MR. WESSEL: If I can get people to sit down we can resume. So in thinking about this event and in what we wanted to accomplish here, what we set out to do was to have Larry Summers make the case why we should think about this, have a number of very experienced monetary economists who have views about what we should do speak about what we should do. And then in this panel the question was could we get some people to -- from very different points of view to talk about so what difference does this really make? Is this worth the energy we spend on it and to whom does it matter?

And so we have a deliberately diverse panel. John Taylor from Stanford well known for his Taylor rule who has been thinking about monetary policy for a long time. Kristin Forbes is a professor at MIT but until recently was on the monetary policy committee of the Bank of England where correct me if I'm wrong, Kristin, you never had the chance to raise rates, right, is that right?

MS. FORBES: I tried.

MR. WESSEL: You tried. Peter Hooper who is the chief economist at Deutsche Bank Securities to think a little bit about how this would look to the markets and my Brookings colleague Sarah Bender who has written about the relationship between the Fed and the Congress which is only briefly mentioned this morning but is relevant given that after all, the Federal Reserve exists because Congress created it and as we know what Congress created it can taketh away. Sarah and her colleague have a book out called the Myth of Independence which traces the history of the central bank and its relationship to Congress.

So I'm going go task each of the panelists a question or two to get things going. We are not going to have the sequential opening presentations but, John Taylor, I wonder if I could start with you. So when you did the Taylor rule, which is a guide to setting interest rates, you kind of assumed that a 2 percent inflation target is where they wanted to be. And I'm curious whether in 2018 given everything you've heard, whether you think that was a good idea or whether if you were doing it all over again and you were trying to come up with some normative guide to policy you would have come up with a different number.

MR. TAYLOR: So it's a good question. I wouldn't say I assumed just out of nowhere a 2 percent inflation target. There was a tremendous amount of discussion for a long time about the optimal inflation rate, the zero bound was very much in our minds. Measuring inflation, the bias associated with measuring inflation so while we maybe thought about price stability at a zero inflation, 2 percent seemed like the best thing to assume. And by the way, that was before the 2 percent inflation target was anywhere. So you have to put that in mind. And it just didn't come out of nowhere. There was lots of thinking behind it.

Part and parcel to that was the assumption which is more of an assumption of the equilibrium real interest rate and I also assume that was 2 percent. That was based on considerations like growth rates. Nobody had thought about it at the time, in fact demotion of interest rate as an instrument was still foreign to many central banks. So 2 on the real interest rate, 2 on the inflation rate gave the nominal interest rate of 4 percent which seemed quite good quite frankly and I think Larry Summers described why that was a number that's useful for many purposes. So that's where it came from.

I think the second part of your question is what would I do now? Well, I don't think there is much difference in terms of what we think the measurement bias is or the zero bound because it has always been there. I think the main difference is the equal variable interest rate and John Williams has done lots of work on this. I have questioned some of that. Not so much about the research but about the uncertainty about our star. I have a paper with Volker Wieland emphasizing how difficult it is to determine our star in this environment. It's sort of the fog of monetary policy. Very unusual monetary policy, still unorthodox in many parts of the world makes it very hard to estimate our star.

So I don't take it as a given, its 1 or it's zero, that's the FOMC thinks it's about 1 now. And that would suggest adjusting if you have a rule that is going to be useful in current policy that would suggest adjusting it to 1 or so which is what I said the FOMC should be doing if they think our star is one. I have my doubts about it though and I think we should watch carefully about it and I think it's most likely to go up based on my considerations which suggests we should stick with that 2 percent inflation target but worry about our star and if I could just add one other thing, David?

MR. WESSEL: Please.

MR. TAYLOR: There are many good things about the inflation target choosing it numerically. Sometimes I worry it's taken too much attention away from other parts of policy and the discussion this morning there was very little discussion of the reaction functions or the policy rules. It was implicit in the comments about strict inflation targeting. Of course with a policy rule you don't do strict inflation targeting. There's a movement towards it.

So anyway I think there is a worry I have that the extra emphasis on the numerical inflation target has actually taken us away somewhat from the notion of a rule or reaction about what the central bank should be doing to active that target. And I have noticed that to some extent and it worries me and I think if we continue with the numerical inflation target which I hope we do, we have to find was to bring more attention to the polices that are actually used to achieve it.

MR. WESSEL: Thank you. Kristin, I wonder if you could talk a little bit, you've had the experience like some other people earlier of being both an academic and a policy maker and do you think this whole framework thing is as important as the speakers on the previous panel suggested?

MS. FORBES: So I would say a very clear yes, the framework is incredibly important. And I can base that based on my experience having to set monetary policy and I think it's important not just it's important for the policy maker sitting in the seats, it's very important for discipline for them but even more important for accountability, transparency for the general public and any government overseeing you.

