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UNCONVENTIONAL MONETARY POLICY: HOW WELL DID IT WORK?

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Paper Presentation and panel: Unconventional monetary policy in the Great Recession and beyond

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P R O C E E D I N G S

MR. KOHN: Good morning. Welcome to Brookings. I'm Don Kohn and a senior fellow here at Brookings. The germ for these papers was hatched or planted I guess or seed -- I guess the seed was planted maybe that's the best metaphor.

In the spring of 2017, David Wessel and I were having a conversation and we thought it was a good time to take stock of what we knew or thought we knew about the efficacy of unconventional monetary policy at central banks that had been used since the central banks hit the zero lower bound in the winters -- fall/winter of 2008.

The asset purchases, strong forward guidance, negative interest rates, et cetera, was a good time for the U.S., because the U.S. had actually begun normalization of policies, so they were -- unconventional policies were being phased out, portfolio additions had stopped, interest rates were rising in the spring of 2017, and the Fed was saying that if rates -- when rates got up a little higher, then portfolios would begin to runoff.

Global growth was good and that implied that maybe the UK and the ECB and maybe at some point even Japan might be able to stop their unconventional monetary policies, so it was a good time to take stock of what we had learned in the previous nine years.

There were lots of studies of various aspects of unconventional monetary policy with desperate results and we wondered whether we could find somehow a consensus of what worked and what didn't work and why it worked.

So were the policies successful in changing financial conditions in the market, were the policies -- were the financial conditions -- how did they affect the economy, did they boost the economy to achieve inflation and employment goals, and what channels did these things work through, what could we say about the cost and -- the cost side of unconventional monetary policies.

It seemed pretty evident that the inflation risk that some people worried

about when they were being put in place weren't -- wasn't a real cost and the Fed was exiting, so concerns about exit didn't seem to be really high, but we needed to review that and the financial -- potential financial stability concerns with the unwinding, so what can we say about cost.

I think we'll hear today that -- how effective these policies are and what channels they worked through still aren't yet settled -- completely settled issues, but we hope by this project we've moved the discussion along.

The conversation with David also occurred in the context of returning from a conference at the Federal Reserve Bank of San Francisco when we were having this -- the conversation happens many times in the U.S. There's secular stagnation, persistently low interest rates, and low equilibrium rates resulting in concerns about is there enough scope for monetary policy to after a recessionary shock to move the economy back to full employment and achieve the two percent inflation target.

We thought that before really undertaking an alteration of a well-understood and accepted inflation target, maybe we ought to assess whether combined conventional and unconventional policies, especially as those unconventional policies had come to be refined over the slow-growth period, would be sufficient to achieve inflation and output objectives in a timely way without changing the basic structure and strategy of policy, changing the two percent inflation target, or going to a price level target, et cetera.

Now, we had in mind a project or some articles that future policymakers could refer if ever they were in the same situation we found ourselves in in the fall in December of 2008.

To be most useful, these articles should be accessible to interested informed policymakers who weren't necessarily technically trained economists and also useful to Congress -- people in the Congress, Senators and Representatives and their staffs who are also interested and informed and who oversee the Fed and help shape

public discussions of Fed policy, and that led us to seek the partnership of the Journal of Economic Perspectives.

These articles will be out shortly in the Journal of Economic Perspectives and we thank Tim Taylor and the other editors who helped to focus and shape the contributions.

We were also struck that most of the literature about unconventional monetary policies originated within the central banks. That's where most of the expertise on monetary policy is, but the credibility of any resulting, any article that might summarize what we thought we knew or didn't know would be enhanced by having authors not so closely associated with policies or invested in their success, and that led us to Ken Kuttner from Williams College for the assessment of unconventional monetary policy in the U.S. and to a number of people at the IME, Giovanni, Dell'Ariccia, Pau Rabanal, Damiano Sandri of the IMF for unconventional policy in the euro area, Japan, and the UK.

Each paper will be presented by the author followed by comments from two knowledgeable observers and then a panel discussion, questions from the audience.

Ken will present the first paper with comments by Anna Cieslak and Ken West. Louise Sheiner of Hutchins/Brookings will moderate the discussion. Damiano will present the second paper with comments by Ben Broadbent and and Angel Ubide. Stephanie Curcuru of the Federal Reserve Board will moderate that discussion.

Ken, the floor is yours.

MR. KUTTNER: Thank you very much, Don. It's great to be here. Thanks for the invitation. Thanks also the Hutchins Center for organizing this event, which is bound to generate some very interesting discussions this morning. So time is short. I'm going to jump right into the topic.

Unconventional monetary policy in the U.S. Most people here probably already know the overarching goal of unconventional policy in the U.S. was to try to lower

long-term interest rates, private sector interest rates, increase the availability in intermediate credit, and the unconventional policy consisted of really two prongs, as I'm sure you know.

The first prong is something I'm calling quantitative easing. When you talk about quantitative easing, we're talking about three asset purchase programs, the LSAPs plus the Maturity Extension Program, or MEP.

So my chart here shows -- you've probably all seen some version of this chart at some point. This shows the central bank defense balance sheet. The thing that I want to bring out from this chart is that the four different policies were rather heterogenous in their nature.

So LSAP1 and LSAP3, you see on the chart, involved large increases in the volume of mortgage back securities held by the Fed, which is a very novel policy.

LSAP2 -- I should say the Maturity Extension Program in particular involved a huge -- a very major substitution from short and intermediate term bonds to longer term bonds.

And then the second prong of unconventional policy was for forward guidance. Forward guidance of course consisted of statements intended to reduce expectations of long-term interest rates -- of short-term interest rates and by doing so, decreased long-term interest rates.

Now, it's worth pointing out that the Fed had already been engaging in some kind of a weak form of forward guidance for some years. So, for example, forward guidance was -- a statement from 2006 stated that the committee judges that some further policy firming may be needed to keep the risks of inflation and output on track, in balance.

The forward guidance policy was kind of in the same spirit, but just more concrete in terms of what it said about future interest rates.

So, for example, the December 18 statement, 2008, spoke of keeping

the funds rate low for time they. Got a little bit more -- little bit bolder in 2009 referring to a low period of very low interest rates for an extended period. Beginning in 2011 they went to calendar-based statements such as exceptionally low levels of interest rate for at least through mid-2013, and then in 2012 they went to a very explicit statements about the level of interest rates contingent on economic conditions, so at least as long as the unemployment rate remains about six-and-a-half percent.

So let me just take a moment to mention what unconventional policy was not. When I talk about unconventional policy, I'm going to exclude things like the alphabet soup of various emergency lending programs, commercial paper funding facility, TAF, and all that stuff. I've lost track of all the abbreviations.

It's also quite different from the quantitative easing policy practice by the Bank of Japan to be called the difference between what the Fed was doing, what the Bank of Japan was doing. The Bank of Japan was focused primarily on bank reserves, which they like to call current account balances confusingly. Whereas the Federal Reserve was really focused more on the asset side of the balance sheet, emphasizing the quantities and the nature, the characteristics, of the assets being purchased.

So did it work, that's the central question here today: Did unconventional policy stimulate spending and speed the recovery? It's actually not an easy question to answer, which is partly the reason why we're here.

So the fundamental problem in assessing the impact of unconventional policy, indeed any kind of a policy, is that we really don't observe anything you might think of as a controlled experiment. Therefore, it's hard to identify a causal effect of these policies.

So a skeptic would say, well, gee, interest rates fell after quantitative easing and forward guidance, but maybe they would have fallen anyway given the weak economy; or a skeptic might say the economy continued to track the spike of quantitative easing and forward guidance; therefore, the policies were ineffective; or it might even say

the economy eventually recovered but maybe would have done so on its own, even in the absence of these policies.

So the trick in terms of identifying the policies is to find some kind of -- sort of an exogenous movement of the policy one might use to identify some causal effect, which is very difficult.

Some additional complications arise in the context of unconventional policy. Well, first there's a relatively short track record. About seven years all told with -- which really is not a full business cycle.

To compare -- in comparison when economists look at the impact of conventional policy, they're drawing on a four or five-decade experience with interest rate policy and even then, there's still some debate and some uncertainty about the effects of conventional interest rate policy.

Second, the quantitative easing at least relied on kind of a poorly understood -- maybe that's too strong a word, maybe under-researched transmission mechanism, mainly the portfolio balance effects which I think are -- were sort of abandoned as a thing research-wise back in the 1970s and then they came back into -- and the Fed and other researchers kind of had to reinvent or rediscover that aspect of the transmission mechanism.

Third as mentioned previously, the policies were rather heterogenous in terms of the asset mix being purchased, the type of assets. Of course forward guidance, nothing like that, had really ever happened before, so it became a challenge for researchers to really come up with summary major of the stance and monetary policy so to speak that one could then assess the impact of.

Then finally of course lots of other things were happening at the same time. Of course lots of other things are always happening at the same time. But what's particularly acute in this point, economists are always -- in order to assess the impacts of any policy, economists are typically looking at how deviations of policy from the normal

course of policy would move, or shocks in the jargon, would move the economy away from its normal trajectory.

Well, things were so different in 2008 that it's really hard to know what normal would have been in that context and, hence, hard to know exactly what a shock monetary policy would have been.

Well, so having explained why discerning unconventional policies effects are so difficult, I'll move on to a very brief summary of some of the research that's out there.

As Don mentioned, there's been a ton of work in countless papers, more being written every day. So already my survey is going to be a little bit out of date, but I think it's useful to start with something of a taxonomy about the kinds of research that's been done on the topic.

So in one bin I have -- I put the studies that look at the impact on interest rates, so this is relatively straightforward to do, although there's some -- there are some issues. The -- and there's two kinds of studies that fall into that bin, one are what I call event studies and the others what I call econometric term structure models.

Another bin of research is studies that look at affects on the real economy, this is a little bit trickier, a lot trickier, and there are two types of research in this category; one would be -- one would be studies that look at -- that are sort of macro level, they look at macro effects, typically using a macro model and then there's some interesting research using micro data, micro level studies and differential impact across different firms or banks.

So quickly event studies, a quick summary of what these are and what they have been -- what they have found. The basic idea of an event study is quite forward, you look at the market's response to the announcements on the day of or maybe in a very narrow window around the announcement of the -- around the policy.

This of course relies on the policy being unanticipated. Because if the

policy were anticipated, those effects would have been priced into the yields, priced into the stock prices, whatever, and so you wouldn't see an effect even if the policy were actually having an effect on the economy.

So what I've shown here in the pink bars are the change in the 10-year Treasury rate on various key announcement dates for quantitative easing. These are my calculations, but they're virtually identical to the ones that are out there in the literature.

As you can see, the first section of the chart shows the impact of the LSAP1 announcements. As you can see, four of the first five announcements resulted in very large negative impacts on the 10-year Treasury yield.

In fact, if you add up all the -- if you add up all those effects, however many there are, you come up to about a hundred basis points, a full percentage point reduction in the 10-year Treasury rate.

What one sees of the announcements -- announcements associated with subsequent programs are somewhat smaller. Again this may because those programs are less effective in terms of raising -- in terms of lowering interest rates or it may simply be that those policies were more widely anticipated than the announcements associated with the first LSAP.

Then another twist in assessing the impact of THE quantitative easing policies is that many of the -- at least a few of the quantitative easing announcements came on the same day, the same FOMC statements as key forward guidance announcements.

So it becomes a little bit tricky to disentangle the effects of forward guidance versus quantitative easing. There are benefits to do so, but I don't have time to summarize those.

So a few other caveats having to do with event studies, one, some of the early LSAPs were associated -- took place in times of market turbulence, so some of the effects one sees from the first LSAP could have been a result of improving market

functioning; second, to the extent the announcements were anticipated as previously mentioned, the observed responses from the event studies would tend to understate their effects.

At the same time, I think there are real concerns about the event study evidence, because they don't really tell us about the persistence of the effects, do they dissipate after a few days, after a couple of weeks, we really don't know for sure. Obviously if they were less persistent, then that would have a smaller macroeconomic impact.

