conducted by non-U.S. based entities. In order to carry out this responsibility, the Data Center will develop and maintain standards for reporting transaction and position data, including the development and maintenance of reference databases of legal entity identifiers and financial products. It will also establish the format and structure for reporting individual transactions and positions. It will collect, clean, and maintain transaction and position data in secure databases. It will provide regulators access to the data, and it will provide public access to aggregated and/or delayed data to improve market transparency—providing no business confidential information is compromised. Keeping this data secure will be an important responsibility of the Data Center. In this regard, the Federal Government has a long-standing and excellent track record in maintaining the security of all kinds of very sensitive data, including financial, military, intelligence, tax and census data and the NIF would adhere to the same data security standards used for existing secure data centers.

**The Research Center** will develop metrics to measure and monitor systemic risk and continually monitor, investigate and report on changes in system-wide risk levels. In addition, the Research Center will develop the capacity to assess the financial condition of large financial institutions and assess their capital adequacy in stress scenarios. The Research Center will be responsible for conducting, coordinating and sponsoring the long-term research needed to support systemic risk regulation. The Research Center will provide advice on the financial system and policies related to systemic risk. In addition, it will undertake assessments of financial disruptions in order to determine their causes, and make recommendations for appropriate regulatory and legislative action in response to those findings.

**An Independent Voice:** It is critical that the NIF have the ability and responsibility to report its findings in a fully independent manner. Because the NIF does not have any financial regulatory authority, *per se*, its objectivity will not be diminished by a conflict of interest that could arise if it had to report on its own regulatory actions. In addition, it is structured in a way that helps insulate it from political pressures. This structure plays a key role in assuring that the NIF will offer its very best unbiased assessments of the risks facing the financial system and the broader economy, as well as its best unbiased recommendations for responding to those risks.

**Funding from Assessments:** The NIF will be funded by assessments on reporting institutions. This method of funding is used by financial regulatory agencies and is appropriate for several reasons. First, the financial sector will benefit from an annual reduction in operating cost of tens of billions of dollars as a result of the standardization of data and reporting. Having the beneficiaries of these cost savings use some of those savings to fund the NIF is the fair thing to do. In addition, like the financial regulatory agencies, the use of industry assessments will make it possible for the NIF to pay salaries that are above the standard civil service pay scale and better enable the NIF to attract the highly skilled staff it will need to fulfill its responsibilities.

#### **Benefits of Establishing a National Institute of Finance**

Establishing a National Institute of Finance will bring substantial benefits to our financial system and the broader economy. The fundamental benefits of the NIF are many.

**It will improve the efficiency and effectiveness of financial regulation.** The Institute will provide regulators with the ability to independently assess the safety and soundness of a bank, market or the financial system, stopping the outsourcing of critical capacity to banks and rating agencies. It will investigate market disruptions and conduct the fundamental research needed to improve regulation of financial institutions and markets. It will also ensure that these findings and advances are integrated into the systemic risk monitoring systems. In addition it will provide an invaluable resource for the analysis of proposed regulatory policy and monitoring of existing policy to help refine and strengthen the overall approach to regulation.

**It will reduce the likelihood of systemic crises and costly institutional failures.** As the NIF develops models and metrics for systemic risk and collects the appropriate data, it will be able to provide a better understanding of system-wide aggregation, of the level of liquidity in the system, and gain a better understanding of potential for liquidity failures and fire sales, which are part of the early warning stages of a systemic failure. When it is fully mature, the NIF will have the ability to see through the entire counterparty network, allowing it to quantify Domino risks—the risk of a cascading failure that might result from the failure of other financial entities—and identify critical nodes in the counterparty network. Along with market participants, it will also have the ability to see through complex structured products down to the underlying collateral (e.g. loans or mortgages providing the cash-flows)—helping improve transparency and avoiding the rise of new types of toxic assets that could trigger a future crisis.

**It would create a safer and more competitive market.** By helping improve individual firm risk management and providing better tools to the regulators to monitor and oversee systemic risk, the U.S. financial markets will be made safer, and will attract more business than competitors that are more prone to major shocks or collapses during times of economic stress.

In addition, the NIF would actually benefit the U.S. financial services industry, as well.

**It would reduce operating costs.** Standardizing data reporting will dramatically reduce back office costs (costs associated with verifying details of trades with counter parties) and costs associated with maintaining reference databases (legal entity and financial instrument databases). Morgan Stanley estimates that imple-

mentation of the NIF will result in 20 percent to 30 percent savings in operational costs.

**It would facilitate risk management.** By requiring daily reporting of all positions to the NIF, firms will be able to present a complete picture of their positions to their own internal risk management groups. This will in turn ensure that senior management has a consistent and clear understanding of the firm's exposures—particularly their exposure to different counterparties during times of economic stress.

### **Conclusion**

The Federal Government has responded to a number of threats to our national well-being by organizing major research and monitoring efforts. The threat of natural disasters led to the creation of the National Oceanic and Atmospheric Administration, containing the National Weather Service and National Hurricane Center, whose skill in forecasting the weather and warning of impending natural disasters has saved many lives. The Centers for Disease Control and the National Institutes of Health have advanced the state of medical research, developed new treatments for deadly diseases, and mobilized to protect the population from the threats of pandemics. The nation's national security has been greatly advanced by the outgrowth of the sustained research programs supported by DARPA.

When we look at the financial losses suffered by the American public and the burden placed on U.S. taxpayers by the government's response to this most recent financial crisis, it is fair to ask why we have not created a similar sustained research and monitoring effort to protect the American people from the high costs of systemic risk and financial implosions. The regulatory reform legislation that recently passed in the House charges a new Financial Services Oversight Council (FSOC) with the task of monitoring systemic risk and provides some new legal authorities to intervene in a time of crisis. However, it fails to provide the tools necessary to carry out the systemic risk monitoring responsibility. That responsibility can only be carried out well if the proposed FSOC has a deep understanding of how our financial system works. Such an understanding can only be based on access to much better system-wide data and the analytic tools needed to turn that data into relevant information on systemic risk. This is something that is currently beyond the government's capability. Unfortunately, as set forth in the House bill, the FSOC would have no permanent staff and no specific authority to collect the many kinds of system-wide data needed. As it stands the FSOC represents little more than a hollow promise when it comes to its ability to monitor systemic risk and warn of future crises.

Our nation's financial markets are a public good. The safety of our country and the well being of our population depend on well functioning financial markets. We have incurred very high costs in this recent crisis as a result of the failings of our current approach to regulating financial markets and institutions. This approach has relied on a fragmented, data poor, regulatory structure that despite its best efforts did not have the tools with which to understand and respond to the threat presented by systemic risk.

The Senate has an opportunity to materially strengthen any proposed financial regulatory reform legislation by creating a National Institute of Finance that will equip regulators and a systemic risk regulator with the data and analytical tools needed to correct the deficiencies that were made so apparent in this recent crisis. The full capabilities of the NIF will take several years to realize, however, benefits will ensue from each stage of its development. Although it will take time and substantial effort to stand up the National Institute of Finance, the benefits should far outweigh the cost.

Lastly, we were pleased to learn that on February 4, 2010 Sen. Jack Reed introduced S. 3005, "The National Institute of Finance Act of 2010." This act lays out a strong case for the creation of the National Institute of Finance. Furthermore, it proposes the creation of the NIF in a way that insures its ability to fulfill the role envisioned by the CE-NIF. It would have the authority to collect the data necessary to monitor systemic risk. It would have the responsibility to establish a Research Center that will develop the metrics for monitoring systemic risk and to report on its monitoring of that risk. It would have the capacity to be a significant resource for the regulatory community. It would have the ability to fund itself in a way that insures that it will have adequate resources for its important mission, and it is structured so that it will be a truly independent and technically expert voice on matters relating to the regulation of financial institutions and markets and the threats of systemic risk.

