

THE BROOKINGS INSTITUTION
FALK AUDITORIUM

DID THE FED'S QUANTITATIVE EASING
MAKE INEQUALITY WORSE?

Washington, D.C.

Monday, June 1, 2015

Welcome:

DAVID WESSEL
Director, The Hutchins Center on Fiscal and Monetary Policy
Senior Fellow, Economic Studies
The Brookings Institution

FEATURED PAPER: INEQUALITY AND MONETARY POLICY, CONVENTIONAL AND
UNCONVENTIONAL:

Author:

JOSH BIVENS
Research and Policy Director
Economic Policy Institute

Discussant:

SUSAN LUND
Partner
McKinsey Global Institute

FEATURED PAPER: REGIONAL HETEROGENEITY AND MONETARY POLICY:

Authors:

ERIK HURST
V. Duane Rath Professor of Economics and John E. Jeuck Faculty Fellow
University of Chicago

ANDREAS FUSTER
Senior Economist
Federal Reserve Bank of New York

Discussant:

MARK ZANDI
Chief Economist
Moody's Analyst

ANDERSON COURT REPORTING
706 Duke Street, Suite 100
Alexandria, VA 22314
Phone (703) 519-7180 Fax (703) 519-7190

FEATURED PAPER: DISTRIBUTIONAL EFFECTS OF MONETARY POLICY:

Authors:

MATTHIAS DOEPKE
Professor of Economics
Northwestern University

VERONIKA SELEZNEVA
Graduate Student
Northwestern University

Discussant:

JEAN BOIVIN
Partner
BlackRock

PANEL DISCUSSION:

Moderator:

DAVID WESSEL
Director, The Hutchins Center on Fiscal and Monetary Policy
Senior Fellow, Economic Studies
The Brookings Institution

Panelists:

JEAN BOIVIN
Partner
BlackRock

DONALD KOHN
Robert S. Kerr Senior Fellow, Economic Studies
The Brookings Institution

SUSAN LUND
Partner
McKinsey Global Institute

KEVIN WARSH
Distinguished Visiting Fellow
Hoover Institution

* * * * *

P R O C E E D I N G S

MR. WESSEL: I'm David Wessel. I'm director of the Hutchins Center on Fiscal and Monetary Policy here at Brookings. Our mission is to improve the quality of fiscal and monetary policy and public understanding of it. Well hopefully we will not be judged by performance. But it seemed to us that one of the most vexing questions that comes up with monetary policy is, did the Fed's very aggressive asset buying -- the bond purchases known as quantitative easing; contribute substantially to the increase in equality. And if so, how much? This is a topic in which there are some very strong opinions. There has been some analysis and we -- our intent is to build on that analysis, to think through to the extent of which it's true, if so how did it work, and if not why is that so many people think that inequality did result from the Fed's quantitative easing?

We have three papers to present this morning, all of them are already posted on our website, three different cuts of the issue. And our plan this morning is to have each of the papers presented. We have a discussion, then we'll take some questions for a few minutes after each paper. And then at the end of the morning we'll end with a panel discussion that includes a few of the presenters along with my colleague Don Kohn, formerly of the Federal Reserve and Kevin Warsh, formerly of the Federal Reserve now at Stanford.

Now it seemed to me as I was reading these papers, some of which are more technical and economic model based and some of which are not, that there are two really important things to keep in mind. The first is, if all that the Federal Reserve did was increase stock prices, then there really wouldn't be much to talk about. Obviously stocks are more widely held by people at the top than people in the middle and the bottom. And if stock prices go up they benefit more. But as Josh Bivens points out in the paper he'll deliver in a moment -- house prices are a pretty important factor in all this and for the

middle class house prices are a large part of their assets. So to the extent that house prices go up, it kind of muddies the story a little bit, just looking at what happened to stock prices.

But the other thing that is important to keep in mind is one that economists do very well, and few other people do, which is to keep in mind the counterfactual. What would have happened had the Fed not done quantitative easing? The compared to what question, which is by its nature hypothetical, is really important, because you can't assume that something would have happened, or you at least have to examine the alternatives. And that's one of the things we'll try and do here this morning.

Before I introduce Josh I just want to point out that Ben Bernanke isn't with us today, he's travelling in Asia, but he's interested in the issue and weighed in on his blog this morning and no surprise, bottom line -- he rejects the view that the Fed's monetary policies have hurt the poor and middle class and relative to the rich. And you can see that on his blog.

We're joined this morning by web cameras from Brookings and CSPAN, so this is live so don't say anything you don't want the rest of the world to hear.

And I'm going to start by introducing Josh Bivens who is Chief Economist of Economic Policy Institute in Washington. He's going to look at the channels through which monetary policy works and discuss the distributional consequences of each and then do that important, compared to what question -- what would have happened had the Fed not done quantitative easing and what would be the distributional consequences of that?

After he presents Susan Lund of the McKinsey Global Institute which has done interesting work on this subject will respond, and then the two of them will join me

up for a little discussion. We'll take your questions before we go to the next paper which I'll describe when that time comes.

So Josh?

MR. BIVENS: Good morning. First of all thank you to the Hutchins Center for the invitation to participate in this conference. Particularly David Wessel and Louise Shiner who talked to me about the paper and undoubtedly made it a lot better than it would have been otherwise. I'm the Research and Policy Director at the Economic Policy Institute, and just if you don't know, I think it's pretty fair to say that EPI has been for years about as exercised as anybody about the rise in inequality that has characterized the U.S. economy over the past generation. And besides being exercised about it we also think the rise in inequality has pretty strong routes in intentional policy decisions. So when I was asked whether I wanted to write something on the intersection between monetary policy and inequality, I was definitely intrigued.

My priorities going in were definitely that successful macroeconomic stabilization policy is strongly progressive -- not just useful and important do, but progressive provides bigger benefits to the low and moderate income households. So I entered with the thought that expansionary monetary policy during the great recession, should that really be different? But we know the monetary policy since the great recession began has been very different in how it's implemented and the tools that are used. So this is definitely worth looking into. And if my look adds anything to this debate, and who knows it might not, it's basically what David talked about in his introduction. You really want to specify some baseline against which you were judging the effect of expansionary monetary policy and the asset purchases in general over the past six or seven years. And so the two baselines I'm talking about -- the first one I'm going to say, I'm going to compare it to a fiscal policy stimulus that yielded just equivalent impacts on

economic output. And so that's one. And what would be the distributional consequences on switching from one to the other. The second baseline is going to be no change in other forms of macroeconomic stimulus at all. Just so that had the Fed decided not to do the asset purchases beginning in 2009, just nothing else happened, and what would be the consequence of that.

The first baseline fiscal policy stimulus that yields an equivalent boost to economic activity, is probably of more interest to academics. And this is a blogger Nick Rowe, he writes a place called Worthwhile Canadian Initiative -- really keen observer of monetary policy and the transmission mechanism, worth reading. And he frames the question like this and basically he's -- what do you think the right question is? If we use fiscal policy instead of monetary policy to remove a shortage of aggregate demand, would that switch from one to another have distributional consequences? And so that's basically what I'm going to look at.

There's a couple problems right out of the gate though. There's no such thing as a generic fiscal stimulus. You can do lots of different things to provide a fiscal boost to the economy. Just think about tax cuts, just one kind of possible fiscal stimulus. The distributional implications could be really different. We have the 2001 and 2003 tax cuts, which they were justified some on supply side long run growth grounds. But in real time they were also justified a lot on Keynesian aggregate demand management grounds. Those were not particularly progressive. The 2008 tax cut that was part of the economic stimulus act, also signed by President George W. Bush, much more progressive. So just within tax cuts, it's really hard to characterize the distributional implications.

Transfers -- the way transfers, the nature of them in the U.S. economy, they tend to focus most of their benefits on the bottom say 2/5ths of the income

distribution, so increases in transfers as a way of doing fiscal stimulus are going to be pretty strong and progressive. And then a really important issue concerns the benefits of direct government spending and investment increases, both in theoretical models and in the empirical research about the fiscal policy that is effective when the economy is stuck at the zero lower bound of interest rates. Government spending, direct government spending comes in really strong and so we really probably want to know what the distributional implications of that spending is. The Congressional Budget Office suggests allocating it in two ways. You can either sort of allocate the direct spending on a per capita basis, think of it as a lump sum spread across the entire population. Or you can allocate it proportional to the existing distribution of income. Those yield two really different results, right? I mean the second one is kind of by definition neutral if you're just going to allocate it proportionally to income.

