Transcript on "The Recession"

Chaired by John Taylor
Opening Presentations by Caroline Hoxby, John Taylor, John Cochrane, and Bob Hall
General Discussion

December 7, 2018
12:00 noon to 1:15 pm

Session 3
"Workshop Series on the 2008 Financial Crisis: Causes, The Panic, The Recession, Lessons"
Hoover Institution, Stanford University

John Taylor: So, why don't we get started? Thank you all for coming. We've put a schedule in front of you, so you can see what we're up to today. We're going to discuss two parts of our workshop series: the recession and the lessons. Of course, the recession part was postponed because of the smoke. It's a beautiful day, no smoke, so we're back to the recession. After this smaller session here, we're going to move over to the larger Hauck Auditorium, and all those who participated in the workshop will make short presentations, five-minute wrap-ups. More people will come to Hauck. We sent invitations around, and 550 people registered to say they were coming. We'll see how many actually come.

On the recession, Caroline Hoxby is going to start, and then I'm going to say a few things, and then John Cochrane will say a few things. And we'll open it up at any time, and Bob Hall Hall's going to add a couple of remarks about a handout which is there too. All the handouts for the Recession session are here, and after we take a break, the handouts for the Lessons session be placed in front of you.

So, Caroline, the floor is yours. To be sure, people can interrupt any time.

Caroline Hoxby:

So what I'm going to do is just talk about a few simple things from my sort of point of view as a labor economist and public economist about the very slow labor market adjustment and reallocation during the recession, and the indicators that we really ought to be looking at—I know that there's a lot of discussion in the public sphere about unemployment. Personally, I don't find that to be particularly interesting. Instead, I'm going to try to show you some indicators that are more important for understanding what did or did not happen during the recession, and why it was we recovered from it so slowly. The primary features of the most recent recession is that it had a very shallow recovery instead of a v-shaped recovery, and one of the things that we ought to ask is why was the recovery so slow?

So, as you all know, a key challenge in any recession is getting people to reallocate themselves. People reallocate more slowly than capital does. People don't like to adjust, and reallocating people to their most productive use is one of the key things that should happen during a recession, and we can encourage or discourage that type of reallocation. So, what I'm going to try to look at really fast is just some indicators of whether that type of reallocation went quickly or went slowly, and if some of it may still remain to be done.

My second slide is just about the fact that we should really care about labor reallocation, because it translates almost directly into the pace of the recovery. In the long run, the growth rate of potential GDP is just equal to the growth rate of worker hours plus the growth rate of productivity output per worker hours. That's just a translation. So any time that we have a slower growth rate in worker hours, it translates more or less one for one into GDP growth. And therefore, if worker hours are recovering very slowly, then we are also going to have very slow recovering GDP growth.

Okay, so the first indicator I want to look at – and this is just my presentation, I have to admit, it's all just pictures. That's all it is. It's 15 minutes of pictures, and we can maybe get through it faster than 15 minutes. My first one is just, let's look at the labor force participation rate. So the first charts, this one is I'm looking at the Participation Rate Fell and Did Not Recover chart, this is total labor force participation in the United States, and you can see it was already falling a little bit before– Sorry, I should say all of these charts have the two shaded areas, which are the Great Recession and financial crisis as defined by the NBER and the previous recession, also as defined by the NBER, which I like to call, "the recessionette."

John Taylor: You'll have to give Bob Hall credit for these NBER dates.

Caroline Hoxby: [Laughter] Exactly. Thank you, Bob Hall.

Bob Hall: My pleasure.

Caroline Hoxby: Okay, so those are the two shaded periods are the NBER-declared periods. You can see that the participation rate was already falling before the Great Recession, and then it decided to decline more steeply. And although there has been a recovery in unemployment rate, the civilian labor force participation rate really has not recovered at all since about 2013. It's just been sitting down there and has not come back up to previous levels. And I think that when people talk about the unemployment rate, they forget that a lot of the action in the unemployment rate is actually the civilian labor force participation rate, which is the denominator of the unemployment rate. And so, we ought to be thinking about this. This is just people not participating in the labor force, and the way the BLS works of course, is that it asks this question about whether you're a participant in the labor force, and that's kind of a question that's based on a 1950's view of the world. So, I think we really need to look at this measure.

This… The following the labor participation rate is true of prime-age men. So if you look at men between the ages of 20 and up, you can see that we've had this big decrease in the labor force participation rate starting with the Great Recession and falling. For women, it's a little bit different, because women have generally been having a rise in their labor force participation rate before the Great Recession. It was pretty level going into the Great Recession. It wasn't falling at all. If anything, it was increasing just a tiny bit. And then, there's this big decrease in the Great Recession, and then no recovery whatsoever.

Alvin Rabushka: That's Obama's election

Caroline Hoxby: Okay. Yeah.

John Cochrane: Many things happened.

Caroline Hoxby: Many things happened.

Okay, the next chart shows you the participation rate for 16-19-year-olds. It's falling also. But that seems to be maybe part of a longer trend. I don't want to over [inaudible] the way we need high-skilled people in the United States, it's not obvious that we want to have lots of 16-19-year-olds working instead of going to school. So, I think we can… I don't worry about that. I worry more about prime-age people working in the labor force, not 16-19-year-olds.

Now, there's been a lot of discussion about the fact that the low participation rates now may just be a feature of the fact that the baby boomers have retired, so therefore, they're pulling themselves out of the labor market, and younger people are smaller in terms of cohort size, and therefore, maybe low labor force participation or declining labor force participation is just a matter of retirement of the baby boomers. And the next chart really just shows you that. It's the percentage of the population aged 65 or more, and it's certainly increasing. It's increased over this period from a little over 15% to just about 20%. So there are [inaudible].

But what I'm going to try to show you in the next slides is that although the baby boomer effect has… is one of the reasons why labor force participation has declined, it cannot be the only reason. So, I'm going to try to emphasize five different points here. The first is that if we condition on age, we still see declining labor force participation. The second is, if we condition on age, we see declining hours. Even if we condition on working at all, so it's not just unemployment, there are declining hours even among those who are participants. So, we have declining labor force participation, declining probability of working, and declining hours, conditional on working for any given age. So, it's not an age effect. It is purely people withdrawing their labor from the labor market, which is probably not a good sign from the point of view of GDP growth, because it is just almost impossible to have higher GDP growth when you have so many people withdrawing their labor supply from the market. And we'll look at a couple of other indicators – disability rates – I'm going to look at school attendance, which is kind of out of my bailiwick, but it is also kind of a special and interesting way of looking at what is going on in the labor market, and finally, just a tiny bit of evidence on migration.

