

# Financial Stability, the Global Economy, and Monetary Policy: A Discussion with Charles Evans and Lars Peter Hansen for the Graduate China Forum



**ERIC HURST:** Thank you. I'm sorry to miss the intro. I'm sure it was very good.

So my name is Eric Hurst. I am a professor of economics at the Booth School of Business. And I'm the deputy director of the Becker Friedman Institute-- or BFI, as we refer to it on campus.

Let me start by paying special thanks to the student leaders from the Graduates China Forum Committee for planning this event. The students were ambitious, with a vision of bolstering a stronger Us-China relationship by facilitating and promoting international collaboration, addressing economic and business challenges, as well as exchanging scholarly ideas. BFI is happy to work with this group of student leaders. And we congratulate them on today's event.

Before I introduce our two distinguished speakers, let me tell you just a little bit about BFI. BFI was launched in 2011 under the leadership of Lars Peter Hansen-- who we'll hear more about in a moment-- to provide a collaborative platform for the vast and diverse University of Chicago economics community. With over 250 PhD economics on campus, and even more scholars engaged in research relating to the economy. Having an institute that brings together these scholars around a common research topics, allows us to coordinate and leverage our work in ways that could have real impact.

At the University of Chicago we support inquiry and impact. And BFI models this approach by promoting and supporting the highest caliber of economic research, while also focusing on the translation and dissemination of that research to policymakers, business leaders, and other interested stakeholders. BFI is committed to working with the University of Chicago's economic students at the undergraduate and graduate levels, through internships, research assistant programs, conferences-- like today-- workshops, and targeted programming, such as the Friedman forum and the Becker Brownback.

It is now my pleasure to introduce the main event for today's economic panel. Two economists who know each other very well, Charles Evans and Lars Peter Hansen. Charlie and Lars will speak about financial stability, the global economy, and monetary policy. These are enormously important topics. And we should all look forward to their interesting conversation.

Charles Evans is the current president and chief executive officer of the Federal Reserve Bank of Chicago. As president and CEO, he serves on the Federal Open Market Committee, the

Federal Reserve's monetary policy making body. Before becoming president in September of 2007, Charlie served as the director of research and senior vice president of the Chicago Federal Reserve, supervising the bank's research on monetary policy, banking, financial markets in regional economic conditions. His personal research has focused on measuring the effects of monetary policy on the US economy. His research with Marty Eichenbaum and Larry Cristiano has been some of the most influential work in monetary policy during the last few decades.

Lars Hansen is the current David Rockefeller distinguished service professor of economics and statistics at the University of Chicago. In addition to having appointments both in the college and at Booth, Lars is also the director of BFI's Macro Financial Research Initiative. Lars is a leading expert in economic dynamics, and works at the forefront of economic thinking and modeling, drawing approaches from macroeconomics, finance, and statistics.

Lars has made fundamental advances in our understanding of how economic agents cope with changing and risky environments. And in doing so, Lars has contributed to the development of statistical methods designed to explore the inner connections between macroeconomic indicators in assets and financial markets. These methods are widely used in empirical research in financial and monetary economics today. And for his groundbreaking contributions to the profession, Lars was awarded the 2013 Nobel Prize in economics.

Without any further delay, please join me in welcoming Charlie and Lars to the stage.

[APPLAUSE]

**LARS PETER  
HANSEN:**

So thank you very much for those kind comments Eric. So Charlie and I have known each other for quite some time, as was pointed out. I think-- I still remember many years ago when Charlie was director of the research department and I was a consultant at the Chicago Fed, having many interesting conversations at that point in time about research questions, and policy, challenges and the like. I

Think neither one of us thought we'd ever be in front of forums like this a decade or so later, but it's uh--

[LAUGHING]

I think it's been a very fun and interesting journey for both of us. I'll let you take this opportunity

to really probe some of Charlie's insights. There's a lot of important questions which we're facing today related to macro and monetary policy, and the like. And I think this is a very good opportunity to get the perspective of somebody who's not only has had a very strong academic orientation, but also very much keyed in to the important public policy questions, and animation in the design of policy. So I think Charlie comes out at us with a very, very unique perspective.

I thought we'd start off by having Charlie talk a little bit about what he does. You know he's a member of the FOMC, the Federal Reserve Open Markets Committee. He's the head of the Chicago Fed. So tell us both about what he does, and how he influences policy making, and his capacities.

**CHARLES EVANS:** OK. Thanks thanks Lars. That's a terrific topic. And it's really an honor to be here.

Somewhat related to your question, I remember many years ago being invited, having the great benefit of attending Milton Friedman's 90th birthday celebration right here in this auditorium. The kinds of things I always remember from that, is at the age of 90, Milton Friedman sat about where we were throughout the entire event, asked penetrating questions all day long, and at lunch. And somewhat related to your question, Governor Ben Bernanke at that time came and talked about the role of the Federal Reserve and the Great Depression.

And from that podium right there, Ben looked at Friedman and said-- I don't know he was authorized to say this. He said Milton you were right. We caused the problems in the 30s, and we won't do it again.

I thought that was really interesting in hindsight, because Ben became chairman of the Federal Reserve during the great financial crisis, during the large downturn. And I think that Ben Bernanke brought to bear all of the knowledge that he had, everything that he had learned from that period, and his work on financial stability in order to design programs to ease the pain that came after the bankruptcy of Lehman Brothers. And instead of the unemployment rate going up to 25%-- like it did during the Great Depression-- on the basis of shocks that by some accounts were every bit as large as that, the unemployment rate peaked at 10%. Which is horrific, but not 25%.

I would say that my normal job for monetary policy involves looking at the economy, and paying attention to what's going on, and trying to achieve the mandates of the Federal Reserve. We have been charged with promoting monetary and financial conditions to support

maximum employment and price stability in the US, and also stable moderate interest rates. If we get the first two right, we're going to have stable moderate interest rates. And so that's why this dual mandate is so important.

We've interpreted this as learning the lessons from the 70s when inflation got out of hand. We need to pursue sustainable rates of unemployment. That's what maximum employment would be. And we want to make sure that we don't try to do more than is possible and in sight inflationary pressure is beyond what our objective is.