The first way is pretty progressive if it really is sort of a lump sum spending on a per capita basis. And then of course, it's probably very different depending on what kind of spending we're talking about. The distributional implications of defense spending are probably really different than grants to provide bus service in urban areas, or school construction in poorer school districts. So the punch line of all this is, it's really hard to think of a generic fiscal policy against which to judge what the Federal Reserve has done since the Great Recession began and so I decided to try to find a particular fiscal policy intervention that is about equal to the estimated impact of the LSAPs over the past six or seven years on economic activity. And it turns out there's a decent one. It's basically the stimulus provisions that were part of the 2010 fiscal deal that sort of pushed back when the Bush tax cuts on the top two percent would be rolled back. And you can see -- I would just look at the two columns on the right, the GDP effect and the unemployment effect. Basically the stimulus portions of the 2010 fiscal

deal which were basically a two percent payroll tax cut on the employee side, expanded unemployment insurance, and extension of the refundable tax credits that are part of the American Recovery and Reinvestment Act -- they basically have almost the same estimated effect on GDP as the impact of the LSAPs and obviously the estimated impact of the asset purchases -- there's a lot of variation there. It's not really tightly estimated. So this is rough orders of magnitude.

The first question might be -- why did you compare it to the American Recovery and Reinvestment Act -- that's the most high profile case of fiscal policy stimulus over the past couple of years. And the answer is that the estimated impacts of ARRA were really quite large. Quite a bit larger than the estimated impacts of the asset purchases -- and I'm not really willing to say that the impact of the asset purchases are linear, that you can just sort of scale them up and say we've done two of those. That will equal ARRA. I don't think it probably works like that. And then also you might ask, why don't I include the actual pushing back of the high end Bush tax cuts as stimulus in the 2010 fiscal deal -- because they're really really small, their stimulus impact. I mean the full range of tax cuts if they had expired in 2010 might have been big, but that was never going to happen. Every single politician in town wanted to preserve everything except it was effecting the two percent and below.

So this is sort of a specific fiscal intervention that I'm going to compare to the LSAPs. And just the distribution of the 2010 fiscal deal, you can use basically the Congressional Budget Office data on household income to get a sense of where that money went. And so that first column, the payroll tax cut, that tells you the share of total payroll taxes paid by different income groupings. So the bottom fifth of the income distribution pays about 5.6 percent of all payroll taxes -- the sort of 96 to 99th percent

pays 11 percent of all payroll taxes. And then you can compare that to the column all the way at the left -- that's the overall income, that's their share in overall income.

And so a payroll tax cut is mildly progressive. The EUC extension, the Unemployment Insurance Extension, the way that column is measuring the share of all non-social security cash transfers that go to different parts of the income distribution. And so I'm going to say that that's a pretty good proxy probably for where the unemployment extensions went. You can see those are quite strongly progressive, definitely concentrated in the middle say three fifths of the income distribution. And then the refundable tax credits that were part of the deal -- they're really strongly important for the bottom two fifths and basically I just allocated -- and those -- those are the portions of the income distribution that actually have negative federal income tax rates in the CBO data. And so that's where I'm allocating those. And so the combined impact of the fiscal provisions of the 2010 fiscal deal, they're pretty progressive. Particularly the refundable credits and the EUC extension -- the payroll tax a little less.

And so now we can get to, what did the large scale asset purchases do to inequality. And the concern is that LSAPs are going to boost asset prices and that income generated by asset holding is really concentrated at the top. And that second point, that it's really concentrated at the top, is true. I mean this is just a measure of share of total capital incomes claimed by various income percentiles. And you would see the top one percent is that blue wedge at the bottom, and so in 1979 the top one percent of households claimed about 38 percent of income generated by asset holding. By 2007 they were claiming 57 percent of income generated by assets. On the bottom 90 percent has seen their shares shrink. And this is the root of the concern.

But I actually, when I started digging into this, and looking at sort of attempts to measure the actual impact of the LSAPs -- I think that the distributional

effects of those asset purchases are smaller than they're often characterized in the popular press. Like some people have even called them the Fed doing a reverse Robin Hood. That strikes me as pretty strong, and I think there are three reasons why these effects are probably smaller than advertised. Timing, the fact that they're not that different from conventional monetary policy stimulus except maybe a little less effective, and then the impact of housing as David talked about before.

On the timing issue, basically the asset purchases are going to boost prices now, but at some point in the future they will probably, almost surely, be unwound. And so that's going to put downward pressure on prices. If you held an index fund of the stock market and you just held it over a long period of time, you would see your fund go up and then come down in terms of the marginal impact of LSAPs on that. Stocks are always incredibly concentrated, so basically when you push up stock prices, you're helping today's stock owners, maybe at the expense of tomorrow's. But tomorrow's stock owners are not poor people, and they're not even middle class people, they're pretty rich people as well.

On the second point, it's really not that different, what the LSAPs are doing in conventional monetary stimulus. I mean conventional monetary policy pulls down short term interest rates and then you hope to arbitrage the long term rates that matter for consumption and investment decisions sort of fall in sympathy. And that's how it's supposed to work. LSAPs sort of go past that intermediating link because the short term rates are already buried at zero and sort of push down long term rates directly.

But the goal of both is to push down those long term rates. And those long term rates cannot go down if you're not pushing up asset prices at the same time, so it's really not that radically different a thing than conventional monetary policy. And in fact some of the estimates in this say, the impact of a given decline in long term rates as a

result of the LSAPs is actually less on stock prices than conventional monetary policy. And I think that's an interesting thing to examine, but that was replicated in a couple different studies. I mean part of it may just be when you're measuring the effect of monetary policy at the zero lower bound you're by definition measuring its impact in a pretty fragile and weak economy. But it's interesting to think about.

And then the last one that's pretty important is -- housing is an asset. And its price can be effected by the LSAPs and it's an asset that is held -- it's very important in the portfolio of the middle class. And so that thing I've highlighted right there, that's sort of the broad middle class. It's the middle sixty percent of the wealth distribution. And we can see that housing accounts for about 63 percent of their total wealth holdings.

So the impact on home prices stemming from the LSAPs is comparable at all to the estimated impact on stock prices. Then you're really going to see a pretty neutral effect here. And in fact what I've found is most of the estimates -- or the implied estimates of the effect of LSAPs on housing prices are probably greater than its impact on stock prices. What I found on stock prices, sort of doing a broad scan of literatures, maybe a five to ten percent increase in equity prices stemming from the LSAPs, and so sort of a broad distribution of housing wealth is another thing that makes these impacts smaller than you might think.

And I think the really important thing -- that's sort of fiscal versus monetary, but then we have to think about the real world. And is it really true that if the Fed had decided to not do as much in the way of asset purchases that fiscal policy makers would have said, well of course we shall jump into the gap and fill that hole in aggregate demand? And this is what has actually happened to government spending over this recession and recovery. And that line on the bottom -- that 2009 is what's

happened since the -- basically since the trough of the great recession. And you see the red line? It slopes steeply up before the trough and that's basically the American Recovery and Reinvestment Act that we actually did do some real fiscal stimulus to fight the recession. Starting at some point in about late 2010, early 2011, though, fiscal policy has been an outright drag on growth, and that's really historically kind of astonishing. If you look at the trajectory of government spending, real government spending, and this recovery versus all others, fiscal policy has been a very large drag on growth. And so if it is true that output stabilization is progressive at all, then this baseline becomes really important. And if it is true that the LSAPs actually managed to keep unemployment lower than it would have been -- then it's going to have really strongly progressive effects.

And we find that low unemployment and that sort of macroeconomic stabilization -- it really is progressive. And these are coefficients on a Philip's wage regression, which is basically the change in nominal wages on the left hand side, lag consumer prices, lag productivity growth, some time period dummies, and then the unemployment rate on the right hand side. And you can basically see that -- and we've got wages at the tenth percentile, the 50th percentile, and the 95th percentile, done them separate for men and women. And you can see that the wages of the tenth percentile and the 50th are much more sensitive to changes in the unemployment rate. The 95th percentile male wage -- that's not statistically significant. That's why it's transparent. That's what the magnitude is but it's not statistically significant. And so there is a strong equalizing effect of just output stabilization and low unemployment rates. And so that has to factor really largely. If you think the LSAPs helped stabilize the economy at all, this channel says that they were quite progressive.

