

## Unedited Event Transcript

### Book Launch: *The Right Balance for Banks: Theory and Evidence on Optimal Capital Requirements*

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Adam Posen: Good afternoon, everyone, and welcome back to the Peterson Institute for International Economics. I'm Adam Posen, the Institute's president. And we're delighted to have the latest in the series of serious works and books by our colleagues on the issues, the critical issues, of financial regulation, bank supervision, bank capital, and non-bank financial stability.

Today, of course, we are releasing the new book, "The Right Balance for Banks: Theory and Evidence on Optimal Capital Requirements" by Bill Cline. We obviously, additionally have just a few weeks ago had a book on a related topic by Morris Goldstein. And we're delighted today to have another of our colleague's work in this area, Simon Johnson, come forward as a discussant.

Before I let Bill and our distinguished discussions come forward, let me just say two institutional things relating to these issues. The first is just to say as ever at the Institute. We're proud to have a difference of views when it's well argued and well thought out. And that's exactly what we have. We've had a variety of takes on financial regulation and supervision without making a big point of it.

Those of you who are following this will see a different place in bottom line and in approach in Bill Cline's book than was the case of Morris Goldstein's book than was the case in things I've written or Simon Johnson or Nicolas Véron or others. We're very proud to have that diversity of views.

But that also means that I hope those of you consuming our works understand both how much debate and thought goes into them that we're all open to each other's criticism and that where we do agree you all should pay particular attention. And so, there are a few issues in the financial regulatory sphere where I think almost all of our fellows who work as experts in this area agree. And all of them will be made worse by the repeal of Dodd-Frank in the present proposals. And I don't think I'm misrepresenting any of my colleagues' views, although they're free to correct me if that's the case.

So the issue of financial stability of financial regulation wherever you come down does require a decent amount of capital in the banking system and does require a decent regulatory supervisory framework independent enough to implement that. I think, as evidenced by the distinguished current and former officials we have in the room, they also agree. And so, while we're going to get into some very serious detailed recommendations and analysis, let us focus on that big picture that all of us in the building and I think most of us who are sensible and honest know that there is a sustainable necessary level of bank regulation and supervision and that the current discussion seems to be going away from that in the US Congress.

The second point I would just make is that Bill's work is extremely fresh. For those of you in an analytical sense and that is something that I've always admired about Bill and I think many of our colleagues join me in this. For the many years he has been here at the Peterson Institute going back to 1981 where he was, I think, employee number three after Fred and John Williamson. Bill has always cut his own independent cloth. He goes back to first principles and he tries to do it right. And this book is another example of that.

As many of you are aware, there has been this debate about capital standards and some of the extremes were put out there by our friends, Anat Admati and Martin Hellwig on one side, saying it would be to caricature them, but only slightly—it would be costless to triple bank capital and a good idea. And then the frankly risible report that came out in the middle of the crisis by an unnamed institution claiming that there would be calamitous costs where we to increase capital standards, which was also wrong.

Bill went about his own business and freshly said this is an insurance problem. What's the right cost? What's the problem we're trying to insure against? What's the right amount of premium? And then what would it take? What's the trade-off for paying that premium? And again, we can all disagree or debate various aspects of how Bill did this, but that was the right principled way to come out.

And in a sense, if I was asked which I am to give the newsworthy bumper sticker of this, it's that increasing capital for banks is necessary, but it is not costless. It is more is needed than we currently have but much more would be highly costly. I think that's a fair distillation of Bill's much more subtle and detailed analysis. And that is news in a world where these things are being debated.

After Bill's presentation of his new book, we will have incredibly distinguished speakers to remark and discuss, and I'm grateful to both of them. Prof. Daniel Tarullo who recently ended his distinguished tenure

and frankly I will thank him—your true public service, Dan—for eight years on the Federal Reserve Board representing the US and the Federal Reserve in international financial regulatory matters, being part of the Federal Reserve leadership throughout the crisis, and maintaining the highest standards of principle. Thank you, Dan, for doing what you did and thank you for joining us today.

Dan this year has been serving as a distinguished fellow at MIT' Golub Center for finance and policy. And I expect he will be continuing to return to legal academia where he had a distinguished career in between his service in government.

We also have with us our close colleague, Simon Johnson, who's been affiliated with PIIE since 2008. He is, of course, the Ronald A. Kurtz (1954) Professor of Entrepreneurship at MIT Sloan School of Management. He is a foundational member of the Sloan School where he's head of Global Economics and Management group, member the Executive Personnel Committee, and chair of the Sloan Fellows MBA Program Committee.

He co-founded and currently leads the Global Entrepreneurship Lab. But many of you on today's panel on today's topic know him as one of the leading voices advising primarily, but by no means solely, Democratic politicians. He'll advise anyone who'll listen to him on some very forthright ways to think about—that's actually true of all of us. But most of us don't get as listened to as Simon—on the realities of financial regulation in today's world.

So I think it's an outstanding program. I think "The Right Balance for Banks" is an outstanding book. Bill Cline, please.

William Cline: Thank you, Adam. And I'd like to thank Fredrick Toohy for his excellent research assistance on this book. Let me begin with a few summary observations on where we stand in banking reform.

First, Basel III did not go far enough on capital requirements. However, capital targets estimated by some leading academics would be far too high and too costly. Second, so-called total loss absorbing capacity or TLAC at 18 percent of risk-weighted assets doesn't solve the problem because of crisis dynamics associated with it. Third, although higher bank capital today makes the system safer than before the crisis, Dodd-Frank weakened the Federal Reserve's Lender of Last Resort capacity, a serious mistake. Fourth, for European banks, the use of internal risk-weighting models remains a source of weakness. It is important to implement the so-called Basel IV reform placing floors on how far below standard risk weights the internal models are allowed to give.

Let me next summarize the main findings of my book. These are also found on page 4. First, the so called Modigliani-Miller offset whereby more equity does not necessarily increase the average cost of capital for banks even though equity is higher unit cost because investors will accept a lower rate of return when they see that there's less risk. He's less than half right. So, more equity capital is not a free lunch.