So we picked out 2% as our inflation objective for the narrow personal consumption expenditures index. Not the CPI but the PCE. Chairman Bernanke was able to achieve that honing of our objectives very explicitly. And so we've been trying to do that.

So in my job, I go to meetings eight times a year in Washington. And in preparation for that, we have a lot of briefing documents. We have documents from Washington.

I've got a large staff. I've got over 30 PhD economists in Chicago, actively doing independent research, research that informs our monetary policy, informs the state of what is sustainable for the economy, potential growth, labor market issues. There have been so many during this time period.

And we get together. They brief me on their insights. We look at the Washington documents, and I go to Washington, and we have a nice meeting.

It takes place in a very large conference room. Very old, it's like two stories high. Sometimes I look at that, and I kind of think my modest size two story house could fit in this room three times over physically.

And we sit at a big table. To give you an idea of the table, it's long. It's really more like an ellipse.

But if you think about a clock, the chair sits at the midnight position. And I sit at about 4:00 on the opposite side of that. You've got presidents that start on the high side of midnight, the New York Fed president at 11:00. And sweeping around you've got staff members in between that at sort of the 5:00 to 7:00 position. And then from the midnight to 3:00, that's where the governors are.

Normally there there are seven governors in total, but we've only got three now. So there's a

lot of empty space. We talked about the economy. We've got a good amount of information about what we think should be done. And then we you know have real debates as to whether or not the stance monetary policy is restrictive, accommodative, what's called for, how are we supposed to meet our objectives.

**LARS PETER  
HANSEN:**

Something that has always impressed me, or maybe seemed a bit remarkable is coming out of meetings there's this projection of lots of consensus. I have to believe that behind the scenes there is some fair bit of disagreement, that there's kind of some implicit agreement to agree coming out of it. I mean you know every now and then we see defections, departures. But overall, this has to be remarkable consensus coming at these meetings. So how does that work?

**CHARLES EVANS:** I love that question. That is a great question, because you're absolutely right. If you look at the FOMC statement, so after we've had this meeting, after we've decided what we're going to do, after the voting members vote. The FOMC issues a statement of here is the action that we took.

Here's the current setting of the economy. Here's how we think it's likely to behave over the next couple of years, the forecast pattern. The issues for monetary policy.

This statement has gotten longer. When our balance sheet got larger we had to sort of explain how that was going to be evolving. When interest rates were at the zero lower bound, we had to sort of describe why are they going to be there so long, and how much longer. So people say, not only as you do, gee there seems like a lot of consensus. Jeez it seems like there's too much explaining too.

Maybe a shorter statement would be good. I don't think it's really that long, but OK. That's fine.

But you could come away thinking, well they all agreed. And you know there's a lot of consensus. Is there too much consensus? Do different viewpoints get represented? Does the statement hide, underlying arguments that are different than the decision that was taken?

So I love this question, because a few years ago the FOMC decided to enhance the economic projections that we've been releasing. We used to do it two times a year. We've been doing it quarterly now. It's called the summary of economic projections. And everybody who participates in the meeting, the 12 presidents, and the now only three governors, but seven governors at full strength, put in you could think about your football pool.

What's GDP growth going to be like over the next three years? What's the unemployment rate going to be? What's inflation going to be like, the total inflation rate in the core-- where we exclude food and energy prices.

And then the enhancement is, we said what's the funds rate going to be at the end of every year in your forecast. And I think this was just crucially important, because you could look at-- we don't release this--

After five years everybody's projections are identified by name. But in the meantime, we don't identify that. But it's easy to see from our speeches.

And now looking back on this, my good friend and colleague Charlie Plosser-- who is the president of the Philadelphia Reserve Bank, and editor of the journal monetary economics, and all of that illustrious career-- he and I could easily have about the same forecast at various times. Oh inflation's going to get up to 2% within a year or two. We're going to be at trend growth. Unemployment rate's going to be at its natural rate.

Underlying that work could be radically different assumptions about monetary policy. Charlie could easily have thought, oh we've got a lot of accommodation. We really need to take care of this. And so you know you tighten monetary policy. And that's how we achieve that, as speeches obviously reflect that transcripts from the time that he's left also.

Whereas, during a lot of that time, I thought we needed more accommodation than we currently had. And that's how we would get up there. If you tried to interpret our identical forecasts without that information, it doesn't make sense. It doesn't hang together.

So because we now release our assumed assumption for appropriate monetary policy, you could see that in what the funds rate projections are. And you could see it in-- we call it the dots, because everybody is a dot-- and it shows you know three years from now. There can be a big dispersion in these dots, and so that's the place to look for.

They have different viewpoints on this. And it might not be today. Today they've agreed that, OK, this is all right.

But the trajectory is what's really important for financial markets, pricing of assets, how businesses will make decisions, if they can kind of see what the difference is of that would be.

And what the risk management consequences could be, if you know you thought that we needed to do a lot more and then something else happened.

**LARS PETER**

So we're participating as part of a China forum. In conceptualized implementing monetary policy, what considerations about the world economy come into play. Exchange rates, the eurozone, interactions with China, trade, and the like, are they like a big part of the conversations, or are they some type of sideshow?

**HANSEN:**

**CHARLES EVANS:** So that's an important question. And it comes up in different ways. As I just mentioned, it's important for everybody who has an assessment of viewpoint on the economy to say, to have in their own mind, what do I think the appropriate stance of monetary policy. Is it going to be a flat funds rate for the next three years, or does it involve rising funds rate? That's going to have an impact.

Same way if fiscal policy is going to be somewhat restrictive, that's going to play into your forecast. If it's extremely accommodative, and now we've had a large tax cut, corporate taxes, income tax have been lowered, Congress and the president allowed themselves to run up the debt by a trillion and a half dollars over 10 years in order to engineer that. And then after that, there's been more bipartisan action taken to loosen the spending caps on military and discretionary spending. And so this looks like it's going to be you know 100, 200 billion dollars of additional spending on top of that.

So fiscal stance is really very important. You have to take that into account. We're at an unemployment rate of 4.1%. We're adding a lot of juice at a time where the economy is already very strong. So you have to think about what that means.