Mr. Chairman and Members of the Subcommittee, this concludes our prepared statement. Thank you for the opportunity to present the recommendations of the Committee to Establish the National Institute of Finance. We will be happy to answer any questions the committee may have.

## FINANCIAL HURRICANES WILL COME AGAIN

When the financial hurricane of 2008 made landfall, the regulators and policy-makers charged with keeping our financial system safe were taken by surprise. Although there were some indications of financial uncertainty, this financial storm hit with the same unexpected suddenness as the New England Hurricane of 1938—which slammed into Suffolk County, Long Island, and then continued into Connecticut, Rhode Island, Massachusetts, New Hampshire, Vermont and finally Canada. The *Martha's Vineyard Gazette* noted at the time, "This tragedy was not the loss of nearly 10,000 homes and business along the shore. It was the psychic destruction of summer for an entire generation."

Earlier hurricanes had brought structural responses from the U.S. Government. In 1807 the United States Coast and Geodetic Survey was established by Thomas Jefferson, a quarter century after the Great Hurricane of 1780—the deadliest on record, killing over 27,500 people. The Weather Bureau was formed in 1870 under President Ulysses S. Grant to gather data on the weather and provide warnings of approaching storms. Even though the Weather Bureau was in place, it was not able to offer any warning for the Category 4 Hurricane that devastated Galveston, Texas on September 8th, 1900. By 1926 reports from sea could be delivered with a varying level of reliability, which was part of the reason that there were a few hours warning for the Miami Hurricane of September 18th, 1929. By the time the New England Hurricane of 1938 hit, the Weather Bureau had better data and better models. Still, as the *New York Times* observed, "Except for Charlie Pierce, a junior forecaster in the U.S. Weather Bureau who predicted the storm but was overruled by the chief forecaster, the Weather Bureau experts and the general public never saw it coming".

Are our regulators and policymakers any better equipped today than the Weather Bureau of 1938? In his opening remarks to the Senate Banking Committee on June 18, 2009, Secretary Geithner observed, "If this crisis has taught us anything, it has taught us that risk to our system can come from almost any quarter. We must be able to look in every corner and across the horizon for dangers, and our system was not able to do that."

In 1970, President Richard Nixon created the National Oceanic and Atmospheric Administration (NOAA), with the mandate to: i) develop data collection networks to document natural variability and support predictive models, ii) develop new analytical and forecasting tools to improve weather services and earlier warnings of natural disasters and iii) conduct experiments to understand natural processes. While NOAA's real-time data collection and analysis infrastructure are significant and continue to bring a range of substantial benefits to society, they were made possible largely through the research arm of NOAA—the Office of Oceanic and Atmospheric Research (OAR)—with its seven research laboratories, six undersea laboratories and a range of research partners. Clearly our financial markets are at least as important and as complicated as the weather. Why don't we have the equivalent of NOAA or OAR for the financial markets?

The current regulatory reform legislation that was passed in the House charges a new Financial Services Oversight Council (FSOC) with the task of monitoring systemic risk—watching for future financial hurricanes—and provides some new legal authorities to intervene in the time of crisis. However, it fails to provide a NOAA type mandate to collect system-wide data and build realistic system-wide models, which can only be built upon a deep understanding of how our financial system works. The FSOC will have no permanent staff and no specific authority to collect the many kinds of system-wide data needed. As it stands the FSOC represents a hollow promise that will leave us unprepared for the financial hurricanes that will surely come.

The Senate has an opportunity to strengthen the FSOC in their version of the legislation by creating a *National Institute of Finance* along the lines of NOAA's key components: providing regulators with better data and better models—built on a sustained research effort. When it comes to safeguarding our financial system our goals should be bold, our expectations realistic and our dedication to the task substantial. Although it will take time, the benefits will far outweigh the cost, just as they have done with hurricanes.

Richard Foster, Senior Faculty Fellow, Yale School of Management; Emeritus Director, McKinsey & Company

John Liechty, Associate Professor, Penn State University; Co-Founder, Committee to Establish the National Institute of Finance

**PREPARED STATEMENT OF ROBERT ENGLE**  
 PROFESSOR OF FINANCE, STERN SCHOOL OF BUSINESS,  
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FEBRUARY 12, 2010

Good morning, Mr. Chairman and members of the Subcommittee. My name is Robert Engle. I am a Professor at the Leonard Stern School of Business at New York University. I recently co-authored a report of the National Research Council that summarized a workshop on Technical Capabilities Needed for the Regulation of Systemic Risk. The Research Council is the operating arm of the National Academy of Sciences, National Academy of Engineering, and the Institute of Medicine, chartered by Congress in 1863 to advise the government on matters of science and technology. This workshop and its report were sponsored by the Alfred P. Sloan Foundation. After I summarize our report, I would like to give you my personal response to the questions posed in your letter as well as the pending legislation on the National Institute of Finance.

Key findings of the National Research Council's report are as follows:

1. With better data and better analytical tools, the participants were confident that we could measure, monitor and ultimately lessen systemic risk.
2. Research to accomplish this goal is already underway in academic and regulatory institutions and is being presented in scholarly and practitioner meetings. This research is now primarily based on publicly available market, size and leverage data. The research however has far to go.
3. Additional data across asset classes and with counterparty, position, collateral and valuation information would be very helpful. But many participants at our meeting said it was not yet possible to determine which specific data would be needed.
4. Compilation and analysis of such data would require standardization and classification that does not yet exist and which would be valuable for the industry as well as for the regulators.
5. Data alone will not be sufficient to understand risk, illiquidity, bank runs, bubbles and other features central to assessing systemic risk. These can only be examined within models, and research is needed to develop some of those models and improve others. As Andrew Lo of MIT summarized, systemic regulators need to know the four Ls: leverage, linkages, liquidity and losses.

I request that the full report be attached to my testimony.

In response to the specific questions and the pending legislation on the National Institute of Finance, I would like to make several points. These comments are my own, not the National Research Council's. I have endorsed the concept of the National Institute of Finance in a letter from Harry Markowitz which is also signed by William Sharpe, Robert Merton, Myron Scholes, and Vernon Smith, all Nobel Laureates. These comments suggest the aspects I find particularly strong or weak about the proposal.

First, let me address the status of data available to regulators.

6. Data collection by supervisory agencies takes various forms. Some obtain detailed information in response to specific requests of entities that they supervise, but it is not automatically generated and reported. Because of privacy issues, these data cannot be shared even within a regulatory body or with other regulatory entities. Thus only partial views of all information are available.
7. Useful data sets exist within clearing houses, self-regulatory organizations such as DTCC or FINRA and surveillance operations in exchanges or regulators. These data will have positions, and counterparties at a fine level of disaggregation. Upon specific request, regulators have been able to access these data but generally cannot share them.
8. Risk reports that summarize major firm risks at a point in time are automatically submitted to supervisory agencies. However, these generally do not have counterparty information, and their information might not be freely available throughout the agency.
9. In summary, regulators have access to more data than the public, but the collection is fragmented, discontinuous and possibly quite delayed in time. Improved data availability would enhance all regulatory processes.

Further comments on the NIF.