So, let's look at the second indicator of labor market adjustment. This is just participation conditional on age. And you can choose your favorite age group. First, we're looking at labor force participation rates among males, ages 25 to 45. Personally, I like to look at people who are age 35 or 45, since they are to me super-prime age workers. These are… males who are 35 or 45 pretty much should be working, unless they're disabled. So this is not… they're not close to retirement, and nor are they young enough to be plausibly engaged in schooling. Hardly anyone age 35 or 45 is engaged in schooling in the United States with the exceptions of things I'm going to talk about later. And so what you can see is, let's say you pick out the 35-year-olds there in green, and their labor force participation rate has been falling really since the recessionette, but also it's been falling since the Great Recession, and it has not recovered at all. Right? So, we see no recovery at all in their labor force participation rate, and this has nothing at all to do with aging, or retirement, or different cohort sizes, or anything. And almost none of these cohorts have shown much recovery—Sorry, none of these age groups have shown recovery since the Great Recession, which suggests there is something going on here which is not of cohort sizes, or cohort aging, or something like that. It's just about decreasing labor force participation rate.

Josh Rauh: May I ask a question? I'm doing eyeball econometrics, but it does look like a lot of the declines in these lines, sharp declines, began between 2005 and 2006. There's like a few percentage

points declines in those lines. It doesn't look like it's totally a story about the recession itself. Do you have any idea what might be going on there?

Caroline Hoxby: So, there's this funny feature, I think, that we're both seeing in the data, that is in 2006 and 2007, it looks like it goes down and then goes back up in 2008. I don't want to draw too much of a conclusion from that. The reason why is, the labor force participation rate now, you can draw from two different sources, either the Current Population Survey or the American Community Survey. This is based on the American Community Survey, because it's just much larger percentage of the US population. It's one percent of the US population instead of 1,000th of the US population. The CPS does not show that funny little downturn, and the American Community Survey does. And I drew from the American Community Survey, because it's the larger percentage of the US population. But there may be something going on with the differences in surveying. So that's why I'm not sure if the ups and downs from year to year are as interpretable as one might think. And we can have a long discussion about the vagaries of sampling.

John Cochrane: It's not in your aggregates at all.

Caroline Hoxby: It's not in the aggregates either, that's right. I think there's something a little bit odd going on with the American... I agree with John about that.

So, I tended not trying to put much [inaudible] in the up and down from year to year, but trying to look into the slightly longer-term trend. We do not have perfect labor force surveys at this point in the US, because for sampling reasons, we couldn't really talk about it a lot.

For females, which is the next chart, the story's a little bit different, because the female labor force participation rate over the long term in the US has basically been rising for a very long time, since the 1950s. It wasn't rising exactly going into the Great Recession, but it was more or less flat. Maybe you can call it rising, depending on your interpretation of the data. But what we certainly see is that it does not look like it's rising anymore. So, if you thought it was rising going into the Great Recession, it now appears to have plateaued, and some of this series suggests, like the age 35 series, which again I view as a very important series, because it's a very prime-age series, you know, does not suggest that women are [inaudible] in the labor force.

The next chart just shows worked last year at all for males 25 to 45. Again, let me focus you on age 25. So what's the difference between labor force participation and worked last year at all? It is that I can say that I'm a participant in the labor force by saying I'm looking for a job, regardless of what I'm really doing. That's the way labor force participation works. So someone who's saying he's unemployed but looking for a job, still counts as a labor force participant, worked last year some is just literally whether you worked last year at all. And we can see none of those series really recovered from the Great Recession. You could argue that they were already falling going into the Great Recession, and I think that's true. But you notice a very steep decline around that period of time. Some of that obviously is unemployment, but there is very little recovery from that. So I think when people think about unemployment rates, what people are not thinking about is this measure that I worked last year at all, has actually really not recovered from the Great Recession. It's still not very far off [inaudible].

Okay, so the next indicator that I want to look at quickly is just hours conditional on age and conditional on working. Because hours are an interesting thing in and of themselves, and of course they're

important for thinking about GDP growth. So the next part does include the zeroes, in other words, people who were unemployed. So it's total hours worked last year, including people who had zero hours of work. So, it is reflecting some of the decreases in work last year at all, that we looked at in the last chart. And again, I would direct you to the age 35-year-olds. And you can see that although they recovered a little bit from the nadir in the Great Recession – not a lot.

I think the next chart is what I really want to point you to. And that is, this is total hours last year among those who worked. So we have now excluded those people who were unemployed last year. This is not about non-employment anymore. This is about among those who work, how many hours do they have? And you can see a very, very slow recovery even among those who are working. So, for instance, if you look at the green line, the age 35-year-olds again, we're still not back up to where we were before the Great Recession among those who work, and we're no place close to where we were before the year 2000. So again, another indication of reduced hours.

John Cochrane: How much of this is a move to part-time work and… look here, other things that kick in if you have a full-time job, and how much of this is just a spell of the year is spent not working?

Caroline Hoxby: I don't think we know that very well. That's a good question. You have to… you know, in order to understand month-to-month variation and how much people are working, and how many hours they work each month or something, you have to use different sources. Here, we're using the American Community Survey, which is annual, so it doesn't really lend itself to that kind of a question. And it certainly could be things like people being pushed out of full-time work into part-time work because of, for instance, the Affordable Care Act or something like that. So, I wouldn't want to… I just view this as an indicator that we're really not coming back completely from the Great Recession. There's something… We're still hanging on to pieces of it, and it could be due to policy. So, I'm going to talk about policy at the end and what policies we think are [inaudible].

The next indicator is something that's been much talked about, and I think should be much talked about. It's take-up of disability benefits among prime-age workers. The disability take-up rate among prime-age workers is low. It's not a huge share of prime-age workers. But it's very disturbing when a person takes up disability benefits, because in the US, it is more or less an absorbing state. If you go on disability at the age of 40 or 35, you are going to be on disability until the day you retire, and you will transition straight to social security. More or less that is true. So any increase in this is a big [inaudible] even if it's not large in percentage terms. And what I would draw your attention to here, this is the percentage of males in disability we're looking at next, ages 35 to 55. First of all, even the 35-year-olds are going up a bit. People should not be on disability at age 35 unless there are increasing healthcare problems in the United States, and really that's not the explanation. It's much more likely to be that people have moved out of the labor force to such an extent that they have decided to be on disability. It's worth remembering it takes about two years to qualify for disability in the US unless people are unemployed for about two years first, before they can get disability. And if you look at the age-55-year-olds, their increase in disability after the Great Recession— So again, there's this two-year delay. So, if I become unemployed in the Great Recession and I decide that I'm interested in being on disability, I'm not going to show up on disability until about two years later. You see this big increase for the 55-year-olds and the probability of being on disability. Those people will all be on disability until they retire. Nobody comes back from disability after age 55, more or less. So, that's a big concern. Females is not that dissimilar. In general, there's a very slightly higher share of females that are on disability than males.