On the international side, also very important. And so I had the high honor of being invited to the World Bank meetings back around the fall of 2013 I believe it was. And it was on a panel with the US and emerging market, Central Bankers at a time when we had gone through the taper tantrum in 2013, with our balance sheet large and growing, because we had undertaken open ended quantitative easing, the third version of that in September of 2012. And then also having a forward guidance for the funds rate is going to be flat at zero until the unemployment rate gets to at least 6 1/2%, or if inflation goes to 2 1/2 % we'd rethink it.

So we had a lot of that. Chairman Ben Bernanke in May 22nd of 2013 answered a question during testimony, jeez are you guys ever going to stop buying asset purchases basically? And he said, you know Mr. Chairman, I've got a forecast. I've got an outlook for the economy. And

we're currently buying \$85 billion a month, but I can envision sometime not too long from now, when the labor market has improved, that we will not need to buy as many, and we will stop this.

Well all of a sudden long term interest rates, 10 year treasury rates went up. 100 basis points taper tantrum is what people called it. And all of a sudden the emerging market economies were very nervous, because this would attract more capital and funds to the US away from their economies.

So there I was invited in that honorific position with the emerging market, Central Bankers, to talk about exactly this. How do you think about us when you're doing this? And you know, I mean the answer to this is we think about it. We look at it.

We look at how the world economy is influencing the US. Just look at how the economy has expanded after the election of 2016. You had a lot going on, right? President Trump was elected, the expectation of less regulatory scrutiny, loosening of perhaps capital standards, tax cuts, we've got those. But also simultaneously, the world economy started to grow. And it had been growing earlier, and really taking off.

So from the very low growth rates, they've been increasing. And so that boost the global demand has put greater pressure on commodities. So we pay attention to all of that, but-- you know and here's the but-- at the end of it, it is a US monetary policy. It's about domestic.

I just mentioned that our mandate is maximum. US employment and price stability in the US. So we pay attention to everybody else. If everything's going well, and there's something that, you know, an action or cooperation among international central banks for more transparency and communication, of course we would want to be helpful in that regard. But tough actions when they need to be taken, you look at the US first.

**LARS PETER**

**HANSEN:**

So a topic that fascinates me these days has to do with the consequences of uncertainty for economic activity, for policy making, design, and the like. Do you see at many of conjecture there is a sense of heightened uncertainty over the course of the last several months? Do you see this? Do you see this as having an important economic impact, and does this effect in any way how you think about policy going forward?

**CHARLES EVANS:** So Lars nicely mentioned you know that we have a relationship going back many years. And I always remember as a graduate student at Carnegie Mellon, having somebody else teach

Lars's generalized method of moments class to first year graduate students and econometricians, econometrics. And so you know I have enough awareness that these can be loaded questions coming from.

So one level, this is not a difficult question. At another level, its very deep and subtle, but deep and very important. So at the not so difficult level, were supposed to be looking at the economy, and how it's going to be evolving over the next few years.

We know from again Friedman's magical turn of the phrase, long and variable lags, that actions that we take or we've taken in past years take a while to have an effect. They come at different times perhaps. We need to be mindful of the stance of monetary policy, and how a seemingly neutral stance of monetary policy might quickly turn the other way, because of developments in the economy.

So we always have to be paying attention to things that can happen that we haven't known about, recognizing that different policies can be differentially effective depending on a whole bunch of circumstances. So that's one way that we look at uncertainty. But that's sort of like the first order that's put together the forecast.

There's a whole bunch of important factors in the US that we sort of defined, constructed that nobody can observe, but they seem to be important markers for assessing whether or not policy is expansionary or not. So I've already mentioned that our objective is maximum employment. But maximum employment should be sustainable employment. The unemployment rate that can be sustained without things going off the rails, or leading to a lot of inactivity know and things like that.

That moves around over time. And I think in the 70s, a lot of policymakers thought that natural rate of unemployment, was like the 60s and 4%. So when they saw 6% unemployment, they thought that was really horrible. And they needed more accommodation, and didn't understand that the nature of markets change at 6% was probably sustainable. So they added too much accommodation, a lot of inflation. Something had to be done.

So there are all these latent variables that we don't get to see. We have to make an inference about that, and there's a lot of uncertainty around that. So we've spent a lot of time talking about the natural rate of unemployment.

Back when unemployment was 10%, then in 2011 it was 9%, it was very stubborn to come

down. In 2012, one reason why we undertook more accommodation, is because unemployment rate was 8%, and we had a forecast that said it's only going to go down a few 1/10s given what we think. And a lot of people said we can't do a lot better. Maybe 7% is a natural rate.

We're down to 4%. 4.1%. We kind of think the 4 .5% might be sustainable. Now maybe it's 6% or maybe it's 3%. The uncertainty demands are really large. I'd love to hear Lars talk about--

[LAUGHING]

So we provide these-- what's the right term? I can get myself into trouble-- error bands around our projections. And they incorporate some measures of uncertainty, like the data could evolve differently. They have over time.

It captures some of that. Doesn't really capture parameter instability that much, but it does to some extent when it's model based. But the nature of the economy can change too.

So we might not understand that well enough. I worry that when we put these bands around three year projections, that people kind of think that, oh, if I'm kind of going along three years in a row at the top of that band-- well as we say that 70% within the band-- so that's likely to be you know continue or whatnot. And I kind of go, I think that's less likely than those confidence bands really indicate. And so this is just straight statistics, right?

The kinds of things that you thought about in your own work, about not really being able to model things adequately, how do you think about that modeling uncertainty and better ways to do it. Those are really hard. But we worry about this to some extent.

In part I'd say one of our defenses against being unable to see so much is being more eclectic. So, I like models. I mean I love the research. I love writing down a model.

Within the model, there's a lot of discipline, and you can answer a lot of questions. And then you kind of hope that the answers to those questions are still relevant for conditions beyond the terms of your model. But there are limitations in the models, because they have to be simple. And so how do you, how do you-- so I like to look at different models, and they might be at variance with each other.

They might be incoherent across the models, but somehow you want to take away the intuition from that. And you always-- I think you always want to keep your eyes on the prize. And so at

some point I'm going to say, I think we need outcome based monetary policies. This model might say we need more restrictiveness, but we haven't gotten to 2% on inflation for eight years in a sustainable fashion. Maybe we need to do more, and understand what the risks are of missing if we went to 2.5% inflation, because what's the loss associated with that.

And those are very important questions. So that's just some responses to this. And I think more research and understanding that better is really, really important.