So let me explain what I mean by that in more detail. So first as someone setting monetary policy, you're asked to comment on a lot of different things and at the Bank of England we were constantly trying to get dragged into the debate on my immigration, on the debate on inequality, some wanted to get into climate change, comments on fiscal policy and then Brexit, you know, so there are lots of ways you could start to comment on lots of issues. And having a clear mandate, 2 percent inflation target was a very good disciplining device for all of us. We are only going to get involved in something or comment on something if it relates to our mandate, our goal, 2 percent inflation target. So I thought that was very good discipline for all of us when deciding when to comment and when not to comment.

Internally too I found it very helpful deciding what I focused on. We would at the Bank of England we would get the staff forecast a few weeks before we'd then meet and debate and decide what the forecast is which then determines what we do with rates. And when you get the forecast there is always a bunch of variables in there, I'll have different views on, different people have different takes. But you can't argue every little point that goes into these huge forecasts so I found it very helpful to say okay, our target is 2 percent, and then run quick scenarios. So I think this variable should be X instead of Y, does that actually matter in terms of how we reach our inflation get or policy? So I would usually go through that sort of list of here is 10 things I disagree with the forecast but 8 of them aren't actually going to matter for our 2 percent inflation target so I'm not going to worry about those. Instead I'm going to focus my energy and the discussion in the points on those things that will actually matter.

So I think bottom line is having a very simple, understandable framework incredibly important discipline internally and also how you talk externally. But where I think the framework was most important is in maintaining the credibility and accountability of the central banks.

Right now central banks have a tremendous amount of power. They are influencing people's lives in ways that people were not aware of at least as much in the past. They play very big public roles and they have to be able to explain how unelected officials are carrying out those rules and justify what actions they take. I worry about this even more going forward as more central banks are probably going to be raising rates and people are going to start to take out a mortgage and realize it is suddenly going to cost more. The banks are going to have to be able to explain why they are raising rates, why they are making it harder to get a mortgage so you need a very clear understandable framework to get out to the public why you are doing what you are doing.

And some of the things we had talked about earlier this morning they seem understandable, easy to us. Nominal GDP targeting, things like that. But explaining them to the public I do worry is going to be incredibly difficult. Even there were some polls in the UK when I was there asking people what inflation was today and they were often off by 2, 3 percentage points so even what seemed very simple, understandable ideas getting them out to the public again gets hard.

And the other issue of a framework that I think is important is making sure it's a framework that is relevant to today. I worry about some of this discussion of frameworks where we are averaging what happened in the past a couple of years so you are justifying behavior today based on what happened, you know, several years in the past. And when you go out and explain to the public why you are doing what you are doing, they don't care what happened a couple years ago. People don't remember those details. You need to be able to explain what you are doing based on what is happening in the environment today or planning forward in the immediate short term future. So for all those reasons

I think the framework is very important but it also needs to be a framework that is very easy to understand, very easy to explain and also very relevant to people's lives today, not something intangible in the distant past or distant future.

MR. WESSEL: And when you were at the Bank of England was there any consideration of whether having an inflation target was a good framework, whether there ought to be an alternative or one thing the Bank of England has done is managed to achieve its inflation target. I suppose we could depreciate our currency by 25 percent and try that as well but, you know, does this issue seem strange to you from the point of view of the Bank of England?

MS. FORBES: So there was a debate before I started when Governor Carney started of whether there should be a change. I wasn't part of that debate but when I was there there was no debate. 2 percent inflation target was, it was a very good focus, a discipline for all of us and we are also told when we started the government sets the inflation target, not us so don't comment on it, don't get involved, don't go public so that if nothing else that was an easy excuse not to get involved in it.

I think the other thing that's important too is some of the discussion we have had suggests that having a strict inflation target is constraining in some way. Doesn't let you do the optimal monetary policy you would do to maximize welfare, reduce output losses, something like that. And the UK has an even stricter target than in the U.S. It's just 2 percent inflation that's it. No weight on the output gap, no dual mandate, it's just the inflation target. But my sense being there was we still had a tremendous amount of flexibility.

We could look through price shocks whether it was temporary, oil price shocks, whether its medium term shocks such as an exchange rate move did not affect inflation for it could be three, four years. We could look through that. We could when there were large output gaps we could explicitly talk about that as part of our inflation framework. We usually brought it in in a way that our goal is to meet our 2 percent inflation target sustainably so that meant even if there was an output gap then we would not sustain the inflation around 2 percent. So that was a way to work in a lot of other considerations.

And more recently right as I was leaving, there was more discussion about the speed with which you returned inflation to 2 percent and the cost of that. So my sense there was in some sense we had a very strict mandate, 2 percent inflation, that's it but yet we could still work in a lot of these other considerations that a lot of these other frameworks seemed to be trying to bring in more formally. So I'm not entirely convinced we need to bring it informally. We were able work that in already informally.