10. The data collection and aggregation functions of the NIF proposal are staggering. Some aspects are likely to be more important than others. In particular, the OTC contracts are the most complex and have the greatest chance of being systemic. Many of these have substantial counterparty exposure so they are inherently more systemically risky. Thus, collection of OTC position and transaction data could be the most important starting point. Establishment of some standardization and common identifiers for contracts, as noted above, would be an important step for making such data more useful.
11. Systemic risk assessment requires selecting entities to monitor and then obtaining data to monitor them. Consequently, a great deal of data on entities that are not risky can be ignored, once the selection is accomplished. This selection process is not completely obvious, because small entities can sometimes pose systemic risks, so it needs to be done through careful analysis and revisited from time to time.
12. The independence of the NIF is important in order to insulate it from corporate or government pressures. However, this could be satisfied by an NIF that was embedded within a regulatory agency that was itself independent and had systemic regulatory oversight responsibilities. There could be important cost savings from such embedding as well.
13. International collaboration is of great importance. Systemic crises are global and the markets are global, hence regulators that only see domestic positions will miss important features. The NIF should immediately coordinate with relevant international agencies to collaborate on data acquisition and analysis. This coordination is important within the US and it is even more important for the smaller countries and regulators around the globe. Sovereign crises such as those experienced in the past in Ireland, Iceland, Latvia and Hungary and in Greece, Portugal and Spain today emphasize the interlinking of our financial system.
14. The security of these data must be ensured. Otherwise, compliance may be difficult to achieve.
15. Congress and the NIF should have as a goal making partially aggregated or delayed versions of the OTC data public so that counterparties can better price and manage the risks that they face. Better individual firm risk management contributes to better systemic risk management. Transparency in financial markets is a powerful supplement to regulation.

# Technical Capabilities Necessary for Regulation of Systemic Financial Risk

## Summary of a Workshop

Robert F. Engle, New York University  
Scott T. Weidman, National Research Council  
*Rapporteurs*

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## Introduction and Major Outcomes of the Workshop

### *Goals of the Workshop*

The financial reform plans currently under discussion in the United States recognize the need for monitoring and regulating systemic risk in the financial sector. To inform those discussions, the National Research Council held a workshop on November 3, 2009, to identify the major technical challenges to building such a capability. The Workshop on Technical Capabilities Necessary for Regulation of Systemic Financial Risk was organized in response to the letter of August 27, 2009, from Senator Jack Reed of the Senate Banking, Housing, and Urban Affairs Committee to the National Academies specifically requesting an appraisal of the data and analytical tools available for systemic risk regulation (Appendix A). Senator Reed identified the following key issues that need to be examined “in considering reforms to financial oversight,” specifically with respect to systemic risk:

- What data and analytical tools are currently available to regulators to address this challenge?
- What further data-collection and data-analysis capabilities are needed?
- What specific resource needs are required to accomplish the task?
- What are the major technical challenges associated with systemic risk regulation?
- What are various options for building these capabilities?

Because every systemic event is unique with respect to its specific pathology—the various triggers and the propagation of effects—the workshop focused on the issues listed above for systemic risk in general rather than for any specific scenario. Thus, by design, the workshop explicitly addressed neither the causes of the current crisis nor policy options for reducing risk, and it attempted to steer clear of some policy issues altogether (such as how to allocate new supervisory responsibilities). More than 40 experts representing diverse perspectives participated in the workshop (Appendix B).

### *Some Underlying Observations*

A basic observation shared by several workshop discussants is that recent decades have seen rapid change in the financial system—driven by innovation and deregulation—that has altered the mechanisms and pace of financial intermediation to such an extent that regulatory tools, processes, and data have fallen behind. The far more numerous and increasingly complex linkages among financial institutions of all types, with essential linkages extending beyond the banking sector and beyond domestic U.S. institutions, suggested to many discussants that the monitoring of systemic risk has become a more urgent and far more complex problem than in the past. George Sugihara of the Scripps Institution of Oceanography emphasized the importance of understanding systemic risk holistically as a “dynamic,” nonlinear problem, as opposed to atomistically as a decomposable, static problem that can be addressed by simply aggregating risks across independent firms.

It was widely acknowledged at the workshop that the United States currently lacks the technical tools to monitor and manage systemic financial risk with sufficient comprehensiveness and precision. While some of the building blocks are available, many workshop participants pointed to major gaps that remain. Andrew Lo of the Massachusetts Institute of Technology presented a simple mnemonic for capturing the range of information that a systemic risk regulator will need to monitor: namely, the “four L’s” of *leverage*, *linkages*, *liquidity*, and *losses* across the financial system. Assembling a holistic perspective will require significant additional data as well as new models and research. Myron Scholes of Stanford University pointed out that even with information on leverage and linkages, liquidity and losses can only be simulated with interacting models. Other elements identified in the workshop were capital, maturity mismatch, and risk concentrations.

Christine Cumming of the Federal Reserve Bank of New York added that risk at the firm level cannot be truly assessed unless the much broader context of overall risk positions and risk dynamics in the financial system is understood. Decision makers at financial institutions, given access to more reliable knowledge about their total risk exposure with respect to proposed actions, should be better able to manage those risks. This more complete understanding could provide help to the following:

- Institutions, in recognizing how they share in creating and being affected by systemic risk;
- Markets, in setting values; and
- Regulators charged with moderating markets and firms.

Market efficiency will be enhanced by improved intelligence about what is going on in the system as a whole. Yaacov Mutnikas of Algorithmics observed that risk analysis has developed almost exclusively to manage firm-specific risks, and that the aggregate of firm risk is not necessarily equal to systemic risk. Firm-based analysis ideally takes into account the market responses and stresses that information about losses in other financial firms produces, so it provides partial analysis of feedback effects. Full analysis of system risks, however, must incorporate more complex interactions, which, as recent experience has shown, can be especially dangerous. Furthermore, individual firms have their own scenarios of concern, which are not necessarily those of greatest significance to the overall system. Thus, to manage systemic risk, new analysis capabilities and appropriate data will be needed.

#### *Major Points for Policy Makers*

Although this one-day workshop was not aimed at developing consensus conclusions, there were some recurring themes that are relevant for policy makers:

- Today’s tools of financial risk analysis will need to be augmented to provide information needed for the regulation of systemic financial risk. As implied above, existing capabilities to value individual instruments and manage firm-specific risks and capture system-wide exposures are not a sufficient foundation for systemic risk management.
- The new understanding that is necessary for systemic risk management calls for new, or extended, mathematical models. These models would be designed to capture better the extensive linkages among firms and markets, the dynamic interactions among the firms

and markets, and the potential for any of these to change according to the state of the system (e.g., in shifting from normal times to distressed times).

- Similarly, the new understanding of systemic risk management will require the use of more and better data. The creation and validation of those models will rely on some data that are not currently used and perhaps not currently available. However, there were a variety of views expressed at the workshop as to what data should be collected. One view argued that complete transaction records in cash and derivatives markets would be the appropriate level of data collection. A more widely held view was that no one knows enough to say what data are needed.
- A new understanding of systemic risk management is just beginning to develop. Inevitably, systemic risk management capabilities will be built up iteratively, starting with the imperfect data and models that are currently available and refining both as research improves our understanding.

Several workshop participants commented that the questions in Senator Reed's letter are valid and generally approachable and that they could be answered through a careful study, which would constitute a solid step toward setting up a systemic regulatory capability. Nevertheless, it will take a long-term, multidisciplinary effort to build up this capability fully, and the structure is not in place yet for that effort. A good deal of research is needed to guide the development of effective systemic financial risk regulation.

## Major Themes of the Workshop Discussions

From the workshop discussions, nine major themes emerged. Points raised in connection with each of those themes are summarized in this chapter.