Well, another approach involves what I'm calling economic term structure modeling and this is a pretty complicated, but rigorous -- but rather opaque way of assessing the impact of changes in quantities on the asset prices and bond yields, not enough time to go into that.

But the bottom line is really trying to effect the impacts of the prices on quantity -- or the quantities on the prices. And in doing so, imposing some economic structure on the model and separating out the advantages that separates out the expected interest rate, effects from the term structure effects which allows the -- allows for the separate identification of those portfolio balance effects that I mentioned earlier.

The advantage relative to the event study evidence is it doesn't rely on the market being surprised. This will work even if markets fully anticipate these announcements.

Ballpark estimate for this kind of study come out to be about 40 to 50 basis points for the LSAPs and about 20 basis points for the Maturity Extension Program, pretty respectful reductions in the interest rate.

Mostly, but not entirely, this is came through reductions in the term premium with some marginal effect on expectations.

Then I have a nice chart here which I don't have time to show, because I'm running low on time.

So we get to the really -- I think the important question here is whether unconventional policy had any real effects. I imagine the effect on interest rates is relatively straightforward, bit tricky, but this is much harder.

One way to do it involves feeding the interest rate reductions that comes out of these other models, which could be the term structure models, into a macro model and see what comes out on the other end.

A couple of studies that do this have come up with an estimate in the range of about one percentage point inflation, pretty respectable with some lag. There's also a set of studies that use, very interesting studies, that rely on micro methods, micro data methods.

The insight is these policies would be expected to effect different firms or different banks differentially, depending on their characteristics, depending on initial conditions.

I'll just mention a couple sets of studies; one found that firms with more reliance on long-term debt tended to respond more favorably, tend to benefited from the Maturity Extension Program which we recall was explicitly designed to reduce long-term interest rates relative to short-term interest rates relative to those firms that relied more on short-term debt. Good circumstantial evidence in favor of the effects of the Maturity Extension Program.

Another trio of studies at least looked at the bank's exposures to mortgage-backed securities found that those with the greater exposure to mortgage-backed securities tended to benefit more from the first and third LSAPs, which recall were primarily focused on purchases of mortgage-backed securities.

The issue with these micro-based studies is they don't really tell you much about the aggregate effects. They're kind of strong circumstantial evidence that policies had an effect. It's hard to aggregate them up and say the bottom line effect on the macro economy was whatever.

What about cost, what about the untended consequences. Well, one, as Don mentions, is inflation. I think we can really dismiss that out of hand without giving it a second thought. I think a more serious concern is that these policies resulted in adverse or disruptive spillovers to other economies, particularly to emerging markets, but a couple points need to be made here.

This is -- one is that these are not unique to unconventional policy. These are true of any monetary policy, low interest rate, expansionary, or contractionary. I haven't seen any evidence indicating that there is anything unusual about quantitative easing.

Secondly these effects are surely more -- certainly preferable to a more protracted U.S. recession, which would have been highly damaging to many other economies.

A less easily dismissed concern is the concern about excessive risk taking. The difficulty here I think is defining what constitutes excessive. During a period of financial crisis, financial market disruption we saw a lot of flight to quality with investors being very unwilling to take on any kind of a risk. In that context, a little encouragement to take some additional risks might actually have had some positive effects, wouldn't be such a bad thing.

In any case, environment of -- an environment of -- this is an environment where little bit of additional risk at a micro level to the extent it attributed to economic recovery would have had a beneficial aggregate effect.

So should the Fed use unconventional policy next time. Well, to summarize, one part of the question is whether it worked and I think the evidence is such that it will never really rise to the beyond a reasonable doubt level. That may be an unrealistic to ask, even though the limitation's in the studies and the short sample period. But I think by the preponderance of the evidence standards, the answer is clearly yes, at least to some extent.

What about the costs. I haven't seen anything to indicate the costs were major, although there is some legitimate concern about too low for too long environment. But I should point out that this is not specifically a function of unconventional policy, so much as it is a function of Fed's interest rate decisions in recent years.

So finally, bottom line, why not?

(Applause)

MS. CIESLAK: Thank you very much for having me here. Let me start by saying this is an excellent summary of UMPs during the crisis and after crisis, and it will become a staple reference, certainly for my students.

I will comment on something that Ken didn't have much time to talk about, that is the communication of those policies. In particular I will ask what is the main piece of news that financial markets gleaned from unconventional monetary policy announcements.

So for a while it has been understood that news coming out at communication events by central banks is not one dimensional. On top of revealing their actions, policymakers also tell us about the path of their actions and these are the works that are contained in the statement.

So the simple graph is showing you the wordiness of statements released by the Fed, starting from the summer of 2007 through the taper tantrum, they were clearly talking more -- or you guys were talking more and they kept talking even more in the period from mid-2013.

Now, what are these words conveying in terms of news, so people came up with at least two other channels on top of this being used about monetary policy. It could be news about the fundamental growth expectations and it could be news that affects risk premium. This is one of the main challenges at least for event study types of investigations to result.

Many of the papers that Ken summarized, most of them, actually focused

on univariate responses of asset prices around communication events. I will argue that to sort out which type of news came out during communication events, it is actually useful to look at bivariate response to asset prices.

In particular I will study the co-movement of stocks and yields across the entire maturity structure to sort out the question about the types of news.

So when you think about the very simple framework in which you have three structural shocks, a standard conventional monetary policy shock that moves short-rate expectations what it should do is it should induce negative co-movement between stocks and yields as Ken and (inaudible) have documented in their work and many subsequent papers did so as well.

So you should see negative co-movement upon monetary shock that weakens with the maturity of the interest rate. In terms of growth --

MALE SPEAKER: Can you use the mic, people who are watching --

MS. CIESLAK: That's new to me, but okay.

So in terms of other types of news; if you have a risk premium shock or growth news being (inaudible) by communication, in general under relatively simple conditions they will generate positive co-movement between stocks and yields but the maturity pattern will be different.

Growth news will affect more the short term of the term structure or intermediate range of the term structure maturities, and risk premium shock through the duration should affect more the long end.

So using this very simple intuition from a stylized macro finance model in some recent work with (inaudible) BIS, we proposed to classify news coming out at central bank communication events in a four-way matrix by whether the co-movement between stocks and yields is positive or negative and which part of the term structure is moving more.

So the two left columns are nonmonetary news, being growth news or

shocks to risk premium. On the right-hand side, you have a conventional monetary policy shock inducing negative co-movement of stocks and yields but more so at the short end and the unconventional monetary policy shock that will move more the long end of term structure than the short end negatively with the stock market.

So here are some examples of what term structures of realize co-variances between stocks and yields look like over time. Let's look at the middle panel. In the middle panel I am (inaudible) realized co-variances in an event window and each bar is showing you the realized co-movement and high frequency between stocks and yields of different maturity. This looks very much like a monetary policy shock where the stocks -- where there was negative co-movement, like in Ken's work, but this co-movement declined in maturity, very much like a conventional shock to monetary policy expectations.

On the right-hand side, you see an event where -- actually you see a positive co-movement between stocks and yields that is highest in the intermediate range of maturities and declines with maturity.

On that particular event, it seems that the important piece of news was the Fed's update to growth expectations and this seems to be the driving shock here. On the left-hand side, you see actually that these announcements can be multidimensional at the same time conveying monetary news moving the short end and risk premium use moving the long end and in the positive direction with those yields and stocks.

We have known that central bank announcements can have dramatic effects on asset prices through the risk premium channel and probably the closest example of this happening is Draghi's "Whatever It Takes" speech.

The short end of the term structure barely changed, but the long end of the term structure moved dramatically. In particular this seems to have been a major risk on event when safe assets, long-term Treasury bonds in Germany lost, yields went up, and the stock market and risky assets rallied. So this would be classified through the

lens of the framework that I laid out as a risk premium shock.

Now, let's look at co-movement between stocks and yields over time. So I am (inaudible) co-variances, realized co-variances, in a narrow event window between stocks and the five-year yield changes, stock returns and five-year yield changes.

And consistent with Bernanke and Kuttner, most of the time the co-movement is negative. But when you look at the period from the summer of 2007 through the taper tantrum you see a lot of heterogeneity in terms of signs suggesting that part of these movements were actually dominated by the nonmonetary policy component that is news that didn't just drive short-rate expectations, but revealed to the public something about growth or/and risk premium.

Now, we can zoom in on this graph on just UMP announcements. So three takeaways for looking at the co-movement of stocks and yields around particular UMP programs. First observation, before 2013, which is the vertical line in the plot, these policies were dominated by positive co-movement between stocks and yields suggesting nonmonetary policy news content. However, if there was a forward guidance component, the co-movement suggested strong monetary news component.

The third observation from the graph is that after Bernanki's taper tantrum in mid-2013, generally policies related to tapering an exit from easy policies were associated with negative co-movement suggestive of dominant news -- dominant component of monetary shocks.

Now, what we obviously want to do is to understand which fraction of variation in asset prices has been dominated by a particular type of news.

So put it in terms of simple equation, we observe asset prices, yield changes, stock returns around central bank announcements. We want to convert the information in asset prices into shocks that have structural interpretation to be able to say which type of news contributed what amount to the observed variation in asset prices.

This can be done, so using intuition from structural VARs, we can rotate

observed variation in asset prices into structural shocks, and I will apply this intuition just looking at scheduled FOMC announcement within a very narrow window of when the announcement happened.

So let's see what the contributions of the different shocks have been over time to yield and stock market returns at scheduled announcements. The bottom panel, the little table, is showing you which fraction or variance in asset prices stem from a particular type of news.

So the first line is telling you that the two-year yield move roughly half and half in response to growth news being revealed, so growth expectations updates, being induced by central bank announcements, by Fed announcements, and the other half stems from short-rate expectations updates, standard monetary policy news channel.

The second row is telling you that the 10-year yield was dominantly moving because of the term premium adjustments. The final row is telling you that equities have been moving around because of the discount -- risk-free discount rate news.

Now, looking at the trajectories in the upper panels, you see how the contribution of those various shocks have been evolving. So on the left panel, you see that monetary news were pushing two-year yields up, but growth news started pushing two-year yield -- were pushing down, but growth news were pushing two-year yields up starting from around 2013.

In terms of equities, what is striking is the very strong effect in terms of increasing equity values, stemming from the risk-free component of the discount rate, or expectations thereof, consistent with the Fed's desire to generate sort of wealthy effect.

So let me conclude. Probably most of us would agree that the importance of communication has increased in unconventional monetary policy times. It seems that unconventional policy announcement have an important component of nonmonetary news and we have found that this nonmonetary news component

essentially increases the more central banks talk.

I would like to leave you with two questions, perhaps for the later discussion. Is what markets heard actually consistent with what the Fed said and wanted the markets to hear, that's the first question.

And the second question, a lot of our work has been empirical. The open question to me at least is what is the optimal design of central bank communication in those times. Thank you.

(Applause)

MR. WEST: Thanks, I'm happy to be here. I thought this was a great paper. Like Anna, I will say I will recommend it to all my students, recommend it to all of you. It's got great information in it for both insiders and people who are new to the topic.

Talking to Ken beforehand he said he tried to present a fair and balanced view of quantitative easing. I would say that in contrast the use of that phrase in some corners outside of this room, I think it really was fair and balanced.

I am probably toward the skeptical rather than enthusiastic side about the efficacy of the Fed's program, but I felt within the range of views that Ken acknowledged in his talk, in his paper.

So what I plan to do is actually -- Ken was careful to acknowledge all points of view. I found it difficult to find something to disagree with, but I did find two sentences I disagreed with. Shockingly in his 15-minute talk, he didn't have a chance to even bring them up. I don't understand why he couldn't say everything he said in the paper in his 15 minutes, so let me work my way toward those two sentences of disagreement.