And just to end. What this says is that since the great recession, as the Fed has been pursuing expansionary monetary policy, I think it's pretty clear that that's

been a progressive intervention. I think when we're trying to choose between fiscal and monetary policy I would have greatly preferred that fiscal policy carried a much heavier load in stabilization. But not necessarily because of its distributional implications, I just think the research says it's much more reliable and effective at the zero lower bound. The distributional outcomes are sort of second order. And I think we should -- this fact that lower unemployment rates have really strong distributional consequences, it does mean that we can look at sort of the history of Federal Reserve actions and what is going to happen over the next couple of years. That should affect us strongly. What this says to me is -- if we go into contractionary monetary policy too soon in the coming years, that actually will have some regressive implications but what has happened over the past six or seven years -- I think the Fed policy has been pretty strongly progressive. And I am out of time. Thank you.

(applause)

MS. LUND: Thank you David for inviting me today. Good to see all of you here. First I want to congratulate Josh on what is a very accessible and interesting paper on the impact of quantitative easing and LSAPs in particular on inequality. He takes us through a lot of the theory and the empirical evidence in a very accessible way and presents two very interesting counterfactuals, which is what would have happened if we had fiscal policy and what would happen had the Fed done nothing.

So overall I find his arguments and argumentation in the paper very interesting, helpful for anyone to read. So I would congratulate Josh. I want to expand on his overall contention, that in fact quantitative easing and the unconventional monetary policies of the last several years have not noticeably or significantly worsened inequality, in terms of either wealth inequality or income inequality. Like Josh, I want to begin with the strong caveat that no one is disputing the fact that we've seen increases in

both income and wealth inequality. In the United States and in other countries not only since 2007 but predating that as a long term trend. And it's a concerning to an economist in terms of aggregate consumption. Particularly for an economy like the United States where 70 percent of GDP growth comes from consumer spending. And so the stagnant wages and incomes of a large segment of the population is indeed a concern. That said -- I would agree very much with Josh that there is very little evidence that the Federal Reserve's monetary policies have contributed significantly to this. There has been, and I'll walk through 3 reasons why this so.

First there's been -- most of the attention has been paid to the impact of low interest rates and QE on asset prices. We did some work in a report a year and a half ago looking at this question and found in fact for equity prices there is very little evidence that ultra-low interest rates have been responsible for the run up in the U.S. stock market. First point is that many people tend to forget, although I'm not one of them, looking at my personal financial statements, that at the end 2008, U.S. equities lost 35 percent of their value. Global equities lost 37 percent. So the increases we've seen in the stock market -- first of all, let's just put it in context. We're climbing out of a very deep hole.

Secondly you need to look at the theory of through what mechanism should low interest rates boost equity prices. Well the most direct mechanism would be through a dividend pricing model. So we discount future cash flows and the lower the interest rate the lower the discount rate and so that should boost any valuation of the net present value, the future corporate income streams. So you think all right, there is a very direct mechanism. However, both empirically and theoretically, there are some problems with this argumentation. First if that you're a rational expectations investor, you should realize that quantitative easing and ultra-low interest rates are a

temporary policy, and so you should not be valuing corporate prospects ten years out based on whatever the current short term or long term rates are today.

Secondly, sophisticated investors should be using an overall cost of equity, which includes not only the risk free rate, which would be the interest rate, but also an equity market premium. And we've done modeling at McKinsey estimating what is the cost of equity and we find that it is actually a very stable figure over many decades, ranging between seven and eight percent for U.S. equities for instance. And this holds true since the recession -- so even if investors believe the risk free rate has gone down -- they are apparently increasing the equity market risk premium likely with the expectation that in fact that rates will increase. So theoretically there is no real evidence there.

The other argumentation is that well there's a substitution effect. You can't earn anything in bond funds and so we switch to equity funds. When you look at actual investor behavior -- again there is very little evidence that either retail investors or certainly not professional money managers and institutional investors in fact see equities as alternative asset class to bond fixed income funds. So overall we conclude that equity -- that QE has boosted U.S. equity prices by maybe five percent at most compared to where they would have been.

So then the question is, well why have they increased? Well corporate profits are at all-time historic highs. Companies are sitting on over a trillion dollars of cash, so there are good fundamental reasons to believe that equity prices have gone up. When you look at a one year forward looking price earnings ratio you see that U.S. equities are valued only very slightly over what a long term average would have put them at.

So to the extent that the wealthy do hold equities, it's true, they may have gotten some slight boost to the value of their wealth holding. The more important impact

of ultra-low interest rates has been on housing prices. And there it's a much more direct channel because people buy housing with mortgages, and so as the cost of mortgages goes down it should have supported housing prices. Which again, let's be clear, they have fallen dramatically -- they fell 30 percent or more across the U.S. on average. But the evidence is that they would have fallen even more and then even slower to recover without low interest rates. It's a more direct effect in economies where mortgages are variable rate -- like the United Kingdom. The Bank of England has said that low interest rates may have supported U.K. housing prices by 15 to 20 percent. And the U.S. -- it's a somewhat less direct effect because most people have a fixed rate mortgage. So you needed a good credit score to be able to refinance to actually take advantage of these low interest rates.

But as Josh's paper points out -- to the extent we believe that housing prices have been supported, that would affect the broad middle class and not the wealthy. Where for the top ten percent of the income distribution, housing represents only ten percent of their wealth portfolio, compared to the broad middle class where it is the main financial asset.

Now the more direct impact of quantitative easing on household financial well-being that we look at in our report is on interest earnings and interest payments. So here it's a very direct effect; we don't even need to go to theory. So on one hand, anyone with debt has a lower debt service ratio. And for U.S. households over all you see that today's debt service ratio, which includes the cost of interest payments as well as principle payments is now at a level last seen in the early 1990s -- 20 years ago. This reflects both a reduction in mortgage debt through the process of deleveraging but also the very low interest rates. So that's been a huge help for households with debt. Now offsetting that of course is anyone with deposits in banks, and certificates of deposits, or

in fixed income funds has seen very low returns on those types of savings. So we look at a figure that we call the net interest earnings of American households which nets out the lower debt service payments from the lower income earned on cash deposits and fixed income. And what you see is that there is a clear effect across the age distributions. So basically households headed by people under age 54 have benefited because they tend to have more debt, and it's almost a linear effect -- so households under age 35 on average have benefited by 1500 dollars per year. That's almost three percent of their disposable income. The group 35 to 44 is benefitting by about 1700 years per annum, two percent of their income. Then when you go to the other end of the age spectrum, households over 75 who tend not to have debt, are losing 2700 dollars per year through lower interest earnings. Households between 65 and 75 are losing 1900 dollars per year, about two percent of their income. So there has been a generational impact for sure. Again overall though, hard to see how this worsens inequality.

So I want to end with an open ended question meant to spark discussion. In the research we did, we looked at the impact of ultra-low interest rates compared to what they had been. But in my mind there's a very important question -- to what extent are ultra-low interest rates even the product of monetary policy? When you look back over history, since the early 80s, you've seen both nominal and real interest rates fall quite dramatically. When you look across advanced economies the real ex-post rate on ten year government bonds averaged eight percent in 1985. It's down to less than one percent today. The nominal rate on ten year bonds fell from 14 percent in 1985 to two percent on average today.

So what explains this? Well as an economist, we learn that interest rates are a product of the supply and demand for funds. And Ben Bernanke who is not with us pointed out long before the recession that on one hand we have the rise of surplus

savings in many economies of the world, are running large export surpluses and also commodity exporters. But at the same time we've seen a real dearth of demand. So when you look at the gross investment rate of the U.S. and other advanced economies since the early 1980s, you see this secular decline in the amount invested in physical capital. Now part of this reflects a shift to a knowledge economy and intangible capital, part of it reflects the fact that capital goods cost less. They have had tremendous economies of scale and their cost has come down. But overall, we're living in a world in which companies don't see investment opportunities. You read about share buy backs every other day in the press. Many companies have now decided to return some of that cash to shareholders simply because they don't see where productive investment is coming from. And so, if we are living in a world of secular stagnation, and one in which there are too few productive investment opportunities -- then I think there's a real question about even with large scale asset purchases have ended on net -- when are we going to see interest rates rise? And the phenomenon of very low interest rates may well persist for years to come and may be outside of the control of the Federal Reserve or other central banks. And I'm out of time.

(applause)

MR. WESSEL: This is what happens when you don't read the directions. Well thank you both for both clear and succinct statements. I was going to start -- I'm going to keep this session short with the questions so we can get to the rest of the papers, but Josh let me ask you -- so there are two things that just intuitively in my gut, I wonder about. And one is -- it seems to me there's a bit of attention here, on one hand -- you say all this monetary policy did a great job at restoring -- getting us closer to full employment, so that's a plus. But then you say, but it didn't really have much impact on the stock market, so it doesn't have as bad effects on distribution as some people think.