**LARS PETER**

**HANSEN:**

I should add at this point in time that road to most policy making realms and policy making discussions, we're having a very advanced discussion of uncertainty here. Years ago Lyndon Johnson was president, and I've been informed that when he was president, he had economic advisors. And economic advisors which would ask them for projections like this, and they would indicate some uncertainty about the projections, and hedged him a little bit.

And then finally Johnson will look at them and say, ranges are for cows. Just give me a number. And that's the mentality of that.

[LAUGHING]

That's the mentality I think of many policy makers. It is very refreshing to hear people like Charlie talk about the fact that we're kind of beyond just kind of making up some number and going with it. And I actually think it's tremendously important that we wrestle with these issues. So I'm very pleased to hear this.

I'd like to now turn to financial stability. So financial stability, we typically talk about the dual mandate, that doesn't really shoot up as being kind of a key component to it. We see places like the Bank of England having a separate financial stability committee in addition to their monetary policy committee. We see discussions of macro prudential policy, that are somehow supposed to be looking at the macroeconomy, and figure out ways to set capital standards.

My own concern is that our understanding of credit cycles versus business cycles, and the interplay is still somewhat in early stages. But how do you see your role in monetary policy as affecting-- as impacting financial stability? And should we be also producing things like financial stability committees, and trying to design a more sophisticated macro prudential financial policies.

**CHARLES EVANS:** Yeah. Institutional design is an important aspect of this. And also different countries have different ways of doing this. And in part, that's because the government is the one that decides

whether or not the monetary authorities the one that also does financial regulatory work, or whether or not they're separate, right?

So the Bank of England has gone through those different phases. When they were granted independence in 97, they took supervisory regulatory authority out of the Bank of England, and created the FSA. And Bank of England just focused on monetary policy.

Know it turns out, they decided that wasn't the best way to do it. So putting it back in the Bank of England, so that the governor sits on both committees, and you have some common expertise on both of the committees. That's the choice that they made. I think that makes a lot of sense.

In the US we have a regulatory structure which has only some elements of that, because we have so many financial regulatory authorities. The Federal Reserve is involved in a particular type of bank supervision, if the bank has a state charter. But if they've got a national charter, then it's the comptroller's office that supervises that.

The Fed is involved in bank holding company supervision, and so that's one line of sight into the largest institutions that aren't state member banks. Most of them are not state member banks. And so-- and then there is the, there's just the expectation that the Fed ought to make sure nothing really bad happens.

And it's like well we have authorities and then we don't have authorities. So if you go back to the 2008 period where Lehman Brothers failed, declared bankruptcy, and then we had to grapple with the fact that AIG a large AAA rated insurance company, which also had a tiny thrift charter, the under pinned hedge fund that not a lot of people knew about. But the largest banks knew about it, because they had been writing insurance contracts, financial insurance contracts with AIG, where AIG took an extended position that was helping the banks continue to fund subprime mortgages, all of the structured finance.

And in the event of a downturn, AIG would be on the hook. Well we had the downturn, and AIG was on the hook. So still a question that I got was how come the Fed didn't do something about AIG? Well it wasn't our authority.

And sort of the person who said this, I understand why they said that. But I thought to myself, golly, if I showed up at this person's door tomorrow, knocked on the door and said, I've heard rumors there's a hedge fund somewhere in this building, and I'm going to go through every

floor until I find it, they wouldn't let us do that. OK, there's an expectation that the Fed's going to do a lot here.

I think-- I'd like to think about that 2005 period with housing. Housing was really the big risk during the great financial crisis. We went through a period where we had a very slow recovery.

After the 2001 recession there was corporate malfeasance that led to Sarbanes-Oxley, that held back a lot of business investment. And eventually housing really got the economy going. And in 2004, in 2006, we started raising rates.

Somewhere in 2006-- and of course then there was a flood of funds coming into the US from abroad-- Greenspan called it a conundrum that the 10 year rate didn't go up, commensurate with what the funds rate was doing. Bernanke said it was a savings glut. In June 2005, the FOMC had a meeting. I think it's very rich reading.

One reason why I always mention this, is go and look at a transcript of the FOMC at that time, because we asked the question, is housing overheated? Is this a danger for the economy? If you look at house price, the ratio of house price to rent, it's like a price earnings measure. And you kind of say this is really high. It's really been going up in a lot of places, large metropolitan areas, sand states, vacation homes, and things like that, it's just going to end badly.

And you look around the world, and there were other countries that had elements of this as well. And so is this a financial stability risk? What should the Fed do?

We can address this with monetary policy when people are criticizing us as not having sufficiently restricted monetary policy. If rates have been too low, it encouraged too much exuberance. And so that could have been one take.

But you might say, I don't know that this is over-- but maybe we're in a new world where this is sustainable. So then you start saying, OK, how do I deal with that uncertainty? Well what if it comes down?

What if prices fall by 20% nationally-- which is sort of an unheard of event at that time. Turns out 20% wasn't large enough. But we didn't know that.

Then we said, what about the banks? Do the banks have enough capital? So that's the first line of defense financial stability. How would they be hurt?

You know it looked like the banks had enough capital at that time. It looked like some banks would be challenged perhaps, but that wasn't the biggest issue. And then after that, then the monetary policy could come during a downturn, drop the funds rate, and then it looked like maybe it would just be a small recession if something happened that way. And it might be that actually things are OK.

All right. Well, we didn't understand structured finance very well. We didn't understand that subprime mortgages were being badly underwritten, rolled into CDO, CDO squares, tranced, and all kinds of things. And then firms like AIG were offering insurance where in the moment they weren't able to pay off.

And they weren't contracts that were traded on centrally cleared platforms-- CCPs. So now we sort of change things in the aftermath where there's mandate, more things be centrally cleared like it exchanges. And so then things get mark to market every day variation margin is posted.

AIG was a AAA rated company, so you sort of said, they've got the wherewithal to make these payments. And as soon as they got marked down from AAA to AA, then they had to make payments. And then they found out that they couldn't do that.

Now we've had Dodd-Frank. The basic regulatory approach has been, banks ought to have more and better capital. I think that's right.