So first a potted summary of the paper. He thinks unconventional monetary policy worked. There's ambiguity about the magnitude and the persistence of its effects.

Ken mentioned persistency in his talk and I'm going to come back to that,

so note the word persistence there. There's considerable ambiguity as to the extent at which it worked through adjusting relative asset supplies through portfolio rebound (inaudible) and the extent to which it worked through forward guidance.

And he concludes that any future use of unconventional monetary policy, we should conduct it in a rule like way. I would agree with that. We should use both forward guidance and asset purchases. I would agree with that. He wishes we were in another world where the Fed could do things it's not allowed to do perhaps.

Finally the two sentences that I disagree with, he said, even if we're away from the zero lower bound, why not use unconventional monetary policy along with our usual targeting of short-term interest rates.

So I agree, the evidence on quantitative easing just makes it ambiguous. I agree it probably had positive effects. I'll lead you up to explaining why I am toward the skeptical side on unconventional monetary policy.

Again I think it works, but I'm not as enthusiastic believer as others. I'm skeptical enough that I'm doubtful that one should be using it as a monetary policy tool in normal times.

This is a graph from a paper that I coauthored with David Greenlaw, Ethan Harris, and Jim Hamilton entitled "A Skeptical View of the Impact of the Fed's Balance Sheet". So when you see Exhibit 4.1, it's not 4.1 in that paper under discussion, it's 4.1 in my paper.

So a two-scale graph and on the right side scale is interest rates, and the line going down there is 10-year yield. The right scale is the amount of Fed securities held outright. You saw that same line in Ken's picture, although he had a nice pretty red color underneath it.

What are the shaded areas, the shaded areas are periods in which the Fed was increasing its holdings of securities outright during any of QE1, QE2, QE3. This is not quite the actual periods of QE1, QE2, QE3. See the scale there, there's an on '09

in the shaded area for QE1, stars in '09 because the Feds started purchasing securities in January 2009. QE1 actually started end of November. So it's not quite QE1 itself, it's the period of purchases.

What I want you to notice there is the 10-year yield was higher at the end of each of these purchase periods than it was at the beginning.

So quantitative easing is supposed to say when we bring things on to our balance sheet, interest rates fall. Interest rates did fall overall mostly in the periods between quantitative easing, including by the way in the period of the maturity extension program which is in the shadow there.

So to say that buying assets increases interest rates, of course not. We -- I always think I'm talking to a roomful of professors. We professors spend a lifetime saying correlation (inaudible). So this graph does not mean when the Fed bought assets, it drove up interest rates, self-evidently.

In a particular context of quantitative easing, I've mixed here purchases of mortgage-backed securities, agency debt, and Treasury debt. A lot of things going on here, but I would ask you to keep in mind when you have a -- thinking about the success of the Fed's program to bear in mind at the end of the purchase periods for QE1, QE2, and QE3 10-year yields were higher at the beginning -- at the end than they were at the beginning.

So as Ken said, we got to figure out some way to identify something causal that -- I'm going to talk about the effect on 10-year yields, I'm going to talk about one of two things that Ken mentioned, event studies.

As preliminary to that, there's a little bit of stuff that Ken didn't talk about, which has to do with regression studies. My reading that literature, like Ken's, is there's little persistence from Fed actions, so just put that in the record, and then talk about the event studies.

I want to say that event study evidence should be interpreted cautiously

that when we get this hundred basis point effect in QE1 that Ken mentioned, which as he said is standard. It's not quite clear, though, the hundred basis points -- it's a meaningful hundred basis points in the sense of persistence of the effects. I'm not sure I'll be able to get to the second bullet point, but perhaps...

First of all, unambiguously this announcement -- the event study literature announcement effects, they identify an effect on 10-year yields, so I'm not going to dispute that unambiguously, unambiguously, unambiguously.

The March 2009 announcement extending QE1 within 30 minutes of the Fed announcements, 10-year yields fell 44 basis points. There's nothing else that could have made them fall, of course it was the Fed announcement, of course, of course, of course, no doubt about that.

However, if we think the way monetary policy works is the central bank lowers interest rates on government lending or influences on -- that lowers private lending rates, that stimulates the economy, we would want any impact on interest rates to be persistent and sustained.

This particular one was not so persistent and sustained. Pointer seems not to work but the -- some the jig jags you see in that rising 10-year yield during QE1 are these numbers I have on the overhead.

So one explanation for this is absent the Fed doing this, everything that followed would have been 44 basis points higher. Another possibility is maybe the event study literature, despite its good intentions, doesn't quite capture the sustained impact of an announcement like this.

My example here actually comes from this Wolfers and Zitzewitz AR paper, which Jim Hamilton also used in a comment on quantitative easing, is step out of the side of monetary policy and take the election 2016.

After it became apparent that Trump was going to win, equity futures fell five percent -- which is a big amount by the way. Standard deviation of movement on the

stock market is about one percent on a daily basis. By noon that had all come back.

An event study over a narrow window would say Trump's election caused the stock market to fall by five percent. What happened between the election and noon the next day. Kind of nothing. The market was digesting the news, I would say.

Similarly with Fed 50 basis point effect there on March 18 arguably what happened was the Fed digested the news -- I'm sorry, the market digested the news. In the end, interest rates were essentially back where they started from.

Yes. I'm going to have to skip most of this. As Don Kohn said, we're not doing quantitative easing anymore. I thought the Fed was doing quantitative diseasing. They're selling off their securities.

So if you think there's this portfolio balance effect it should still be working its way along, it doesn't seem to effect the markets. People are kind of ignoring what's going on.

So let me end here. I think unconventional monetary policy worked. I'm not sure it worked as effectively as some people argue. So I would say if you're the zero lower bound, by all means use it; but if not, stay away from it. We really know how things work. Let's stick with that and stay away from quantitative easing when you're away from the zero lower bound.

(Applause)

MS. SHEINER: Thank you all for really, really interesting and informative presentations. I'm sure that we have a lot to talk about.

Let me start with kind of where you were, Ken, at the end, which is just asking the questions about event studies and how to think about using something like an event study to figure out whether something like QE works.

Is it a little funny to know that the central bankers who are doing QE aren't sure if it works and they look to the stock market to decide, especially at the beginning of something new?

Why is that they understand better than we do whether or not QE is going to work for the economy, anybody?

SPEAKER: Which Ken was that addressed to?

MS. SHEINER: I was starting with the stock market and the Trump effect, but why don't you start by answering that question and I'm interested in anybody's comments.

SPEAKER: So the little mouth.

MS. SHEINER: Yeah, the little mouth.

SPEAKER: So I've got the mouth on here I think. The red light means -- can you hear me? Great.

That's an interesting point Louise and I think it's good that you bring that up. This is a time that I wasn't there at the Fed. I had left the Fed long before, but it is kind of an awkward situation where, as you say, looking to the markets to determine whether the policy is effective.

I think Anna's presentation was spot on in terms of -- I'm perfectly happy to agree on Anna's point that the markets are able to kind of figure out what these affects are going to be on yields with a caveat this is something -- one of the issues with the policies is that these are really things that had never been seen before. So the markets are figuring out, just like the Fed is figuring it out.

MS. CIESLAK: I would like to add to this that we have growing evidence that tells us that markets respond not just to what we would believe is traditional monetary shock but also some other information that is revealed by central banks, and I think the empirical evidence on this is pretty strong.

Now, the mechanism that underlies it, I do think we are still a little bit in the dark about. When I talk to Fed people, they tell me that -- they are adamant that they don't actually have more information about the economy than the private sector does.

So what is that the Fed is releasing to the public some different

information that actually makes the public update their expectations about the economic outlook is I think an interesting question.

MR. KUTTNER: Let me just jump in after that. That was -- I think what Anna's referring to is the difference that some people -- the distinction people -- something made between deficit and (inaudible). You didn't mention those terms in your presentation, but that's exactly what you're talking about.

I actually had one more slide, which I didn't get a chance to -- and the final bullet point of my last slide actually ties in quite nicely to what you said, which is the communication strategy for this kind of policy becomes critically important, and I'm not sure exactly how to do it.

I agree with you, there are some announcements. I think just -- just -- you know the one I'm talking. It was a Brookings paper, so you all know it. It very legitimately made the point that there were these information effects.

So the communication that one would have to -- the communication that one would have to craft to accompany that to convince the markets that the Fed wasn't -- by conducting expansionary policy wasn't telling the markets that things were actually worse than people thought. That's a tough challenge.

I think that's going to be a challenge, but there's not to say that's a challenge unique to unconventional monetary policy, things are challenged for any Fed policy communication strategy.

MS. SHEINER: Let's talk a little bit more about the question of persistence, right, because that seems to be sort of the -- so everybody agrees that on the day there was obviously -- there was a reaction, right, by the markets that we know. So (inaudible) quite clear, they're reacting, and they thought they were hearing something.

How do you feel about the evidence that shows that these things weren't necessarily that persistent? I guess I was thinking it was just the event study, but you

said also the term premier regression stuff also shows lack of persistence?

MR. WEST: Progression studies, yes, I'll let Ken --

MR. KUTTNER: One thing I did in the process of preparing this paper was I also came in with, I hope you can tell, with kind of a skeptical viewpoint, and one of the things I did was to say, well, I did some of my own regression analysis to try to figure out, well, how often of these -- Ken, if we look at a longer window -- or if we look at a period of time not just measured in one day or two days, but even over like even a week, I did find that a couple of -- that some of these announcements actually did have highly persistent effects and they could measure them at even as long as two weeks.

Again, one of the -- couple of those announcements were the really big reactions associated with the first LSAP. You might say, well, okay, so the really persistent effects there may have been traceable to things other than the reduction of the term premium, the restoration of market functioning, or whatever. But I think -- some of these things are so huge, comparable to five percent drop in the stock market and they didn't recover right away.

Some of these effects you can see over a period measured in as long as ten days. That doesn't mean they're -- at that point the problem, Ken, as you know is you lengthen the window and a lot of other news comes in.

It's like okay, it goes away after a couple of weeks. Is that because the market has overreacted and is coming back or is it just because a lot of other stuff is happening that's going to mess things up.

It's the nature of event studies, you can't really -- it's a tradeoff between event window, shorter event window, you can get some of these overreactions. A longer event window, you can get other stuff going on this, kind of messing up the results.

So it's a tradeoff. I think, as I said, that's one of the inherent limitations of the event study method.

SPEAKER: So is a couple weeks a long time?

MR. KUTTNER: It's long enough that you can't ascribe it to market overreaction, the day of market overreaction, as in the Trump effect.

MS. CIESLAK: So I think the distinction in terms of persistence is closely linked to whether it was the term premiere that moved or short-rate expectations that moved. And it is true probably that all the effects that went through the term premium are not particularly persistent, because term premiere means relatively quickly.

However, we know that short-rate expectations are incredibly persistent. So if the Fed is able to move short-rate expectations, I would expect these effects to have a large -- these announcements to have a larger and more persistent effect.

MS. SHEINER: So when we think about what you just said in terms of forward guidance versus asset purchases, we all agree that forward guidance is the changes the market expectations short rates works, right, and the question is much more on these asset purchases is another way to think about it so that -- therefore, the asset purchases would intend to move the term premiere or less likely to be persistent, is that kind of what you're saying?

How do you bring in the evidence, the micro evidence, that's sort of a different way of looking at it about certain firms and certain households and how they were affected, Ken, does that have a lot of weight in your view that QE worked, little weight, and, Ken, what do you think about that in light of your skepticism. Well, you're the skeptical one.

MR. KUTTNER: I think a very traditional view the way monetary policy works, which is -- it lowers -- monetary policy pretty much expands the economy. It works by lowering nominal rates, prices move slowly, so it lowers real rates, falling real rates encourage spending.

So I think the first step in the transmission -- if the first step doesn't seem to be working, one should be skeptical about the ultimate final steps of that working and kind of the burden of proof is higher.