And there, trends are sort of upward trending, very [inaudible] over time. But even small trends, as I say, these numbers matter, because this is a permanent state.

And the final couple of indicators I want you to look at, the next one is about schooling. As you all know, I do a lot of work on schooling. And one of the things that happens during every recession is that people go back to school. That's largely because of opportunity costs. The opportunity costs of being in secondary education fall, because you can't get a job, and so, that's normal. What's abnormal is that in the Great Recession, and I think this has largely been facilitated by changes in the educational market, a lot of the people who went back to school or who stayed in school were what we call "mature" students. So for instance, this is the percentage of males and females attending school at age 35, and you can see this big surge in 35-year-olds attending school. So, there's nothing necessarily wrong with that. If you were going back to school to be retooled, get a new set of skills, and then to go on to a higher-growth job or a job where wages are growing faster, employment is growing faster, there's nothing necessarily wrong with that. But it's important to understand that these 35-year-olds who are going back to school are not going back to schools like Stanford University. They are largely going back to for-profit online schools that they attend at some considerable cost to themselves sometimes, but they don't spend a lot of time doing it. So, what we're interested in is they go back to school, is that just, they go back to school and there's no return? Or they go back and there's a big return?

So, the next chart is a little big complicated, because it's from a paper of mine on online schools, and I'm just showing you a few of the charts from this paper. But this is for the typical… an enrollment episode of three years of enrollment at an online school, which is actually a fairly persistent student, because most students who enroll at the age of 35 or 36 or whenever, that's their typical enrollee, in the Great Recession, actually drop out within less than one term. Okay? So, somebody who's enrolled for three years, that's kind of persistent, that this is a fairly typical person. And just to give you an idea of what's mainly an online for-profit school, that's Phoenix University, Devry, etc., etc. These are huge universities which have enrollment of say, 1.2 million students every year. These are not small universities. This – we're not talking Stanford here. And what you can see is their earnings trajectory before they go, the year in which they start attending is Year 0, you can see their expenditures – those are the green bars – and then you can see how their earnings develop before and after. And there is a very small reduction in their earnings while they're attending school that is consistent with their giving up about 45 minutes of their work a week – so, probably not super full-time attendance. And then they're actually paying some not-insignificant amount of money, and their increase in earnings is so trivial that they couldn't possibly pay back the amount that they paid during the years in which they were paying for tuition and fees to these online schools. So, if you actually calculate the ROI on these investments, everyone is underwater.

The next chart is very similar. It just shows a wholly online school. We have wholly online schools in the United States now, this is like Walden University, you can see it looks even worse. Basically, nobody's making any money.

And then finally in this paper – actually, it's a series of papers – I look at if you go to an online school, and you're one of these types of people, do you at least move to an industry or an occupation which has higher expected employment growth as judged by the BLS? And the answer is really no. There's not a lot there either. So it's not as though they're moving to sectors of the economy which seem to be growing faster.

Okay, the final indicator that I just wanted to point out is that during the Great Recession, not every state and not every labor market had similarly troubled labor markets. And if you look at this little map of the United States which comes next, this is the peak unemployment rate during the recession. I apologize for those of you from Michigan, because somehow Michigan got removed from the United States. [Laughter] It was so bad that they all left. [Laughter]. There are some states that had peak unemployment between 4.3 and 6.9%, that's the bottom decile. And then the top decile is about 12-15%. But there are just enormous variations across the United States. And you would expect that people would need to move from labor markets that are severely distressed to labor markets that are not. You find that is one major way that people can reallocate their labor to places where there is still demand.

Alvin Rabushka: Is that harder for homeowners than renters? You can't sell your home, it's hard to move.

Caroline Hoxby: Well, yes. Okay, so we're going to talk about that. I agree with that.

And the next chart just shows you that there's no increase in migration during the Great Recession. It looks like people were no more likely to move during the Great Recession than they were before or after. If anything, it looks like they were slightly less likely to move, suggesting that labor reallocation during the Great Recession was not high.

To just conclude, let me just say what I think are the main hypotheses about why we saw so little labor reallocation. I'm not saying these are the only ones, just the ones that came to mind for me. The first one was that by extending unemployment insurance as much as we did, that can be a precursor to disability take-up. And I think this is a really important point. If you give someone something close to two years of unemployment insurance, that's really a way to get onto disability, because that's how long it takes for people to transition from employment to disability. Once you're in disability, that's pretty much permanent.

Also, extensions of unemployment insurance can cause your skills to deteriorate. We don't really understand how that happens, but if you're unemployed for two years or a year and a half, that's potentially a lot of time for your skills to deteriorate.

There was a change in the attitudes towards social insurance, especially disability and the food stamps, which are now called SNAP. So, we've seen over time that it's not just a matter of the rules, but a matter of how welcoming the rules are or how welcoming the program administrators are, and that seems to have changed a lot during the Great Recession. Those programs, as we know, grew tremendously, especially SNAP. A lot of the states used their stimulus money to prop up the wages of state and local employees, and that is not helpful for labor market clearings. So for instance, I'll just give you an example for California. California took a lot of its stimulus money and used it to ensure that state and local employees did not face decreases in earnings and did not face decreases in employment. And that's not necessarily helpful for clearing the labor market.

The Pell grant is the main means-tested higher education grant in the United States. It allows you to go to college or university for free if you go to an inexpensive college or university. There was a huge increase in the Pell grant during the Great Recession, the biggest one we've ever had – the biggest in real terms the Pell grant has ever increased. That's important, because already during recessions people tend to enroll in college and universities. You don't need to give them an increase in grants. They're

going to do it anyway because of the opportunity cost falling. But there were very big increases in the Pell grant, and that may have encouraged a lot of this post-secondary enrollment, and there's a lot of thought among economists of education that it also encouraged a lot of these for-profit online schools, because many of them live almost exclusively on the Pell grant. So it's not uncommon for a for-profit online school, you may think of it as a firm – it's really not; it's just dependent on the federal dime. A lot of them make almost 100% of their money from federal grants.

The Pell grant was also made available to the unemployed, which has never been done before. So, if you were an unemployed person, regardless of your age, you could get a Pell grant. That's normally not the case. [Inaudible]. For veterans, you can get… Let's say you were an unemployed veteran, and you wanted to have an income and living expenses and so forth, you could get this by going back to school, because there's this stipendiary benefit for veterans, it's not only their [inaudible] but also their living expenses and so forth. And there's a lot of though that there was a kind of deal between the schools and the veterans. I don't really wish to go to school, but I wish to have a stipend. You don't really wish to have me enrolled in class, but you wish to have the money, so we agree. That may be true. Veterans certainly enrolled a lot in post-secondary enrollment and seemed to have shown very few earnings increases. And then as Al mentioned, a lot of the housing programs during the Great Recession really discouraged [inaudible], which may have discouraged labor reallocations.