Well, aren't those two ideas at odds with each other? If the quantitative easing packs such a big punch, that we think it'll help get the economy stronger, how can we say it had such a small effect on stock prices?

MR. BIVENS: Yeah, so I wouldn't say it packed that big a punch. I guess maybe -- I definitely think the direction of the LSAPs on economic activity and unemployment were in the right direction. It boosted economic activity; it lowered unemployment. I don't know that it was an enormous punch -- like the slide I had up there, I think it said basically a two percent of GDP peak effect, which happened sometime in the past year or so.

I guess my -- and so that to me is consistent without enormous impacts on the stock market. I guess my bigger point is that any positive impact in lowering unemployment has such strong progressive distributional consequences that even if the Fed's actions didn't have enormous impacts on unemployment, any impact on unemployment is so strongly progressive that that channel works really well, if you're concerned about equity.

MR. WESSELL: Susan, can you talk a little bit about the impact of very low interest rates and government bond purchases on governments? You wrote about this in the McKinsey report, and I think that goes to the really hard to answer counterfactual, which is, so did governments benefit from this? And shouldn't that have made it easier to do more aggressive fiscal policy even though they didn't?

MS. LUND: Yes, thank you for remembering, one of our conclusions was governments are very clear direct beneficiaries. When you look at the net interest payments, it's been much cheaper for governments to borrow. That's particularly true for the United States. At the start of the recession the average maturity on government bonds was in the neighborhood of four, four and half years and they've now extended

maturities a bit. But is a direct savings to governments who can raise money more cheaply than they had. I would never suggest that the Federal Reserve made monetary policy decisions with that as even a remote consideration. But it did enable the U.S. government to have a healthier fiscal picture than it would have otherwise. And we can debate whether that should have been used on more aggressive fiscal stimulus early in the recession. Or even now.

MR. WESSEL: Do you agree with Josh's view that -- so Josh made the point that there was no reason that the Federal Reserve could have expected, had it done less, that Congress would have done more. Do you agree with that? It's a political question.

MS. LUND: I'll say I'm not a political scientist, but I am an economist and empirically we need only look back at the last seven years to see that there has been gridlock in Washington.

MR. WESSEL: You don't need to be an economist to see that.
(laughter) I think we can take a couple questions. Brendan has a mike if there are any. Andy Levin over here. No, no, don't wait for the mike. We don't want to miss anything, Andy.

MR. LEVIN: I really like your paper Josh. It's a really important question. I just checked on a couple websites. The medium real household income has dropped very substantially still since 2008. So I mean, that to me -- it's hard to believe that's all kind of part of a structural trend. And so what you said at the beginning, that there are problems with intentional policy design, I think is the right answer here. And as you know, unemployment isn't the full measure of what's been happening in the labor market. So I think we should also be cautious about not exaggerating how much improvement there's been.

So two points. First, you mentioned about, well, the stock market goes up, but then later when they withdraw the LSAPs, it's gone down. I'm not completely satisfied with that argument. Partly because I think that, as Susan said, the stock market dropped a lot in the aftermath of the recession. And so part of the recovery that we see is the recovery back to something more closer to a normal level. So it's not necessarily the case that ending the LSAPs, or normalizing the balance sheets is going to actually cause a fall in the stock market. But we can think of, is this was a policy that brought the stock market back up closer to its normal level quickly. And that was a policy decision. We could have made policies to try to bring employment back quickly to its normal level. And that didn't really happen.

Okay, and the other point is, what you're comparing to are fiscal alternatives and for the reasons we've talked about including the gridlock, I don't think that's the right comparison. So let me suggest two alternatives. One of them is forward guidance. That's the other tool that FMC has used and other central banks have used. It's an important tool. Mike Kiley has some very nice empirical work examining the differences between forward guidance and LSAPs. There are important differences in how they work. I think there's a strong argument that maybe Don could weigh in, at some point maybe over lunch, about the extent to which the Fed didn't really use forward guidance aggressively at all until around 2013. Right from 2009, 2010, 2011, it was kind of the extended period language which basically said we're only a few months, or nine months away from liftoff. And so in the same way that you're critical of fiscal policy. I think you could ask questions about what would be a counterfactual where the Fed would have introduced much more aggressive forward guidance. And then look at the distributional issues there.

The other --

MR. BIVENS: I just want to ask -- so do you think there's a distributional difference between forward guidance and asset purchases?

MR. LEVIN: That's what Mike Kiley's results suggest. It has to do with the effects on the term premium versus the expected future short rates. So we could talk about that during a coffee break or something. But the other alternative, which was not considered in the United States, but has been considered elsewhere, is to how direct more credit programs to try to provide credits to entrepreneurs, and small businesses. And there are critical distributional issues here of the extent to which the easing monetary policy helps large corporations reduce their debt obligations and really has not helped -- we know this, right, because the business start-up rate has really not improved since 2008. So again, this would be something you could compare as a clean comparison -- again it has to be monetary policy. We're not going to count on the fiscal authorities jumping in. There are a couple other possibilities that could be considered and what are the lessons for the future.

MR. BIVENS: So to be clear, it is in no way my contention that monetary policies sort of satisfactorily fill the short fall in aggregate demand since the Great Recession. To me the most reliable way we could have done that was with really aggressive fiscal policy and we absolutely did not do that and that is why I am so critical of fiscal policy makers. To the degree that someone fumbled the ball in a mammoth way -- to me it's them. And to go back to your earlier question about how can we be sure that they wouldn't have somehow acted better if the Fed had not been so aggressive -- to my mind the Fed chairs communicated really strongly every time they spoke to Congress that fiscal policy is a drag on recovery. I think that's the furthest exam, and yet still there was no response from Congress.

In terms of other counterfactuals and other ways to do monetary policy that could have been better than what we did or amplified it -- I totally agree with that. I mean the recent paper by Simon Renn Lewis and Mark Blythe about maybe trying to figure out a way to give the Fed the ability to actually provide 500 dollars to everybody's checking account, you know, maybe postal bank. They can't do it now -- for sure -- but that would be a great thing for future recessions to think about. And then I would also add housing policy as a big part of this. I think we did miss a key transmission mechanism of lower interest rates. Because so many people who could have been able to refinance couldn't, because their loan to value ratios were too high and if we could have done some program to allow those people into the refinancing channel, that could have helped a lot. So we got --

MR. WESSEL: We'll get to that in a second.

MR. BIVENS: Yeah, this is not to say the Fed did absolutely everything right. I think it's just to say that what they did do pushed it in the right direction, even from a distributional angle.

MS. LUND: I would make two points. I think that the academic literature on forward guidance and its effectiveness is a little bit more subject to debate than you would suggest. At the end of the day I think that we all believe that should economic conditions change suddenly for the better, or for the worse, the Federal Reserve and any other Central Bank in the world would act very quickly, no matter what they said previously.

But the second point on funding for small businesses -- Europe has been the most aggressive with directed lending towards SMEs and trying to promote SME securitization to get credit going to small businesses. And I know this only because we're

doing new research on this. But the results are quite astonishing. So if you take the E.U. as a whole and the U.S., they're roughly the same size economies in terms of GDP.

U.S. SMEs outstanding, according to a study done out of London have three trillion dollars of outstanding credit and in European it was one trillion. So despite the attempt to get credit flowing to SMEs in Europe, that has not been a successful policy. So whatever the Fed has done right or not done right, funding for small businesses in the U.S. is dramatic --

MR. WESSEL: I think what Andy is saying is -- any time you want to feel good about what happened in the U.S. you just use Europe as a benchmark right?

MS. LUND: Good point, good point.

MR. WESSEL: So the question is, what could have we have done that would have made the outcome different? Why don't we take one more question and we'll get more to the second. Bob Samuelson over there, and then we'll move to the second paper. We'll come back to these issues as the day goes on. Bob Samuelson.

MR. SAMUELSON: Thanks, Bob -- Bob Samuelson Washington Post. Last week Byron Lean, who well known stock strategist, now works for Blackstone, put out a commentary in which he accounted the following arithmetic. Since the low point in 2009, stock market valuation has increased 13 trillion dollars. Of that he attributes three trillion, which is almost a quarter to the Federal Reserve's QE policies. That's a major part of the increase. By contrast, your appraisals, both of your appraisals, is that the QE had at most a very modest effect on the increase in stock prices. Could you explain why you think -- and I take Lean's arithmetic to be typical of Wall Street -- that this serves an obsession with what the Fed is doing and has done and will do -- could you try to explain why there is such a large gap between people who are in the markets and people who are watching people in the markets and trying to decide what they're doing?