So I'm skeptical about this first step working very well. I think it worked somewhat again. I'm not saying it didn't work, but I'm lessen enthusiastic I think than Ken, for example. So I'm a little skeptical about the first step, that makes me a little more skeptical, all things equal, about the evidence -- about it working at the final step.

MR. WEST: I think you make a good point, Ken. The one set of studies I was referring to, which I thought was actually quite nice by some people at the board, was didn't really rely as much on the interest rate channel as it did on what you might call the bank lending channel. That's the one that said, well, you have some banks that are higher exposure to mortgage-backed securities, so if you can take some of those mortgage-backed securities which were a little bit iffy or perceived to be iffy at the time, if you take those off the balance sheets, then that could increase lending through -- by making even apart from any effect it might have had on the interest rate.

I think part of the issue with the literature on this is that it's been so focused on the interest rate, that it's tended to ignore some of the other channels of transmission, particularly through the financial system and through intermediation, which I think can't be discounted.

MS. SHEINER: So obviously figuring out the effects of QE and unconventional monetary policy is credibly difficult looking back to see whether or not it worked and what the counterfactual would have been, so now let's look forward a little bit.

So you ended your slide with why not, which is hardly a vote of confidence. So looking forward, I think you read the literature and there's some people who think, look, you don't have to worry about the zero lower bound at all, we have these other tools. These other tools are just as effective. We can translate them by scaling them up, we can kind of get any effect that we want, and no worries about low R Star and having to change the framework, because we have tools.

What do you think, each of you, why don't you start, Ken Kuttner.

MR. KUTTNER: Yeah, let's see. Ken characterized my conclusion, which I didn't really have a time to get to, as enthusiastic. I wouldn't say I was -- maybe enthusiasm was an overstatement. I think the experience opens up some possibilities that are worth considering.

So, for example, using balance sheet policy, independent interest rate policy, I wouldn't say that -- I think that's -- I mean, the standard economic dodge is to say more research is necessary, but in this case I think absolutely true. I think we have to think about what are the situations in which that might be an appropriate kind of policy to make.

I think my view of the evidence is that that kind of policy would be possible. Whether it would be advisable depends on whether there was a well-defined objective, for example a financial stability objective, that kind of policy would further.

In a nonzero -- referring to the nonzero low bin environment, in a zero low bin environment, I'm going to echo something that Don has said on a number of occasions to me and that is essentially when you're talking about lowering interest rates, you're talking about sort of moving expenditure forward in time.

There may be some limits as to how much that can be done, so the interest rate effects might be somewhat more limited than -- I'm not sure how far we can push those, but clearly we were able to push them farther than maybe a skeptic would have expected going into it.

MS. SHEINER: I'm just asking question, so this question about moving assumption forward, is that something specific to unconventional monetary policy or that's just a question about any interest rate effect?

MR. KUTTNER: I think that's the question about really any interest rate effect that's true. But to the extent that the scope for that becomes a little bit more limited when you're talking about unconventional policy, then it would become more binding.

MS. SHEINER: Anna.

MS. CIESLAK: So going forward, I guess I personally have to question. So one question, we have spent a lot of time thinking about international spillovers on emerging economies and so on, but the general question is how did those policies affect market functioning even in very liquid markets, in U.S. Treasuries and so on; what were the effects, I am not sure -- I don't have an understanding of an answer to this question, that's my first question going forward.

The second question is about inflation, so you end your paper saying inflation has certainly not been a worry, and I think this is true when inflation -- when it's essentially inflation driven by demand shocks and there is no trend inflation, bonds are very risky, we don't need to worry about inflation.

But if we start to have persistent updates in inflation expectations, then we might get all issues related to the pricing of Treasury bonds and financing of deficits and so on and so forth.

So the question is: Will we have any persistent shocks to trend inflation going forward?

MR. WEST: Well, I said I thought there were two sentences in Ken's paper I disagreed with, maybe I misread them. Maybe we don't disagree at all.

I thought you said you were supportive of using LSAPs in normal times, but now you're saying maybe not. So I think in zero lower bound situation, absolutely LSAPs -- my view is once you're away from there, no.

We understand, we think we understand, how monetary policy transmission works when the Fed is controlling a short-term interest rate. I think we're kind of very uncertain about how monetary policy works when we're using LSAPs, so I would stay away from the zero lower bound, stay away.

MS. SHEINER: Kind of what I was really getting at, are we ready for the next recession, should we think that we actually need to do something else besides thinking we've got LSAPs in our back pocket so we're okay. Should we worry enough

that we need to change monetary policy framework, raise the inflation target, how often confidence does the experience with unconventional monetary policy give you that says we're going to be okay?

MR. KUTTNER: I think if we could avoid zero lower bound, it would be great. Whether that comes with some sort of price level targeting, raising the inflation target, I don't know.

I think we're all aware interest rate cuts usually add up to three or four percent traditionally when we're going through a recession. We're not even at the three percent level, on the four percent level, so the next recession we could end up back at the ZLB and I think it would be great if we could avoid doing that.

SPEAKER: No disagreement from me on that, Ken. Maybe a future conference would be one dedicated to raising the inflation target. That opens a whole other set of issues.

Yeah, obviously to the extent we want to keep as far away from the zero lower bound as possible, subject to other policy considerations.

MS. SHEINER: I'm going to open up to the audience for questions. Raise your hands if you have a question. We have mics coming around. Come up here.

Tell us who you are please and where you're from.

MR. ENGLISH: Bill English, (inaudible) University. So I wanted to follow up on the persistence question. I guess I took some comfort from the regression result and yield curb results like Lee and Way in thinking they were showing persistent effects. Ken expressed -- Ken West suggested some suspicion, so I'd like to hear your thoughts on that.

Let's say we convinced ourselves persistence was a real problem. Well, can't the central bank then just peg out the yield curve? The Bank of Japan is pegging the 10-year JGB yield, so maybe it's a change in the way you do this, but not necessarily something that's terminal for that sort of policy.

SPEAKER: So the paper you mentioned I can't comment on. I don't remember it well enough. Yeah, I think we should worry about persistence pegging the 10-year yield possibly I guess. So I'm going to punt on that.

SPEAKER: Thank you for taking my question. I'm just a member of the public, but it seemed to me in 2008, 2007, or whenever it was that quantitative easing was announced, the fear was runaway inflation would ensue and yet it never has ensued. So, one, I'm wondering what will happen, but doesn't this just tell us that really all these economic theories that you had going into 2002 are wrong?

MR. KUTTNER: Well, that's kind of a big question. The impact -- I think the -- at least the consensus thinking nowadays is that the main driver of inflation is going to be sort of the level of slack in the economy and the degree of excess capacity.

To that extent no would gain say. The point in 2008, 2009 into relatively recent time there was very little -- there was a lot of slack in the economy. And even though the Fed had injected a lot of monetary base, the slack was keeping downward pressure on the price level.

So that's conventional wisdom I'm perfectly happy to accept. I think in that context maybe the puzzle is -- and this pertains to Japan too is why inflation actually didn't fall more, because there was so much slack in the economy.

Take Japan for example, very prolonged recession, only very -- only very small amount of inflation. So if there is going to be a puzzle, I'd say the puzzle is in the opposite direction.

MS. SHEINER: We have time for one more question.

SPEAKER: Thank you, (inaudible). So far we talked about the efficacy of this program and the aggregate totality rate, but is there any evidence in your mind that the efficacy may have changed over time, maybe changes with the level of the balance sheet with level of interest rates? It seems an important question if we want to address the perspective efficacy of this program.

MR. KUTTNER: Absolutely. I think the great question, I wish we knew the answer. The problem is it's hard enough to discern just the overall effect of unconventional monetary policy to slice that more thinly and say was it more effective during these three years, versus these three years. That's asking a lot of the data. I just don't think we have enough information to address that in a serious way.

MS. SHEINER: Question for Anna. So when you're looking at what information was conveyed over time, does that tell you anything? At some point if let's say part of the information is that people know the Fed's reaction function once they know it, is that kind of -- are you sort of done or is that always something that you can continue doing?

MS. CIESLAK: So I think the problem is we're identifying the strength of the effects over time is that indeed markets learned about the reaction function and then event studies do not resolve the issue of whether the subsequent programs were more or less effective, just because we are looking at those narrow window where probably all expectations were already adjusted.

Now, in terms of -- what we have found at least is that through the period of the financial crisis, it is clear that communication by most big central banks like BOE, ECB, and the Fed were dominated by nonmonetary news content and starting from the tightening -- in the tightening period starting from around 2013, it was strong monetary content. So I -- but I cannot comment on the strength over time, because it's an event study evidence.

MS. SHEINER: Thank you so much. Please join me in thanking our panelists and we'll move on to the international portion of our program.

MR. SANDRI: Thank you very much for coming. Thank you to the Hutchins Center for hosting this event.

Now, this joint work we join with the region part of Iran and the usual disclaimer applies, so these are our own views, not necessarily the ones of the IMF.

Now, what we do in this paper is supervise an overview of unconventional monetary policies in the context of the euro area, Japan, and the United Kingdom.

Now, let me start by giving you a little bit of the background about the economic situation in in the central bank response in these countries, regions.

As you can see on the left-hand side chart, first of all, all of these regions were severely affected by the global financial crisis with GDP falling between six and seven percent within the first year of the crisis.

Now, the central banks in the middle column. You can see the lower policy rates quite sharply all the way essentially to the zero lower bound. Then as you can see in the right and side chart, they also engage in a broad range of varieties of unconventional monetary policies which led to the expansion of central bank balance sheets.

What we're doing in the papers first of all to provide sort of conceptual overview of a few key issues that we think are quite important is that we are reliving the episodes of UMP in these countries.

First of all thinking about what were the objectives of these policies, what were the challenge of those missions, and what were the possible side effects.

Now, I'll be very brief for the sake of time, because some of these points we already touched in the previous presentation by Ken and the discussion we had. Let me give you a few key takeaways from this.

First of all in terms of objectives, I think we really sort of (inaudible), which was especially clear in the context of euro area. Now, the first column was to provide monetary accommodation once the zero lower bound was reached, so to find a way to deliver an increased negative demand that ultimately would fall into stronger growth and higher inflation.

The same time there was, again especially in the context of euro area, a

joint objective which was to provide support to the banking sector to ensure monetary transmission across the (inaudible) countries in the euro area. So if we think about the experience of UMP, we think it's quite important to keep these two objectives in mind.

Now, in terms of transmission channels, there are of course several avenues to which these kind of policies can impact the economy, we just emphasize a couple of those, which I already mentioned in the previous presentation.

First transmission channels works through the notion that there is some sort of market segmentation in financial markets, which is particularly acute during financial crisis.

What we mean by that is that there are some investor preference towards some certain kinds of assets, for example government bonds, so that when central bank steps into these markets by (inaudible) is in large quantities they can have an effect on prices, on (inaudible), and this (inaudible) to the rest of the economy.

The second important transmission challenge is the signaling effect. There was quite obvious in the case of forward guidance with the central banks they aim explicitly to provide some indications about the future stance on monetary policy, but signaling effects can also come through QE. Why is this so, because this show the commitment of central banks to truly provide exceptional and monetary accommodation for a prolonged period of time.

Now, in terms of possible side effects, we're listing the four that we think were sort of probably paramount in people's minds, especially the beginning of the crisis.

The first one worked through concerns about bank profitability. The notion there was with QE and other measures by central banks that tend to compress (inaudible). This would essentially reduce the profitability of banking sector, ultimately impairing the capitalization of the banking sector and possibly generating financial stability concerns.

A second rated notion was (inaudible) lowering yields and same

securities and government bonds. The central banks were ultimately providing incentive to financial institutions to look for higher yields by providing (inaudible) securities. Now, to some extent as discussed also before, this was intended all of policies, but also concerned that this may have been pushed too far leading to excessively risk taking and ultimately possibly (inaudible) of resources in the economy.