Niall Ferguson: Caroline, I have a really simple historian's question. And it may be just so obvious to you that I'm naïve to ask it, but I'd be so much more convinced by this paper if you'd shown me that completely different things happened the last time the United States had a big recession. Because although we use this word "recession" back and forth, I actually don't know that it's very helpful to call this the "Great Recession." I prefer the "slight depression." And you have to go back to the early eighties to see anything like it. Now, tell me it was all totally different in the early eighties, and you've sold the paper. I'm convinced.

Caroline Hoxby: That's a very good question. So, the 1980s recession or small depression or whatever you want to call it, first of all was more severe and much more v-shaped. It went in, went out. The extensions of unemployment insurance were not *anything* like what they were in the Great Recession. So that's the first thing, is that that just didn't happen. Disability is not so much a function of… disability take-up has been more a function of the way in which people get into disability. It's less a function of the rules, which don't seem to change much – the formal rules, which don't change very much over time.

John Cochrane: The rules did change, right?

Caroline Hoxby: The rules did change.

John Cochrane: In 1980, you couldn't get on disability for back pain, or psychological problems. It's a lot more available, the disincentive to work is stronger, so people are more likely to get stuck in disability.

Caroline Hoxby: Yes. I agree with John and everything he just said. What I mean is, if you look at disability benefits, they are not particularly more generous during the Great Recession than during the previous recession. It's really with disability the action tends to be more, do you get accepted into the program or not? And in the Great Recession, I think people feel that there was a lot more acceptance

into both the disability program and into SNAP, and that's largely about enforcement of the rules, how much accepting you do, attitude, how often you have to check in, and it's a lot of—

John Cochrane: The administration went out of their way to get people into SNAP. They practically went down the street and grabbed people to get them on SNAP

Caroline Hoxby: They actually sent recruiting sort of flyers out to people saying, we think you might be eligible for SNAP, you might be eligible for disability, why don't you apply? So it's actually more about that than about the benefits becoming more generous. But that did not happen in the previous recession, which I guess one could call the Reagan Recession, to keep it clear.

The Pell grant, there was no increase in the Pell grant during the Great Recession. In fact, for-profit colleges didn't really exist in the 1980s. They did exist, but they were a tiny, tiny share of the market for higher education. They are now a booming share of the market for higher education, in fact, the main growth in the market for higher education. So, I think that's a difference too, but it discourages reallocation.

And finally, there's nothing really parallel in the Reagan Recession to the housing programs that discouraged migration. So, I didn't look back, but I should look back to see what happened with migration.

Niall Ferguson: I think the answer is it's really different, from recollection. I looked further back when I was writing *The Great Degeneration*, and was really struck by those differences in things like disability and mobility. But for me you have to clinch the argument by showing… Well, here's the question, a follow-up, if I may ask. Is the inference then it's better to have Ronald Reagan as president under these circumstances than Barack Obama? Or, are we just seeing core fundamental social changes, or changes in the way that the state behaves, and try to disentangle the different variables here?

Caroline Hoxby: I guess what I was trying to do with this, was to show a lot of pieces of evidence that said, labor reallocation, or lack of it, is probably a smoking gun for why the recovery from the recession was so slow, and why the recession, once it hit its trough, just kept going and going. And why… Some of these indicators suggest that we're still in it.

Bob Hall: Well, this is a great tour of the data. I congratulate you for that. I want to disagree a little bit with some of the voiceover. This won't surprise you, I don't think. Like most labor economists, you're hostile to the notion that unemployment is a measurable, meaningful state, and I've done a lot of work on that, which, I think, points in the exact opposite direction. We can talk about it later, but when you look at the unemployment picture, you get a stunningly different understanding of this period by far. Unemployment shot up, but then there was nothing delayed about the recovery in unemployment. This is critical to understand. The unemployment rate fell pretty much along the same path that it did in the other serious post-war recession, 1981-82. And we got to a phenomenally low rate--as of this morning, the unemployment rate is 3.7%. So, if you combine that with the findings that I can point you to that I think are completely convincing that unemployment is a meaningful concept… And it's a primary—putting people back to work is a primary reallocation method in the economy, and it was extremely successful.

With respect to participation, which becomes a meaningful concept once unemployment is a meaningful concept, all of the decline in participation that you were talking about that was not demographic, and I think we agreed that some fraction like a third of it was demographic but two-thirds was non-demographic, occurred among high-income families. So, it points in a very different direction for why people aren't working as hard, and it's related to the increase in the dispersion of income There are more and more seriously prosperous families, and in those families you see a lot of decline in work.

Bob Hall: I'll share my results. It surprised me. In fact, I told my co-author that I didn't believe it, but he gradually convinced me that it was right. Anyway, we'll see on that, but, so I come out with a definite belief that reallocation occurred big time and successfully, quickly, there's nothing slow about the recovery from the Great Recession. It was an enormous feat, because I would measure the speed of recovery by the recovery of unemployment back down to its normal very low level for the US, and that occurred right on schedule. That's the mechanism for reallocation.

Caroline Hoxby: I think we have a macro/labor economist disagreement here.

John Cochrane I think there is a unifying view of the facts here .. Unemployment came down quite swiftly. Labor force participation did not, and GDP recovered very slowly. Now, back to you, Bob.

Bob Hall: Sure, because people weren't working as much, exactly what Caroline said. The decline in employment was considerable , there's no question about that. The key thing to look at is it's not that we have a slow recovery of unemployment. It's because the labor force declined.

Caroline Hoxby: We agree on the facts. I think one of the reasons why, I guess I would say, I don't pay very much attention to the unemployment rate is when I think about the Current Population Survey, I think that the questions about labor force participation are very frail. Okay, so to me, those questions are… I understand that there's a human being, and that that person is working or not working. It seems to me like that's pretty clear. Here's a human being, working or not working. Whether or not that person is in the labor force depends on their answers to a bunch of questions on the Current Population Survey on are you looking for work, how much are you looking for work, have you looked in the past week, da da da da da. To me, that seems like the denominator shifting around. I would rather look at the numerator, which is, "I'm working," and the denominator, which is "I'm a human being." And this thing in between—

Ramin Toloui: This is also a question about the data and another part of the data that looked anomalous during the recovery: the so-called Beveridge curve, which is the scatterplot of unemployment versus the number of job openings. We observe one relationship between these variables in the period that preceded the Great Recession, but then another relationship after the Great Recession, where the rate of unemployment was higher for any given number of job openings than it had been previously. And that occurred for most, if not all, of the recovery. A lot of people hypothesize that this was because of a skills mismatch – that is, there are lots of job openings, but they are not absorbing as many unemployed people because there's a difference between the skills needed in the job openings and the skills of those who are unemployed. First of all, do you subscribe to the view that there is an anomaly, and do you take that data seriously? And then, how does that fit in with the story that you're describing?