Second, higher cost capital banks translate the higher cost of capital to the economy and an increase in the ratio of equity to total assets by 1 percentage point, I calculate, reduces the level of potential GDP by 0.15 percent as measured by a standard production function, aggregate production function.

Third, I estimate that the long-term damage from a banking crisis is 64 percent of one year's GDP.

Fourth, the probability of a banking crisis is a highly non-linear function of the amount of bank capital dropping off very steeply at first, but then turning very flat.

Fifth, the key finding of this study is that the optimal capital requirement of equity is 7 to 8 percent of total assets, which corresponds to 12 to 14 percent of risk-weighted assets.

Sixth, Basel III is target of 9.5 percent of risk-weighted assets for global systemically important banks is accordingly too low.

Seventh, the too-big-to-fail literature which has supported the TLAC requirements incorporates an incentive to excessive risk-taking that I believe has been exaggerated and may have disappeared in the post-crisis period. Finally, the recent study's finding that there's already too much finance I believe confused correlation with causation.

Chapter 3 of the book makes new estimates of the Modigliani-Miller offset for banks. I use the original M&M formula as my estimating equation in this slide instead of estimating the so-called market beta in the capital asset pricing model, which is known to seriously exaggerate the response of equity return to the beta. Using two different measures of unit equity cost for about 50 large US banks in 2001 to 2013, I find that the Modigliani-Miller offset is only 45 percent. This estimate then becomes a crucial parameter in the analysis of the optimal capital ratio in Chapter 4.

The cost-benefit analysis begins with the quantification of the typical damage caused by a banking crisis. This figure shows the path of actual output through time  $t_1$  and has assumed continued trajectory thereafter. A

large estimate of damage would be based on projecting growth from the peak output before the crisis. But typically that peak would have been above output potential. So it's more relevant to use. For comparison, growth would have occurred from potential output.

Second, because the capital would have been formed in the absence of the crisis would not have had an infinite life I phase out the loss after or over a 15-year horizon. Now, this method arrives at an estimate of long-term loss from a banking crisis that equals areas A plus B amounting to 64 percent of one year's GDP base based on past experience of many countries.

Now, I calculate that the frequency of banking crises for industrial countries over the past 40 years has been 2.6 percent incidents per year. So the annual expected loss from a crisis equals 2.6 percent multiplied by 64 percent of GDP or 1.7 percent of GDP.

Next, one needs to calculate the benefits curve showing how higher capital reduces expected damages. The base damage is the 1.7 percent of GDP. The probability of crisis declines as the capital ratio  $k$  increases and it shows about a cubic relationship with a very rapid initial decline. The benefit, of course, is the change in the probability of crisis multiplied by the size of the base damage.

I estimate this probability curve of crisis related to capital from the set of estimates prepared by the Basel Committee in 2010. As you can see, their base probability of a crisis is higher at 4.6percent for 7 percent ratio of capital risk-weighted assets because they have a shorter period. They use a shorter period that was heavily influenced by the Great Recession.

I retain, however, the curvature of their probability schedule. For example, it shows that a drop or that if you go from 7 percent to 10 percent of risk-weighted assets, you can reduce the probability of the crisis by 3 percentage points. But if you go from 12 percent to 15 percent, you only reduce it further by 0.4 percentage point.

I'd like to underscore that the sharp curvature is crucial to the diagnosis that I obtained that far higher capital ratios such as those advocated by Admati and Hellwig would provide very little additional benefit. I would also emphasize that the Basel Committee study remains the most authoritative study and survey on this issue and is based on numerous econometric studies and portfolio models.

The resulting curve for the benefits of additional capital show a steep initial phase and improving results. But then the curve flattens out at a plateau of about 1.6 percent of GDP once capital reaches somewhere in the range of 7 to 9 percent of total assets.

The next step in the analysis is to evaluate how costly additional bank capital would be to the economy. Well, the average cost of finance to banks depends on the cost of equity this  $\rho$ , the interest rate  $r$ , capital ratio  $k$ , and the Modigliani-Miller offset  $\mu$ . Banks pass along the higher cost from higher capital requirements.

I assume that there's some spillover to non-bank credit. Average cost of capital to the economy  $w$  is a weighted average of bank, non-bank, and corporate retained earnings equity finance. The proportional change from higher capital requirements  $v$  is then a key input to the cost calculations. At this point, I decided to use the aggregate production function approach of Miles, Yang, and Marcheggiano.

In this approach, the cost expressed as a proportionate reduction in output  $C$  depends on the proportionate increase in the cost of capital  $v$ , the income share of capital  $\alpha$  and the elasticity of substitution between capital and labor  $\sigma$ . This approach gives a far higher output reduction as you raise capital than some other approaches.

For example, my colleague, Morris Goldstein, cites US macro models as indicating that a 100 basis point increase in the federal funds rate would reduce output by 100 basis points after two years. But if the economy-wide real cost of capital were to rise by 100 basis points from its base level of what I estimate is about 5 percent, that would be a 22 percent increase in the cost of one of the two factors of production in the economy, capital.

In the aggregate production function approach, there would be a resulting large cutback in capital stock causing long-term output to fall by, I calculate, 700 basis points; seven times as much as postulated from the short-term macro model rule of thumb.

One could calculate the marginal cost of additional capital requirements by applying the chain of derivatives going from output impact to price of capital to cost of bank lending. This chain of derivatives turns out to comprise a series of constants. So the result is that there's a constant marginal cost to economy of additional capital  $\psi$ .

The cost curve is thus a straight line with a slope, it turns out, of 0.15 percent of GDP output loss for each additional percentage point of total assets in required capital. One can then confront the benefits curve against the cost curve and identify the level of capital where the slopes are identical. This point will be the optimal ratio of capital to assets. In my base case, the optimal ratio turns out to be tangible common equity at 6.7 percent of total assets or about 12 percent of risk-weighted assets.