Better capital, there were poor forms of capital before. Now there's been-- we had stress tests. And so another way to reinforce the fact, do they have the right amount of capital at the right time, is to sort of ask, hey, what if something happens you're not thinking about it? So again uncertainty, if we find that they're not ready for a stressed event, then maybe we need to think about their planning, and how they're dealing with capital. So we have supervisory stress tests every year.

And we've got resolution planning. So the banks have had to you know sort look at their corporate structure and you notice that they have hundreds of separate legal entities that were constructed for who knows what reason. And sometimes they don't necessarily know themselves. And so they've got a better inventory of what's going on.

I think the pendulum may-- now we're at a point where it's 10 years after Dodd-Frank, new regulatory environment, and everybody is sort of looking, OK, what do we need? Is that right? Can we make some smaller, some adjustments, small or large. And that's what the Fed is

looking at within our own authorities. And also Congress has looked at a bill in the Senate to change that.

Are the regulatory authorities in the right place? I think that's a good question. It ends up we have a lot of them in the US. And so I'm not quite sure how everybody wants to make those adjustments.

But the Fed is you know committed to approaching monetary policy, to get the economy in the right place, and inflation. As best we can, we want to be paying attention to financial stability. And we get quarterly reports, and we think about these things. But if we got into a very sticky situation where inflation was really low, unemployment was high, and there were financial stability risks that came with that, I think we have to recognize monetary policy is one instrument. And I've already listed two objectives, and I layer a third on, and we need other authorities to use them appropriately.

**LARS PETER**

**HANSEN:**

So let me follow up on that a little bit. Your response I think leads to some other interesting questions. First, even if an issue of bank supervision, I would think that if I'm a supervisor of a big bank like Chase, or Citi, are like this, these things are so complex. It just seems to be like this, how to supervise such entities with that complexity already seems to be incredibly hard putting aside the macro components to it.

The next is, when have monetary policy we sometimes talk about rules based monetary policy. We think about the Taylor rule. I remember at one point in time reading about the Evans rule. I mean we try to have some systematic characterization of them.

Should we be thinking about the same in terms of capital adequacy for the overall banking system under which we have that feedback on the macro conditions, and we have the knowledge base to support to construct those type of kind of systematic policies-- those systematic policy approaches? I understand the Fed may not even have the mandate to execute them at this point in time. But would those be useful things to be thinking about?

And the third one that it's I find very intriguing is, how to run a stress test. Obviously it seems to be like a potentially very important tool. But when you're really concerned about the system wide consequences of it, it's almost like, well, if this happens that this big bank, how's that big bank to react to what goes on with this big bank, and how is that system interactions going to happen. So that there's kind of these feedback effects, and network effects, and general equilibrium effects seem to be challenging to conceptualize as in terms of stress tests. So that

seems to be an interesting tool going forward. It seems like that might also be quite a challenge.

We recently had an event a few months ago with Dick Berner, the former head of the Office of Financial Research, he basically conceded something. Which I mean it was stated openly, which I agree as well. This regulatory mandate cause systemic risk, had to do with the fact that well there are these externalities out there, system wide externalities are meant to somehow figure out how to code them. And academically we're still trying to figure out exactly what those are, what those externalities are. Which seems to me maybe, makes it all the more challenging to figure out the right way to conceptualize regulatory frameworks here.

So I understand that some of the stuff is even if you could do it, even if you wanted to, you can't. But you have any thoughts on those type of issues just as a follow up, it'd be great to hear of them.

**CHARLES EVANS:** You're absolutely right that financial institutions are extremely complicated. Some of this could be the regulatory environment, which encourages them to sort of arbitrage their activities in certain places, where the capital requirements are lower, or the regulatory scrutiny is lower. Maybe because we have so many different regulators, you get to choose a regulator that's a little better and lighter in that regard. So that's sort of the lay of the land.

Just because-- so when it's complicated, then is the supervision more complicated? I mean it's sort of hard necessarily to think about a simple supervisory approach if you're dealing with a lot of complexity. Now that's not a great answer, but it's sort of that's where we are with that.

Well if you want sort of a bolder simpler approach is which I think are always worth thinking about, because they help us think more carefully about the current system. You might just sort of say, well, why don't we have a lot more capital. Let's reduce the regulatory scrutiny for people who are willing to put an awful lot of capital in place, so [? Nada Admadhi ?] has talked about this. I don't remember the number, let's say it's 30% capital. Remember people are arguing over 15% capital requirements as being very large.

Banking is a business where if you have access to a deposit or money, that is cheap financing. Because people keep their money in the depository accounts, and then you get to use it. They don't come and call on it very often. And so that's a lot cheaper than bond financing.

But is bond financing necessarily that expensive? Maybe it's expensive because of all the risks

that aren't taken into account in other cases. So if you've got 30% capital, maybe bond financing ends up being a lot cheaper.

So it's all of a sudden-- I mean I know we've got Miller-Modigliani. And so you know what's the right capital structure for this? And so I think [? Ahmahdi ?] sort of says, you know if you're like other corporations, you just have a lot of capital, and then your debt financing is easy, and it really shouldn't matter a lot.

Banks push back on this vociferously. So they certainly think that they've got a better situation in other settings. Yeah, I think that the more structure we put on this would be helpful.

You know formulas, think about-- and so what are stress tests doing. You know Dodd-Frank does allow for the Fed to invoke a cyclical capital buffer, so that banks would be called upon to build up capital during a good time, when times are easy. So that when times get more difficult, they could use the cyclical buffer, let that run down, so that then perhaps they would do their lending activity on the strength of a smaller amount of capital, but still an adequate amount of capital.

At the end of the day, the name of the game during a financial driven downturn is going to be, do the financial institutions still feel that the outlook is good, so that they're going to do lending, and you know fund working capital, and all the things that keep the economy going? Or are they going to be shepherding their capital? They're worried about, and so they end up not lending very much. When they're stretched out in a very complicated fashion, and then they realize that made a lot of sense two or three years ago, but in this environment, I'm not going to make that loan, I'm not going to be in that area, and then they pull back.

The 90s were like this too after the first Basel capital increases or whatnot. You know the banks would kind of go, I've got to make sure I feel comfortable. And you're going to do everything you can, and you get smaller. And then the economy suffers from that.