Caroline Hoxby: So, I do think there's an anomaly. I do note that. And I also do believe that there's an increasing skills mismatch. Because the people who were displaced from employment during the Great

Recession were largely – not entirely – but largely lower-skilled workers who were in industries that were somewhat declining or had been upskilling the previous period. They were out of match with the skill demands of those industries, and those people may be almost permanently out of match with the skill demands of growing industries in the United States. And that would suggest that they'd be discouraged. If they're discouraged, they may drop out of the labor force. Right? I don't think there's anything inconsistent between these different… I think it's different ways of seeing the same thing. First I'm a discouraged unemployed worker, then I'm so discouraged I say I'm no longer looking for work, I drop out of the labor force. Give me two years of that, I'm on disability.

David Mulford: I have two questions. In your research, is there any attention paid to the linkages that may be existing or building up between opioids on the one hand and these data that you set out? Secondly, in disability, is there any attention to what I would call the associated fringe industries of people whose chief motivation is to keep people on disability, because they benefit from keeping them there and feeding their longevity into retirement and social security? I've seen a good deal of that, and I don't know if you measure or inquire about that or not.

Caroline Hoxby: No, I'm not an expert on opioids and wouldn't want to portray myself that way. But I think that many people think there is a connection between discouragement, dropping out of the labor market, opioids, disability, these things are clearly very correlated with one another in geographic data. So areas that have high rates of non-labor force participation have relatively high rates of opioid addiction and so forth, and so you can imagine that the process is, I decide that I'm never going to be reemployed again, that it's very unlikely. I don't have the right set of skills for employers, which we've been talking about. And therefore, I've become totally fatalistic, so opioids become a more appealing idea. I'm less discouraged from being on disability. These things may go together. But it's very difficult to prove which comes first, the chicken or the egg. Although, I guess I feel reasonably strongly that it might be discouragement related to having low skills.

I would mention that this is, I think, related to the education findings. So, we have all these people who go back to school in the United States now at what are called "mature ages" for education. I realize 35 is not mature, but for education it is. Okay. And most of those people are people who really really struggled in high school to get a high school diploma. And they are 35 and do not have any years of college education, or they have part of a year of college education, or they've already dropped out of college once. So this is suggesting to me that there are a lot of people who kind of know that their skills are not well matched to the labor market. They're aware of that. They think, "I'm too low-skilled for the jobs that are being offered. I need some sort of college degree to apply for those jobs. I really can't make it through college education." Because the vast majority of them drop out. The normal, the modal amount of time that people spend when they go back to post-secondary education as a 35-year-old, is like six weeks, suggesting that a lot of people are really struggling.

David Mulford: The disability industry, the people whose motivations, advisors, matters and so on, keep them in disability because they continue to get paid for whatever goes on between disability people, that's a sort of industry that I see anyway. And you wonder what really has been done about studying that, because those people keep the disability people from becoming a worker again.

John Taylor: Tom, do you have a point?

Tom Stephenson: The issue I was raising was similar to David's, namely the opioid crisis and its correlation with lower labor participation rates. .

Dan Kessler: I just wanted an opportunity to ask you about how you think Casey Mulligan and the redistribution recession stuff plays into it, because it sounds like you and he are saying many of the same things but just like how much overlap is there? Are you guys kind of different, or kind of on the same page, or what?

Caroline Hoxby: I guess I'd say we are largely on the same page. We may have different emphases, because I think Casey has emphasized more – I don't think there's anything wrong with this – has emphasized more what I would call the policy changes in the recession that are – especially the Affordable Care Act – that have moved more people into part-time employment or [inaudible]. So I didn't emphasize that very much in my presentation, but I don't think that's wrong. I guess maybe because I work more in education and, therefore, think about skills all the time, I am more concerned about things that have put people in positions where less-skilled people are kind of permanently out. But I don't think there's any real conflict.

John Cochrane: I want to pose a reconciliation between Bob and Caroline. We haven't heard one of the standard views that it's secular stagnation, perpetual lack of demand, hysteresis and so forth They agree on that. There's "demand" versus "supply." In that context, I hear substantial agreement. If we measure demand by unemployment rate, Bob is saying, "there was a lack of demand for a while, but then pretty quickly we're out of a lack of demand." The major slowness of the recovery is a supply problem, disincentives to work, save, invest, start businesses, and so on. That would seem to explain the slowness of GDP recovery, even after the lack of demand and with low unemployment.

Caroline Hoxby: That's a good reconciliation.

John Cochrane: Is Bob happy?

John Taylor: Bob, you look very happy.

[Laughter]

Actually, I'm next on the list of speakers. I'll be talking about fiscal policy. I begin by recalling we had a conference here five years ago about the same fiscal issues. There was a huge amount of disagreement then about the impact of fiscal stimulus packages. In the last five years, however, there seems to be more and more people who think these stimulus packages worked. I have some quotes from Ned Phelps and others to that effect. So today I'm going back and look at the research that was done earlier. It's mainly a series of charts, and I can go through them quickly.

Figure 1 is just a reminder that there's huge disagreement amongst economists about the impact of fiscal stimulus packages. This was a chart that I made at the time Romer and Bernstein made their chart in early 2009 to show how impactful an increase in government purchases as a share of GDP would be. And that was drawing on what I would call old Keynesian models at the time. And so, I looked at a new Keynesian model and it's completely different. I still think that you're better off using models like this which include expectations, dynamics, and some kind of microeconomic behavior, as the so-called new Keynesian models do.

Figure 2 is a calculation from research with John Cogan – by the way, a lot of the research reported here is done with John Cogan. It shows the multiplier from the actual stimulus package that was passed in 2009. It's looks at government purchases and its impact on GDP. The multiplier is significantly less than one, and those bars are the actual spending that was passed.

Ken Judd: John, was that federal expenditures or both? Federal and local? (49:22)

John Taylor: That's all government. That's the stimulus package. There's very little state and local; it's mainly federal.

The next chart shows you that there's a lot of agreement about this result. A bunch of models were simulated the same way at the time – the IMF, the Fed, the Bank of Canada. And CEE is Christiano, Eichenbaum and Evans. And the differences are relatively small.

People may think there's a difference among the models, but this is quite a bit of similarity. And the Cogan Cwik, Taylor, Weiland (CCTW) is kind of right in the middle.