The third concern was the notion runaway inflation, a notion by increasing the monetary base so greatly with large quantity easing problems for example, this may affect very high inflation and the central bank would have been in difficult position to contain.

Fourth, we think it was also a prominent concern about the political economy aspects of central bank interventions. Here the concern was that by showing our central banks and stepping to the economy going well beyond traditional instrument of short-term policy rates.

This may have raised a lot of political and public attention in central banks, also because of the risk that central banks by buying risky securities may have suffered losses and ultimately these may work as a threat to independence of central banks. We'll come back to this issue as we (inaudible) from the presentation.

With this notion in mind, let me move forward to provide you brief overview, what was done and what were the facts across these three different regions.

Now, let me start with the case of the euro area. We think it's fair to divide the experience of the ECB in three main periods. The first period was the very beginning of the global financial crisis in 2008, 2009.

This was in essentially a time where the ECB was focused mostly to provide liquidity to the banking sector through the HERO program. So the scope of intervention was relatively narrow.

Also because of a fear concern, the ECB really didn't have the mandate to start buying government bonds at that time.

Now, things changed quite substantially. At the peak of the euro area crisis between 2010, 2012 there were now concerns about the (inaudible) in the euro area, including Spain and Italy.

In fact, monetary policy really took a secondary goal (inaudible), which was to backstop the sovereign debt that drives in your area and especially to dispense fears over possible breakup in the euro.

The way in which that was accomplished was initially with a security market problem, which was eventually complemented in 2012 with a prominent speech by President Draghi where he made it very clear that the ECB was ready to do whatever was necessary to keep the euro area together. That was also complemented with the lounge of the Outright Monitoring Transaction program.

We think it's quite fair to say very visible in the daytime, this commitment by ECB was quite powerful in reducing yields on the southern bond of different countries. There are several research papers that also document strong positive impact on GDP and inflation around that time.

Now, finally the ECB also engage in unconventional monetary policy from 2013 onwards. Unconventional monetary policies which little bit more of a conventional goal, which was primarily to support growth and bring inflation back to target.

This was done with a combination of instruments, with forward guidance announcements, with starting up of an asset purchase program and also with implementation of negative interest rates, so negative rates that were charged on bank reserves.

In our own work, we've documented how the initiation of negative interest rate period led essentially to downward shift of (inaudible) throughout the euro area countries.

Now, for what (inaudible) of the United Kingdom, the initial response to

the crisis in 2009, 2012 were very much in line with what the Fed did at that time. In particular, the Bank of England engage in multiple rounds of QE.

The first round of QE was very noticeably associated with the strong decline in yields, which as in the case of the Fed was essentially in the ballpark of 50 to 100 basis points.

Now, there are interesting questions surrounding the subsequent rounds of QE, QE2 and QE3, because the fact they seem to be somewhat weaker raising concerns whether they are decreasing returns from quantitative easing.

On the other hand, though, we also need to keep in mind as what was already mentioned in the conversation before, that substantive round of QE became more expected by markets, so it is intrinsically more difficult to measure the impacts on financial markets and on yields.

Now, the Bank of England also enter its second phase of unconventional monetary policy in 2013 and '14. This was mostly based on forward guidance announcement. Essentially in the bank (inaudible) inflation had been running above target for a long period of time, so there were thoughts in financial markets that Bank of England was possibly closed to start tightening cycle.

Now, the Bank of England sort of pushed out these concerns about tightening monetary policy and it did so with a forward guidance announcement, which interestingly used a quantitative target where the Bank of England said we're not going to raise rates until a new prong is essentially at least below seven percent.

Now, this forward guidance announcement did not seem to have major impact on the level of yields, but it seem to have provided more clarity to markets. Because when you look at the short term volatility in movements and expectation of short-term rates they became more angered, the volatility became smaller.

Finally the Bank of England also engage in the fourth round of quantitative easing 2016, and this was just for the call of supporting economic growth on

the back of the Brexit vote.

Now, finally during the case of Japan, the response of the Bank of Japan to the early phase of the crisis was actually relatively weak. In 2010, 2012 what we saw was a few rounds of forward guidance announcements where the Bank of Japan essentially made it clear that they were not going to raise rates any time soon, which didn't come as very unexpected use of the market since Japan had been trapped in a long period of mild deflation and low rates to begin with.

The Bank of Japan also engage in some limited asset purchases. Now, these had a very small effect on yields and especially on inflation. To some extent, again this is just a reflection, that the yield curve in Japan was already quite low and flat to begin with, so there was limited scope for further changes in yields, but it also sort of revealed the fact that markets did not have very strong credibility about the commitment to the Bank of Japan to really bring inflation back to target, given that Japan had been coming out of a very prolonged period of my deflection to begin with.

Now, things changed quite substantially in 2013 and '14 when Mr. Abe campaigned on a platform of economic stimulus, which involved also very strong monetary accommodation. And when Mr. Abe became prime minister of Japan, essentially that gave the Bank of Japan the political banking to switch gear and provide much more monetary stimulus in the economy.

Now, this was done first of all with introduction. Now explicit inflation target was also set to two percent above from the one percent the people were sort of considering before. Also with the launch of the very large quantity and quantitative easing program, which involved not only the open-ended purchase of government bonds but also private rescale securities among which for example even ETS, (inaudible) real estate investment trust.

Now, these kind of announcements and this kind of actions by the Bank of Japan did have a very visible effect on inflation, but unfortunately this effect was

relatively short lived. Because after one year or two, inflation essentially came back down hovering around zero.

That showing that even when the central bank extremely determined to provide more recommendation and terms of political banking for doing so, it's still remarkably difficult to defeat entrench inflationary dynamics that were already present in Japan.

This clearly calls central banks to take action early on, not to do intervention until the point at which inflation is essentially a common phenomenon in the economy.

Now, finally 2016, the Bank of Japan renewed its efforts to raise inflation and did so by also embracing negative interest rates and then also mentioned before by adopting a new monetary framework, which is called the yield curve control framework, whereby now the central bank actually announced it's not only short on interest rate target, but also long-term interest rate target, extends (inaudible) in the market to ensure that that rate essentially materializes (inaudible).

Now, thinking through these episodes which really provide a very great variety of UMP across three different countries. I think we're able to draw some key insights, which can often be quite helpful to policymakers down the road.

The first insight is that across these three countries, UMP they did seem to provide monetary stimulus once the zero lower bound was reached. Especially in the euro area crisis, they also have definite (inaudible) transmission to three countries.

Now, this is quite visible when you look at financial conditions. Again there are very relevant question about the persistence of this events, which are not going to be easy to be identified. But at least in the short term, these events are quite significant.

Also analysis, which looked at the facts on the real economy out with the inflation and the general consensus that there was positive effect on output and inflation.

Again it's a challenging question to answer, but in any case we think that if we do take for granted that at least the effects on financial markets are significant, it's hard to believe that they do not have some positive spillover to the rest of the economy.

Now, we also think that looking at these examples, you can see that UMP tends to be more effective during episodes of severe financial distress, which is when market segmentation is really at its peak.

I think they came across in the case of quantitative easing the first round in the UK where the movements in financial markets were quite strong, it was also the case with OMT announcement in 2012 by the ECB, when in the peak of the euro area crisis, the commitment of the central bank to stand behind the euro and intervene as much as needed to ensure that monetary transmission will essentially operate functionally was quite effective in bringing down sovereign spreads and averting (inaudible) could have been quite dire.

Now, at the same time we also think that UMP tends to less effective and unfortunately much less so when the inflationary pressures are already entrenched in your economy. Japan gives us a clear example of that.

It's also much less effective when market participant do not believe about the commitment of the central banks to really stand behind their words, and that is probably the case of Bank of Japan before the election of Mr. Abe and is probably also the case with ECB at the very early stages of the crisis where the attention was focused on the LTRO and there were very severe doubts about ECB being able to undertake large-scale asset purchase programs as for example the Fed and Bank of England were doing.

Now, in terms of side effects, we also think it's fair to say that no major side effects have materialized, at least not so far, probably with the caveat with a strong political scrutiny the central banks are being subjected to.

Now, to some extent this is a very natural working progress that clearly in

democratic societies, policymakers, central banks included, are subject to public scrutiny. But of course we need to make sure that that doesn't feed eventually into threats to political dependence about the operation of dependence in central banks. That is something of course we want to preserve.

Now, in terms of conclusion, our own reading of the literature and perception about the UMP is that UMP should definitely remain the toolkit of central banks, because it can provide some important relief if the zero lower bound is ever reached.

Now, at the same time, we also very well aware that UMP should not be treated (inaudible). So there are limits to what can be done through QE. You can push the yield curve all the way to zero, flatten it all out to the 10 year, but that is sort of a limit which Japan unfortunately has reached.

Now, you can think of doing something more with negative interest rates. Also there are thresholds how much you can push rates into negative territory at the point at which people in institution would switch over cash.

Therefore, we need to be very mindful of (inaudible) policy tools that can be deployed, especially to reduce the likelihood that the zero lower bound can be reached. This can include fiscal and structure reforms to boost potential growth rate, national interest rates in the economy, or for example high inflation targets that can again provide more room for policy rate cuts in in case of a recession.

There are also very important open question that I would love to provide an answer to, but are extremely challenging, and so again this is definitely a case where more research is needed. For example, are there truly decreasing returns to scale from asset purchases, are there limits to how much you can do by purchasing assets, is it the stock of flow that matters.

We have these relevant questions about, for example, the persistent of the effects is that we need to keep up the flows, because the stock is not what drives the

impact on yields for example.

Should purchasing be restricted to specific asset classes or can the central bank broaden up its reach and purchase rescale assets, and, if so, what is the boundary between monitoring fiscal policy.

Thank you for your time. I look forward to the discussion. Thank you.

(Applause)

MR. BROADBENT: Hi everyone. Thank you for asking me, Don and David, and thank you too to the authors of this papers, which is very clear and very comprehensive account of all of the unconventional policies conducted outside the U.S. and the major central banks outside the U.S. during and since the crisis.

Ken West said he found two sentences in Kuttner's paper he might disagree with. I haven't succeeded in finding a single sentence in this paper. I'm sorry, to disappoint you.

I will put my own spin on some of this and in particular try and talk a little about why I think we might expect the effects of QE in particular to vary, according to economic conditions and what else the central bank communicates. We've heard quite a lot about this already and there was an explicit question about it earlier. I think the answer is it probably does vary.

There are three main conclusions. I'm not going discuss all the details in the paper about the nature of the policies that were conducted. For that, I would recommend reading the paper. It's very clear, as I say, but I'm just going to jump straight to the conclusions, three main ones, the authors give us.

First QE is more powerful in periods of heightened financial stress. I think I strongly agree with that. That's a view that can be justified in theory. Some of the effects of QE, these so-called portfolio balance effects, are mother likely to work when markets are functioning less well.

And when markets are functioning better, I think the other channel in

particular, the commitment QE involves to keeping monetary policy easy in the future, that becomes relatively more important. I'm going to try to give you a couple more pieces of evidence of that later on, some of which comes from the U.S., which as we know now is engaged in what you might call quantitative tightening.

The authors also say that unconventional policy requires that the central bank be credible. That's certainly true. It's true I would say of all monetary policy, whether it affects inflation target certainly. It's particularly true of QE I think precisely because it works partly of our signaling something about future policy.

As the author points out, there are limits to our ability to commit and those limits are particularly stark when we hit the zero lower bound, not just with current spot rates, but in forward space as well.

So the particular spins I want to put on it are first to say what everyone else is saying, which is we must be modest in our approach to this and our claims for what we know about QE. We have much more limited evidence than we do for standard monetary policy. As I say I think the effects almost certainly vary, which narrows even further our ability to say anything.

Therefore, I think to his statements, and I confess that the Bank of England, of course I wasn't there at the time, but Bank of England was amongst those that said this that X billion of QE equals Y basis points of short rates. These statements are unlikely to be reasonable or valid.