I do a sensitivity test or analysis to calculate the optimal capital ratio using three alternative values for seven key parameters resulting in about 2,200 combinations. For example, I set the damage from a crisis as low as 30 percent of one year's GDP or as high as a 100 percent and the Modigliani-Miller offset as low as 35 percent and as high as 60 percent.

The resulting histogram shows a concentration of likely outcomes in the range of about 6 to 9 percent of total assets. The median is 6.9 percent. And the 75th percentile is 7.9 percent. So my central conclusion is that the optimal capital ratio is 7 to 8 percent of total assets. And this corresponds to 12 to 14 percent of risk-weighted assets.

It turns out that my results are consistent with a median of the leading studies on this issue; some are what I called heuristic or seawall studies. Some are dynamic stochastic general equilibrium models, but most are calibrated optimization models similar in approach to mine. I would note, by the way, that the Admati-Hellwig estimates is right at the beginning or right at the top of this chart and it's an extreme outlier in this field.

My former colleague, Tam Bayoumi asked whether my results are just US specific whether the cost of the economy of more capital would be much higher in the Euro area where banks are much more important in providing financing. So, I included in the book a special calculation with corporations obtaining one-third of financing from retained earnings the other two-thirds coming in credit. And with credit primarily from banks in Europe and primarily from non-banks in the United States, how much difference does it make?

Well, I calculate that the optimal capital ratios would not be that different. For the US, the optimal rate will be only about one-sixteenth higher than the optimal capital ratio for the Euro area. And this again, I think, shows the extreme importance of the curvature of the benefits curve and of the crisis probability curve.

The book includes a special appendix on the recent study by the Minneapolis Federal Reserve which found that the optimal capital ratio is 23 percent of risk-weighted assets. Minneapolis uses the IMF estimates of [inaudible 0:23:00] on the amount of losses relative to capital experienced in past OECD crisis. But these include extreme cases such as Iceland that tend to give higher needed capital to avoid crises than would be likely for the United States and main European countries.

The resulting Minneapolis curve for crisis probability actually starts out well below mine. I think that's because they made a logical error in not realizing that if banks held no capital at all we would have observed more

crisis than actually occurred in the past. But the real action is in the right-hand side of their curve where their cost curve is much or the benefits curve—the cost curve is much flatter than mine.

I'm sorry. I'm talking about the crisis probability. Now, with the flatter curve, the marginal benefits do not fall to the level of the marginal costs until a much higher capital ratio is reached. But again, the benefits of high capital are based on extreme cases such as Iceland.

The book has an extensive initial chapter surveying the literature on optimal capital ratios as well as a major chapter surveying the literature on issues associated with too-big-to-fail on TLAC. Now, much of this literature is premised on excessive risk-taking by the largest banks because of subsidy of too-big-to-fail.

But I find that in the United States for the 50 largest banks, the proportionate losses in the Great Recession were no larger for those banks with assets over \$100 billion about halfway across this chart than for those with assets below this threshold. Moreover, the literature now seems to be showing that the too-big-to-fail bond spread advantage has disappeared, had done so by 2013 reflecting a higher risk of mandatory bail-ins.

My literature search also looks at what I think may be one of the biggest unanswered questions, which is whether there are major economies of scale for the large banks.

Finally, the book examines the recent studies in the so called too much finance literature. I run regressions there to show that one could also calculate that there are too many telephones and too many doctors and this is reducing GDP and that is a manifestation of conflating causation with correlation of trends associated with a higher per capita income.

So there are many aspects in the book that warrant attention that I've not addressed such as a special appendix on Deutsche Bank which a bank and the scare last September and somewhat skeptical observations on the effectiveness of so-called Orderly Liquidation Authority and single point of entry.

However, I will stop here so that we can hear the views of our distinguished discussants. Thank you.

Daniel Tarullo:

Thanks to Adam for his introduction. And thank you, Bill, for this important contribution to the challenging topic of cost-benefit analysis for bank capital requirements.

Many of you know that Bill is no stranger to challenging topics having tackled the economics of climate change a full quarter century ago. In a deservedly award-winning book published in 1992, he pushed back against what was then probably the majority view among economists across the political spectrum that the costs of proposed abatement measures would exceed their benefits. But he pushed back not with high-flown rhetoric, instead careful comprehensive analysis and with complete transparency about the methodological choices he was making. As you can tell from his presentation a few moments ago, those same qualities are evident in his new book.

Now with Bill and Simon and Adam being the other speakers today, I'm obviously at a comparative disadvantage in modeling costs and benefits. So I'm going to make use of my comparative advantage by speaking from a policymaker's perspective.

First, I'm going to offer a few observations on the limitations of at least the cost-benefit analysis that have been done to date for policymakers faced with the practical imperative of developing, applying, and adjusting capital requirements. Then I'll very briefly suggest how I think cost-benefit works should be used as regulators carry out this job. And I'll end with an even briefer comment on the current state of capital regulation in light of all that has gone before.

So my first observation is the almost axiomatic one that responsible policymakers should always think systematically about costs and benefits in considering any regulatory action. But given the necessity of assumptions about relationships among economic variables, uncertainty about the adaptive behavior of regulated entities, difficulties in quantifying many intended benefits of regulation, and other factors, one should usually read point estimates of optimal regulatory requirements with a critical and at least somewhat skeptical eye. Ranges that take account of reasonable differences in key assumptions are generally more convincing and helpful.

My second observation is that this comment I just made applies with particular force to assessments of the costs and benefits of prudential capital requirements and more generally to regulation intended to protect financial stability.

While all good cost-benefit analysis is complex, in some regulatory areas the relevant economic and other causal relationships are at least somewhat discrete. For example, in considering a specific OSHA regulation, one must assess empirical studies, assumptions about pass-through of costs, and the like in evaluating the costs to employers and consumers and the benefits to employees, insurance, companies, and taxpayers.