The next chart addresses the following question: If the estimates showed that the stimulus didn't have much impact, then how did the press think there was a big impact? The chart is from an article written in the *New York Times*. It's around 2009, 2010. And the *Times* said how great the stimulus packages were in terms of getting the economy moving. The *Times* article had the three charts, shown on the left. These are simulations of several models, and they show a big impact. I added a fourth one – it's not in the *New York Times* article, and a fifth one – also not in the *New York Times* article – which is the Smets-ECB model and shows almost no effect. And then finally, just for the sake of comparison, a sixth one is Robert Barro's model, which has zero effect. So, in fact, there is a selectivity in reporting of these three models. You have to be aware of that; it affects people's opinion.

So far, I've looked at model simulations. It's also important to look at the data directly. This is a chart which I published in 2008, which shows you the impact of the 2008 stimulus package. This was before President Obama. It was a rebate package, which was to send money to people, so they'd spend more. And so, I got the data, and plotted the red line which shows the enormous rebate. Cash was sent to people. The line below it is personal consumption expenditures. You have to really tease these data to see anything. And this chart is most amazing. It was published in the *American Economic Review*.

Figure 6 says this is not uncommon result. I took 2001 (remember, we had a stimulus package in 2001), and 2009 under President Obama. I used regressions to see the impact of these packages on personal consumption expenditures. If you compare column two and column three, or just look at column three, you see personal disposable income without the stimulus and the one with the stimulus which is insignificant. Temporary cash injections just don't affect consumption very much

The next question relates to the part of the stimulus packages that tried to get the states to spend more. I've illustrated the idea in Figure 8. ARRA was the stimulus package that passed in 2009. And I've divvied this up into categories. One is the temporary transfers and tax credits. The green is grants. The red is federal government purchases. So, you can see the federal level is really small. There's nothing much to multiply there.

John Cochrane: Isn't that Phelps and Krugman and company's complaint? That actual purchases should have been much higher?

John Taylor: That is a complaint. I don't think it's legitimate. I'll come back to it in a minute, but

it is sometimes hard to get government to do something that quickly. You don't build a road and bridge overnight. You have to get permits, and it takes a long time

Figure 9 tries to look at what the ARRA grants did to the states. The grants to the states were supposed to stimulate purchases by the states. The grants are shown in blue as the change from 2008 fourth quarter. So, lots of money went out, but almost nothing happened. The green is government purchases at the state and local level. Net borrowing went down. Effectively, the state and local governments put it in their coffers. They needed to have some money for various reasons. They borrowed less. So, there was just very little effect on purchases, expenditures, or other transfer payments at the state and local governments.

Another stimulus package was the so-called Cash for Clunkers. Figure 10 takes estimates from Mian and Sufi and shows you the impact. Personal consumption expenditures is shown in blue. And the impact of the Cash for Clunkers – remember that is when we gave money to people if they traded in their car and bought a more fuel-efficient car – is negligible. The effect is temporary and was offset later.

Figure 11 adds that to the 2008-2009 stimuluses and looks at personal consumption expenditures. The only thing you really see is the Cash for Clunkers, and it's ridiculously small from any reasonable comparison.

Given the time constraint, maybe I will just stop there. The rest of the paper reflects on the fact that these fiscal policies have left us with a legacy of more debt and more deficits, even though they did not work very well. And so, we've got a problem on our hands. The deficit is growing. Interest payments on the debt are growing, and we ought to do something about it. Through model simulations, I show there are relatively painless ways to deal with that. And that's something that we should be doing. So anyway, that's my presentation.

George Shultz: Why doesn't it work?

John Taylor: In the cases we looked at, giving cash to people, they mostly just save it. They don't spend very much of it on average. Some do, obviously. The explanation is the permanent income theory or the life-cycle theory. The increased government spending is harder to deliver. The federal government couldn't increase its spending very rapidly. They just couldn't do it. So, what do you do to make it go faster? I don't know. And then for the state and local, the idea is that we would give grants to state and local governments and they would spend it, but we have a federal system. You can't make the State of California spend the money you give them or the State of Nevada.

George Shultz: Just give the money to my wife Charlotte.

John Taylor: There you go.

[Laughter]

Well, we can have another table for that. But that's the problem.

Bob Hall: You mentioned spending--the transfer component of spending just went up hugely. The government can turn on a dime when it comes to issuing people checks. It's building bridges that takes a long time. But writing checks, they did a real good job of writing checks.

John Taylor: That's right. It's pretty impressive. I was in the Treasury in the 2001 stimulus package, and you got the checks written almost instantaneously. The Treasury Secretary would call out, "print checks!" And it would happen.

John Cochrane: The high-speed train, remember, was part of the stimulus package. "Shovel ready." I don't think we've had a single rod of track laid yet.

Bob Hall: I hope not.

John Cochrane: I hope not too.

John Taylor: So, anyway, there's still a lot of evidence that these didn't work. There's disagreement, to be sure. But the notion that the consensus is that it all worked is just not correct.

The next topic is QE. We have talked about that a little. John or Bob?

John Cochrane: Let's let Bob go first to make sure Bob has a chance to go.

John Taylor: Okay. Bob has a one-page handout.

Bob Hall: So, I want to start with this page, flip it over. Not being an egoist, I didn't put my name on this.

Okay, so one of the things we haven't come to yet is sort of the economic mechanism of the contraction itself. So, I wanted to comment on that. So, if you look at the red line, which is real disposable income, I did not put a gray bar here. In fact, I toyed with the idea of not putting the years at all and saying, "Find the recession." You can see that real disposable income, which is the driving force of household spending, made an almost invisible response to the recession. And the reason is that although there was a big chunk of income lost primarily through the big reduction in employment that occurred, it was exactly made up for by the government writing checks. The government filled in the entire gap in the economy by writing checks. I think in that respect it was an incredibly successful counter-cyclical policy. And then if you ask, well, how did households respond? They responded in one dimension, which is not shown here, which is they stopped buying durables. But the great bulk of consumption expenditure – something like 85% of it – is consumption of nondurables and services. And again, you can just barely see any response to the household whatsoever. So, any story about the mechanism of the recession that goes through the kind of thing we teach in Econ 1, that there were multiplier effects operating to amplify the reductions in consumption, just didn't occur. The government prevented it from occurring by writing checks. And again, if I didn't tell you the dates at the bottom, you'd have a lot of trouble finding the Great Recession. This was 65% of GDP. This is not a small amount of money. So, in that respect, the counter-cyclical policy achieved through, for example, a great increase in unemployment insurance. Every counter-cyclical fiscal policy… every automatic stabilizer came on big time, and basically blocked any household response, *except* people got scared, and they stopped buying durables. So that takes… This is what we refer to, this is the Cochrane-Hall view of this recession.