So that's sort of the nature of the game. And the best way to ensure that they can continue lending in a robust fashion through the cycle is what everybody's after. And it still requires a lot of thinking about that. But it's the nature of the activity I think that means this is always going to be at risk for everybody.

**LARS PETER  
HANSEN:**

Just to give the audience some context. If you want to have something that helps to go to sleep at night, you should get a copy of the Dodd-Frank bill. It's got many hundreds of pages

of discussion. And even coming out of the passing of the bill, it left lots of stuff to be worked out over subsequent discussions.

Was simultaneously this very big beast of a bill with some ambiguities left on top of it. I guess this is just the nature of how legislation, lawmaking works these days. But it's been kind of a challenge and interesting to watch it as it materializes. I have many more questions I would like to ask Charlie, but at this point in time I think I'd like it to open up the audience for a couple questions from them.

**CHARLES EVANS:** Yep.

**LARS PETER** Who's calling--

**HANSEN:**

**CHARLES EVANS:** I remember doing this.

**LARS PETER** Who's supposed to be calling on the answers.

**HANSEN:**

**SPEAKER 1:** I got the mic, so I'm just going to go first.

**LARS PETER** [INAUDIBLE]

**HANSEN:**

**SPEAKER 1:** This is a question to you Mr. Evans. There is still a lot of uncertainty surrounding the underlying economics of cryptocurrency in regarding the impact on the monetary system. So I believe you said previously that Bitcoin is not money-like, and the bitcoin investors are here, I quote, "Swimming with all the sharks in a world, because of all the [? limiting." ?] So how do you think the development and application of Blockchain technology has challenged the current monetary system? And how do you see it possibly be applied as a monetary policy tool?

**CHARLES EVANS:** So I get a lot of questions which basically boil down to Bitcoin, tell me about it.

[LAUGHING]

And Bitcoin is not really my area of expertise. There are a number of people looking at this, but it's very common to get somebody. You know my brother-- older than me-- gives me a call. Hey what about Bitcoin? And you know the price of Bitcoin is going up, right?

And so he's talking to his buddies, he's older than me. And you know what, do you think? Well Bill, I don't give investment advice. I can't, you know I can't do this. But you know then I run into my standard answer which is Blockchain technology is really something very innovative. And it's sort of tune to allowing anonymity in financial transactions.

And so money, cash, cash is a pretty good vehicle for anonymity. You go to a street fair, you buy something, you pay cash. I don't know if the person I bought it from is going to declare taxes on their activities or not.

If you wanted to buy something illegal, cash. Something that's not going to leave a paper trail. So anonymity is something that's highly valued by many people.

Who? Who tends to value it the highest? Criminals, tax evaders, regulatory evaders, terrorists, people who-- now cash isn't going to work for this-- but Blockchain, if you're-- you know what I say, and I could have the details wrong-- but it's sort of like exposure in China. You've amassed a substantial amount of wealth, there are capital controls, you're worried about the government might come along, because of the nature of the government, and take away all of your wealth.

Could happen in any country. But under those circumstances you might want to move it somewhere safer. But you can't get it out of the country. Bitcoin is one way that you might be able to do that.

Now the price variability is amazing, right? It goes up. It goes down. And who knows what this is-- it's not really money-like.

I've heard people sort of say, some day you know you're going to use Bitcoin. BMW will be priced in Bitcoins. And I kind of go, I think the nature of a transaction might be something like this. OK, you agree on the value of the BMW, and it's so many Bitcoins. And then two days later you show up to take delivery. And then somebody is going to say, you know the value of Bitcoin in dollars isn't what it used to be, and you now owe me more Bitcoins.

That is dollar transaction hiding as Bitcoin, not a Bitcoin transaction. Who's going to assume the risk of that price volatility? But if I wanted to move my money out of a country where I might lose all 100% of it, and at the end of this I might have 70% of it, that might be a good deal for some people. Not for my brother or somebody else who wanted to be doing that.

So I think you just have to be savvy. And that the anonymity doesn't strike me as something that is suitable for everybody. Now distributed ledger technology-- Blockchain technology is one example of that-- if you give up on the anonymity, I mean corporations are using things like this in a closed network, where everybody is as a trusted source. And I think it's potentially very interesting.

I don't have the best understanding of this. And so when somebody describes it to me, I keep coming back with it sounds to me like you've got a lot of people maybe around the country, maybe with different pieces of information, and they're all wanting to make entries into some Excel spreadsheet type thing database. And you want trusted people to make these entries from remote locations. This technology could allow you to do that. But that's just some type of information technology.

If you're talking about corporations, changing all of their information systems, that's usually a cost center. This sounds kind of expensive. So I don't know who's going to make this really easy and all of that. But I mean, those are some of the questions that come to mind when I think about this.

**CHARLES EVANS:** I mean I think there is scope here for some interesting technological advances in the future and kind of creative activities by how to use this technology. I think there's no doubt that Bitcoin's volatility makes it not money or kind of money-like. I think the interesting question to me would be, does some form of cryptocurrency show up in the future that somehow figures out of much more sane way to have stable values to it, and has any chance of becoming some type of international currency.

It's certainly going to have to achieve much more stability to have much hope with success. And I'm not sure I know the answer to that. But I don't believe--

**LARS PETER**

**HANSEN:**

So I can see the technology side. And it's always for the more clever, futuristic, visionary people other than myself to sort of understand how there's a market for it, and how that works out. So if you're going to be talking about international currencies, you're going to have to have some assessment as to why other interested parties are going to allow this to take place, right?

So there's the private market competition. And you've got bigger companies, worry, you know who might have inordinate power against smaller companies. And this is international currencies, and so governments are going to have an attitude towards this. And so how is that

going to play out.

There are an awful lot of barriers that have to be overcome. But it is easy to get excited by the power of the technology. I mean I always remember as a graduate student, looking for an interesting topic, finding this very, very interesting paper by Lars Hanson and Tom Sargent on how to more quickly calculate equilibrium decision rules using something I think they referred to as a short [? ricotti ?] method.

**LARS PETER** That sounds very exciting to me.

**HANSEN:**

**CHARLES EVANS:** As opposed to a long--

[LAUGHTER]

Yeah, well I mean the whole point of something was let's do this more quickly, because computing power is pricey, very costly. Then circumstances change. I did get that to work on my computer, but it took me about eight weeks.