This I think partly reflects some of the other things the authors talk about is the political criticism of QE. In my view looking back with the benefit of hindsight, is it under pressure to defend the policy, central banks were perhaps at times a little too precise in those statements about what it did.

Equally, I think some of the more extreme criticisms one can easily reject actually. There are so many, that maybe that's bound to be true of some of them, but still they go on it seems. I think one should push back. If they were to use this again, it's

important that we don't let those stand.

Final remark, and I won't talk much about the ECB but it's obviously operationally and politically more difficult to conduct these policies in a currency union where there's no single fiscal authority. But as we've discovered, and I think this is a good thing, it's not impossible.

So let me start with those criticisms. These were ones certainly heard everywhere to varying degrees. It was new and dangerous. We heard it was going to lead to very rapid inflation. It didn't help the economy. We still had a recession, we still had a sluggish recovery, and what one heard particular in Europe was that it served only to subsidize the more profligate government and we heard a lot in the UK certainly and obviously in this country that all it did was push up the price of risky assets and those are held disproportionately by the well off, so it wasn't inequality.

Finally, we heard quite a lot of the time that this is a policy that couldn't be reversed and, therefore, represented monetization.

I put that in square brackets, because I said that's already rejected given what's going on here. It already is being reversed, so I don't think that one's -- that one's already gone.

One very general comment about Newfangled, we know that's not true. There are buckets you can read about discussion of what might have been QE during the Great Depression Friedman and Schwartz over 50 years ago argued, perhaps too forcibly but with some persuasive force I think, that it would have helped to have done it during the Great Depression and the failure of the Federal Reserve then to reach policy sufficiently including our large-scale asset purchases was one of the reasons.

There are many other differences between the last financial crisis and the one in Great Depression. I would just pick out one comparison that's quite interesting, which is on the left-hand slide. These are U.S. data. Zero point in both is the stock market peak, one in 2007 in red and in blue the zero point is late 1929.

For what it's worth, the data which QE was begun in the United States was also the date of the peak for yields, not necessarily in government debt but certainly in corporate bonds in the early '30s. Those went on rising, even as the economy was collapsing. As we know, deposits also collapsed and so did the real economy.

I don't want to claim that QE is the thing that made all the difference. Obviously that's not the case, but I think it is interesting compare the two.

In the paper there's a summary of some of the studies of -- more careful studies of what it might have done to the real economy this time round. Many of these use the same techniques you've heard about with the U.S. Event studies -- some of them are quite richly identified with include other asset prices, various sign restrictions, people that work very hard to try to try and learn what we can about the impacts.

Generally they are positive. First one I pick out says one percent of GDP of asset purchases increases the level of GDP by a quarter of a percentage point.

The only thing I pick out here is that you generally find those that either look at the whole sample or concentrate on the early part of QE generally find stronger results both on bond yields and on GDP.

There is some sense from reading all these papers and there are many of them that the effects were more powerful early on. You can clearly see that in reaction to bond yields. In the bank we used surveys of what people were expecting to try and extract the pure surprised component in QE announcements, but that's difficult to do accurately.

What we can say is on the day the biggest reaction was very clearly in those early announcements in the early part of 2009 a very material decline in bond yields, undoubtedly due to what the bank was doing and what it said it was going to do.

When it comes to risky asset prices, however, the effect is much harder to detect even on the day. There was so much else going on that even during various purchases in -- the one on the right-hand corner is on March 2009 even as bonds yields

fell, equity prices declined very significantly. There was news about the banks that came through on the same day.

The Bank of England itself was suddenly more pessimistic about the economy, and there's no real clear patent here at all, even if you narrow that window to two or three hours and the effect of risky asset.

Overall if you look simply at the levels of these things, these are just the real price of UK equity prices, at least the prices of domestically focused companies in red and house prices, there's nothing here to me to suggest there's been sort of uncontrollable asset price inflation. If anything the opposite is true, it's been a period of fairly weak growth. In fact, equity prices certainly have responded only to the extent that the real economy has done so in the UK again.

I wouldn't look at this graph and think that there is something really weird going on, whether due to monetary policy or anything else boosting the price of equities. Indeed you can see that even after the economy began to recover in late 2009, you go through '11 and '12 and equity prices were weak despite a recovering economy. That was very much associated with the Eurozone crisis.

And I would point out, and I'll come back to this point later, that the trough here was not for equities and that little dip in the red line, is not an actual policy measure. It is Mario Draghi's "whatever it takes" statement.

I just put down a marker here that that is communication. It's not actual asset purchases and it probably had the single biggest effect of any policy major I would say the ECB has undertaken since the crisis.

Indeed if you look at the overall period and you compare the behavior of bonds and equities, and the previous commentator did this for the U.S., again it doesn't come through to me that there's any material shock that's driven equity prices, driven these markets, either before or since QE, certainly in the years running up to the crises.

Here I've expressed equities sort of inverse sense -- inverted P ratios,

really earnings divided by the overall value of the firm data as well as equity. And for the last, I would say, 15 years what's dominated the behavior of these prices is a negative correlation between these two, where in other words you tend to have had events which have driven -- when they've driven bond deals down, they've driven equity prices down. In other words, yields of equities up.

It doesn't look to me as though we've had a sample dominated by shocks, which might include monetary policy shocks that have driven these things in the same direction that have tended either to push prices of bonds and prices of equities either up or down, that's simply not the case.

Even the big dip in the blue line you see there, which happens to coincide with QE actually, is more about big write-downs in the banking system. You can see the Brexit effect at the end, equities have performed very poorly, that yield has gone up, but beyond yields have not.

The same is true in Europe. Even in the U.S. whereas we heard, you find more evidence of shocks that have driven these things, these markets in the same direction while U.S. has behaved quite differently in this respect actually.

But certainly I don't think the evidence says in Europe that there's been some massive effect on the price of risky assets. I really can't see that at all.

Why might these effects vary over time, why might it be the case that QE more effective early on than later. I shy away from saying there are necessarily diminishing returns. I don't see why that should be the case.

But I do think if we think about the way it's meant to work, you might well expect them to vary. The authors point out that in markets that are working very effectively and they're complete and all prices are moving fine and people can arbitrage whatever they want, these big asset purchases shouldn't do anything.

There's a well-known paper, which is over 30 years old, which mirrors a famous paper in finance. A famous paper in finance says if a company decides to swap

some debt for equity, that would do nothing at all under certain conditions and this paper in the mid-'70s said, well, there's a similar argument concerning the balance sheet of the state, i.e. the consolidated balance sheets of the government in the central bank.

If you say issue more short-term debt or issue central bank money and buy longer term government bonds in perfectly functioning markets, that would do nothing at all. And as the authors point out, at least for this channel, for the portfolio balance or for the liquidity effects of QE, you probably need to have some dysfunction. And its reasonable to think, therefore, that the more dysfunction there is, the more powerful this channel is.

There's certainly no reason to expect the markets have equally functioning behavior over time during the crisis. It's going to be worse. There's great demand, not to say desperation, for the safest asset of all to central bank money. In those circumstances, you might expect QE to be more powerful.

Let me give you a couple more pieces of evidence as to why I think, at least from my part, I've become more convinced of that. One involves what we've seen in this country over the last year, more event study type things.

What I've done here on the left-hand panel is to add up all the incremental announcements which began long before the actual contraction of the Fed's balance sheet going back probably to the beginning of 2017. It's in the middle panel.

I said, let's suppose we add up every bit of news during those particular days, what's been the total change in U.S. Treasury yields cumulatively in the runup to the quantitative tightening and the answer is nothing basically.

The left-hand panel shows you what you would have expected if you're taking projections of QT, the likely part of the Fed's balance sheet over the next three or four years, and that's a published number, and you use the same multiple as you apparently inferred from the first phase of QE, and you get a very big number.

So I think we should be surprised, or at least we should be surprised if

we had the prow that there was some fixed translation of asset purchases into Treasury yields, we should take note of the absence of any effect over the last year. I drew this chart before we had the selloff in Treasuries recently in the rise in yields. But over that period, there was no move in bond yields and no move even if you focus it on days in which these announcements came through.

The other piece of evidence is to take account of what Treasuries were doing, even as central banks were conducting QE. So again if you think of sort of crude as a simplest description of QE as one involving a transaction within the balance sheet of the state, what central banks are doing is essentially shortening the maturity of the private sector claims on the state.

We're going to take away some of your longer term claims, the bonds you earn, and instead we're going to give you central bank money. If that were the mechanism by which it were to this portfolio balance effect were the only way it worked, then you might expect actions by Treasuries say to vary the issuance of government debt to have similar effects.

You can find some in the literature, but they're generally pretty small. I point out that in the UK -- let me come back to this actually.

In the UK, even as we were conducting QE at the bank, the government was lengthening its issuance. This pink line shows you the average maturity of those consolidated claims of the private sector on the state, the central bank and the government combined.

So you should find that when you do QE, this pink line falls. That's what should happen, because we're giving the private sector sort of zero maturity assets and we're buying off them much longer term maturity assets. In UK they're pretty long. The average maturity of government debt is 13 or 14 years.

Yet despite the fact that we ended up buying somewhere between a fifth and a quarter of all government debt, the maturity hasn't fallen at all and that's because in

the background the DMO, which is the agency that issues government debt, was busy lengthening the maturity of its issuance.

It looked at the yield curve and thought, well, this is nice and flat and whether this is the right decision or not, decided to sell much more longer term debt.

So when I first drew this, I thought, well, maybe I should find some negative correlation here between these two and I didn't find that at all. I would point out that the same is true in the U.S. where the correlation goes entirely the wrong way for QE that here too the Treasury department has been massively increasing the maturity of its issuance, such that that has more than dominated -- that has dominated the action of QE in terms of the average maturity of the private claims on the state.

I think this is relevant, certainly relevant, because I've heard (inaudible) couple people saying, well, maybe the Treasury should do QE in the future or would have the same effects, I'd only point out this doesn't seem to -- well, at face value it doesn't work. That even as the length -- even as the maturity of the Treasury stock has lengthened, very significantly the yield curve has flattened.

So what instead is happening won't might explain both the absence of the effect of any -- QT on yields apparently and also what's going on here. My feeling is, at least I've become more convinced, of the power of the signaling channel, which only the central bank can conduct.

I would point out, for example, that whereas during the taper tantrum that was the first soundings back in 2013 that the fed was thinking about possibly starting to slow down asset purchases in that case. This wasn't QT. There was no statement sort of mitigating that in terms of what the Fed was intending in terms of future policy.

So market saw this and felt they were learning something about the hawkishness of the Fed and you had this very big selloff, because the information markets took from that was, goodness, the Fed is more hawkish than we thought. Even though unemployment is still high, they're thinking of reducing monetary easing and even

starting monetary tightening that brought forward the expected data the first rate height and had this dramatic effect on bond yields.

Compare this with what the chair said when QT was sort of first announced in early 2017, she did precisely the opposite. She said look to the extent that quantitative tightening -- that asset sales have any tightening effect on the economy, we are going to counteract that by ensuring that the short rate is lower than it otherwise would have been -- so whereas in 2009 in a sense quantitative easing and its signaling component were using a complimentary fashion, we're buying assets and we're going to signal that short rates will stay low, when you've got to last year they were used as substitutes.

We said, well, look, to the extent that selling assets does anything to the economy, we will counteract that by keeping short rates low than we otherwise would have done.

So we had a very different approach to signaling. I would argue that is why you had a very different reaction in the Treasury market and at least begun to convince me that the most important part of QE at least when you're outside times of crisis is really about signaling and QE is in some sense forward guidance, unless you're in the middle of a crisis and the market's not working at all.

Finally as I say, I point out in the Eurozone, I'm not going to talk much, the securities market program was the first thing to try and address some of these fundamental concerns about the existence of the Eurozone. There were some asset purchases then.

The really effective thing was Mario's whatever it takes. He didn't actually do anything at all. It's the most powerful three words a central banker has ever said I suspect.

Thank you very much.