MR. WESSEL: Peter Hooper, does anybody in the markets care about what framework they pick? Nominal GDP, price level, 2 percent inflation target? Turn on your mic or they won't know whether you care or not.

MR. HOOPER: Well, let me start by giving the disclaimer that what I'm about to say does not necessarily reflect the views of the entire market.

But certainly there is quite a bit of interest. I won't say that we have put it quite at the level of importance as inside central banks at this point but yes, there's interest and the possibility of something happening here I think people looking to the likelihood we would see a substantial increase in uncertainty, I mean, if it went to the level of raising an inflation target substantially to 3, 4 percent that would obviously open up the Federal Reserve Act. That’s no longer price stability and by any stretch. And that would I think raise quite a big question as well.

Certainly anything, any move in that direction you are raising inflation expectations but over time very slowly. People tuned in to the possibility there and the inflation risk premium. I think the inflation, the notion of a shift in the inflation target upward 3, 4 percent I kind of agree with Ben, it's not like us. People are generally discounting that would be my sense. It's, I mean, the view in the markets currently is if the Fed changes their target, they should change it to something achievable like 1 and a half percent which is where it's been, I mean, that was a question raised at the end of the last session which I think is a serious one. People in the markets generally don’t believe there is a Philips curve or many or at least the view of the inflation is always and everywhere a monetary phenomenon has certainly seemed to have been violated. There are global forces, there are technological forces, demographic forces all tending to hold inflation low even some nice work at the San Francisco fed recently suggesting that the non-cyclical element of the economy is growing as is now more than 50 percent and tending to hold inflation down. So there is going to be a real challenge getting inflation back. Maybe up even to 2 percent let alone 3 to 4 percent. So the notion of an inflation target increase just isn’t there. If I can go on and talk a little bit about --

MR. WESSEL: Sure.

MR. HOOPER: -- well the alternative, the one that seems to be coming through a little bit more on the discussion today is the sort of the average inflation target or price level target. Here you are dealing with something that would I think folks in the market recognize increased volatility, certainly to hit an inflation price level over time you're going to have shocks to the downside. That will have to be offset exactly with shocks to the upside. That means not only more variance in inflation but also more variance in output I would argue.

Let's take an example of what if we had adopted this has been suggested when we first hit the zero bound and we find ourselves today as we do at 5 percent below target on inflation. What are we going to do over the next 5 years? Are we going to raise the inflation rate immediately to 3 percent and have it stay there? Maybe that raises inflation expectations? I will say inflation expectations adjust slowly. They are adaptive. And it's going to take some time to get there. So let's say we do get there. How does the Fed achieve that? It achieves it by driving the unemployment rate I think significantly lower. It's always below Nayroo [phonetic 7:57:49] maybe we go down in the mid three's, maybe lower, a lot of uncertainty about our inflation models now and exactly how to get there.

But I like to go back to the 1960's, the last time we had an occurrence sort of like where we are now. We went through the 50's at 2 percent inflation, the first half of the 60's it was 1 and a half percent. From '63 to '65, through '65, the unemployment rate went down below Nayroo, reached about 2 percent points below Nayroo with no move in inflation about 1 and a half percent. Then suddenly in '66 it jumps by 2, 2 and a half percentage points in one year and from there on we, that’s sort of the opening saga of going into the great inflation.

I think the, there is a fair amount of work suggesting there are non-linearity's in the Philips group so if we are getting down there are we going to have control over the situation going the other way. What is going to keep us from overshooting?

MR. WESSEL: But okay. So we could relive the 60s.

MR. HOOPER: Yes.

MR. WESSEL: I do sometimes think that everybody in monetary policy is fighting the last war but different people are fighting different last wars. We have been -- you don’t seem to agree with Larry and some of the others that we have an urgent problem here. That we are likely to hit the next recession unable to use monetary policy sufficiently to get us out of it. That the risk of hitting the zero lower bound is large, uncomfortably large, the natural rate has come down and that the risks of being not reliving the 60's but reliving the last five years are worth thinking about.

MR. HOOPER: Okay. I'll observe that the Fed has never been able to get the unemployment rate up from significantly below Nayroo back to Nayroo without a recession ensuing. So the record in achieving soft landings here is pretty remote. Question is how -- does this lack of evidence, does this lack of ammunition create significant risks going into the next recession?

My view on this is that the costs are pretty significant. We need to get a better handle on what the cost of higher inflation may be. Yes, there are benefits obviously from the ammunition for policy standpoint but the balance here is pretty close. I would say rather than jumping into something right away, let's see how it goes in the next recession, okay. And let's see how it goes in terms of getting us back to Nayroo, I mean, what is our ability to control things here?