### *Need for a Common Language for All Securities and Financial Contracts*

An important building block for systemic financial risk regulation is the development of a common nomenclature and language to enable the unambiguous aggregation and interpretation of data collected from firms by regulators. Virtually all data on complex financial instruments and risk measurements (and many other data) are captured differently by different firms, and this is a major limitation facing any effort to analyze risks that cut across firms and markets. Standard transaction type and entity identifiers would, for instance, be helpful in enabling a regulator to spot concentrations of risk that otherwise might be obscured. It would also enable more transparency, thus facilitating investors' understanding of the products that they purchase.

At present, it is expensive merely to assemble consistent, specific information that would enable appropriate analysis, disclosure, and oversight. Many workshop participants noted that there is a need for unique identifiers for the wide range of over-the-counter derivatives and financial contracts, analogous to the numbers developed by the Committee on Uniform Securities Identification Procedures (CUSIP) that provide a standardized and unique way to identify many types of securities. Just knowing the prices of these instruments is not enough; a systemic risk regulator also needs to know a fair amount of detail about the contract terms of the instruments in order to perform aggregation and make comparisons across firms. Every firm has its own way of capturing this detail, and much discussion at the workshop addressed the benefit of a common language.

To the extent that such common nomenclature would be shared among firms, it would also improve firms' ability to evaluate their risks because, for example, terms and conditions would be unambiguous. The identification for complex or customized financial products is not as straightforward as it is for conventional financial products. It would be important to capture both nominal terms and related counterparty commitments with some specificity. Although some workshop participants said that there would be even greater clarity, among other benefits, if products or instruments were themselves standardized, many argued strongly against pushing that concept too far, since many end users value the customization of transactions to meet their specific exposure profiles.

One participant argued that a requirement that firms agree to standards for data collection would be useful not only to a systemic risk regulator—which would then be able to aggregate appropriate data to develop partial insight into systemic risks—but it would also be useful to firms' own operations. Such a move might also strengthen firm-level risk management. The rationale for this argument is that the back-offices in firms invest enormous resources in the reconciliation of transaction data that are booked in accordance with varying standards. If a certain level of standardization were mandatory, firms might realize cost savings by re-engineering their processes so as to capture their transactions electronically. The speaker believed that the cost savings to firms would be substantial.

Participants noted that some work on creating standard identifiers has already been done or is under way, and that this work could provide an effective foundation for a more comprehensive protocol. The task of creating standard identifiers will involve compromises, but it is essential to improving firms' and regulators' ability to understand and monitor systemic risk. Some workshop participants suggested that this task might be carried out by a joint public-private working group. This could be a first step in building the capability for systemic financial risk regulation.

#### *Data Needed for the Regulation of Systemic Financial Risk*

Many workshop participants stated that neither the regulatory system nor individual firms currently have adequate data to monitor and regulate systemic financial risk. For example, when the market for mortgage-backed securities ran into trouble in 2007, it would have been helpful to know different firms' exposures to this asset class. However, no one regulatory agency had complete information. More generally, risk professionals at firms do not necessarily examine the same tail events that would be examined by a systemic risk regulator. This is especially true if the firms' risk professionals do not fully recognize the degree to which the systemic risk associated with a given scenario is resistant to diversification or hedging. Therefore, if a regulator wants to analyze tail risk, steps must be taken to gather the relevant data explicitly.

A systemic financial risk regulator will need to make judgments regarding the following:

- When certain firms or market segments are overleveraged,
- When asset bubbles are growing,
- When exposures are becoming correlated, and so on.

In effect, the regulator will need to interpret the "four L's" of leverage, linkages, liquidity, and losses across the financial system. Workshop participant Tanya Beder of SBCC Group emphasized that context is important. For example, the degree of leverage that a firm can sustain depends both on its underlying health and on the amount and type of stress in the system. Thus, merely collecting raw transaction data is not sufficient in itself to address the problem.

A good understanding does not yet exist about which linkages contribute to systemic risk, and there is much theoretical work to be done on how financial crises propagate in interconnected markets and on specific topics, such as liquidity. Just knowing positions does not give a clear indication of whether a liquidity freeze could occur, and access to data for every transaction would not necessarily foretell future illiquidity episodes because those episodes depend heavily on how firms react to different stresses.

For systemic regulation to be effective, it is not enough for a regulator to know every firm's exposure to, say, mortgage-backed securities and how the firms and the markets related to mortgage-backed securities interact. The regulator would also need to know what "levers" to pull, and knowing that depends on the answers to questions such as how those firms will respond to different regulatory actions. If a systemic risk regulator knew enough to recognize that a small number of firms in a certain market were all holding the same positions, what actions should be taken? Should a "concentration warning" be signaled to market participants, or should intervention be undertaken? Should the regulator tell each firm to divest some percentage of its position in that security, or tell one firm to divest a larger fraction? What is the most effective course, and what are the ramifications of each action? Simply gathering and analyzing position

data might not inform those decisions. Moreover, is it necessary for the regulator to pull a lever? If the regulator made these data public, would that be sufficient to ensure that firms would take care of this risk concentration? Or would such an action lead to undesirable responses such as flight from that risk? These are questions that might be answered through research into financial system dynamics. Currently, not enough is known about the causes of systemic financial risk and the potential effects of alternative mitigation steps that might be taken by regulators.

What is the necessary level of granularity of the data? One view expressed at the workshop was that every trade and contract should be reported to regulators in a timely fashion. Another was that data with somewhat less granularity, including lower frequency, would be easier to examine and interpret, with some suggesting that the capacity to collect highly detailed data on demand would also be required. A third view was that no amount of detail would at present be adequate for the task of systemic regulation since, without models in place first, one would not know how to analyze these data. It will not be possible to develop a relevant suite of models without agreement on the relevant system-wide facts that the models must explain. In short, many at the workshop questioned whether anyone can currently say what data are needed for the regulation of systemic risk. As models and analytics are improved and advance our understanding of systemic events and their dynamics, it is likely that data needs will become more sharply defined. David Rowe of SunGard summed up this matter by saying that the establishment of a systemic risk regulatory capability will have to be an iterative process, one that will evolve as more is learned.

Some data of potential value are already collected centrally. Included are those in regulatory reports filed by financial institutions or other data provided by those institutions to supervisors, the Federal Reserve's Flow of Funds accounts, the records of market utilities such as the Depository Trust and Clearing Corporation (DTCC), tables compiled by the Bank for International Settlements, or data generated by shared trading platforms and the operations of financial institutions. However, access to these data is carefully controlled, and they are not necessarily available, or not available in the degree of detail required, for analyses that would inform systemic risk regulation. Workshop participants raised a number of issues that would have to be addressed in order to make these data more readily useful for guiding systemic risk regulation:

- The quality of the data would have to be examined and possibly improved,
- The existing level of granularity of the data might not be well suited to systemic financial risk regulation, and
- Protections, some mandated by Congress, would have to be reconsidered.

Most workshop participants who commented about existing data sources did not view them as a panacea, and participants expressed caution about making them more widely available. Despite this, Beder said that they do contain some important centralized sources of information that may provide a window into some aspects of systemic risk. Thus it might be valuable to start with analysis of these data if privacy and policy issues can be resolved.

In a breakout session, Charles Taylor of the Pew Charitable Trusts proposed a three-pronged strategy for data collection:

1. *Broad indicators at the level of markets plus aggregates of firm measures.*

2. *Data that illuminate how institutions address their own risk management*—not only the reporting of it but also how they process risk information. The goal of this information would be to provide an opportunity for regulator feedback. This process is, of course, already carried out at the individual supervisor level. Taylor’s concept—which was not discussed in depth at the workshop—could make that feedback process more scientific, consistent, and transparent, and therefore more useful for systemic risk management. It could also provide insight about hidden sources of systemic risk, as mentioned in the final section in this chapter, on human behavior.
3. *Data that would be defined through ongoing research to model systemic risk*, which is expected to point to new types of indicators as both the financial system and knowledge about it evolve.