MR. BIVENS: Okay, Wall Street or economist, right?

MS. LUND: I'll definitely go with the economist. But the stock prices have risen, but they fell 35 percent. Okay. There's one factor. Second factor is look -- in our analysis of QE boosting stock prices by no more than five percent, we did not take into this broader based economic growth effects -- so that if the recession had been dramatically worse and corporate earnings would have therefore been dramatically worse, how bad could have it had been? That counterfactual is something we didn't measure. But for the reasons I explained, I think that corporate profitability is up -- low rates have helped companies very slightly to lower debt service payments like they have helped households. But overall we are living in a world where companies have done very very well. Particularly in the U.S. and that explains the outperformance. But I would -- I will take a look at those calculations and see where we come out so dramatically different.

MR. BIVENS: Yeah, I haven't look at his detailed calculations either -- I haven't heard of this -- so I would like to take a look. I would say I occasionally see traders overestimating -- in my view -- the impact of Federal Reserve decisions. And my guess it's they because they live in such a short term world. I mean if you look at some of the empirical research on LSAPs and event study, where they look at what happened when it was announced and if you stop there you might get a pretty dramatic effect. But then the price goes up when it's announced and then it decays over time. And so getting the impact of the LSAPs over the entire period of time rather than that day that I remember when they announced it and stock prices jumped through the roof, maybe, I feel like that's part of the difference between the trader view of the world -- which is what happened day to day versus what has happened over the entire timespan.

MR. WESSEL: Well let's say that Byron Lean is right. And let's say that -- I mean, after all people who bet on the stock market tend to make more money at it then people who don't bet on the stock market. So if he was right -- and if the effect on stock prices was a lot larger than in your -- as you discussed with the literature, given all the other things -- including house prices, would that have made a big difference on a distribution question?

MR. BIVENS: Yeah, I mean the real horse race is between what it does to stock prices which are very concentrated at the top versus what it does to housing prices which are broadly distributed. If I'm wrong and there is a much larger impact on stock prices, then absolutely a lot of my conclusions need to be modified.

MR. WESSEL: Okay stay here for a minute, we're going to -- I'm just going to introduce the second panel so we can keep this going. The second paper we have which follows really very nicely after this is by Martin Beraja, Erik Hurst, an Joseph Vavra of the University of Chicago, and Andreas Fuster of the New York Fed. Erik Hurst and Andreas are here with us today. And what they look at is -- okay, it's great to say this was good for housing prices, but if you happen to be -- had the misfortune of living in a community where all the housing prices were underwater, it wasn't going to lift your ass -- you weren't going to have this luxury of refinancing -- it might not have helped. So their paper looks at inequality -- but regionally rather than across classes. So why don't we go sit down and we'll come back.

MR. HURST: So our take is a little different than a lot of the other papers that are going on today. Because we're not talking as much about people as we are about space. And we want to ask the question -- where does monetary policy have more of a bite. In the places that were doing relatively bad, or in the places that were doing relatively good. So in terms of the recent economic performance within the U.S. or within

Europe, we know there's a large amount of heterogeneity across different types of places. So, Las Vegas, Nevada versus Dallas -- very different economic performance during the recession. Unemployment rate in Las Vegas got up to 13 percent or so, Dallas peaked at about seven and a half, eight percent. The same type of scenario was going on within Europe -- where Spain is hit much harder than it is in Germany.

So when we think about monetary policy we usually think of it as a pretty blunt tool. There's interest rates, some sort of policy tool moving and that kind of -- because we're talking about monetary unions, by definition that interest rate is constant the member states of the Union. So what we want to think about though is the spatial component of monetary policy, also has some sort of -- is the result of variation in collateral values potentially across space -- the transmission of monetary policy to real activity. You've heard lots of different stories in the first paper about how monetary policy effects real activity -- it boosts stock prices, it boosts home prices. It kind of lowers the cost of credit making firms borrow more, expanding investment which might also cause them to hire more workers. To the extent that some of those transmission from a given monetary policy action to real activity is dependent upon local collateral values, and to the extent that different local collateral values differ dramatically across space -- monetary policy could then have differential impact across space. And I'm going to show you this through some data, that the places where collateral values are most depressed, sometimes see the least amount of response in terms of real activity to a given type of monetary policy.

So what we do in the paper is two things. I'm going to spend almost all of my time today on just the first part, which is data. I'm just going to show you a bunch of data around the first quantitative easing. Not because I believe quantitative easing is different than other types of monetary policy, but just because we can date it exactly.

And I'm going to show you the response across different types of regions within the U.S. to some type of collateralized lending. In this case I'm going to focus exclusively on refinancing. Again -- our point is this applies to much broader types of lending and much broader types of monetary policy. But I'm going to use as a case study quantitative easing right around quantitative easing in the refinancing channel. And I'm going to show you a bunch of data about how refinancing was much stronger in parts of the economy, in parts of the U.S. that were doing relatively stronger. And I'm going to show you, that's actually going to translate into some aspects of spending -- local real activity.

Then the second part of the paper which I'm not going to spend much time on today -- is we try to write down a quantitative model that tries to put in the collateralized lending channel, where there are two types of shocks in the model. One is a shock to call it local income -- local productivity, something that makes Las Vegas doing worse than Dallas. And then there's also going to be another type of shock which is to collateral values. They might causally correlated -- the shock to productivity might cause house prices -- or collateral values in one place to change more than another place. Or they might be arbitrarily uncorrelated. But it's the correlation between these two shocks that is going to determine the distributional effects of monetary policy and also the aggregate effect of a given monetary policy. So if we lower interest rates and the people in the places in the country that are wanting to borrow the most -- or having the most demand for credit, aren't actually able to get that credit because collateral values are low, it can make monetary policy less effective in the aggregate than it would have otherwise. So this correlation between collateral shocks and real productivity shocks or some other local driver of local income is going to be a key correlation that determines the distributional and the aggregate effects of monetary policy. So I'm not

going to spend much time talking about that today but that's going to be the insight from the model we write down.

So from the empirical part we use a lot of data. So I'm going to try to measure again as a case study, quantitative easing -- the first one and I'm going to look at refinancing behavior. And I'm going to use data from the Home Mortgage Disclosure Act -- which actually measures mortgage origination and mortgage application activity in real time. And we're using the micro data of this that is able to be accessed from within inside the Federal Reserve that could date this by day. So you could get very fine type of temporal response in terms of when the mortgage activity takes place. We're also going to use data from Equifax that has their credit risk insight servicing, a data set, which kind of merges credit records into applications -- with mortgage origination activity. So then we can actually see large amounts of information about the borrowers and their loan to value ratios at the time of refinancing. So -- and then a bunch of other data sets as well to merge in, but those are our main two.

So this first picture you should see here is -- the solid line is refinancing activity in the aggregate measured by the Mortgage Brokers Association. And the dashed line is just the 30 year mortgage rate rolling average over time changes. And you can see right at the moment of every picture I show you for the rest of the day -- that red line is going to be the announcement of the first quantitative easing program in November of 2008. And you can see at that moment mortgage rates fell and refinancing activity increased within the U.S. at that moment.

Now the second picture shows you the dark shaded line -- how much of that mortgage activity was due to refinancing and how much of it was due to new originations. And you can see almost all of that activity that responded after the first quantitative easing was in mortgage refinancing. There wasn't a whole bunch of new

home ownership buying at that time. It's just the refinancing of existing mortgages. And that's what we're going to focus on, refinancing, in the paper.

Now in the back of your mind -- we should note what defines space, as I've been talking about. It's the value of collateral that these locations are going to have at the moment that quantitative easing takes place. So what I'm showing you here is the loan to value distribution of borrowers in five different U.S. cities at the moment the first quantitative easing took place. And you can see that bottom line is Las Vegas. And that red line in this picture is how many borrowers have at least 80 percent equity in their home at the time of quantitative easing. And the moment that takes place in Las Vegas in November of 2008, only 20 percent of borrowers have at least 80 percent of how equity within their house at that time, where the comparable number in Philadelphia is like 70 percent. So you could see the type amount of borrowers at risk to be able to refinance differs dramatically across different types of cities at the inception of this first monetary action that we're focusing on in this paper.