Still, the most relevant factors are largely isolated from the broader economy. But preventing a financial crisis or the costs of a financial crisis or the costs of higher capital requirements to the economy as a whole, these issues by definition implicate the entire economy and the financial system thereby introducing new levels of uncertainty into the analysis.

And in this context, some of the most consequential assumptions turn out to be very contestable. Consider, for example, the likelihood of a financial crisis. In addressing this issue, Bill notes that the 2010 Basel Committee cost-benefit analysis considered banking crises going back only to 1985 and that there was a Spanish banking crisis in 1977. He then extends the relevant timeframe back to that date.

Since reading his table, I don't think there were any other crises in that additional eight-year period. So the result is a lot more country years in what's effectively the denominator with only one more crisis in the numerator. There's no right or wrong here. But as Bill explains with his characteristic openness, this choice is quite consequential for the estimates of benefits of crises avoided.

Another key factor identified by Bill is the cost of a financial crisis and specifically the degree to which it has a permanent effect on the economy. Talk about a complicated question and one very much under current debate. Again, while there may be some unreasonable answers that we could justifiably ignore, there is surely a range of reasonable answers based on current knowledge.

Bill, for example, applies straight-line depreciation and seeking a middle ground between only temporary effects and permanent ones. A recent study by some Federal Reserve Board economists stipulates a decay of 5 percent a year of the post-crisis effect on GDP growth. These both seem to me within a reasonable range.

But the fact is we really don't know enough about the persistent effects of different kinds of financial crises to be very confident about any. Again, the impact of the assumption on long-run effects and then conclusions about optimal capital levels can be substantial and what of the arguable proposition that the cost of financial crises may be rising as capital and traditional lending markets have further integrated.

My third observation is that nearly all the cost-benefit studies I have seen use aggregate capital numbers when considering the likelihood of a crisis and cost to the economy. These studies tend to produce either a single optimal capital requirement or a range within which such a requirement could be chosen.

But there's a significant variance in the vulnerability of firms to systemic stress and an enormous variance in the impact of the strains or failures of different firms upon the financial system. The costs of failure of a large systemically important institution are disproportionate even to its significant share of total lending.

The implication for regulation is that required minimum capital levels should also vary. These and similar issues as well as the limited number of observations we have of financial crises leave me uncomfortable with using even the most careful and transparent of cost-benefit analysis as the direct basis for setting capital requirements. But they should play an important role in that process. So let me now briefly sketch out how.

To begin, I would still start with what Bill describes as the seawall approach to calibrating a range for capital requirements. After all, the principle though not only motivation for capital requirements is to ensure a buffer that could absorb a level of losses at banks that would for example endanger the Federal Deposit Insurance Fund or endanger continuing financial intermediation or endanger financial stability.

This is hardly a mechanical exercise, of course. And judgment is needed among other things as to the hypothesized severity of the storm from which one is trying to protect the system and the amount of damage one is willing to risk. But these kinds of discussions actually force explicit consideration by policymakers of the degree of protection they are seeking in their regulatory undertaking.

The next step, I think, is to then calibrate different levels of protection for different kinds of institutions depending on their specific vulnerabilities and their potential for imposing negative externalities on the rest of the system, hence, my earlier mention of the Deposit Insurance Fund, viable credit intermediation, and financial stability as distinct regulatory aims.

In doing so, one should also consider additional factors such as the impact of other regulatory requirements and the relative degree of risk aversion that is appropriate to the various regulatory aims. Now, this I think roughly describes the regime we've been moving to since the crisis.

Here in the United States, the generally applicable capital requirements are complemented with the higher loss buffers for larger banks as determined through stress testing and capital surcharges for the most systemically important institutions.

Having derived at least presumptive ranges for capital requirements using varieties of the seawall approach, I think one then should import the

insights gleaned from careful cost-benefit analyses of the sort that Bill has presented today.

One use of these studies is simply as a reality check against the seawall approach. If the presumptive capital requirements seem out of line in either direction with a rough consensus emerging from rigorous studies, then some adjustment would be called for. Less dramatically, the cost-benefit studies may help make a choice within the range of minimum requirements suggested by seawall analysis.

A second use of these studies arises from some conclusions that may be common to many even where their quantitative prescriptions vary. Notable among these is the apparent shape of the cost and benefit curves, which Bill emphasized in his presentation.

In Bill's view, one that is shared by a number of other authors, the cost curve is more or less linear while the benefit curve has a steep upward slope that then levels off rather markedly. Bill underscores the importance of the conclusion about the shape of the benefits curve and notes the need for more research on its shape and I would add the approximate point at which the leveling off begins.

But if this general conclusion is correct, the implications for policymaking could be significant. For example, erring on the low side of capital requirements would yield a dramatic reduction in benefits because of the steepness of the slope there on the left.

So finally, how should we assess the current set of capital requirements against the kinds of observations I've made and against the kinds of studies that Bill both rehearsed in his book and contributed to?

Well my own sense is that the generally applicable capital requirements that is those relevant to all but the 30 or so largest banks in the US are just fine. As to the roughly 30 largest that is the group which is subject to the stress test and to the quantitative side of CCAR, I think they're probably okay from many of the regional banks in this group because what the stress test essentially does is to substitute a more severe storm for that which is implicit in the generally applicable requirements.

This is important to make sure that those 30 largest banks which constitute about three-quarters of the prudentially-regulated financial system would continue to be viable financial intermediaries even given a severe economic outcome.

However, because the stress tests do not include second-order losses associated with financial strains such as those resulting from funding

shortages or fire sales, I regard the capital requirements for the largest banks particularly those with extensive capital market activities and significant reliance on short-term wholesale funding as still below where they should be.

The fact that the surcharges have not yet been incorporated into the post-stress capital requirements for G-SIBs means that we are not getting any de facto offsets of those vulnerabilities, much less the full additional protection from the negative externalities of G-SIB failure that the surcharges were designed to address.