And this figure comes directly from a paper that I published in the AER last year. So you see the employment rate plunging, as Caroline talked about. And then a crucial measure of the fact that investors, including households, were scared, which is the discount rate implicit in the valuation of the stock market. The stock market fell by about 50%. So that generated implicitly, or was a signal of a big increase in discount rates. You feed those into a model, you can track this pretty well. So this is a very simple theory of the recession. It's completely contrary to things you read about anywhere, except

things that John and I write that says the story of the recession is extremely simple. Everyone who's looking to the future and deciding whether or not this is a good time to invest in real capital, either household capital like cars – there's a tremendous decline in car purchases – or plant and equipment virtually collapsed. That's the one thing that happened. That's the only thing you need to know about the recession, is that it happened. And of course, it had a huge effect of raising unemployment and the corresponding decline in employment.

Well, but this problem kind of disappeared, sort of phased out over the years. By 2013, it was pretty much gone. The discount rate implicit in the stock market was about the same in 2013 and 2014 as it was in 2007. And then correspondingly the employment rate. There's a theory of unemployment, which I won't go into, that supports this mechanism. It's a very simple and novel, I think, theory of recessions. And it works in other recessions – before Niall asks the question, I can answer it. This works throughout the time when we measure these variables well. So, I think this is the right way to think about it. Now I'll let John add whatever he wants to add.

John Cochrane: Let me add a little big picture to what Bob's saying. What are our macroeconomic issues, and what have we thought about for ten years? If you look backwards in time, why was the recession so long, especially the GDP growth part, not the unemployment rate part? Was that supply frictions? Sand in the gears? ACA and so forth? Or was that perpetual lack of demand? I think you've heard the supply view, which I agree with as well. But that is one of the big questions.

Second big question: why did we not have another Great Depression? Why did this one stop? You've seen all the graphs, you remember. "Oh my gosh, here we are exactly repeating 1929-1930." Why did we not go on? To hear the Fed, it is because of their heroic efforts to stimulate and stop things from going. What I have to say about QE will, I hope, give you some doubt about how heroic the Fed's stimulus was in stopping the Great Depression. I'll give my opinion: The Fed did not screw up. It did not repeat the mistakes of 1929 and 1933. Ben Bernanke said to Milton Friedman, famously, "You taught us what went wrong in the Great Depression. We won't do it again." And they didn't do it again. We didn't have every bank in the country closing. Not screwing up is pretty good. But it's not their positive, active efforts that stopped the recession from getting worse

Which leads us to the question, why was there a recession in the first place? Here I offer essentially an introduction to Bob. The rest of you may not see this as an important issue. *Duh, there's a financial crisis. There's going to be a recession.* Actually, that's not as obvious as you think.

In this financial crisis, the banks kept operating. There was a crisis, but none of the big banks closed, unlike 1933. Bernanke's original great insight was in 1933, if the First Bank of Lincoln Nebraska's closed, you want to go for a loan, there's nobody there. The doors are closed. That did not happen. The banks were open for business. There was nothing stopping you from bringing them your money, and there's nothing stopping them from lending to anybody with a reasonable project. I asked a banker, and she said, "There's nobody coming to the door to borrow with reasonable projects." Now, Ben Bernanke's view has been this credit-supply disruption view. But that just doesn't make sense given that the banks were still open and working.

There's the aggregate-demand view. Bob just demolished the aggregate-demand view, driven by nondurable and service consumption decline through a multiplier. So, that leaves us with quite a puzzle. Why was there such a big recession? I like Bob's view, and I think our joint view – people got scared.

People thought, “Oh my gosh. Horrible things are happening in the financial markets. Who knows what’s going? This is a lousy time to invest. I’m not going down to the bank to ask to borrow money to build a new business. Why? Not because there’s some financial friction, because it’s perfectly obvious right now a recession’s coming, and I don’t want to build any new business.” So that was my cheering for Bob.

Now, on to QE.

I brought slides for an hour and a half talk on QE zero bound and the lessons of macro and monetary economics. Since we’re very short on time, I’ll just give you a quick artist’s view of the picture.

The first picture gives you the size and scale of QE. QE tends to be evaluated sort of like bloodletting was evaluated in the 1700s: we did it, the patient improved, it must have worked. And I think in all of these things, as I just said in my comments about the recession, we need to ask why. Public policy going forward should not be based on correlations like we bled him, and he recovered,” but some vague understanding of why. So, when Ben Bernanke says, “QE works in practice but not in theory,” that really should lead you to ask, “Why does it work at all?” Will it work again?

One view of QE is that it was monetary stimulus. See the graph on the top right graph on the second page. If I were to have one graph, that’s it. You can see on the black line marked “reserves” the size of reserves. Excess reserves went up from $10 billion to $3,000 billion. And Milton Friedman rolled over twice in his grave.

So, one view of QE is this was like a helicopter drop of money. And] if it goes from 10 to 3,000 it should have sent us past Zimbabwe and Venezuela, as commenters on the *Wall Street Journal* op-ed page loudly predicted. We learned is that did not happen. You cannot have a clearer experiment in monetary economics than this. It did not happen.

So, lessons learned? The lesson I learned from that is arbitrary amounts of interest-paying reserves don’t cause inflation. In fact, there is a liquidity trap. In fact, zero-interest rate bank reserves and government debt are perfect substitutes. You cannot ask for a bigger experiment to prove that.

What else did we learn about QE? Skip down to the bottom of page three. Most of the work has been announcement effects. When the Fed announces QE, interest rates move. Here are some graphs. You can see there the announcements, and you can cherry-pick like March of 2009 was a big one. Of course, on the other hand, next graph, sometimes it doesn’t work. So, there’s a danger of cherry-picking. There’s also a deep question. Are we measuring the effects of QE or of the Fed announcing QE? People can interpret that announcement as “My God, the Fed is scared to death, and going to keep interest rates low for a long time.”” Or we might be measuring the mental model of the average bond trader, which is typically static-ISLM version about 1968. It’s really hard to rely on rational expectations for something no one’s ever seen.

I gave you in the next pictures some of the latest research on these announcement effects. There’s table 4, top left, is from Ken Kuttner in the recent *Journal of Economic Perspectives*. Most people think in the depths of the recession, when the bond markets were completely dysfunctional, yes, it worked. The same way if you go down in front of Whole Foods with a truckload of tomatoes at two in the morning and say, “I’m selling tomatoes,” you’re going to have an effect on the price of tomatoes. But if you go down to Whole Foods on Saturday at noon, when markets are working pretty well, it’s not going to

work. And that's what you see in the columns to the right. Tiny effects for the subsequent QEs. They set off what should have been an atom bomb, and we're arguing about ten basis point.

On top of the next page, this is from Jim Hamilton and coauthors. If you look at all of the announcements, and you look at the cumulative effects, there's just not a lot there.