The second thing I want to show you -- not surprisingly, this is well documented -- the correlation between how many borrowers are underwater on the vertical axis or at least have loan to value ratios above 0.8 and the change in the unemployment rate up to 2008 November, is highly correlated. The places that were hit hardest in terms of real activity, measured by the unemployment rate going up were the places where the most borrowers were underwater. So there's this strong correlation between real activity, the unemployment rate, and house price declines -- which are making borrowers underwater in these different cities.

And here's pictures -- I'm going to show you a few pictures like that in my remaining time so let me set them up for you. What I've done is clumped all of the MSAs for which we have data -- so think about 300 MSAs in the U.S. -- population weighted into

quartiles based upon how many borrowers are underwater measured by a loan to value ratio of 0.8 at November in 2008. The bottom line is going to include the MSAs like Las Vegas where there a lot of borrowers underwater. I'm going to refer to those as high loan to value ratio places. Okay. The top line is the lowest quartile of borrowers. These are going to include your Philadelphia and your Seattle's in these types of metric. And at the moment that quantitative easing takes place -- the first one, you see a spike in refinancing activity -- they are trending very similarly before. You see a spike in refinancing activity that is much larger in the parts of the country that are doing relatively well. These are going to be these low loan to value type places. And this is in application data -- so this is the moment using the high resolution data. You can see applications spike immediately after the announcement. And differentially in the parts of the country that are doing relatively well.

This is actually on origination data using our Equifax merging of credit records and mortgage data -- and you see, again you see that increase in refinancing activity even in this data set between the high and low loan to value ratios. But it's delayed a month or two. Why? Because it takes time between when we apply for a mortgage and when the mortgage actually closes. So you can see this is actually on closing origination of the mortgage and that's kind of, even though the policy took place in November -- you're seeing big effects in January and February because it just takes time between when an application turns into an origination.

So what about people removing equity? This is going to be one channel for which we're going to be linking to real activity in the economy -- you basically lost your job, the economy is suffering, you have some equity in your house. You basically want to refinance when interest rates go down -- tap into home equity. You might remove some of that equity that you might be able to use for current consumption. And you can see the

amount of equity being removed from the refinancing -- during the refinancing process in response to the quantitative easing was much bigger in the places that had equity. This is not surprising. So you can see that they tapped into their home -- removed some equity during the refinancing process, more so than in the cash out refinancing.

I want to, before showing the next picture of on spending -- I just want to say we kept talking a lot about the effect of monetary policy on house values. Okay, which is something we need to think about. The key thing to keep in mind is that house prices were falling a lot in all areas in this period. And monetary might have stopped the house pricing from falling a little bit more in one region than another. But it still didn't cause people to get equity in their house. People in Las Vegas still had essentially no equity in their home in November of 2008. And the monetary policy might have stopped it from even being less. But the key difference is -- it just didn't help put equity back into people's houses. House prices continued to fall for the next two and a half years from the start of the recession.

Okay. And this is just a measure on spending. So we have one measure of local spending that we look in the paper. And that's new auto purchases. And you can see between the high and low quartiles of MSAs in terms of their spending on cars, or at least their purchases of cars -- they were tracking nearly identical with each other until QE. You see there's a little delay by a couple of months there -- and why is that? Because by the time the originations started -- the applications started and turned to origination. It took about three months before it showed up in spending -- which is exactly what we would expect, if people were liquidity restrained and they needed to tap into their equity before they could actually increase their spending. And you could then see a pretty big difference in spending -- measured by new car purchases between the

places that had equity in their home and the places that didn't have equity in their home at the time of the monetary policy extension.

So I've got two more slides before I conclude. The first of which is -- is this a common feature of all recessions? And the answer is, we don't find evidence of it. So what I'm comparing now in the paper is the 2008 recession -- each one of those dots are different MSAs about the correlation -- change in house price with the change in the unemployment rate. So in this recession there was a strong relationship between unemployment growth and how much house prices change during the recession at the MSA level. That correlation in the gray was not there in the 2001 recession. There was a very weak correlation between house price growth and unemployment changes at the local level during that recession. And then when we look at differential refinancing behavior across MSAs based upon -- in this case, not how much equity they have in their home, just by unemployment changes, we don't see any differential response between the two regions in this recession. If anything, you might see a stronger response in the parts of the country with the higher unemployment rate in terms of refinancing propensity. So it's again this correlation between collateral shocks and something like unemployment that is driving the differential heterogeneity during this recession.

So just putting a little bit of back of the envelope numbers on some of this -- I'm out of time. As we go through and look at how much due to refinancing cash out -- how much is due to mortgage resets? So in the paper -- I didn't talk about here, we have a whole bunch of variable rate mortgages that we look at. We look at home equity lines of credit. So we look at whole bunch of vectors of ways that households can get cash into their hands through the interest rate change from QE and you could find of the total effect that we find in terms of cash out and determined consumption -- home equity lines of credit -- refinancing cash out and reduction or changes in mortgage payments.

About 15 percent of it went to the bottom quartile -- about 30 percent went to the top quartile. So you can see that the distributional effects were helping more the places that were doing relatively better than the places that were doing relatively worse.

So again, this is my summary. It's important to understand the interaction between regional heterogeneity and monetary policy. In the U.S. -- but in particular, Europe as well and we might want to think that the collateralized lending channel might have an effect that we need to think about. And at least during the Great Recession that monetary policy, at least by our estimates, was exasperating regional dispersions. It was helping most, the parts of the country that were doing relatively better, and not helping as much the parts of the country that were doing relatively worse. And then going forward, there's a whole bunch more things that we want to think about -- like who holds the assets and whether we can think about optimal policy. That's it.

(applause)

MR. WESSEL: Now we're going to hear from Mark Zandi from Moody's Analytics who, as long as I've been a reporter in Washington, is someone who we turn to, to help us think about the way that regions of the country differ. So, Mark.

MR. ZANDI: Thank you Dave. I can remember my first conversation with you. It was about the Mount West and I can remember you telling me -- that just doesn't make sense. (laughter) I literally remember, it must have been 25 years ago. But I literally -- actually you were right I wasn't making a lot of sense. I really wasn't making a lot of sense.

Let me say a few things -- first I enjoyed the paper very much. I think it advanced the ball and our understanding of the advocacy of monetary policy. And I'm very sympathetic with your two premises. One, that if you've got an economy with a lot of different regional economies it impairs the advocacy of monetary policy -- both in terms of

its sensitivity of the economy to the monetary policy change but also in terms of the timing. I think that's intuitive, it feels right to me. And also that monetary policy changes can have different regional economic consequences. And also I think looking at a lot of business cycles over 25 years, I think that makes a lot of sense to me -- it's very very intuitive.

I do have some observations though. First is that -- and I think you said it and you said it in paper. This is a case study. It's very partial equilibrium kind of analysis. And you focused very nicely on one aspect of QE monetary policy and the impact on regional economies, and that's the refinance channel and cash out withdrawal. It's a very important channel no doubt, but only one of many -- and I think to really truly understand the effect of QE and other monetary policy on regional economies, it has to be considered more broadly. So, one example of that would be the impact of QE, lower interest rates on ARM readjustment. And you mentioned this in the paper and I think you were right. But I think you're using the wrong counterfactual. And you almost said -- you said it up here. You were looking at the change in the payments resulting from declining interest rates. But the real counterfactual is what would have happened if the Federal Reserve had not done that, and lowered interest rates. The impact on those hard pressed regional economies would have been much more severe. I mean if you go back to before QE, the six month LIBOR which is the key index rate for most of the 228 subprime ARMs that were readjusting at the time was four percent. And right after QE it was zero. And that made a huge difference in terms of those 228 ARMs. I can remember there was a lot of concern at the time about those exploding ARMs and what impact they would have when they actually readjusted and the fact that they did not readjust was a huge boost to those regional economies like Vegas to California to Miami, to Arizona. So, very very important.

There are other channels that matter -- lower interest rates obviously help out the banking system in lots of different ways. Lowering the cost of funds -- that was very very key to the very hard pressed banking system and a lot of these regional economies. One might argue that the lower interest rates were quite helpful in bringing out mom and pop investors that ultimately came in and caused house prices to bottom out and to rise. Without those lower rates those investors couldn't come in to the degree that they did, certainly not as soon as they did.