Of course, if as I hope the Federal Reserve proceeds with previously announced plans to integrate the stress testing regime with point-in-time capital standards, then the requirements for non G-SIB stress test banks will decrease modestly. The requirements for G-SIBs will increase. And the total amount of capital in the system will also increase somewhat.

I note that while this is not Bill's policy recommendation, I think it's compatible with his analysis and with other studies cited in his book as well as the recent Fed paper to which I have alluded.

I would also note that while one shouldn't place too much weight on conditions at any single point in time, the profitability and lending patterns of the American banking system in the past few years would certainly not suggest that capital requirements are imposing unnecessary costs for the protection that they're buying. After all, we want sustainable sound lending not just more lending for the sake of more lending.

Just one more point though that that I wanted to add that I don't have. As you can tell, I'm still wedded to the old fed prepared remarks approach. I want to start pulling myself away from that over the next few months.

But one thing I was thinking about on the subway on the way up which we need to emphasize is if one takes the sort of tiering approach if you look at the greater vulnerabilities and potential negative externalities associated with some or all of the G-SIBs. Then you can place higher capital requirements on that set of institutions but not on even the rather large regional banks, thereby allowing more intermediating to be picked up there where presumably you have more forthright funding patterns and less capital market involvement.

If I had more time, I'd say a few words about some other issues that are raised in Bill's book such as the relative utility of using the leverage ratio as the metric for looking back at past capital levels, the role that TLAC I think is intended to actually play, and the different ways to think about

capital coming out of a crisis as opposed to in a roughly steady state. But I don't have more time, so I won't.

Simon Johnson:

Thanks very much for the opportunity to be here today. And thanks Bill for as Dan said another stimulating, very transparent, clear, deeply analytical, and thought-provoking book. I have three questions that I'd like to put to all of you now.

First of all, what is bank capital? What is this bank capital that we keep talking about? It's very common among sophisticated audiences of this kind that nobody actually defines bank capital and talks about it in any specificity. We rush to this more sophisticated nuanced discussion. Maybe that's fine, but I can assure you there's a lot of people out there who are fundamentally misunderstanding what bank capital is and misrepresenting it when they write about it including in our leading newspapers on a daily basis.

The second question is if we can understand what bank capital is, how much capital do banks currently have on their balance sheets in the United States? Again, it's very common for officials, for example, to say we need more capital, capital, capital. But the numbers are a little elusive. This is all about the numbers.

And the third question is if we know what capital is and if we can figure what the numbers are, is it enough? Is it enough for what we think may be coming to the world?

And I like the discussion of seawalls? I think we should spend more time studying seawalls. Perhaps, we should even go on some field expeditions and go look at some actual seawalls. I talked to some Japanese officials recently about the Fukushima nuclear accident. And they said, "You know the problem was the seawall. It wasn't big enough." I said, "Why wasn't it big enough? They said, "We had a lot of data on tsunamis in Japan in thousands of years. But that tsunami was bigger than any one that we'd seen historically."

So what is bank capital? I realized that there's a lot of really good stuff in the book and Dan flagged a lot of it and I'll mention some more of it. The one thing I really don't like about the book and I see Steve Weisman in the back row. So I'm looking to you, Steve. The cover, the cover is a picture of a bank vault. When you see a bank vault, you think, "Oh this must be about what the banks have in their vaults."

No. Bank capital has nothing to do with what's on the asset side of the balance sheet. It's not about cash or liquidity or anything like that. Bill knows this. I wish the book were clear about this at the beginning just

because so many other people misunderstood it. It's about how you fund your bank. Do you fund it with equity or do you fund it with debt? Very simple, very straightforward, basic corporate finance.

Now, there is something strange here. I think we should admit and be very clear about this. Capital requirements are the government and government officials like Dan and his colleagues at the Fed telling the private sector how to fund their businesses. Now that's a really strange thing to do. We don't do that across almost any other part of the American economy. Why do we do it for banks?

Well because we had a lot of very difficult early experience with banks. Banks perform obviously some functions there that are essential for the broader economy. And we learned that they have under various circumstances an incentive to run themselves with a lot of debt, very little equity. Now, you can argue about why they do that and Bill has some review of that in the book.

But historically that's the case. They over-leverage themselves. There are some externalities from that policy. So they don't fully bear the costs of their failure for one reason or another. And actually that long predates the modern period and the big banks.

So we're talking about the amount of equity on the balance sheet of banks. And we're talking about how much the government should require them to have. So this is obviously about the numbers. And what are the numbers?

Well, there's a lot of debate about the numbers. And we can spend a great deal of time on this. I always carry with me in a one-page format Tom Hoenig's numbers on bank capital. Tom is sitting in the front row here. Because as Oscar Wilde said, "It's important to have something sensational to read on the train." And Tom has done a really good comparison across countries and across banks. It's extremely fair and transparent with an emphasis for a good reason that you can read in Tom's work and I don't think Bill disagrees with this too much and I think Dan was very much in line with this both in this public policy life and what he just said—more emphasis on the leverage ratio than on this risk-weighted measure of capital.

What are the risk weights? What are these risk weights? Well, the risk weight is this idea which maybe doesn't seem too implausible that some things are safer than other things. So you could let me have more debts more leverage for these safer assets.

The problem with risk-weights as an approach thinking about banks and potential economic tsunamis is the definition of a financial crisis I would

suggest is that moment in time when the risk weights are wrong, mortgage-backed securities and everything related to that, European government debt and everything related to that. Those are two big ones for the past decade.

So I think that drives us towards the leverage ratio. How much equity financing versus debt did the large global banks have in the run-up to the financial crisis of 2007-2008? Well, the most leveraged of them had less than 2 percent equity that's more than 98 percent debt on their balance sheet. That's a lot of debt.

And as Bill points out and emphasizes and Dan said the same that's your loss absorbing part of the balance sheet. That's what stands between you and being insolvent and all the complications that come with insolvency for these large global financial institutions.