The purpose of these three prongs is to enable the systemic risk regulator to react to the next crisis or, ideally, to anticipate it.

#### *Some Signals That a Systemic Regulator Might Monitor*

In various remarks, workshop participants suggested that a systemic financial risk regulator might monitor risk concentrations, profits, unusual escalations in asset prices, and other indicators as signals of potential instabilities. Unfortunately, it is difficult to know whether an excess is a systemic risk or a business opportunity. Risk concentration was also suggested as an important indicator, but not one that is easy to measure in a definitive sense. The reporting of counterparty relationships might enable improvements to this capability, or there might be some more specific approaches. The evaluation of various potential indicators of emerging systemic risks is an ongoing topic for research.

Other measures proposed involved the velocity of transactions and variances in valuation. Some workshop participants suggested that velocity in the system—how rapidly new instruments are being developed, how frequently an individual buys a house, how many times the same piece of risk get repackaged, and so on—might be correlated with systemic risk. Thus, tracking velocity (suitably defined and measured) might be a form of systemic risk monitoring. Beder reported that her breakout group had suggested, for example, that regulators might monitor the difference between mark-to-market values and those produced through widely used theoretical models, especially given the observed divergence of these two indicators during both overheated and dislocated markets.

Several workshop participants noted that it would be beneficial for a systemic risk regulator to see gross (unnetted), rather than net, disclosures. As a financial firm becomes more distressed and approaches failure, its counterparties will manage transactions more tightly, potentially making it difficult for the firm to manage its gross positions, and the firm’s failure will require the effective unwinding of both long and short positions of the firm by market participants unless netting arrangements are in place.

Barry Schachter of Moore Capital Management reported on his breakout group’s discussion of the potential for finding leading indicators of trouble. One perspective in that group was that this is a futile goal, because by the time indicators provide unambiguous signals, a problem may have reached the point at which little can be done to reverse or mitigate it. Another perspective was that market-based data, such as credit spreads or volatility, might provide useful signals, although

concern was expressed that it is not known which measure of volatility would be most useful. Some participants noted that the market might misprice some of these key variables, thereby undermining their usefulness as early-warning signals, as was the case during the run-up to the current crisis. Another view is the network perspective, which would look for such things as measures of changes in interconnectedness that might indicate a reduction in stability or resilience. At present it is not known what those measures should be.

There was some breakout discussion on the need to use past bad and good times as benchmarks for determining where we are in certain cycles (e.g., the leverage/volatility cycle). Such an approach might lead to a broader range of stress test scenarios for firms to address. Some way of characterizing what constitutes a “normal” market is also needed, and that in itself is a daunting task. Different state variables might be more important during systemic events than in normal times. Regulators might specify the state variables for which data should be collected and aggregated and the stress test conditions that market participants should apply.

Several workshop participants suggested that the Supervisory Capital Assessment Program (SCAP) exercise of February 2009 might be a good starting point from which to build. That exercise “allowed supervisors to measure how much of an additional capital buffer, if any, each [of the 19 largest U.S. bank holding companies] would need to establish today to ensure that it would have sufficient capital if the economy weakens more than expected.”<sup>1</sup> Joseph Langsam of Morgan Stanley suggested possibly extending this model to incorporate leverage and liquidity cycles. Several participants observed that the exercise facilitated good communication among economists and modelers from industry and government, supervisors, and financial institution managers and might have changed the dynamic among those groups, a positive side effect with long-term salutary consequences.

### *Monitoring Networks of Counterparty Risks and Exposures*

Schachter reported that his workshop breakout group had agreed that the data currently available publicly are insufficient for spotting many conditions that can lead to a systemic financial crisis. Firm-specific data, viewed in isolation, do not necessarily illuminate all relevant sources of risk; the exposures of a firm’s counterparties are also important. Indeed, Schachter noted that there can be real systemic risk even if individual financial institutions are doing an ideal job of controlling their firm-level risks. Since systemic risk arises from a complex and multilayered set of relationships—for example, counterparty risk exists in a cascade of relationships—it is an understanding of the relationships (and their dynamic properties) that is essential to systemic risk regulation. To achieve such understanding, models of networks may be needed.

Regulators should know the risks to the system of a failure of any given counterparty. Thus some members of Schachter’s breakout group pointed out the value of data that improve the understanding of the dynamics of the network and the system. Better understanding of network relationships represents an opportunity to enhance the models used by regulators and the Federal Reserve. More generally, crisis detection must cast a wide net because, in a globalized world, systemic problems can be triggered by such a wide variety of geographically dispersed actors and situations. A better understanding of these networks could lead to better risk management by individual banks as well as better systemic risk management.

<sup>1</sup> From <http://www.federalreserve.gov/newsevents/press/bcreg/bcreg20090507a1.pdf>, accessed November 24, 2009.

Taylor pointed to the failure of Herstatt Bank in 1974. It was a small bank outside the purview of U.S. regulators, but its midday failure resulted in significant foreign exchange settlement losses and extended disruption in the ensuing operation of those markets. The experience with Herstatt is an illustration of the fact that we can export our risks and we can be affected by risks from other countries. In the current crisis, highly leveraged Icelandic banks neared default owing to losses on securities and derivatives positions, with serious consequences for depositors and regulators in the United Kingdom. Analogously, the current crisis was in part precipitated by subprime loan problems, which were viewed as being on the regulatory fringe of the U.S. financial sector. Other participants added that systemic risk monitoring will have to extend to firms beyond those in the core banking system and to instruments that might not currently be classified as regulated securities or transactions.

J.B. Silvers of Case Western Reserve University summarized the comments in his breakout group as pointing to the need for insight into the whole counterparty interconnectivity network. In large measure, today's data and models illuminate only the first-level impact of a crisis. In order to understand systems behavior, such as how an initial impact might affect exposures in other firms or sectors, much more understanding of interconnectivities will be needed, including how those connections might behave or change under stress conditions. Of course, attaining this level of understanding involves modeling as well as data. The stress tests applied in the spring of 2009 to the largest banks rested on relatively simple models of risk based on the behavior of financial measures computed from currently available data and without the interconnectivities proposed in the workshop. Measures of interconnectivity both imply and demand more sophisticated models to accompany them. These must be developed in parallel to be effective. The importance of understanding the topology of dynamic networks is well known in the natural sciences where, for example, in fields such as ecology and epidemiology the identification of ever-changing critical nodes (keystone species or superspreaders) can inform how epidemic collapse occurs and spreads.

George Sugihara of the Scripps Institution of Oceanography suggested extending thinking about financial networks from a natural science perspective. One might use that lens to explore generic behaviors of the financial markets viewed as a complex, evolving, dynamic system (analogous to ecosystems). In particular, this might entail monitoring growth in the homogeneity (reduction in the diversity) of the network that increases the number and strength of linkages. Such changes are known to increase cross-correlation and predispose natural systems to collapse.

Sciences such as ecology and epidemiology have long focused on understanding the relationship between diversity changes and system stability. Translated to the financial network, instability would occur with increased linkage strength as each institution is affected more by the balance sheets of neighboring institutions. If this analogy holds, Sugihara suggested that increased correlation among institutions and markets could be one of a set of generic early-warning signs for identifying impending system vulnerability. Considerations related to diversity (heterogeneity) might also apply to institutional structures, products, consumer populations, and so on. These models can be compared and contrasted with the general equilibrium models widely used in economics, the simplest versions of which have a representative agent with no diversity but with well-defined risks.