(Applause)

MR. UBIDE: Let me start and entertain you in the meantime. Thank you to the organizers for the invitation. It's an honor to be here and let me start by saying that I basically agree with most of everything that has been said so far, both on the first paper and on the second paper.

I think there is a fair amount of evidence by now that monetary policy, and notice I did not say unconventional for a reason, monetary policy has worked, has been effective, and basically it has done what was supposed to be doing, which is to impact financial conditions the way we want the financial conditions to be impacted.

So we got lower interest rates, we got lower corporate yields higher stock prices, and weaker exchange rates in the countries that were using monetary policy the way it was supposed to be used. Now, this might not work, but I will continue.

Now, one problem we have and it has been said is how to know whether these change in financial conditions did affect GDP and inflation or not. We cannot possibly know, because we don't know what the counterfactual is, but the reality is that if you think about monetary policy as monetize policy rather than separate them between unconventional and conventional, what we have is an issue of financial conditions.

So I see no other reason to say that (inaudible) of financial conditions have no positive impact on growth and inflation.

Now, it is true it was probably more effective when there was financial distress. Well, it makes sense, because the level of rates is higher. There is a tightening of financial conditions that you can offset. That's exactly what you would expect also in a normal circumstance.

It's more effective when central banks can credibly commit to provide accommodation. Again, as it was said before, that happens all the time also when you are operating on the short-term rate.

I think it's very important that we stress that the undesired effects that everybody was panicking about have not materialized. Inflation has not run up. If

anything, it's not high enough. There hasn't been a big increase in fiscal deficits, at least until last year, but during the time when QE and the other policies were in place what we have, if anything, was too tight fiscal policy.

Again as of now, I think we can argue that there hasn't been excessive search for (inaudible) or any of the undesired effects that some people were worrying about in terms of financial stability.

Now, the question and one of the things that I would like to stress here is should we use it again, and the answer is, at least in my mind, yes. So what I was planning to do and show you, but I don't know if I'm going to be able to, is to give you a couple of thoughts about what the ECB did, what the Bank of Japan did, how monetary policy really worked putting the stress on what I like to call the insurance channel of monetary policy, and then give you my thoughts about how to do it next time and essentially how to create a monetary policy framework that works for all seasons when inflation is low, when inflation is high, and when inflation is at the target. Part of it is based on a book I wrote last year on some of these issues that was published by the Peterson Institute.

So let me start talking about the ECB. If we can get the charts, I'll show you a couple of quick charts that I think are interesting. Let me just say this, the ECB had two phases in monetary policy -- one was passive easing, the other one was active easing. I think it's very important to stress in terms of understanding whether policy worked or didn't work.

So until 2012 basically the ECB was avoiding a tightening of financial conditions by providing endogenous liquidity. You remember, yes, they cut rates, but basically what they did was to provide LTROs.

So the idea was LTRO are self-absorbing. We are really worried that some of these policies may have an undesired effect. What we are doing here is just provide what the market requests, that's not easy, that's avoiding the tightening.

Now, in the meantime, obviously we've had the euro oil crisis and there was a sharp tightening of financial conditions in south countries. So basically we had to shift at some point into providing active easing, and that's when Mario arrived and said whatever it takes and then eventually two years later, they cut rates and they decided to do QE like the rest of the central banks.

So I think that's important in terms of understanding the impact of monetary policy in the euro area. The objectives were different before 2012, '13, and after that.

Now, when (inaudible) finally decided to do active easing, they went all the way. QE was very large when you think about the ratios to totally stop, for example, it was quite large and it was assigned the right way. It was to stay contingent and I will tell you later what I think is the right way of doing quantitative easing.

Now, it was also suboptimal because there were restrictions that were self-imposed, capital key, the 33 percent, some of the other things. So even not having euro bonds and eve not having fiscal union, QE could have been done perhaps in a more efficient way.

Now, one thing that I would comment and criticize perhaps of the way the ECB did policy is that the ECB is the only central bank that hasn't really changed the monetary policy framework.

If you think about the fact the Fed issued a statement of long-term objectives, put the two percent on the inflation target puts him at good balance way.

The Bank of England had an update of the (inaudible)). The Bank of Japan changed to that two by two by two, even changed from quantities to rates. The ECB still has the same definition of crisis stability, close but below two percent.

In my mind that is an issue. I mean, I wrote about it in 2015. It's asymmetric, it creates a bias toward lower inflation rather than toward higher inflation. It may have contributed to anchoring expectation, inflation expectations, albeit on the low

side.

So this is something that I think when we talk about -- and as Ben was saying at the end of the day it's all about signaling. This could have been a cheap way of fixing policy in a significant way by pricing inflation expectation from the point of view to the finish of pricing stability. That's about the ECB.

The Bank of Japan is a very interesting experiment. That's not what I meant by interesting experiment, but, okay, finally, we got something there. If you can keep that slide there.

Let me show you one thing, beautiful, let me see --

SPEAKER: (Inaudible, off mic).

MR. UBIDE: Let's stay on this slide. If you look at the chart on your left, what I wanted to show in terms of whether the ECB was using a tightening policy, that is the 10-year interest rate swap deflated by 10-year expected inflation -- from inflation swap. So it's a way of summarizing what the stance of monetary policy was in the euro area.

The dark blue line that is in the middle is the weighted average of the euro area using the capital key, and you can see there it is essentially flat until it finally comes down after 2012. So that's the stance for the euro area as a whole.

Now, there is one interesting thing in this chart when I did it that I didn't expect. The purple line is German, the green line is the UK, the red line is the U.S.

So the stance of monetary policy in Germany was exactly the same as in the U.S. and in the UK, even if the ECB was not doing QE, which is interesting.

If you think about what is a country that didn't have a country risk premium, what is the kind of policy was enjoying, it was exactly the same one that the Bank of England and the Fed was delivering.

Now, this chart here on the right is what I was suggesting about inflation expectations. This is a term of structure of inflation swaps. So on the horizontal side,

you have the one-year inflation, one-year forward, one-year inflation, two-years forward, and so on until nine years down the road.

What you see is that the U.S. and the UK are basically a stable at a round target for the UK (inaudible) minus a hundred basis points essentially.

For the euro area instead, you can see that it basically never reaches two percent. I'm not saying it's wrong. I'm saying that maybe this is what close, but below, two percent inflation does to you if you are not strong unclear about what your objective is.

The former thing is wrong, but it still helps. I think the one thing about Japan that we have learned is that inflation is not a monetary phenomenon. It's not a monetary policy phenomenon. It's really an economic policy phenomenon.

Why do I say that, the key of Japan is the reasserting of economics in 2016. In 2016. Why do I call it reasserting, what happened in 2016. 2016 was the moment when essentially fiscal policy took the lead and monetary policy said, I am going to follow and I am going to support.

If you remember there was a big fiscal package that was published in 2016 by the Japanese government, and it was choreographed, so it was announced the fiscal decision one day and the monetary policy decision the day after. The whole idea was to show we are playing together.

So when you are at the zero bound in a situation like that, fiscal policy has to take the lead and monetary policy in some sense has to follow or there has to be cooperation just to call it like that.

Why, because then you focus on the relationship between the interest rate and the growth rate, you try to ensure that R is below G and you try to reduce the debt overhang effect in economy like Japan. That is basically what the Bank of Japan is trying to do.

So it's difficult to analyze the Bank of Japan with the same jar stick as the

other central banks, because they have a different economic situation.

Now, I call what they did a modern version of helicopter money. Why is that, well, they also added an explicit inflation overshooting.

What did you achieve with that, you achieve with that that the monetary policy report is an experiment, because you are essentially very far away from their objective. And so by doing this, they provide an insurance on the economic outlook. We are going to be here until we achieve what we want to achieve.

And then the third point, and that's what I say is an economic policy phenomenon, you need income policies to make sure that wage growth becomes consistent with inflation target that you are trying to achieve, and that is why Prime Minister Abe has been involved in the (inaudible) negotiation trying to raise wage growth, because otherwise your inflation expectations are low and you cannot push them up.

Now, the final point they have more (inaudible) yield curve control and I think this is good for the future of central banks. What do you do when you don't have more assets to buy. So we have learned that you target yields.

What we have seen is that it sort of works, works in the sense that they haven't been forced to buy the whole issuance, even when interest rates on a global level have gone up.

So I think Japan provides a few interesting lessons in terms of how to do it again if the next 15 years are going to be similar to the last 15. Just to a say one thing, Japan has had zero interest rates since 1995, which means that somebody needs in his 40s has never seen interest rates that are positive in its adult life, something I thought about it the other day.

So how did monetary policy work, and take this in some big picture way of thinking about it, but I think it's perhaps a good way to think about it.

Think that monetary policy operates in two spaces. One is what we call the growth inflation space, which is what our models tell us, and the other is risk space,

right, uncertainty.

And the objective of monetary policy has to be stabilize both gaps, so the output gap on the inflation gap on one side and the risk gap on the other side, think about the sharp ratio or think about the (inaudible) risk. Ricarado (inaudible) and some coauthors have been doing some work along these lines in terms of specific model.

So in a normal recession in normal times, the risk gap is irrelevant. There is no too high risk aversion or too low risk aversion, so all monetary policy needs to do is to close the inflation output gap.

Because we believe and we are confident that the economy is self-equilibrating, in other words there's is a recession we know the central bank will cut rates, we know potential growth is not changing, we know the inflation target is going to be there, so we can price assets and we can take long-term investment decisions.

Now, what happens when you have a large crisis, you are stuck at the zero lower bound, or you are in deflation and you don't know what's going to happen, then the risk gap dominates.

Because we no longer know if the economy is going to be self-equilibrating. This is all of us in 2009 basically.

So in that case, it's very difficult to price assets or to make a long-term investment decision, because you don't know how to forecast the future (inaudible) of revenues.

So what do you do as a policymaker, do you sell insurance on the economic outlook. That is why when QE was defined as just quantities, for example QE2 by the Fed, didn't really do much. You are telling many you are buying 600 billion of U.S. Treasuries, but I have no idea where that takes me.

Now, when you move to QE3 on the thresholds, so when you make it a state contingent and you say I'm going to be here until inflation is a target and the employments rate is where I want it to be, then if I believe you, then I can price assets.

I can price the yield curve, I can price the future of growth and inflation, and then I can take long-term investment decisions. So this is key, so the design of policy via open ended and state contingent rules with explicit forward guidance in my view was the secret to getting out of this, because essentially was to say I'm selling you the insurance.

So now this is where it's interesting, how did it really work. So we thought this would work through the portfolio rebalancing effect, that the private sector would go and buy equities and sell bonds because the central bank was buying bonds.

Look at this chart on the left, those are the cumulative inflows. This is for the U.S. into ETFs and mutual funds. This is basically retail and institutional investors and the flows that went into bonds and into equities.

So what we see is that there wasn't really a rash to buy equities, because the central bank was really giving us this insurance. What happened was look at the chart on the right, we recover risk aversion, that's the P/E ratio, right.

So at the end of the day, all that monetary policy did was to restore the credibility of the end point of the recovery and so there was a decline in the P/E ratio, which if we flip it is basically an increase in risk aversion and all we did was to normalize risk aversion to levels that where he could consider normal.

Then we can argue until we are blue in the face whether that's normal or not, but the point at the end is that it came back to basically similar levels to where we were before.

I think this is an important message in the sense that if we can stabilize risk aversion, then monetary policy can go back to tweaking the growth and inflation forecast and then the normal transmission channel of monetary policy is going to work.

So let me conclude just by giving you what I think should be changed in terms of how monetary policy is done based on everything we have learned.

First point, and I agree with the authors, I think central bank should do

opportunistic reflation, which is the mirror image of the opportunistic inflation we had since the '70s until now, essentially take positive demand shocks and accommodate them.

I could argue what the Fed has been doing with the recent fiscal stimulus is basically this. Taking advantage of that, that has left inflation and inflation expectations simply accommodate it.