**LARS PETER** Just for the record, I'd like to say that I've done other research that might sound-- that might

**HANSEN:** be somewhat more interesting than what Charlie just described.

[LAUGHTER]

**CHARLES EVANS:** It's just an example. Right, but computing power became so much more available. Other ways of doing it that was sort of the--

**LARS PETER** Next question. Who's-- I'm having trouble seeing here so-- Who's in control of the mic?

**HANSEN:**

**SPEAKER 2:** This is for Professor Hansen. Could you share the story behind your own noble winning theory, and also if you think this was your most important contribution? And also any of your academic pursuits.

**LARS PETER** What was the last part of this?

**HANSEN:**

**SPEAKER 2:** Your latest academic pursuits.

**LARS PETER**

I think to answer all those questions would take about 40 minutes.

**HANSEN:**

[LAUGHTER]

At least. So let me try to give a very, very abbreviated version of this. The Nobel Prize, I wasn't the one who made the decision, but I think it had to do with not just some theory, but had to do with trying to think hard about how to go between dynamic models with uncertainty, and kind of how to assess them. How to think about them critically.

And I think about a lot about its influence had to do with the fact that it took a bunch of the existing models of the day and expose their weaknesses, and lead to lots of other researchers trying to figure out better models and better ways to confront evidence. So I'd like it contributed to our subsequent development. And I guess that's the way I look at it. I don't look at it as one kind of little civil contribution, but it's something that I was able to influence research in a way that helped us think about how to build better models.

Stuff I'm interested in right now. I've been rustling of with for a while now get to these real questions of uncertainty. My early work I dealt with uncertainty I think at very restricted ways.

It's ways in which we often teach in our economics classes when we talk about risk aversion, and stuff like this, where we presume for simplicity that everyone has all probabilities all figured out, and they just don't outcomes. It's like we play games of chance. We flip coins. We think we know the probabilities, but we're not sure it's a heads, or tails, or the like.

And whereas I think in a lot of situations that abstraction goes way too far, and there's a lot more complexity to one certainty. We're never really not sure what the right viewpoint is, what the right model, is what the right perspective is, and how do we confront that? Which I think is - I personally find that a very fascinating topic.

It plays off, not only how we think about markets function, but how we might design sensible policies. So those are the type of questions that keep you awake at night these days. We should go on.

I I don't have a microphone. But

I'm sitting in the front seat, so I think I have a little bit privilege that you can hear. So many people believe in, economics psychology [? cycle. ?] So financial crisis, that could be

[INAUDIBLE].

So my question to [? Mr. Harris, ?] what do you think? How far next crisis is from us?

[LAUGHTER]

**LARS PETER** Good luck with this. [LAUGHS]

**HANSEN:**

**AUDIENCE:** [INAUDIBLE]. What may trigger the next crisis this time, bitcoins, blockchain, or whatever, what else? And what would you suggest our banking sectors prepare ourselves for next crisis? By the way, I'm from [INAUDIBLE].

**CHARLES EVANS:** OK, thank you. I don't know if everybody in the back could hear that. But the question is basically, do you have difficulty accepting compliments on great monetary policy?

[LAUGHTER]

I used that joke one time, and it went over well. So the question is, where is the next crisis likely to come from? And how might it be averted and all the difficulties there. I think that's always an important thing to be thinking about. My example of the June 2005 FOMC discussion about housing, was housing going to be the next financial crisis?

We didn't think about it quite like that because we-- financial crisis? If we did, it wasn't a great financial crisis. We were thinking about it, and we could not see through to all the structured finance that was in place, where leverage was more embedded in the markets and then recognize that the state of underwriting had deteriorated in the non-regulated areas, where there were some state people who perhaps weren't doing locally the oversight that they should have.

So in response to that, what the Fed does, it's not at the same level of the organized financial stability committee that the Bank of England has, but the FOMC four times a year will receive a financial stability type of report, where they go through all of the markets in the US looking at different products, looking at different agents, looking at banks and institutions with an idea towards asset valuations. Are they extended? And then that's always a difficult question, right?

I mean, when is the value of an asset just about right? And when is it overextended? Are there

bubbles? We can go on. Not me, but others could go on about that. Look at different players and look at internationally how that takes place.

I think that-- so we're a lot better at regular discussions with more people, where we can see the lay of the land as we see it. The question is, what's taking place that we're not really aware of through the view that we have? And like syndicated loans, you have some players, some large banks creating a large-- these big loans. And then they syndicate them out. Other people participate. And how are they rated?

Do they start paying off right away? Or are they making these loans to people who are having more difficulties? Those are some of the things you'd be looking at. But whether or not there's some activity that everyone's not mindful of is always something that makes you very nervous. And so we try to pay attention.

But I don't believe that these cycles have any regularity to them. I do think that the financial regulatory structure is important. That it could perhaps curb or it could have perhaps incent other types of arbitrage into other areas. So it's a very difficult issue, as you can tell by my meandering around the topic.

**LARS PETER**

**HANSEN:**

There is this notion that somehow we figure out how to deal with the last crisis. And so we sort that out and put regulatory frameworks in place in order to avoid the repeat of that. But what's the next one going to look like? And part of the challenge of producing robust policies going forward and oversight of financial markets is exactly because we're not going to know necessarily now what the source of that's going to be, or else we'd already be preventing it. So I think it's a huge policy challenge. I don't think there are simple answers to it.

**CHARLES EVANS:** I'm I get nervous when we start looking at certain things. So you look at asset valuations. And after a while, you kind of go, wow, this is pretty high. Or these are-- I mean, this is what markets do, right?

I mean, people are taking their hard-earned capital, putting in place, trying to use it. And capitalism is all about if you reap a benefit, you get to keep it. And if you do have a loss, you eat it. And that's the consequences. And so I think that that system works pretty well.

I think that when people receive extended leverage, that somehow they're not going to feel the consequences during a loss, that's where a lot of the problems are. And so I'm always thinking to myself about how much leverage or how many of those activities. And so it was just

extremely difficult to see that AIG was offering insurance to depository institutions, who the supervisors could go in, and they could see closer to balance positions.

But that was premised on somebody paying off in a state of the world that when it happened, they actually wouldn't pay off. And that's hard to see, because everything looks great right up until it doesn't. And so that's sort of the nature of the question marks.