MR. WESSEL: I know it seems to be a little bit like saying you've had this massive heart attack and you are trying to decide whether they should do a coronary bypass and the cardiologist says well, why don't you wait until you have a another heart attack before you decide. I mean--

MR. HOOPER: That analogy is not perfect.

MR. WESSEL: Well, but it was not as good as Summers, I can't come up with them like that. I take your point, I'm sorry.

Sarah, let me give you a chance. So one of the interesting things about the conversation this morning was that every once in a while Congress would come into the picture, I think most notably there were some suggestions and people have made this a number of times that 4 percent inflation may be hard to justify with the price stability and that just a, in a legal sense, not in a political sense. So I know you have done a lot of thinking about what role does Congress play in this and how would you look at this discussion we had this morning, I mean, earlier this afternoon from the eyes of the political realities of the central bank in the United States?

MS. BINDER: Sure. So I think there has been as you've said a good discussion of economic costs earlier today about either raising the target or alternative regimes. But I think with the exception of Ben Bernanke no one has really kind of nailed down what the political cost is here. I would argue politically Congress really has to buy in to either raising the target let alone any other more potentially quote unquote radical changes to how it goes about pursuing its mandate. Again the usual --

MR. WESSEL: Sarah, why don't you pull the microphone -- if you're going to look at me, be sure the microphone is on my side --

MS. BINDER: Okay.

MR. WESSEL: -- of your mouth.

MS. BINDER: Okay. I will keep looking at you, David, okay. I think the usual objection before I get going here that I usually and it's good to anticipate is well look, keep in mind that's Dan Fisher distinction that the Congress gives the Fed its mandate so sure, the Fed has goal dependence but then we always say that the Fed has instrument or tool independence and so why should we worry about any political, potential political costs. To put it bluntly, the notion of independence for the Fed we could call it a myth. I will give you three reasons here that will help us I think think about the political costs.

First its crystalized by Bens comment that if the Fed pushes too much in an expansionary policy by virtue of changing its target, we could easily see it risk losing half the side of the mandate, the employments of the mandate in the first place. So but second, even without legislative action, it's not at all clear on this sort of goal versus instrument distinction. It's not really clear to me where the inflation target or any GDP targeting where it fits. Right, is the target a goal? Is it an inherent part of the feds price stability mandate and thus changing it is Congress's prerogative? Is it a tool for achieving price stability but of course Congress also sets tools, right? 13.3 interest on excess reserves and so forth. So conceptually I think there is very little apriority expectation of autonomy on the Feds part for making changes to the target.

Third, perhaps more importantly, right, set aside the conceptual issues, think about how the Fed got its current target. Bernanke as we know from his memoir and from reading the FOMC transcripts, right, he worked for a decade to convince not just his colleagues on the FOMC but also his congressional bosses on the Hill that the feds should have an inflation target. We hear those constraints for those of us not around the table but are dependent on the transcript, Don Coh, 2008 quote having an inflation target won't have any effect if it's repudiated by the Congress. Bernanke in 2010 again around the table or one of the main issues has been whether we could succeed politically in creating an inflation target or whether there would be quote, pushback from Congress unquote.

And of course there was pushback from Congress. Bernanke has said the new, when he went to the Hill in 2009 Bernie Frank then Chair of the House Financial Services Committee said this would be a particularly bad time at the height of the recession to dot the target for just one side of the Feds dual mandate. All right, think about it. That was 2009. It took until January 2012, all right, it took the Fed three more years --

MR. WESSEL: Well, they were a little busy during those years.

MS. BINDER: For sure. But in any theory of instrument independence, all right, when they might have most needed it we might have expected it perhaps to move more quickly. But I think what it is critical here is that six years later all right, lawmakers they're still threatening the Fed about the target. Not from the left this time but from the right. We have the videotape.

MR. WESSEL: Go ahead.

MS. BINDER: Let's just, assuming this goes -- okay. Here we go. This is Jep Hanserling, the outgoing chair during Financial Services Committee. This is during the last July semi-monetary report, the hearing held with Janet, oops. Oh no.

MR. HANSERLING: In a recent press conference, some interpreted comments that you made to indicate that you were open to an increase in the inflation target. Are you pursuing an increase in the inflation target or other members of the FOMC? Is this a matter of discussion within the FOMC to increase the 2 percent inflation target?

MS. YELLEN: It is not. We reaffirmed our 2 percent inflation target in January. We are very focused on trying to achieve our 2 percent inflation target and it is not a subject of discussion.

Mr. HANSERLING: Thank you, I will take no for an answer.

MS. BINDER: I mean, that crystalizes the dilemma here, right. I will take no for an answer.

MR. WESSEL: We get Hanserling back? Having Jeb Hanserling look over my shoulder is not.