Given what we have seen in terms of the behavior of growth, I would say we should really find perhaps the objective of monetary policy of maximizing growth subject to price stability.

I know this is pushing it a little bit, but basically what I'm trying to say is this: Maybe money is not neutral in the near term. Maybe if there is hysteresis or the risk of hysteresis and the (inaudible) very flat, the divine coincidence no longer works. For those of you who don't know what a divined coincidence is, it means that if you achieve price stability you will achieve output and potential -- well, that may not be true anymore.

So you would really want to flip it and say let me make sure I put output and potential obviously subject to not break in price stability. That's a way of avoiding our weight demand trap.

Now, we really have an issue with real time narrow Nairu estimates. I've been surveying all the central banks and all of them have reduced the Nairu estimates in the last three or four years by a significant amount.

So, again, let's not make the opposite mistake that central banks made in the '70s and '80s. There, there was an overestimation of potential growth, let's make sure we don't underestimate potential growth now.

Third point, keep large balance sheets, be ready to buy all the assets. I completely agree that this should be done at all times. Now, one thing that is important that is a political concern about losses, well, increased capital, that's what the Bank of England has done.

So I want to have a central bank that is able to do whatever it needs to do without worrying about what the political reaction is going to be.

Fourth point, and it relates to what I meant about insurance channel of policy, use cyclically adjusted forward guidance as a way to manage risk taking, and this is important for today.

Why is the Fed today reducing the amount of forward guidance that it's giving? It's not just because we are near R Star and maybe we don't know what R Star is.

If you give less forward guidance that is less confidence about where the future path of interest rates is going to be and increases volatility and it reduces the amount of risk that the financial sector is going to take.

So this is a symmetric tool. In some sense it could be the way for monetary model to address financial imbalances by adjusting the amount of forward guidance that it gives along the cycle.

Then my final point, please stop calling it unconventional. There is monetary policy, the (inaudible) that is tightening. There is nothing unconventional about buying assets and doing forward guidance, but more importantly calling it unconventional creates a stigma and creates a bias to exit and we want to avoid those two.

So let's justs call it -- these papers are really good and I'm really happy that they are called the way they are, but from now on let's talk about monetary policy. Thank you.

SPEAKER: Thank you. We're a little behind schedule, but not so much that we don't have time. So can I invite Stephanie Curcuru from the Federal Reserve Board, although she's not speaking for the Federal Reserve Board, to come up and moderate a panel with the authors of all the papers, the international papers. We'll do this for about ten minutes or so.

I want to particularly thank Angel for his being able to talk without slides,

which as I've learned is not something they teach you when you get a Ph.D. in economics.

MS. CURCURU: Thank you to David and the Hutchins Center for allowing me to participate in this panel. So I'll start quickly by first welcoming Giovanni and Pau who are Damiano's coauthors here and I'll toss out a question.

There's a big difference in tone between the discussion of the first paper and the second paper. For example the discussion -- the first discussion led some -- raised the doubt that some of the reaction we see -- that we're attributing to QE is actually to reassessment of economic conditions, that people are taking some signal from the other commentary by the Fed.

The second paper, the one chart they showed the increase in interest rates over the period during which QE is supposed to be suppressing interest rates is another source of doubt about the effectiveness of QE.

In contrast the second papers, my takeaway was that the -- if there's any criticism, its' that the action should have been earlier and more aggressive, and in the case of Japan done with more -- in a way that they were more credible.

So I'd like to hear your views on why we don't hear those similar criticisms of foreign QE that we're hearing about the U.S.; was there some difference in the QE programs, the way it was implemented, the political concerns, what about it leads the U.S. QE program open to these criticisms that the foreign QE programs don't seem to be subject to?

So we'll start with Giovanni or Pau, since you guys didn't get a chance to talk.

SPEAKER: Just to make sure, we are still speaking for ourself, not for the fund.

MS. CURCURU: Yes.

SPEAKER: I do support a family. I need a job, so.

I think -- well, let me answer the question maybe in two parts. One is maybe we just have either nice or more group thinking discussions than the previous paper.

I do think that if you go to Europe, I would say especially in Germany, you will find sharp criticism of QE, as sharp, if not sharper than you find it here.

So I think to some extent this is maybe just a random draw, this particular panel, and I don't really see a big difference. There may be an element of the degree of market fragmentation we did experience in the euro area for a prolonged period of time that allowed conditions in which QE was particularly effective. And in particular forward guidance and the whatever it takes speech by President Draghi.

Beyond that, I personally don't see a much of a different climate in terms of how controversial things were. You just need to read the general press to get enough of that.

SPEAKER: I didn't read the paper as saying that -- there were some common areas. In particular, the idea that QE, at least in normal time, is mostly about communication, about the future approach to the central bank was common to both.

I think that's absolutely right. And as far as criticism of the policy concerns, certainly. I think if you go to Frankfurt certainly if you were there in 2012, 2013, I mean, most of the last six or seven years, they don't hold back on it.

One other thing I would say about the ECB is it's in a slightly different situation and it wasn't just the sort of path of the median economy they were concerned with or the overall rate of inflation, it was perceived risk at the time that the Eurozone itself would break up.

Both the S&P, but certainly whatever it takes, were in some ways cause a fiscal statement that the central bank was ready to, in some sense, underwrite the very heightened risk in the peripheral parts of the Eurozone. That's one of the reasons that led to the opposition publicly at the time.

It was very important I think for that to be credible, the statement got backing very shortly after it was made by Angela Merkel, who led the country with the strongest fiscal position.

So the ECB's experience has been a slightly different one. As far as the economics are concerned and how it works and whether it works for our communication, I actually found quite a lot in common in the two papers that unless you're in the teeth of a real crisis in which markets are barely working, QE is really about signaling your future intentions of the central bank.

SPEAKER: We talk a little bit in the paper, but perhaps Damiano have time. There's cross-country evidence in the euro area that the effects were quite different in different countries. So certainly QE helped in the periphery of the euro area, but also it's important to stress that no country really the effects were negative about QE.

You might think that given the way QE was implemented with a capital key and so on, Germany received the fair amount of QE, yet you don't see these negative effects showing up.

So at best QE was neutral and there was no financial distress. It didn't do much, but it didn't do harm. And it had large beneficial effects in the periphery, which is where the stress was.

MS. CURCURU: So another tricky piece about estimating the effects of QE is that a lot of these programs were going on at the same time. So each country was likely experiencing positive spillover effects from the QE happening elsewhere.

I was wondering if you guys think that those effects were important enough to be really muddying the estimates that have come up with or if they are -- that each situation was so unique that it's not an important consideration?

SPEAKER: For what the event studies are concerned, there's not really a problem unless the committees were meeting exactly the same time, then you don't have a separate window to extend it. So from that point of view, as a technicality, this

was not a problem.

Obviously when you look at the real sector effects, then this is a bigger concern and you want to look at the overall conditions across -- across the board. I think this is interesting you're asking it this way, because it goes in the opposite way of the criticism that often we hear that the spillovers are negative, for example, vis-a-vis emerging markets.

Let me make one point about that. I think that -- I don't know how much we cover this in the paper, but spillovers are always there when you're a large country or a large zone like the Eurozone or the United States. When you conduct monetary policy, you will have spillovers. Whether it is through UMP or through change in interest rate, you will have them.

The only difference may be that because of the debt or the recession with UMP, we were creating sort of a one-sided (inaudible), so think about carry trade for example. Carry trade the worse thing that can happen to you is your own central bank suddenly tightens and you have to -- you basically had to carry your position short when your central bank is telling you for three years the interest rate is going to be at zero.

Well, now you can freely take large positions on carry. From that point of view, you would expect spillovers to be larger. Now, this doesn't really show much in the data, but at least from maturity point of view this is one difference you could find.

SPEAKER: Now, just one comment I wanted to make a bit on this is that if we think about why is the beginning of the runoff of the balance sheet of the Fed not having much of an impact on the long-term rates is that we can argue that term premium in some sense is a global phenomenon.

So the fact that all the central banks were operating at the same time, basically self-reinforced each other and it was a sort of self-coordinated action.

The fact that as I was showing before German rates were exactly following the path of the U.S. and the UK, that wasn't by design, that's essentially what

global arbitrage, that's the use.

So the market was essentially pricing the bonds of the countries without a country risk that was elevated essentially at the same level.

MS. CURCURU: Should we go to questions?

SPEAKER: Take a couple.

MS. CURCURU: In the light blue shirt.

SPEAKER: My name is Dimetre (inaudible), thank you very much for an interesting -- my question's kind of just what you were talking about, the spillover effects to emerging markets.

I'm wondering if they were different based on from the Fed and to these other countries or it was a just a difference in scale or a different kind of spillover effects.

MR. GAUL: Hi, Carl Gaul,. I'm in demand reference and idealliveson.net. My question is drawn from a book I recently found, A History of Central Banking and The Enslavement of Mankind by Stephen Goodson.

He raises a question, in this day and age does all money related to (inaudible) as credit at usury cannot money, public money, enter the economy through the governments of the various countries.

The question in my mind is what percentage of central banks in the world truly have a private ownership component, which would make things like quantitative easing perhaps selectively beneficial private corporatized interest versus what percentage of the global central banks are truly owned by their governments and their populations of those countries?

MS. CURCURU: The first one.

MR. BROADBENT: I'll take the second one, if I may.

So the Bank of England is a public company, public-state owned, and has been for 70 years. It was nationalized in 1946.

One of the (inaudible) criticisms of QE as I say has somehow it's pushed

up these risky asset prices and led to inequality that's simply not true.

So inequality in the UK has declined in the last ten years, whether of income, more of wealth. I showed you some graphs of risky assets, which show how much they've underperformed bonds.

I should point out that to the extent monetary policy supports the economy, and we can all give up that extent, but I'm convinced in 2009 it was vital that that is a progressive thing to do, because the people who had otherwise lost their jobs are generally the less well off, the less well paid, the young, the marginally attached.

So I think there is nothing basically that I can see in the evidence, certainly in the UK. And I think in Europe, ECB recently published a very good paper on the marginal effects of QE on inequality that suggests this was anything other than the progressive thing to do.

SPEAKER: On the issue of spillovers, I think it's pretty well known that the dominant of the U.S. dollar in trade and finance these days, and there's many papers that have been written about it.

Of course U.S. monetary policies are sort of at the center of the global financial, so Fed policy has large effect on other countries.

The Eurozone understood those countries that mostly use the euro in finance, that's smaller, but few papers have found effects of ECB, unconventional monetary policies on Eastern Europe for instance where it's sort of more connected.

There's also been some episodes where ECB quantitative easing has been thought of affecting U.S. interest rates. Recently when, as (inaudible) was saying, when the ECB launched QE, there was some impact on U.S. Treasuries because of the different positions in the cycle of the Fed already thinking of unwinding, quantitative easing, but the ECB increasing the size of their balance sheet.

SPEAKER: So I think the measure of a good conversation is that you wish it could continue, and unfortunately this one will not.

I want to thank all our participants and all of you who came and people who watched online. The papers that we referred to are already posted on our website, and as Don said will be posted on the journal -- it will be printed in the Journal of Economic Perspectives I think the beginning of November, and we'll post both the video of this and the slides, especially Angel's slides, on our website.

The goal of the Hutchins Center is to improve the efficacy of fiscal and monetary policy and public understanding. I want to thank all the participants, because I think we furthered both objectives today.

One final favor before you join me in thanking all the participants, if there are coffee cups or papers at the bottom of your feet, if you'll put them in the recycling at the back my colleagues here will greatly appreciate them and won't punish me for going 25 minutes over time, so thank you very much.

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I, Carleton J. Anderson, III do hereby certify that the forgoing electronic file when originally transmitted was reduced to text at my direction; that said transcript is a true record of the proceedings therein referenced; that I am neither counsel for, related to, nor employed by any of the parties to the action in which these proceedings were taken; and, furthermore, that I am neither a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

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