And there's also a lot of second order effects. One of the interesting things you point out is, and you spend a lot of time on it is, the impact of the cash outs on consumption, particularly auto sales. Well the benefits of those auto sales actually go primarily to one of the hardest pressed regions of the country and that's the industrial Midwest, which was getting hammered by the collapse in the auto industry. So there was a case where the lower rates -- the cash out revise helped the regional economy that was struggling to a significant degree. The other thing to consider is regional mobility. Very important. So even if you're lifting the stronger economies more than the weaker economies because of the mobility in the economy allows for the economy to adjust more quickly and unemployment falls much more rapidly in places like Nevada and Arizona and California because the Texas economy is doing a lot better and you saw those migration flows pick up quite substantially. So even if you're only lifting the initial effect is the stronger regional economies also has a second order effect which I think is very important.

So the bottom line is that when you consider all of these things -- I think it doesn't obviate the result. I think it mitigates it though to a significant degree and you can actually see it in the data today. So go look at employment in the four stand states that got creamed in the downturn. California, Arizona, Nevada, and Florida -- since the

bottom of the recession, let's just use Q2-09 as the bottom -- that's national -- the native of the national recession. Employment in those economies is up 12 percent. Employment everywhere else is up eight percent. Those economies have done marvelously well. Job growth in those four economies has been stronger than the rest of the nation since 2012 and by orders of magnitude current job growth in those four economies together is three percent year over year compared to two percent for the nation. So obviously lots of other things going on, not just QE and you are focused on QE but I think it highlights the point that we need to think about this in a broader, more general equilibrium, so that's very important.

Couple of other observations -- one other observation is that this is a case study and it feels very idiosyncratic to me. So for example -- if I were constructing a scenario for a recession today, and the Federal Reserve does this in its stress testing every year, if you look at the last Fed stress test and the scenario that generated it -- it was motivated by a global downturn -- European crack up of Chinese recession. Okay so if that is the motivation -- if that's the cause of the economic recession that we will struggle with -- and the Federal Reserve's response to that would be to lower interest rates, then that would also -- the key effect of that would be to affect the value of the dollar and benefit the very same regions that are getting hit by the slow down and global activity. So I think it depends. The case study is interesting, but I'm not so sure it translates into other types of economic shocks. It really does depend on the shock in terms of time to understand what the impact is across regions.

And the final observation I make is that the relationships here may be changing pretty rapidly because the financial system is changing very rapidly. I think if we went through this kind of downturn, 25 years ago, 20 years ago, before interstate banking, the regional impacts would have been much more significant than they

ultimately ended up being. This go around, we had a much more nationalized banking system. So when Annie Mac went belly up in San Diego, which is a very large California lender -- Wells Fargo the big national mortgage lender could come in and fill the void and do a lot of that FHAA lending. So the regional impacts are much less significant. And I think they'll be much less significant in the next go around. Because not only is the banking system now more national, but also the shadow banking system is starting to fill in the holes and that is truly national-international. And that will -- I think, in the future mitigate some of the regional heterogeneity that would result from any change in monetary policy.

Let me end by saying a couple things about what all this means for policy. Again let me revert back to point number one. I think the paper is really good. And I think I agree with it, it makes a lot of sense to me, it's very intuitive. So let's just take that as given. And this gets to the final point. This has policy implications. Number one policy implication is that in economies that have more regional heterogeneity, we have more aggressive monetary policy. And this is patently obvious in the context of Europe and European central bank. Their regional dispersions are much much greater than the regional dispersions that exist in the United States. And I would have argued for a much more aggressive ECB than even the Fed. And of course we got just the opposite and of course I think that's one of the reasons why we got such different results here.

The second implication is that in an economy with regional heterogeneity -- you need more fiscal stimulus and or less fiscal austerity and I think that also -- point is very clear in the context certainly of our experience, but certainly of the European experience. And the fact that they went to austerity almost immediately was very counterproductive and much more so than it would have been here primarily, in part because of the disparities in regional economies across Europe.

Finally on policy, this might be more controversial. I think it also argues that fiscal policy should be used to help facilitate monetary policy. And we got a good example of that in your case study, opening up the credit channel for more refinancing. And that was the HARP program -- the Home Affordable Refinance Program. Which was first implemented in 2009, got a revamp at the end of 2011. This cleared out -- cleaned out that channel and actually as of today, 3.3 million home owners in those very distressed states got refinancing because no longer was CLTV a criteria for refinancing for a Fannie/Freddie loan. It made a huge difference to those economies. And I think we need -- obviously there's a lot of political economy issues with regard to the state that the fiscal policy should be used to help support monetary policy and vice versa -- but I think smart fiscal and monetary policy going forward does need to think about how to work together to clean out those channels to allow monetary policy to work more effectively in recessions. Thank you.

(applause)

MR. WESSEL: So in case -- the unfamiliar face here is Andreas Fuster from the New York Fed, who worked on this paper and I'll say on his behalf that nothing he says has anything to do with anything that they think about at the Fed. Or something like that, isn't that the standard disclosure? My favorite was, somebody from the Fed gave a paper at the IMF and said when I use the word we, and he put up a picture of Janet Yellen. I'm not talking about her and me. (laughter)

So I want to pick up a little bit on where Mark ended, Eric and Andreas -- the kind of so what question. So monetary policy always works on an economy as whole. You can't -- it's kind of hard to target it at particular regions. So is there any lesson here for how monetary policy could have been different? And then I'll pick up on the fiscal in a minute. I mean just something -- so you can basically do more --

MR. ZANDI: You have to do more. So at the end if the places where the people have the highest marginal propensity consumed aren't able to borrow and you want to stimulate aggregates. So that's your goal. Your target is the aggregate unemployment rate -- you might have to do more because you're not targeting the people who have the biggest marginal propensity consumed for a given change in interest rate. So --

SPEAKER: No, I agree with that.

MR. WESSEL: So now, I think you raised a good question about fiscal policy Mark. But I want to put it differently --

MR. ZANDI: Of course you would.

MR. WESSEL: If you know that your monetary policy is going to work better in some regions of the country than others -- then should you structure your fiscal policy, your housing policy, to complement what the Fed does? In other words, should they have done more, earlier, on the fiscal side for the Las Vegas's? You know, it took a lot of time to get that -- it was a lot of acronyms before we got to HARP.

MR. ZANDI: Right.

MR. WESSEL: Is that the lesson here -- if you have a housing bust and you know monetary policy, in a world where you have fixed rate mortgages so a lot of people just don't adjust automatically, should they have designed fiscal policy with this in mind? If we had to go through this again would that be the right lesson? Target fiscal policy.

MR. ZANDI: Well, yeah I think that is the lesson. I would say though in all fairness to fiscal policy makers -- it's not like they didn't understand this -- and it's not like the didn't try to grapple with it. I mentioned HARP --

MR. WESSEL: Right.

MR. ZANDI: But there was HAMP, there was all the things that the FHA did. There was the DADSP -- I mean there was a zillion and one things that were designed to address these regional problems. But stating these things and putting them on paper and then actually executing on them in the context of all the different parties that are involved is -- and also given the complete mess at lots of different levels -- in the servicing, and the underwriting originations. I mean a lot of different moving parts here. It was hard to make it work well. And the one program that actually worked in my view well -- it took a little time to get it going, but at the end of the day, it was a slam dunk success was HARP. I mean 3.3 million people -- mostly in these hard pressed areas. I mean you go into Nevada, to Florida, to Arizona, and California. These are mostly -- because they were underwater. You can see Erik's data, they were underwater, and by the way I live in Philadelphia. I don't feel like I have a whole lot of equity. I don't know. I wish I home in Las Vegas right now.

MR. WESSEL: There are a lot on the market --

MR. ZANDI: Much less so then there used to be. But I think the HARP program worked exceptionally well. But that's one of last -- the third thing I said about using fiscal policy to help monetary policy. Of course you have to have a very prolonged attenuated economic problem -- you know, like the great recession to give you the time to be able to do something like that. And in a more typical kind of economic downturn that doesn't work a whole lot well.

MR. FUSTER: I mean fiscal policy in general does have regional components built into automatically. So we can talk about HARP having some effect because it was treating people under water and it did have more effect in some of the stand states than others. But the key thing is unemployment benefit extensions and food stamps and all of those things are set to act in when people are out of a job or don't need

some asset limit -- so those are automatically set up so fiscal policy is built in to do some of this automatically -- we can always just cut a check to people in Las Vegas and there's different ways we can cut a check to people in Las Vegas. Some of it is bailing them out if they're underwater -- some of it is extending unemployment benefits.