The average—I've gone back and tried to reconstruct the Hoenig measures back in time. It's not easy to do it for all the banks. But as far as we can determine, the average for the large US banks before the crisis is between 3 and 4 percent equity financing measured on the basis I just defined and for the European banks is between 2 and 3 percent, very highly leveraged. And officials have said, Tim Geithner has said, it's capital, capital, capital as the heart of the reforms and I don't disagree with that. So how much capital do we have today on our balance sheets?

Well, if you if you take the average for the big US banks in Tom's numbers, it's just over six percent equity so about 94 percent debt. Now that's a change. There's no question about that. It's a big change if you measure two to four to six. Yes, you can define it that way. Is it enough to withstand the shocks that we're going to face?

And I think that Dan put his finger on a really key point that I wish Bill would emphasize a little bit more when he presents the book because there's a lot in the book, Bill. And I think people are looking to you to give them some guidance including on the practical side for how to interpret this for policy.

As Dan said, we have some small banks. We have some regional banks. We have some large regional banks. And then we have some very large global banks in the United States. In fact, we have banks that if we measure them correctly and the measurement of bank balance sheets depends on how you account for derivatives; again, there's some controversy there. I like the Tom Hoenig approach. I like the Federal Reserve's approach in the Systemic Risk Reports. So what's the total exposure including what you can infer from derivatives and other off-balance sheet obligations?

We have a bank like JPMorgan Chase in these numbers at \$3.3 trillion total assets we have Citigroup around \$2.3 trillion assets. We have Wells Fargo just over \$2 trillion, Bank of America \$2.8 trillion, very large global banks. Now, I think I think the world is risky and I think we should have a bigger seawall which means higher equity capital climates for those banks.

I agree with Dan. I think that the capital requirements for the smaller banks are fine. These banks by the way, fail with some regularity. It's not a particularly traumatic event. And everything should fail in the capitalist economy. I think that's fairly fundamental. I don't think there's a problem there. I think for the smaller regional banks also don't have a major issue with capital. They have much more transparent and simpler business models as Dan said. That's pretty important.

These big global banks are new historically. Before 1995, we didn't have banks of this scale and this complexity with this amount of derivatives trading. You know this because we don't have derivative markets anywhere near this scale.

And what we learned in the crisis and Bill has written extensively about the Lehman crisis with Joe Gagnon and others. What we learned is it's very difficult. When it gets complex, it's very difficult to unwind these institutions through bankruptcy. And what was the cost of that crisis? Should we measure it just in terms of GDP? Should we measure in terms of the impact on the broader economy, the millions of people who lost their jobs, the permanent loss to those people?

Or maybe we should measure in terms of the impact on our political system, which as far as I can see is still unfolding and is quite profound with all the risk to the global trading system, looking at Fred Bergsten here who's fought long and hard for a sensible fair global system that completely seems to be in jeopardy to me right now.

So I think that the tsunami you have to fear is the tsunami that will take down these very large complex global banks. It's a US responsibility. It's a European concern as well. There's a few other countries but not that many. They need to consider that.

And I don't believe to go back to the Fukushima example that it is entirely wise to rely on historical data. I think you should look forward. I think you should look at the kinds of risks that may manifest themselves not what happened in the last 10, 20, or even 1000 years. The world is changing. Economic and financial structures are changing.

And I think, Bill, it will be it will be fascinating to redo your analysis on the basis of higher capital requirements for the largest globally important systemic banks. Because if you're right that the cost of capital goes up for them and I find that not completely convincing; but if that is right and the business shifts to other banks that are less [inaudible 0:51:42] when they fail. I don't have a problem with that. If it's the case of these big banks become a little bit less large, a little bit less complex, that seems like it has some advantages also.

And if there really were a profound effect somehow on the structure of interest rates that slows the economy, then we're looking at Dan's successes of the Federal Reserve and others because they have control over interest rates. I agree with Dan. I think we not be arguing for a low-interest rate policy forever. That's not the way you run this economy and not generally considered to be the goal of monetary policy either. So with those caveats, I think that I would love to see the implications of significantly higher capital requirements for the globally important global footprint extremely complex banks.

A final thought, we call them banks. We call everything banks. And we use this shorthand again in this conversation between specialists. I also find that to be somewhat misleading to be honest because much of what these very large financial firms do. They have a banking license right? So now it's fair to call them banks. The ones that got into trouble before the crisis, of course, were not strictly speaking banks. They were investment banks, which meant they were large trading houses, trading financial securities. And that's a very big part of what the large global banks do today.

Now, if it's the case—and Bill does take this position on to some degree. If it's the case that having these big complex global financial situations that were all developed since 1995, if they have some fantastic economies of scale, which you said in the book or some other special source that is really great for productivity or growth across the economy, where's the result of that? Can you show me a single study that demonstrates with any degree of clarity or plausibility that the creation of these big global banks has benefited anyone outside the financial sector? Consumers, producers you could name it as you want, or actually anyone in the financial sector except primarily the people who work at those banks, and even within those banks, the primary beneficiaries have been the people who run the banks, the CEOs, not the shareholders.

Bill, you and I have discussed the fate of Citigroup shareholders many times. And I'm sorry they aren't mentioned a little more prominently in your book because I think what happened to them was a tragedy and an abuse of the system. And I think it would be extremely useful and a nice

complement to your otherwise extremely constructive book to dig more deeply into the effect of as Dan suggested differentially higher capital requirements for these very large banks. Thank you.

Adam Posen: Thank you, Simon. Thank you, Dan. Thank you, Tom, for your silent assent. We now have the opportunity to draw together Bill and our discussants. Rather than give Bill any sort of rebuttal correction time, which he can do, what I'd like to do is actually pick up on something Simon said and make sure we're all on the same page.

Bill and then Dan, do you agree with Simon about the importance of leverage versus capital ratio both in the sense of how he characterized your view but also in the sense of what we should be focusing on? Bill?