*Regulators Need New Analysis Tools*

Workshop participants noted that no one model will suffice for everything. Rather, there is a need for a suite of models, some coarse-grained and some fine-grained, some at the macro level and some at the micro level. There was some recognition that, as models are developed to help in systemic regulation, the need for a dynamic view must be taken into account. That is, the models must be able to adapt to changing topologies and networks, because the connections that exist among financial firms change during the buildup to a crisis and during the crisis itself. Systemic financial risk supervision must be able to track such changes in a timely fashion.

There was some discussion in Schachter's breakout group about the challenge of monitoring systemic risk when such risks have not first been properly modeled and relevant data have not been collected. Data and analysis are naturally intertwined, so plans for improving both should be developed in tandem, not sequentially. Mathematical modeling is needed to represent systemic risk. Other models eventually will be needed to monitor a given firm's contribution to systemic risk. Participants in that breakout group suggested envisioning a variety of complementary models that achieve targeted improvements over the existing capabilities. These models would serve both to aggregate firm-level information and to capture the interstitial phenomena that are not modeled at the firm level such as certain tail risks. Charles Lucas of Osprey Point Consulting pointed out that systemic risk regulation requires understanding more than just position and transaction data; it also will require new macroeconomic data, models, and analyses.

Some workshop participants noted the need for regulators to model and influence negative (offsetting) feedback mechanisms, both those that exist and those that could be envisioned. As Andrew Lo of the Massachusetts Institute of Technology observed in his keynote presentation (see Chapter 3), a lack of timely feedback seems to underlie systemic crises in many engineered systems. Another participant pointed out, however, that not all feedback will induce the desired change in behavior, implying a need to learn more about what sorts of interventions can be effective and on what timescales. Schachter said that, overall, the discussion pointed to a rethinking of modeling approaches in order to understand the mechanics of systemic risk. For example, aspects such as the dynamics of liquidity generation and erosion are still poorly understood.

Yaacov Mutnikas of Algorithmics pointed to the potential value of a regulator's being able to run sector-wide stress tests without relying on firms' models and involvement, which can lead to delays and can signal regulators' areas of concern, which could become self-fulfilling. This is not a capability that currently exists to a meaningful degree in any U.S. financial regulator. During times of liquidity failure, in particular, the ability to perform stress tests quickly and quietly could be very valuable.

*Privacy and Other Issues That Limit the Regulatory Use of Data Already Collected*

The workshop discussion suggested that systemic risk regulation requires more comprehensive access to data at a detailed level than is currently available to any single regulator. A full assessment of the regulators' access to data will require comprehensive study, including an analysis of applicable statutes, but the discussion highlighted several points. First, the access by regulators to data is limited by their statutory authority, which determines their

jurisdiction over specific legal entities and/or markets, and systemic risk regulation may require data collection beyond the scope of currently regulated entities. Second, regulators are granted broad access to information subject to constraints and penalties for its misuse, because such data may involve information that has commercial and competitive value or that involves the privacy of individuals; even U.S. government nonregulatory statistical agencies seek to safeguard commercially valuable data and consumer privacy. Third, U.S. regulators face constraints in sharing information with one another, and the international sharing of data by regulators remains subject to substantial impediments. Fourth, data may need to be available to researchers in academia, research institutions, and the financial industry so that the models and tools proposed in the workshop can be developed.

In these respects, the situation is not the same as with, say, meteorology, where governments are free to gather all the data that they need and can afford. There is a tension here about what data to collect, about what supervisors and systemic financial risk regulators should be expected to do, and about the conditions under which (and restrictions on how) data may be shared among regulators and with researchers whose work might provide the measures and models to assist the regulators. These are major policy questions that will require research and debate. Beder reported that her breakout group thought that good progress has been made in mathematical and technology-based transformations that protect the owners of the data.

#### *Which Data Should Be Public Information?*

The transparency provided by making some data available to all can be a powerful tool to improve the market's ability to price risks that can contribute to systemic risk, such as counterparty risk. Price transparency generally improves market efficiency and liquidity, but position transparency might reduce returns from proprietary research and thus be resisted even if it does provide risk information.

For example, Beder reported that her breakout group discussed the potential value of tracking and releasing information such as the bid-ask spread for instruments on an ongoing basis, with several participants noting that spreads had widened prior to dislocations in many markets. This is a complex issue, because the behavioral responses to public information may enhance or threaten systemic stability. Further research in this area will help guide the systemic regulator's policies on disclosure.

Schachter's breakout group agreed that, to a first approximation, data that were public during the run-up to the current crisis were not adequate for enabling a regulator to have foreseen the crisis. This echoes what was said in the keynote talk by Lo: a number of people were able to publish warnings in the years prior to 2007, but the data were not strong enough to provide a definitive justification for mitigating actions. For example, there were limited data available to regulators on subprime mortgages. It might have been valuable to know who held subprime-based mortgage-backed securities and other assets that could, and in fact did, become "toxic" in the absence of plentiful market liquidity. More generally, the data available would not necessarily expose the details of the network connections and flows. Information on the "four L's" (leverage, linkages, liquidity, and losses) would have been helpful in identifying potential trouble spots and in managing through a systemic crisis.

What is the appropriate richness of detail that should be made available and to whom? The answer depends on whether the information will be available only to regulators, or also to

competitors and even to the general public. If the data are the notional values of derivative contracts, for example, accompanying information would be needed to put these data in context, such as which models were used to determine exposure, the mark-to-market values, and whether exposures are static or dynamic. One of the breakout groups concluded that data must be comprehensive, internally consistent, and suitable for feeding into analytical models. The question of which data to share—with regulators, with other firms, and with the general public—will require further study.

#### *The Need for Stronger Training in Financial Risk Management*

At several points during the workshop, various participants noted the need for more people, both in industry and government, with strong training in financial risk management. Modeling and analysis are going to be necessary no matter what system of regulation is developed. It was suggested that some federal agency might invest in extramural research that also contributes to the training of financial risk analysts. Fields other than traditional economics and finance are showing themselves to be important building blocks for advancing the understanding of systemic risk, so any such program should be multidisciplinary.

Access to data is also critical for training. Financial risk managers need access to real data in order to become well trained. In the current context, it is very difficult for academics to gain access to relevant data, with the easiest path being to consult for a bank. Myron Scholes of Stanford University pointed out that such an arrangement provides value, because an important aspect of training is to develop a real understanding of how things work, and that process can be facilitated when students and professors work with industry practitioners. It does, however, steer researchers toward those problems that are longstanding rather than their contributing to newly emerging issues of uncertain significance, because industry's timescale is shorter and its breadth of focus narrower than that of academe. This channel for data analysis also concentrates energy on questions of interest at the firm level which, as noted above, might be of limited relevance for advancing the knowledge of systemic issues. It might be necessary for the systemic financial risk regulator to sponsor research on such issues.

Several workshop participants observed that without strong support or "tone at the top" from the chief executive officer, risk managers can readily be outvoted in corporate decision making, especially when an opportunity for immediate profit presents itself and when there are great uncertainties associated with some of the worst-case risk estimates. Beder suggested that there is a need for more training of corporate managers and boards of directors with respect to risk and scientific thinking. Ultimately, this should facilitate communication about risk and its uncertainties and improve executive decision making.

#### *Incorporating an Understanding of Human Behavior into Systemic Risk Regulation*

One workshop participant noted that systemic risk is not driven solely by financial engineering; behavior, auditing rules, and governance also play important roles. Therefore, models to inform systemic financial risk regulation need at least to simulate processes of individual behavior and feedback arising from individual behavior.