MS. BINDER: Just to think about it, right, will Jay Powell be treated any differently than Janet Yellen was? Obviously remains to be seen or part of it depends on whether the criticism coming from the Hill was purely ideological in terms of economic views or was part of that partisan right because it was a democratic --

MR. WESSEL: So let me just go to you for a moment. So if the fed decided it wanted to move to a price level target, as has been discussed. Is it your view that they would need kind of the at least consent in an informal sense of the members of Congress before they did that?

MS. BINDER: Well, that's my interpretation judging from not just the inflation target but other episodes when the Fed has looked for particular tools or changes. The challenge here is, I'm not an economist but the challenge here is sort of history dependence that Kristin just mentioned, right. If there is ketchup behavior going on here but what law maker's care about is the state of the economy and whether they are going to be blamed for things going poorly. Their eyes are going to be what the current state of the economy is and they're not going to be pretty wild I don't think about numbers of inflation rising on their watch.

MR. WESSEL: John Taylor, so what would you do? Would you give up on all this talk of frameworks and just try and pursue the Taylor rule? Do you think there is some attractiveness to price level or nominal GDP targeting or some variant?

MR. TAYLOR: So the Taylor was a framework, right, of policy rules are frameworks for thinking about the decisions about policy making. I don't think there is any way to think about it, it's a little more detail than just the inflation target. That's part of it but it's not the whole story. So no, I wouldn't give up on it at all. In fact it seems to me you could talk about the Congress there is a bill which I think this would require the Fed to say what it's doing on its policy. In fact, what if the Fed came with a rule of some kind which was price level targeting but what makes you think they would be rejected. Its, they basically they would like the Fed to say what the Fed is doing. If the Fed comes, and this is what we are doing well I'm sure there would be lots of discussion. But why would you just [inaudible 8:09:34) said they are going to ignore it. And I think that's the way to think about things now.

The instrument independence versus goal independence I think the Congress would like the Fed to describe its decisions on the instruments doesn't take any independence away. The Fed just to describe what they are and if it is along the lines that John Williams has said then it's hard to see why they would just scratch at it out [inaudible 8:09:59]. I do think there is a better way to go about this which actually goes back to earlier work of John Williams and David Reifsnyder which is, it doesn't have, you don't have to change the inflation target or have price level targeting. You just commit to when the interest rate hits zero to keep it at zero a little longer is a beautiful way to think about this. It's a description of the instruments, it's kind of a meta rule and that's one of the things I would do going forward is say here is what we are doing and here is why it worked and I don't think you have to go through the whole inflation targeting change or the price level targeting to achieve that. It seems to me it's, it is very close or much closer to what the Congress is asking the Fed to do.

MR. WESSEL: So, Peter, do you think the market -- let me ask, I won't ask you to speak for the whole markets, that wasn't fair. Do you worry at all about that the our star the equilibrium loan run rate is low and that we might find ourselves in the position of having recession that's hard to fight both because of monetary policies out of ammunition and fiscal policy is either paralyzed by political gridlock or by too high debt to GDP or do you think that's just a fairy tale that we shouldn't worry so much about?

MR. HOOPER: Oh, I think it's definitely something to worry about. No question. The question is what to do about it.

MR. WESSEL: Right.

MR. HOOPER: And --

MR. WESSEL: So what would you do about it?

MR. HOOPER: For now I would stick with the policy we have but recognize that it does give you room for some flexibility on the upside, I mean, allowing inflation to overshoot into the 2 and a half, 3 percent range giving you a little bit more ammunition when the time comes I think would certainly be wise.

MR. WESSEL: Do you think the markets think the Fed is willing to let inflation overshoot the 2 percent level right now?

MR. HOOPER: I, you know, right now the market is having a hard time getting its head around the idea that it will get to 2 percent. I mean, the tips break even longer dated five year forward five year expectation is about a half percent less than the Feds 2 percent target if you adjust CPI to PCE. So yes, I think it's getting there would be a --

MR. WESSEL: So then why wouldn't the people in the markets be screaming that the

Fed is making a mistake by raising interest rates?

MR. HOOPER: Make --

MR. WESSEL: I mean, if we don't have, we are not hitting the target. You're saying the markets don't think they can hit the target so wouldn't it follow then that we shouldn't raise interest rates?

MR. HOOPER: Okay. Well, there are certainly are people in the market who are saying that's going to occur. And then market expectation about interest rates is substantially less still --

MR. WESSEL: Right.

MR. HOOPER: -- than the average FOMC.

MR. WESSEL: John?

MR. TAYLOR: Yes, let me just interrupt here. The fact that the inflation rate is somewhat below the target doesn't meant the interest rate should be zero. It could be a little higher than zero, it could be 1, it could be 2 and so this notion, in fact I think that's one of the other problems I worry about with the inflation targeting is it seems to be if its 1.5 or 1.63 oh my god we have got to put our foot on the floor but that is not how monetary policy should work. If the interest rate maybe should be a little lower, it should be a little lower than otherwise but not complete full throttle.