**LARS PETER** There exist some economists who always like to say, well, I predicted the crisis. Well, very few  
**HANSEN:** of them predicted the timing, the magnitude, or exactly the cause of it.

**CHARLES EVANS:** And they were predicting it long before it happened.

-

**LARS PETER** Yeah. So if anyone makes that claim, you want to take it with a little bit of a grain of salt,  
**HANSEN:** because it starts getting fudged quite a bit. Let me take one more question right back here in the back.

**AUDIENCE:** I have a general question regarding inflation for both Mr. Evans and Professor Hansen. So I have a quote from Miss Janet Yellen, former Chair of the Federal Reserve. She said that our framework for understanding inflation dynamics could be [? misspecified ?] in some fundamental way because our econometric models overlook some factor that would restrain inflation in coming years, despite solid labor market conditions. So my general question is, as a key to monetary policy, how much do we really understand inflation? And what are the difficulties and how can we better understand inflation in this context? Thank you.

**CHARLES EVANS:** Oh, that was for both of us?

**LARS PETER** Yes.

**HANSEN:**

**CHARLES EVANS:** OK, excellent.

**LARS PETER** [INAUDIBLE] go first, but.

**HANSEN:**

**CHARLES EVANS:** All right. Well, I mean, inflation's obviously-- [INAUDIBLE] the monetary authority. And so when I took monetary economics classes, it's the central bank. It's a monetary authority that's responsible for the level of inflation that we're going to get.

Maybe we can introduce some fancy fiscal theory at the price level. But I think that tells more about price levels than inflation. So inflation's really the monetary authority's responsibility.

Well, I remember from some simple more classically oriented classes that if you had a steady growth rate of money that led to a particular inflation rate and then you increased the steady growth rate of money, then, well, you're going to have-- the desired real balances are going to be lower, which means that price levels are going to bump up. And for a time, you're going to have higher inflation. And then you're finally going to get the rate of inflation associated with that money growth.

So money ought to be associated with inflation. Well, we can't really find good evidence of that in the data, the financial markets. The stability underlying that simple monetary analysis doesn't really seem to be present. And there are different kinds of money, and who knows exactly how that works.

Now, we've ended up having to-- I said, I'm really focused on output-based policy. And so at some level, when we're supposed to deliver 2% inflation, we need to be setting our monetary measures so that we think we'll achieve more or less inflation so that it's in line with that.

Now, a theory that gets a lot of criticism is Phillips curve theory. Can I say that here?

**LARS PETER** Yeah.

**HANSEN:**

**CHARLES EVANS:** The criticism part, for sure. So the idea that resource pressure is somehow related to inflation.

So the '70s certainly seemed like a period where there would be cost pressures. That's resource pressures. And then the monetary authority would really accommodate that so businesses could pass along those to higher prices.

The Burns Fed did not push back enough, so costs kept going up. Prices kept going up. And so the setting of monetary policy was not restrictive enough. And if you had a better idea of that latent variable of sustainable unemployment, then perhaps you could have done better.

Now, because it's latent, it's kind of like tautological. I'm going to start redefining what I think sustainable is so that that inflation outcome is more understandable with the policy setting. So we have to grapple with that circularity and hope that we see enough other information so that we get some insight on inflation.

I'm a big fan of the way that Janet Yellen thought about inflation, described it in public, and it's sort of a partial model of this. But basically we think of inflation as there's some transitory factors that are going to have an effect on measure inflation rates. And so the dollar moves up and down, and the price level might adjust, but inflation is the continuing change in price levels. And so that's not going to have a permanent effect of inertia-- inflation is inertia, so it takes a while to get there.

There's resource pressures that I think come to play. But again, with this theory that resource pressures, Phillips curve, it looks like those slope effect is a lot lower than it used to be. Maybe it was never a good theory. But maybe it's just that it's not as big a deal. And then the last one, inflation expectations.

Well, that's the learning from the '70s and the vertical Phillips curve, which is inflation expectations are going to be really important for this trade off. You think there's a trade off? No, not forever. Inflation expectations will adjust. And we've learned a lot from Barrow Gordon, [INAUDIBLE] Prescott and all of that.

So getting inflation expectations so they're consistent with our 2% inflation objective, I think, is really the biggest issue at the moment. We're very close to our 2% objective. And I think the data are going to be more consistent with this within just a few months.

But longer-term inflation expectations seem to be a little bit lower than periods when we've really hit 2%. So I think the markets are still wondering if the zero-lower bound is going to have an effect on our ability to deliver all of this. And so we need to be mindful of that. That's a little bit of how I think about it.

**LARS PETER**

I think inflation is certainly a case where we've observed the Fed as announcing some target.

**HANSEN:**

I'm not even sure where the target of 2% comes from. But let's not go there for the moment. And [? if ?] it's had trouble sustaining it, it really means that there are issues about our full understanding of mechanisms.

But real policy making has to confront the following, that our understanding of certain phenomena is not super fine-tuned. It may be at a [? coarse ?] [? weight. ?] But you still have to do intelligent things. So people like Charlie and Jerome Powell are trying to wrestle with exactly these type of challenges. And those are tremendously important.

Since this is Chicago and it has a [INAUDIBLE] tradition, let me kind of brush back a little bit on

the money price thing. I think we look across countries and see dramatic differences in the behavior of the money supply. We certainly see connections to the price level.

I think there has to be some type of low-frequency connections. And you get the whole problem with this money, what the whole money demand literature historically has been how do we really measure money? As we kind of change, as there's technological advances, what do you really mean by money? And there exist researchers out there trying to expand the notion of money to try to keep those ideas alive and still having some meaning.

But I think what has been very clear is any type of simplistic short-term connections between money and the price level is just [INAUDIBLE]. I'm not sure it was ever there in very firm terms. And it's been much less so there for the last few decades. And that's really what Charlie has tried-- Charlie and other people have to be responding to. So that's made the money supply a much less valuable indicator in the actual conduct of policy on a kind of quarter-by-quarter basis.

With that, what I would like to do is thank Charlie for his very insightful discussion. And I've learned a lot. I hope you have. And I think with that, I'd like to close this session. Thank you.

**CHARLES EVANS:** Thank you. Thanks.