Human beings have difficulty incorporating potential worst-case scenarios into their decisions. This limitation applies as much to risk managers and heads of large organizations as to anyone else. Christine Cumming of the Federal Reserve Bank of New York recalled that many have characterized the current crisis as a failure of imagination. The scale of this crisis is in part a reflection of the multiple layers of modeling and technology and associated opacity that swamped the capability of risk analysis systems to produce reliable metrics. A great deal is learned about the financial system when it is under stress, including how people behave. Cumming suggested that the methods of science might help extract from our recent experience lessons about the interplay between human behaviors and market stability.

Scholes pointed out that there is an inherent timescale associated with human decision making within organizations and that in times of high volatility, that timescale constrains the ability to make decisions as fast as the situation demands. When a shock occurs, intermediaries need time to reassess the calibration of their models, both formal and heuristic. In the meantime, intermediation can halt, leading to credit markets freezing up and a sudden lack of liquidity.

Sugihara suggested that there could be value in an increased use of behavioral surveys to monitor and understand convergence within evolving behavioral models. That approach might improve regulators' understanding of important trends, such as the actual underwriting standards applied in practice and how they are changing over time. For example, Beder reported that her breakout group mentioned firms' use of similar risk limits as a contributor to systemic risk. She illustrated this with the common rule of limiting exposure to no more than the average 20-day trading volume. Her group suggested that it might be valuable for a systemic risk regulator to collect information on such rules. Such knowledge might also, for instance, inform the understanding of when traditional, stylized forms of risk management should be overruled by other, more dominant considerations such as sudden and contagious shifts of public mood. Several workshop participants said that such shifts of mood had contributed to the run-up to the current crisis. Sugihara speculated that emerging regulations may shape the next systemic event and that behavioral models designed to evolve stylized innovations that "skate the edge of regulation" are likely to be useful.

### Observations from the Workshop's Keynote Presentations

The workshop keynote presentation by Andrew Lo of the Massachusetts Institute of Technology began by looking broadly at the causes of crises in other technology-based sectors besides the financial sector, such as aerospace, nuclear power, and transportation. He echoed Perrow,<sup>1</sup> who studied accidents and concluded that they are a normal phenomenon of complex, nonlinear systems with tight coupling. Human behavior is an important contributor in many cases, and many complex systems embed human decision making. Lo added that, in addition to tight coupling and complexity, a third necessary condition for a crisis to develop is the absence of negative feedback over an extended period of time.

Lo pointed out that simply losing a great deal of money is not what defines a systemic risk. He contrasted the current crisis, which has cost the country \$1.5 trillion, with the major stock market movement on April 14, 2000, when the market lost \$1.04 trillion. No one considers the latter event to have been systemic, even though it involved losses on the same scale as those of the current crisis. The difference is that people who invest in the stock market expect some downturns and were presumably aware of the risk prior to April 14, 2000. A characteristic of systemic events is that they result in losses among people who were not expecting them and were unprepared.

Many ideas have been developed for reducing systemic risk. Lo listed 14 possible policy responses that academics, policy makers, and other observers have proposed in light of the financial crisis (see Box 3.1). He observed that, over the next several years, the nation will be rebuilding its financial infrastructure for the future and it needs more, not less, financial expertise. Systemic risk *can* be measured, and people have made steps in that direction. The data available for early warnings were suggestive but not conclusive, and so more has to be done to develop an understanding that is clear and reliable enough to use in managing the financial system. All of this suggests that people with strong expertise in engineering and quantitative modeling are critical to addressing the challenge.

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<sup>1</sup> Charles Perrow. 1984. *Normal Accidents: Living with High Risk Technologies*. New York: Basic Books.

**BOX 3.1****Some Possible Steps for Reducing Systemic Risk in the Financial Sector**

- Break up banks and broker/dealers that are “too big to fail.”
- Create exchanges for credit default swaps and other large over-the-counter contracts.
- Create an equivalent of the National Transportation Safety Board or National Weather Service for analyzing blowups and monitoring risks.
- Require confidential disclosure regarding “network” exposures.
- Implement countercyclical leverage constraints for bank-like entities.
- Enforce “suitability” requirements for mortgage-broker advice.
- Require certification for management and boards of complex financial institutions.
- Impose more mark-to-market accounting and risk controls.
- Impose capital adequacy requirements for all bank-like entities.
- Create a new discipline of “risk accounting.”
- Impose a small derivatives tax to fund financial engineering programs.
- Revise laws to allow “pre-packaged” bankruptcies for finance companies.
- Change corporate governance structure (compensation, role of the Chief Risk Officer, etc.).
- Teach economics, finance, and risk management in high school.

SOURCE: Adapted, with permission, from Andrew Lo, Massachusetts Institute of Technology, presentation at the Workshop on Technical Capabilities Necessary for Regulation of Systemic Financial Risk, Washington, D.C., November 3, 2009.

Myron Scholes of Stanford University gave a keynote presentation that discussed the costs of adjusting portfolios when conditions change. Flexible portfolios are more expensive and less profitable. One must pay for an option that gives flexibility, and the option price is high when volatility and illiquidity are high or may become high. Leverage is inherently inflexible because positions cannot easily be sold in a downturn to pay off the debt. Illiquidity also rises in a crisis. In the run-up to the current crisis, too much leverage was taken by consumers, investors, governments, corporations, and financial entities, making the system unstable.

Scholes noted that the cost of the bailout should be compared with the costs of proactive solutions such as tighter regulation. It is possible that the bailout is less expensive. Systemic financial risk regulators are essentially risk aggregators. He believes that many systemic risks can be identified by careful aggregation of firm risk measures. This must be dynamic, as the value of liquidity provision varies over time. Stable-value products are inherently unstable and might be a source of systemic risk. Debt convertible to equity when triggered by systemic events might be an important tool for increasing flexibility. Accounting must be improved to reduce the impact of false profits and short-run compensation. Overall, firms should hold bigger capital cushions. Regulation to ensure this could improve everyone’s welfare. Incentives and monitoring must work together to reduce the possibility of systemic failures.

The keynote presentation by Robert Engle of New York University discussed the financial crisis in terms of two features—the failure to assess risks adequately and the incentives to ignore

risks for many market participants. Solving the incentive problems has been the primary goal of regulatory reform. Solving the risk assessment problem is at the heart of the workshop discussions.

To measure risks of individual firms and systemic risks of the financial system as a whole requires both data and models. Models of volatility predict the magnitude of short-run price movements. Over longer horizons, there is a possibility that the risk itself will change, or at least that the volatilities will change. Thus, long-term risk measures must reflect the way that risks are likely to change. Counterparty exposures are important systemic risks in the over-the-counter derivatives markets, and these can be managed by a combination of central clearing, collateral contracts, and improved transparency.

Regulators should have access to counterparty exposures and position data in Engle's view. In this way, models can predict the impacts of stresses that flow through networks of counterparties and positions ultimately affecting the whole system. His talk discussed new research on systemic risk measures. Such measures can be constructed from public information or, with more precision, from nonpublic information. He argued that systemic regulators should be given access to these data and, in the meantime, should continue to develop models of systemic risks based on public financial data.

**Appendix A**

**Letter from Senator Jack Reed to Ralph Cicerone, National Academy of  
Sciences President**

JACK REED  
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August 27, 2009

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Dr. Ralph Cicerone  
President  
National Academy of Sciences  
500 Fifth Street NW  
Washington, DC 20001

Dear Dr. Cicerone:

As the United States recovers from perhaps the most severe economic and financial crisis since the Great Depression, we are learning about and seeking to repair many of the shortcomings in our financial regulatory system. Among the lessons learned is that our regulators face significant limitations in the data and analytic tools they have available to identify and mitigate potential systemic risks that cut across financial institutions, products, and regulators.