MR. WESSEL: Kristin --

MR. HOOPER: You should allow the inflation rate to rise above target which the current system allows you but I don't see the need to put yourself into a tighter straightjacket if you will --

MR. WESSEL: Right.

MR. HOOPER: -- of having to achieve a certain average over a certain period of time which is more difficult than the current one.

MR. WESSEL: Kristin, I'm going to let you answer any question you want so I'm going to ask you a question but don't feel you have to -- so does the rest of the world, and put on your international economist hat for a minute. Does the rest of the world care about the conversation we had here earlier about how the Fed is choosing to define price stability under its mandate?

MS. FORBES: I would say yes to differing degrees in different countries but the Fed is a leader, I mean, what the Fed does does set examples for the rest of the world. The Fed is highly respected, it has a very smart group of economists. I know for example the Fed, the fact that they are cutting back on QE the Bank of England, we were very excited because we could see what happened and see what happened in the U.S. economy to get a sense of what might happen when it's time for the UK to follow that path. So, yes, the UK is a or U.S. is a role model. But I also I wanted to take advantage of your suggestion to jump on anything. There were three points that were raised earlier that I wanted to get in there.

First, Peter, you said expectations tend to change very slowly. Inflation expectations are very adaptive, very slow to change. My experience is that's not always the case. In the UK inflation expectations were quite low especially around 2015 after the oil price shocks and inflation hit zero, it even went briefly negative. So inflation expectations were quite low and then we got a Brexit shock and suddenly inflation expectations popped up quite high and now if anything they are a big higher than some people might be comfortable with or about historic expectations or historic averages. So we saw inflation expectations change very quickly, you know, I'm not suggesting a Brexit shock and a 20 percent depreciation of the currency is the way to accomplish that but it does show how quickly people can change when the situation changes.

Another question, David, which you asked was how big a risk is the zero lower bound and I think that's an important point. I came here so for all the people who have spoken today, I think a lot of people came here with priors on what the optimal framework is or where we should go. I'm one of the people came here without a prior and I came here largely to learn and hear the arguments and listen to the cases and then try to form my own opinion and what hit me is most, I think all of the cases this morning started with the argument we need to change the framework because of constraints around the zero lower bound and fall in our starred so we just aren't going to have the room to operate in the future that we would like to have when the next bad thing happens.

So I largely agree with that I think especially in terms of theoretical models if you believe the lower zero bound is a constraint, this all holds and there are big welfare gains from changing the framework. I don't know if Larry Summers are quite as accurate but there probably are welfare games and certainly in theoretical models but in practice where I wonder if the argument is quite so strong is how tight a constraint is the zero lower bound. And here when I started, I will draw on my own experience in the UK. When I started in the UK I was also worried about the zero lower bound and that also made me more cautious starting a tightening cycle knowing we were so close to the zero lower bound and there could be another native shock.

But then we had the Brexit shock, interest rates then were at point five so we weren't quite at the zero lower bound but in the UK the estimate with weights could probably go a touch below 25 basis points but not much lower due to the structure of the finance societies in the UK. So we were pretty much almost at the zero lower or effective lower bound for the UK. So in the response to Brexit, the committee decided to do a package that was lowering interest rates 25 basis points, you know, pretty small and pretty token given the predictions of what would happen to the economy but then also doing QE, starting a new corporate bond purchase program and starting a new lending program to make it easier for banks to pass on lower interest rates, so a four prong package. We did some estimates of what impact that should have on the economy. We had a skeptical view of how effective QE or these pretty small packages of corporate bond purchases would work, not sure at all how much this program in terms of having banks pass on lower rates would work.

And what we saw is this package worked quite well. It was more effective than our estimates and I became convinced that things such as QE, these asset purchases programs can be quite effective in helping alleviate constraints around the zero lower bound. They did stimulate the economy more than we expected and it wasn't because financial markets weren't functioning or there wasn't liquidity, I mean, there's a whole line of arguments that QE only worked because markets weren't functioning, they eased liquidity issues and that was not the case. So I guess the bottom line of all that is I'm less convinced that being near the zero lower bound is such a tight constraint. We do have a whole set of new tools. Those aren't optimal tools, I would rather go back to the old fashioned way of adjusting interest rates and not using these new tools for sure but if we are in this situation we are at the zero lower bound again, I think we do have options so we shouldn't -- I don't feel as big an urge to dramatically change the framework with potential costs because of that constraint.