Moreover, when the Fed actually buys bonds – go to the next graph for a good one – interest rates go up. That's kind of hard to reconcile with the view that the Fed is pushing on people's portfolios. Next, while the Fed was buying, the Treasury was selling. The private sector was overall holding more and more long-term debt, not less and less. Portfolio balance logic should have sent interest rates up, not down. Really, was the reason for the long slow recovery only that the morons at Treasury sold too much long-term debt and not enough short term debt and had they just done the opposite we would have been growing like 1984? That's preposterous, but that's the idea behind QE.

And, next graphs, people have held vastly different maturity structures and quantities of federal debt over time, with no visible effect on interest rates. So, this idea of a very strong portfolio balance effect seems completely at odds with the facts.

Next page – so I'm up to the big picture again on the top left. You see the fed funds rate, you see the reserves exploding, you see the treasury and the mortgage rates. Long-term rates have been on this long, downward trend for the last 20 years. I wish you luck in seeing any difference in this recession and previously to these long-term interest rates. The extra graph: Canada did not do QE, and the US did (top part). Bottom part: our interest rates lie almost exactly on top of each other.

So, in summary, it's very hard to find evidence that QE worked as its advocates claim. Theory says it shouldn't work. If it's so great, why didn't the Fed just peg interest rates?

What did QE do? The only answer I could find is QE was great marketing for the Fed. Imagine the Fed had said in January 2009, "Well, interest rates are zero, it's as much as we can do. We've done our bit. We didn't blow up the banking system this time. We're going to be in Tahiti drinking piña coladas with little sun shades in them. Tell John Taylor to call us when it's time to raise rates. See you later." Well, that wouldn't have been very good politically. QE allowed the Fed to make a big and important sounding gesture, say they were saving the world.

Bob Hall: And harm nobody.

John Cochrane: Well, yeah. Exactly. Now I do have one doubt about this view that QE did nothing. John Taylor made the graph on the bottom left that I poached here. In my view especially, I can't think of any theory by which QE stokes reach for yield and return premiums and asset markets and so forth. Asset markets always have low risk premiums in the ends of expansions. That's the way it always is.

But John made this graph about QE affecting the exchange rates, which bothers me. I can't close without saying it bothers me.

Now, my last point – the most striking thing in the intellectual history is how these ten years at the zero bound are a dramatically important experiment for macroeconomics. Existing macroeconomic theories, as of 2008, say that If we hit the zero-bound of interest rates, and stay there for ten years, one of two things happens, depending on where you went to grad school. Either there will be a deflation spiral, if you went to grad school near Cambridge, or there will be multiple equilibria and sunspots if you went to

grad school somewhere near Chicago or Columbia. None of that happened. (the top left of the last page shows you deflation spiral.) That's just wrong. Sorry IMF, *New York Times* op-ed pages, that just didn't happen. We learned a lot. Those theories are completely wrong.

So, let me leave it there. There's a potshot at Christiano, Eichenbaum and Evans and the magical multipliers that John Taylor mentioned, but that's for another day.

Ramin Toloui: Let me offer the perspective from a trading floor. I was head of emerging markets at Pimco for much of this period of time. I think the mechanism through which QE acted on the markets was via risk appetite among asset managers. QE was a strong signal by the Fed to the markets of the Fed's determination to maintain easy monetary conditions and to underwrite risk taking by investors. Fed policy was a green light to the market to take risk.

John Cochrane: So, there's three channels. One, it's an announcement. "We're really scared. We're running up the pirate flag in front of the Fed. Interest rates are going to be low for a long time." The other is, that portfolios portfolio have to have a bit more short term debt and a bit less long term debt. You're going with the first interpretation. There is also a view that low interest rates stoke risk appetite through some new model we have to write down.

Ramin Toloui: QE was a signaling mechanism of the Fed's commitment to maintaining low interest rates but also generally to doing whatever it took to boost the economy. It's a version of the Greenspan put. If policymakers will take action to curtail left-tail risks, it makes for an environment that's conducive to risk taking. I think that's the psychological way in which QE affected the market. In terms of the price movements around announcements, there's a market saying, "buy the rumor, sell the fact." That's why you tend to have effects in one direction on the announcement, and then markets go in the opposite direction when you actually take the action. I think we can discuss what kind of data you'd need to see to validate the story that I've just described. But I can tell you from the self-perception of a market participant, that's how market participants would have interpreted the chain of causality from the Fed's actions to affecting broader financial markets and, therefore, the economy.

Niall Ferguson: Well, this reminds me of Andrew Sullivan's observation that everybody has a religion even when they say they don't. And basically, market participants have a religion, and the religion is the Fed is God, and, I mean, observing market participants over the last decade, I've constantly been struck by their need to believe that there is an authority. And that it has efficacious action. But this may, in fact, be complete illusion.

John Cochrane: Yes. When there was a good rain, our ancestors went to the temple of Jupiter, and said "thank you."

Niall Ferguson: I mean, that's really what you're saying.

John Cochrane: Milton Friedman just won far more than he should have, convincing people that the Fed is immensely powerful.

[Laughter]

John Taylor: I have a question. I agree with your point about this impact effect on announcement. And then the market bounces back. You could see it in the data even in the first QE. Why has the other view dominated so much?

John Cochrane: Let's watch Bernanke on this. You're exactly right. He cites the announcement effects and then treats them as a permanent. Now we know in finance, if you go out announce you will buy a trillion-dollars-worth of treasuries, you will have price impact. And we also know it would last about three days.

John Taylor: Right.

Ramin Toloui: But the decline in credit spreads is more durable. There is not a graph of credit spreads in these charts. Credit spreads compress after these announcements. That's the willingness of investors to take risks.

John Cochrane: For a while. But credit spreads are also—

Ramin Toloui: I think if you look at this period of time, you'll see that although Treasury yields might come back up, credit spreads stay low. We should look at it.

Bob Hall: So, John mentioned the importance of paying interest on reserves. The traditional view of monetary policy, that still has stock in the Wall Street Journal and other places, was that the central bank pays no interest on reserves. So, if it expands reserves, that's a serious monetary expansion, and banks make more loans as they're trying to unload their reserves, because it's an asset that pays less than the market rate. The Fed paid more than the market rate on reserves. So, there's a very good argument – I have said this many times over this period – there's a very good argument that QE was contractionary, because it loaded up bank balance sheets with an instrument that paid more than the market rate—

John Cochrane: More than treasuries.

Bob Hall: More than treasuries, exactly. And that's a great discouragement to lending. So, I stand by the negative effect of QE. I think it was a big mistake. I've never heard anyone else buy into this theory. But it's always struck me as right.

John Taylor: That might be a good way to end this session. We'll take a short break, five minutes or so, and then come back to talk about the lessons learned.