William Cline: I think you need both to look at the leverage ratio and the risk-weighted ratio. And the reason is that if you just do it on the leverage ratio, you're going to be setting up this perverse incentive in a system for everybody to go out and do risky stuff because it's not going to have any marginal cost as opposed to doing the safe stuff.

That being said, I think that there should be what they call an output floor for the internal models that is fairly close to what a widely-agreed standard risk weights by categories. So I would like to say it should be a balanced view on this.

Adam Posen: Okay. Dan, what do you think?

Daniel Tarullo: Yeah. Actually, one of the things I telescope there at the end was meant to be a more narrow comment, which is if you look back to the degree people try to say, "Well, okay, we're going to use the leverage ratios as predictors," or " We're going to judge capital strength based on what the leverage ratio was in 2003."

I think there is a problem with that because at the time guys were optimizing their risk-weighted capital position because that's what was binding on them. And if you change it so that the leverage ratio is binding on them, they're going to optimize to that perhaps in the way that Bill just suggested by taking on way more risk.

So that's why like Bill and I think like a lot of people. I think many of us, myself included, thought that leverage ratios were way under-emphasized in the pre-crisis period. Now I wouldn't want to go—I mean just to be straightforward about it. I wouldn't want to go the CHOICE Act route and have only a leverage ratio. I really do think you need both because both allow for different forms of arbitrage.

Adam Posen: I'm just following up on that. I'll go to Dan first and then come back across Simon and Bill. I mean we do have the CHOICE Act under way. We do have some potential changes coming without asking or for that matter wanting you, Dan, to get into a whole defense of everything you did, which of course you believe was perfectly right except for the parts that other people made you do.

In terms of TLAC and the other more complicated pieces you put into building the seawall, what should we be monitoring? What should we be worried about? What should we be trying to maintain?

Daniel Tarullo: So I think Simon and I were both suggesting that capital levels applicable to the largest most systemically important banks are key accomplishment of the post-crisis period. And their erosion would be, I think, really a very unnecessary and potentially quite harmful development.

And that erosion can happen in several ways, one of which would be just you sort of changed the scenarios for the stress tests or you do something like that or you use internal models. And all of a sudden, the de facto risk weightings are way down.

So I think that's what we need to keep an eye on. And Adam, I think you and I discussed sitting here five or six years ago. Higher capital is something that historically has brought principal conservatives and principal progressives together. It's got a moral hazard dimension. It's got a lot of dimensions that appeal to both.

And as the Wall Street Journal has editorialized by higher capital and people on the Left have been advocating for higher capital. I think there's something to be gleaned from that convergence of views. So I really do have that right at the top of my list as a prudential regulator. I mean consumer protection is a whole other issue.

Adam Posen: Right. Simon, I do believe that that's very much aligned you've been on. But is there anything you want to add on this issue?

Simon Johnson: I think we're agreeing a great deal on this issue [inaudible 0:59:54]. It has both risk-weighted capital and the leverage ratio and I think that worked very well. Before the crisis, we have too much emphasis on the risk-weighted ratio and [inaudible 1:00:07] on the leverage ratio but particularly because the capital requirements are extremely complicated and very gainable.

And I worry now that [inaudible 1:00:14] and then the other changes that in the complex details are not fully observed [inaudible 1:00:19] what's inside the stress test. And Morris Goldstein has written eloquently about

this that that system will unravel in ways that are not socially evident until it is too late. So I'd rather keep it simpler more transparent that's a nuanced sort of emphasis.

Adam Posen: No, no, but it's worth spelling out. Thank you, Simon. Bill, I just wanted to come back to you because both Simon and Dan did—as always, very forthright and very clear which is something we all want to be.

You are less concerned about both the too much finance and especially the too-big-to-fail than some of your colleagues here. Could you just go into a bit more detail about your views on that?

William Cline: Well, I think it's important that we not get a bit of a red herring. My sort of saying one of the big banks that's one thing, but we're really talking about for the system we got to take account of the small banks. I mean that's in some sense obvious to me.

But the fact is the big bank is where the money is. 50 US banks account for 80 percent of the assets. So the operational question is really and much of my book is about the big banks, I talk about the 9.5 percent. Well that's already a differentiation in the existing system between the big banks and everybody else.

So the operational question is whether Basel III should go above 9.5 percent of risk-weighted for the big banks and leave the smaller banks at 7.5 percent I would say the most important thing now on the legislation is not to reduce the capital requirements for anybody. I don't see any—

I think what needs to be reduced is probably all of the countless accounting and legal and if the burden of and that's got to have economies of scale. And so if you're a small bank and you've got to go through all these hoops that city has to go through and you got to do it by contracting out so that's got to be a problem.

But keep the capital. Don't reduce the capital full stop for the next phase of legislation. Then the question is how much should you increase the capital for the biggest banks? I'd like to see it increased by about a third. In this climate, I think that's probably optimistic. So that's sort of where I'm at.

Adam Posen: Great. Thank you for that. As ever, our guests have consented to taking questions on the record. Jessica has a roving mic up front. There's a standing mic at the back. Any volunteers before I continue trying to find fissures between the three of them?

No? Okay. So let's go back. One of the things, Bill, which you raised and which I know both Simon, in writing and Dan, in practice have coped with

is the differential organizations and frankly the differential stability of the European banking system at present versus the US.

And as you said your [inaudible 1:03:15] colleague Tam Bayoumi was visiting here last year. You ran your progression. Again, can we bridge it to practice a bit? Where do you see the European banking system having to go from here? And then maybe Simon— sorry. I said your name at exactly the wrong time.

Simon, you and Nicolas Véron among others have written about the problems of accounting and differences between US and Europe. Maybe you could say a few words about that as well, but Bill.

William Cline: One of the appendices that I would suggest people might want to look at is this one on Deutsche Bank. And as that was breaking out in September, I tried to decipher what was really going on.