And the final point I just want to make that it hasn't come up as much as I expected despite, David, I think one of your mandates to everyone was to discuss how their policy would function during all stages of the economic cycle. What hit me this morning is most of the discussions focused on this stage of the economic cycle or when inflation is too low and again in the UK we went through that and then very quickly we got another shock and now inflation is too high. Its 3.1 percent. So when the committee, not me anymore, is in the position of having to write to explain why inflation is too high. So I think we have been in a very unusual state of the global economy. We had the global financial crisis, prolonged recovery, Euro crisis and then just as things might have been starting to normalize, we got the commodity shocks that brought headline inflation down around the world. So we are, it's not surprising we are focused on the situation when inflation is too low but we forgot, there is a whole other set of shocks out there that could hit and we need to make sure that if we do make a change any framework is going to function well in that alternate environment also.

MR. WESSEL: Peter.

MR. HOOPER: I stand corrected, Kristin. I certainly inflation expectation are sensitive to oil shocks et cetera, so less so in the larger less open economies and less over longer dated periods but I do think that the key question here is what effect do central bank announcements have on inflation expectations? At least in the G3 have had, the Bank of Japan has certainly had its troubles with that one. And I suspect that a Fed announcement that -- oh we are going to go to 4 percent if, unless inflation had already risen to near that level could be problematic and announcing something when you are well below it and failing to get there could be really devastating to credibility.

MR. WESSEL: John.

MR. TAYLOR: So your question about international I think is very important and for the last few years there has been a tendency for central banks to follow each other. I think it's quite clear. The examples I give is Japan followed the U.S. in quantitative easing because the Yen was too strong and then the Mario Draghi and the ECB follows as well because the Euro was too strong. Both actions changed the currencies dramatically and you can see emerging market countries all over the world worried about exchange rate behavior because of the very unusual policy. So this is a global phenomenon and I think I have a great concern about the exchange rate effects.

Many people feel that we need to have a more rules based international system, that is not a view of a few people. I think the best way to get to a rules based international monetary financial system is for the individual countries to follow that kind of a policy. Inflation targeting, the 2 percent inflation target has effectively become global is what the Europeans talk about, what the British talk about, what the Japanese talk about, of course we are talking about it. If you move away from that I think almost in a clearly if it's from 2 to 4 you can upset that and its obvious currency issues will come to the fore right away.

I also think that even more modest changes of the price level targeting and by the way, my original work on policy rules was price level targeting way back in ancient history if anybody is interested. But we changed that because it had some of the problems that people are referring to now. So I think even a small adjustment like that threatens the problem, the goal I would say of moving towards a more rules based international system. And a lot of people want to do that. I think there is an opportunity for it now. There is more and more evidence coming about the exchange rate volatility, the capital flow volatility that has come from the unusual policies and Europe is talking about moving back, even Japan is talking about moving back and so that seems to be a goal. I don’t want to upset that goal by a change in our policy. Very important. Very important for me to white a stick to what we are doing as best we can.

MR. WESSEL: Thank you. I think we will have time for a few questions if anybody has one, any. Peter Doyle here and there is a woman over there. Why don’t we start with the woman in the back because the mic comes to you Peter.

MS. DUROSIS: Sophia Durosis [phonetic 8:23:15] from TL Macro. One question I had is regarding the framework of monetary policy. If going forward there is more of a role for say asset prices than just the credit transmission channel so if the transmission mechanism has changed, how should the framework change? Some of you sort of touched on it with regard to implying that unconventional tools might be here to stay but can you just kind of address maybe how the framework to change if the transmission mechanism has changed.

MR. WESSEL: Okay. Peter Doyle?

MR. DOYLE: The discussion as I hear it has reached a conclusion which is that every single person is advocating either for the status quo or for a change, acknowledges some shortcoming in their proposal. We have nobody is claiming universal benefits for their own proposal. What that situation tells me is that we've pretty much exhausted the possibilities that there are. We now have to choose between, you know, do we think something is more probable or something is less probable? There is no silver bullet.

What that suggests to me is that we need to also devote as much intellectual tension to thinking about an assumption which we all share in this debate which is that the shocks are acts of God. There is a shock and to which we respond. How do we respond, how does that fulfill the area, we need a certain kind of instrument. We have all taken the same assumption which is they are acts of God but they're not acts of God. These are things which are produced by economic systems, by economic policies and I think we should be devoting at least as much attention to thinking about diagnosis of the problems that gives rise to these shocks as we are to devoting our attention to policy frameworks who deal with them when they happen.

MR. WESSEL: Okay, thank you. I think, Peter, you are being a little unfair. There was discussion and in fact disagreement about whether we have to accept that the natural rate of interest had come down or whether we could do something about it which seems to me part of the point you are trying to make. Does anybody want to take the point on either question? Sarah?