As has been identified by a number of individuals and organizations, policymakers and regulators have faced significant challenges resulting from the lack of the necessary tools to fulfill their obligations to monitor and manage the health of financial markets. Financial regulators, including any new systemic risk regulator that Congress creates, will need clear responsibility, sufficient authority, adequate tools, and comprehensive data to monitor and mitigate systemic risks.

In considering reforms to financial oversight, we must have a better understanding of the existing data and analytical capabilities of current regulators, and what specific additional tools and resources are needed to successfully modernize regulators' ability to fulfill their missions. As such, I would request that the National Academy of Sciences prepare an analysis of this issue that examines:

- the data and analytical tools that currently exist among regulators to address risks in the financial system;
- the data-collection and analysis capabilities that are needed to ensure that regulators can successfully address systemic risks in the future;
- the resource needs that are associated with these improvements;
- the technical challenges that are associated with systemic risk supervision; and
- the options that exist for building these capabilities, including high-priority research questions.

It is my hope that the National Academy of Sciences can complete this analysis by October 31, 2009. Thank you for your attention to and consideration of this request. I look forward to your response.

Sincerely,



Jack Reed  
United States Senator

**Appendix B****Workshop Participants**

Viral V. Acharya, New York University  
Tobias Adrian, Federal Reserve Bank of New York  
Lewis Alexander, Department of the Treasury  
Tanya Styblo Beder, SBCC Group, Inc.  
Penny Cagan, Algorithmics  
Mark Carey, Federal Reserve Board  
Robert N. Collender, Federal Housing Finance Agency  
Christine M. Cumming, Federal Reserve Bank of New York  
Deborah J. Danker, Department of the Treasury  
Giovanni Dell’Ariccia, International Monetary Fund  
Robert F. Engle, New York University  
Randall Fasnacht, U.S. Senate Banking Committee  
Gregory Feldberg, Department of the Treasury  
Charles Fishkin, AllianceBernstein  
Darryl E. Getter, Congressional Research Service  
Michael S. Gibson, Federal Reserve Board  
Daniel L. Goroff, Alfred P. Sloan Foundation  
Alan J. King, IBM Thomas J. Watson Research Center  
Paul H. Kupiec, Federal Deposit Insurance Corporation  
Joseph Langsam, Morgan Stanley  
C. David Levermore, University of Maryland  
Mark Levonian, Office of the Comptroller of the Currency  
Nellie Liang, Federal Reserve Board  
John C. Liechty, Pennsylvania State University  
Andrew W. Lo, Massachusetts Institute of Technology  
Charles M. Lucas, Osprey Point Consulting  
Thomas J. McCool, Government Accountability Office  
Allan I. Mendelowitz, Federal Housing Finance Board (retired)  
David K.I. Mordecai, Risk Economics Limited, Inc.  
Yaacov Mutnikas, Algorithmics  
John W. O’Brien, University of California at Berkeley  
Gerald Peters, GP Gallery  
David M. Rowe, SunGard  
Barry Schachter, Moore Capital Management  
Myron S. Scholes, Stanford University  
J.B. Silvers, Case Western Reserve University  
Charles Smithson, Rutter Associates  
George Sugihara, Scripps Institution of Oceanography  
Charles Taylor, The Pew Charitable Trusts  
Charles M. Vest, National Academy of Engineering  
Scott T. Weidman, National Research Council

**PREPARED STATEMENT OF STEPHEN C. HORNE**

VICE PRESIDENT, MASTER DATA MANAGEMENT AND  
INTEGRATION SERVICES, DOW JONES & CO.

FEBRUARY 12, 2010

Good morning, Chairman Bayh, Ranking Member Corker and Members of the Subcommittee.

My name is Steve Horne and I am the Vice President of Master Data Management for Dow Jones. I have spent over 30 years building complex databases, transforming highly complicated data into usable information.

Thank you for inviting me to speak with you today.

I have testified many times over the past year on the impact of the financial meltdown and the need for a comprehensive analytic database that is designed to capture the appropriate real-time information necessary to prevent waste, fraud and abuse of the TARP program and to ensure that the American taxpayer's money is being used as intended.

Legislation that would create such a database has been introduced by Senator Warner, S. 910, with a companion bill that has already passed in the House, H.R. 1242, by a vote of 421-0. Both these bills have been strongly endorsed by organizations such as the U.S. Chamber of Commerce, OMB Watch, and the Center for Democracy in Technology.

Using the same basic infrastructure of the database that would be created under the legislation described above, we at Dow Jones have identified over 400 leading indicators that when *used together* can identify potential systemic risk within the financial system and many other parts of the economy. The challenge is to combine this disparate data into a structured database to be able to make informed judgments about the risks.

Systemic breakdowns that impact individual geographic markets in this country are caused by a combination of factors, including unemployment, bankruptcy, foreclosures and commercial real estate failure.

For example, in Las Vegas, a huge influx of different socio-economic groups moved into this market over the past 10 years. One of these groups is retirees. When the financial meltdown occurred, these Americans were mostly living on fixed incomes: savings, retirement investments and their social security. They bought retirement homes either with cash or with mortgages that were smaller than many, but they still incurred new debt. Over the last 3 years, the income from their retirement investments went negative and they have had to dip into the principal as the only way for them to gain cash.

As the foreclosures generally grew around them, retirees saw the value of their homes decrease in half as well. Those who had mortgages were now upside down, those who did not, saw the major investment they had spent a lifetime building dwindle in value.

Now these senior citizens face a much more difficult situation. With a major portion of their principal gone, many cannot afford to live on their fixed income and have to go back to work. In Las Vegas, 16 percent unemployment does not bode well for anyone looking for work. If they own their home, new mortgages are very difficult to get. Reverse mortgages are not an option because of the reduced availability of these programs. The combination of these factors shows the market for retirees in Las Vegas is in systemic failure right now.

This example is known in statistical terminology as the "Compounding Effects of Multiple Indices." If we can integrate this data into an actionable database, regulators can quickly implement surgical solutions that will apply the appropriate programs/funds to the most serious problems.

We are currently observing markets in North Carolina and Tennessee that are at risk of systemic failure. If the proposed data base were in place the government would be in a better position to confirm, quantify and tackle these problems proactively.

Unfortunately, the data is in disparate systems that cannot talk to each other. The value of the data base that is proposed in S. 910 is in its ability to combine and analyze this data to predict and prevent systemic risk. The transformation of this data into actionable information is neither easy nor inexpensive. However, the implementation of the proposed data base will *save* significant taxpayer dollars in three ways: *first*, through more efficient targeting of resources and serving the areas of greatest need; *second*, by enabling the government to insure that the appropriate actions are taken before systemic failure occurs; and, *third*, by helping prevent waste, fraud, and abuse of taxpayer's money.

The data base proposed should not create additional security concerns. The security methodologies under the IPISA Act (Information Protection and Security Act of 2009) and the contractual controls for the use of commercial data are sufficient to protect this information. In addition, language included in H.R. 1242 that passed the House provides for even greater protections for non-public data.

The system being proposed is designed to expand to cover global data. Although some of the data from overseas may not be accessible due to laws of specific countries, other international data is in better shape and can be built into accurate analytic systems because of the early adoption of XBRL technology by many countries.

In summary, the data and technology exist today to equip financial regulators with the tools necessary to monitor systemic risk. The only thing lacking is government action to make it happen.

Thank you again, Chairman Bayh, Ranking Member Corker and the Members of the Committee for your time and attention. I am happy to answer any questions you may have.

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