And one of the things that struck me was the high level of derivatives on the balance sheet of Deutsche Bank. And if you go through a sort of back-of-the-envelope calculation, it doesn't take much of a discount. They're not really worth what it says to help explain why the market valuation of the capital was so much lower than the book value of the capital. And this is a pattern that distinguishes the European banks from the US banks. US banks tend to be a lot closer of that.

So I think there's some questions there. I think the most operational question on the European banks as I said is the Basel IV and that seems to have fallen apart. I mean it looked like there could be some sort of agreement on these output floors for internal models.

I guess it's also interesting to keep in mind that Simon is very concerned about these large US banks. But in Europe and even in Canada and Australia, the large banks have a much larger percent of GDP. Asset is a much larger percent of GDP than in the US. So we're in trouble that in some sense maybe they're in real trouble.

Adam Posen: I don't think Simon disagrees with that.

William Cline: Well, there you go. I think an interesting question is whether—I don't think Europe has undermined Lender of Last Resort as much as we have. I think the ECB has a lot of flexibility. Now, they have undermined it to some extent by I think both places we've gone to a sort of a political demand to not have the taxpayers bail out the banks. And that is at odds with the Lender of Last Resort function.

And so, I don't know. These are just some of the issues that come to my mind when I think about European banks. It does seem that some countries in Europe are acting more forcefully to make sure that—we just saw Banco Popolare in in Spain where there's lingering doubts about what situation is in Italy.

Adam Posen: Thank you. I'll go to Simon in a second. But just to say that's of course the issue near and dear to my heart in my limited writing is the cutbacks and Fed Lender of Last Resort and emergency authority that came with Dodd-Frank even.

In another alliance, Dan, of progressives and conservatives may have in this case have not done in my view the right thing, but anyway, Simon on European banks.

Simon Johnson: If I call on the Lender of Last Resort, I think it did more positive about the Dodd-Frank Act than the new bill. But I would say that, Bill, given your articulate and long-standing concerns, you should include that as cause of the crisis.

One thing [inaudible 1:06:59] mechanics of your institutions including how your central bank operated and I think [inaudible 1:07:04] was considerable and that had some unfortunate consequences where you guys fighting [inaudible 1:07:16]. So I think this is another reason to worry about [inaudible 1:07:21].

Adam Posen: Oh just being quick, you were nodding vociferously to saying Europeans have more trouble.

Simon Johnson: If somebody says to you or you just found out just kind of reacting what you have in your country is dangerous. I don't think it's an overreaction to say, "Well, you may be right. But look, they've got five of them in Germany and three of them in Japan."

No, no. We have changes. We have a dangerous technology that work. You should build stronger safeguards around this. This is point. And I think that if other countries have more of this, I feel sorry for them and I'd like to help but I think [inaudible 1:07:53].

Adam Posen: Well let me turn since it is—I mean Bill and Simon are treats to listen to. But, of course, they're in some sense internal to the Institute. Let me turn for the last word to Former Governor Tarullo.

You've been back and forth with the Europeans and the Japanese and god knows who else in the FSB or we do know, but anyway. Supposedly, I think Schäuble and the Europeans are supposed to be meeting on some

sort of agreed standard in the next few weeks about what they want to bring to the Basel table on capital.

As we seem to have your designated de facto successor coming in at the Fed not yet approved, what should the US representative of the Fed at the FSB and in the major venues be pursuing in the next year? What is it you think is critical?

Daniel Tarullo:

Yes. So I mean a lot of the issues—Bill referred to Basel IV which was kind of what the banks tried to call it on the theory that if they call it the Basel IV maybe you could stop it from happening. And to some degree, I think there was success there because a lot of the changes that were thought about which would effectively have raised capital requirements across the board have been moderated in line with what was concededly a shared premise at the beginning that the last stages of Basel III should not appreciably raise the capital requirements that apply to everybody.

So what I think is the key issue is the one that you alluded to that Bill and I think Simon have already referred to, which is the risk weighting and the floor for the risk weighting. I mean one can start with a fair degree of sympathy for European authorities because if you think back to 2009 they didn't have the SSM at the time. There wasn't a way to really respond Eurozone-wide much less EU-wide to what was going on.

And then in a period in which I think we were in a position to force banks out to raise capital to get them at least up to some baseline from which we could then build with retained earnings, they then hit sort of the various iterations of the Eurozone crisis, the Greek problems, which I think were further handicapped for them moving forward.

So they were kind of behind in a lot of ways. They weren't in a position to force the recognition of losses to get those initial recapitalizations. And they've been trying to play catch-up, I think, ever since. And yet, they've now got the new resolution system in place which kind of presumes that everybody got well recapitalized, which they didn't at the time.

So I actually have quite a bit of sympathy for the policymakers in Europe. I think the SSM is composed of a very professional very committed but limited group of people. I think there are only somewhere in the 900s in the entire SSM. And so they can't do the whole job themselves. And they've got a lot of pressures that they're facing in the EU.

I think that the technical issue is still capital levels for these banks' derivatives, some of the other things that have been subject to internal ratings where they probably haven't been well scrutinized, the models haven't been well scrutinized over the years. And I just worry that the

level of resistance in some quarters to an 80 percent floor of standardized reflects not enormous confidence in the greater risk sensitivity of the internal ratings based approach but the fact of a bunch of stuff that's still sitting on balance sheets that really isn't worth what it says it's worth.

And as Simon said, capital is not something stuck in the vault that's on the front of Bills book. It's the difference between assets and liabilities. And if those assets are not worth as much as people say they're worth, you've got a lot less capital. The second edition will have a Simon Johnson design cover.

Adam Posen:

Well, on that note, I'm going to hold up the book again. This is actually Simon's copy. As you can see he really did—"The Right Balance for Banks" by William R. Cline. It is still a lot about capital, and Bill has done some foundational thinking about how we should deal with that. Thank you to Dan for gracing us with [inaudible 1:12:42]. Thank you for Simon for your collegial comments not only today but throughout the process of all our research. And thank you especially to Bill. Congratulations on the new book.