MS. BINDER: So I just want to make explicit what's been sort of implicit to you mentioned it, the assumption that unconventional monetary policy is here to stay. All right. That we had the Bernanke and Yellen playbook and we have put it on the shelf and we are going to break the glass and take it out again. I don't, wouldn't make that assumption. I could imagine, first of all we know that parts of it have been tinkered with, right, the 13.3 authority. It's not irreparably harmed but it would be harder to use it in the targeted fashion it was used in 2008 and I guess late 2007. I wouldn't guaranteed that the Fed, that Congress might weigh in on asset purchases, on the size of the balance sheet, on paying interest on excess reserves, right, which wasn't immediately part of the playbook but one could imagine that the set of tools that that had the first time around assuming it's a similar type of crisis might not actually be ready on the shelf or even that there might not be able to take them off the shelf. And just to keep in mind that also probably assumes that there is a massive tarp but I wouldn't necessarily bank on another Wall Street bailout certainly looking like the one that it looked like back in 2008.

MR. WESSEL: John?

MR. TAYLOR: So these two questions I think are somewhat related because there is the shocks are coming from somewhere else and I agree that studying the best way to react to those shocks is a big question and there will be more coming, the asset markets. But what I think is we also have to emphasize and sorry to bring this up but some shocks are caused by monetary policy. I happen to argue that big changes in polices so called great moderation became because those shocks diminished. I have also argued that this terrible tragic great recession we went through had a lot to do with monetary shocks. So those are part of the discussion. That's why we want to have more stable monetary policies and there is various ways to go about it but I agree, don't forget that powerful aspect of monetary policy which can be very damaging if it's not done right.

MR. WESSEL: Kristin, did you want to respond?

MS. FORBES: Hit a couple of reactions. So first question on has the role for asset prices in the transmission mechanisms in monetary policy. I mean, asset prices are front and cetera in central banks model, not because central bankers want to affect the asset market or put equities at a certain level. It's centrally not but more you know that changes in monetary policy are going to affect asset markets and those changes in asset markets will then affect consumer wealth, consumer spending and have real effects on the economy which is what you are driving so that is built in there implicitly. Those transmission mechanisms may have changed but there is also a lot of other things that have changed in the economy. So I had actually been surprised.

For the UK there were some modeling we did of how we weren't sure given that interest rates had been near zero for so long what would be the effect of the first change in a long period of time of course the change down and then the change up. And to at least the best you can estimate with all the usual huge number of caveats is that there hasn't been a huge change in how these transmission mechanisms worked. But having said that there has been a lot of other changes in the economy and this is one, another point that I don't think got enough attention earlier today was we don't know where Nayroo is in many economies around the world. We don't know where our starred is. I was struck, John, when you showed us the graph of our starred you showed a steady downward trend and then it plummets around the time of the global financial crises and then it falls gradually and then you said the main factors driving this are demographics and a couple other things which are largely still moving. I had this argument with someone at the Bank of England once. So if most of the factors are slow moving and, you know, there were a couple other things you unmentioned but if most are slow moving, why was there this drop off a cliff? Why won't some of that come back? I mean, I think we don't know. So there is a lot of uncertainty.

Another uncertainty, John, which you hinted at is more and more monetary policy seems to be working through changes in exchange rates. Especially in many smaller economies or in the Euro area or Japan so that changes how monetary policy is transmitted. So there is a lot of structural changes that have happened. We don't know where things are going to normalize, where things are going to settle so any consideration of changes in the framework are particularly hard given that we, it's hard to know exactly where normal is and what, how things will settle in. So that again makes me cautious making any changes until we are a bit more comfortable with where some of these big structural variables settle until the next shock.

And then the, your comment was you commented that you had heard a lot of suggestions and everything had pros and cons. I challenge you to find any economic policy ever discussed that does not have some pros and cons so I actually thought there was something healthy about the debate, how most people were pretty candid and not just pushing one side of the argument, we really did hear both sides of all the polices and that's what makes economics interesting. There is always costs and benefits and you have to weigh them.

MR. TAYLOR: Just one quick observation on QE. I can't imagine that if the economy is going into a significant recession, jobs are being lost, markets are crashing, Congress can't get its act together with any kind of fiscal support that they wouldn't allow the Fed to use a tool that has proven to be somewhat effective in the past, the QE. So that, I can't see taking that off the table.

MS. FORBES: Mortgage backed securities. Can they buy any asset that they currently have the authority? I don't know but I think it would be at least prudent given the rather pretty tough criticism that came from the far right on the Hill about whether the Fed had strayed or whether it had strayed into credit policy or fiscal policy by buying housing mortgages in essence, right. I was thinking about the future recession knowing past criticism, I would wonder how broad a range of the playbook would be available.

MR. TAYLOR: Well, I think we are, our shop hasn't yet called it officially but we are thinking we could see a recession in 2020 and I can't imagine the current administration sitting on the wayside, by the wayside and allowing conservatives in Congress to call the shots here.

MR. WESSEL: I'm not sure which is more heroic. Predicting the date of the next recession or predicting Congressional reaction to it. For that please join me in thanking this panel.