MR. ZANDI: In the case of HARP I don't consider that to be a bail out at all. This was a Fannie to Fannie and Freddie to Freddie transaction. And actually it made Fannie and Freddie better off because it reduces the creditors. So that was not a bail out --

MR. FUSTER: But it comes out as subsidy to other people that are being backed up at some tax payer dollars. So there is some in the background -- some of this is going on.

MR. WESSEL: I thought the loser was the person that held debt.

SPEAKER: Fast Freddie --

SPEAKER: Exactly or if it were to be said that we're subsidizing --

SPEAKER: But they expected those -- from their expectations they expected free pays. They didn't get free pays because they were underwater. So you just --

MR. FUSTER: Can I maybe add to HARP -- it's a slam dunk it happened sort of late. It happened 2012 is when it really took off. Secondly non-agency borrowers were not helped by the program. So sub-prime (inaudible) borrowers that were very prevalent in Vegas -- they could not refinance under that program. So if you compare it to the world in which we have the adjustable rate mortgages, or mortgages that ratchet down or where you don't have to re-underwrite the loan, I think that even with HARP, the transmission was quite a bit weaker.

MR. WESSEL: What about the Europe -- do you draw parallels. Mark made some observations about Europe.

SPEAKER: When you start thinking now. There's two things about the Europe -- the dispersion is bigger, so we can know the Spanish versus the Germans are bigger than Dallas versus Las Vegas. But at the same time, they don't have an integrated fiscal system. So some of the automatic stabilizers we have built into our system doesn't exist. So when we're thinking about monetary policy as being the tool of the European Union, if it has distributional effects, if there's big values and collateral values you don't have anything in the background to come in and offset that through automatic -- and that's what you're seeing now, you've got cut checks. And the Germans have to vote every time they want to cut a check. The people in Greece as well as into the U.S., it's just built into the political process that Las Vegas got more checks than Dallas.

MR. WESSEL: Question in the back there -- and then (inaudible).

SPEAKER: Good morning, Tom (inaudible) from the FL-CIO. Thank you very much for a very interesting paper. I would like to try and roll the question back a little to something that Josh asked, and make the connection. We know that contractionary macroeconomic policy is essentially in-egalitarian. And expansionary macro policy is egalitarian. It makes sense. You're going to be improving the labor market, good for wages, good for jobs. And if you're doing interest rates, loans capital interest rates, sort of a payment between groups. But the question then is -- could we have done better? And Josh kicked it off by saying, monetary policy versus fiscal policy. I think -- since we're talking QE, and we want to draw some implications for future policy -- let's try and pull it back to monetary policy versus another form of alternative monetary policies. And then of course Josh started saying something -- let's try and get

to the policy implications and how we might improve future performance and make monetary policy more egalitarian -- even if it's pushing in the right direction -- can we make it even better? And so here Josh started with the idea of giving the Fed, somehow or other, the power to send people checks directly. I think that's probably -- would be a good way of doing things. Address directly these things if you think that monetary policy is some sort of transfer of funds between groups, this goes to everybody getting it and the Fed can draw it back again if it ever wants to pull liquidity out of the system -- it can use its existing powers to raise interest rates and get people to redeposit their funds with the --

MR WESSEL: But do you see any line then between fiscal and monetary policy?

SPEAKER: Fiscal policy is about buying resources. That's traditionally how we've seen it -- government spending. But anyway -- I just want to make a list of things that might do that. The other thing is refi directly. Mark talked about HARP. Anyone who has -- this QE in terms of the housing market could have been so much more effective had people just been able to jump -- if you could set up some mechanisms to jump through the process so that you get direct access if you want it. I mean refinanced a couple of times. And every time I had to pay 1800 dollars in mortgage insurance -- by the way I'd like to put that on the Brookings agenda. Can we do something about this question of always having to pay for fantastic mortgage insurance? I can't believe it's actuarially fair that on defaults on property rights and so on -- that's the justification every bank will always tell you. It's a fantastic fixed cost to refinancing. And that's a policy consideration if we could really get that --

MR. WESSEL: Okay, one more on your list otherwise we won't have any time for anybody to respond.

SPEAKER: I've advocated for a very long time, is something called asset based reserve requirements. So for instance you could -- and a mortgage fits that very directly, you could have different reserve requirements based on the state of housing markets. You could say, new mortgages in Nevada versus new mortgages in New York. Very applicable by the way to Europe right now. If they had some sort of asset based reserve requirement scheme. Finally how about bringing about marginal requirements looking to the future, one of the things that's driving monetary policy now has been fears of an asset bubble. Well let's not torpedo the economy with higher rates that might affect investment, the exchange rate and housing. And if we are worried about an asset bubble the Fed should be getting back into the business of adjusting marginal requirements.

MR. WESSEL: I'm sorry -- that's a separate conversation. Do you want to respond?

SPEAKER: That's a lot of thoughts. But the key thing when we're thinking about -- kind of the point of our paper, we've got to think about the channels in which monetary is taking place. And some of those have regional components to them and some do not. Mark touched a little bit on this. The strength of the banking sector to the extent that the U.S. banking system is mostly national now doesn't have much of a regional component except to the extent that people are willing to extend credit. So if we prop up banks by having asset limits of ex ante, and we still have booms and busts in local housing prices -- the fact that when the Fed lowers interest rates and they are making a decision about whether to make a loan based upon local collateral values, you're still going to have regional distribution well on top of that.

SPEAKER: A lot of interesting ideas and obviously a lot of negatives and positives we have to iron out. But the one thing you didn't quite mention which I think

would be very useful in the context of future crisis and recessions would be counter-cyclical capital standards. Right now they're pretty much set through the cycle and in fact one could argue given the way they are implemented and likely to be implemented in the future through the stress testing process, they could very well be pro-cyclical. And that is exactly the wrong way you would want to do it. So you would want to set up a system where you have capital standards set -- counter-cyclically. And some countries are effectively doing this. So if you go look at macro prudential responses to central housing bubbles in New Zealand or Australia or Canada or even the U.K., they're taking this counter-cyclical stance. And I think that's the approach we should take.

MR. WESSEL: Don't we have to have counter-cyclical capital buffers in Dodd Frank? We see whether the Fed will use them.

SPEAKER: We'll see how this works, but my gut tells me --

MR. WESSEL: Basel III.

SPEAKER: Yeah, we'll see how this is actually -- MR.

WESSEL: Fair enough. John Sablehouse

SPEAKER: Thanks, I'm John Sablehouse from the Fed so anything I say should not be held against them. But I think is a question anyway. It's for Erik. And so what you're diff and diff analysis showed us was the lack of a positive effect in the sort of low LTV -- or high LTV regions. I'm wondering is, if the same analysis could be used to show the absence of a continued negative trend in the same areas -- so in particular looking at defaults and new defaults that were happening. So was there anything around that time if we drew the same sort of pictures -- we would see much higher default initiations in these high LTV regions. And did that suddenly change right around the time of QE and is that an avenue that we could add to the ledger on the other side?

MR. HURST: Yeah, so to be clear -- everything that picks up -- nothing is about levels, so everything is only about differences. That's kind of the design of these regional things. Anything that's general equilibrium in general, could push everybody up or everybody down and this is only differential. So you should think about it, it's not these regions are not helped at all -- it's just that they're helped relatively less than the good regions. So that's the first thing. When you look at things like defaults or house price changes or things that we've looked at -- some of those, you don't see much differential response, and if anything the better-ness when you have to squint a little -- looks like the better regions are having less house price to cut. And part of this is -- the bad regions were overvalued to begin with. So if people keep wanting to talk about propping up house prices, we're just effecting the trend back to the equilibrium. Some times that trend could go fast; sometimes that trend could go slow. So we know these bad regions were going down much more than the good regions just because they were much more overvalued. And you still see that. Now when you try to look at or slow down the trend or not? You can't see much avenue of differential effect, between --

SPEAKER: In defaults.

MR FUSTER: Yeah you notice that at the regional level you don't see very much. There are micro studies that show that you know, when the payment is lower, the default propensity falls substantially -- sort of on impact.

MR. HURST: We look at that, so we have that in the payment reset in our things and they didn't look that much differential between the two regions. Again, it could have aggregate effects but we're only picking out the relative effects. And you don't see anything else adding up in the relative effects between these two -- the high and low region.

MR. WESSEL: Let's stop here and we can revisit this later. We're going to take a break and I'm going to try to hold it to about five minutes so we can get close to being back on schedule. There's coffee and some pastries out here in the lobby. Thank you guys very much it was great.

(applause)

MR. BIVENS: I just want to ask, so do you think there's a distributional difference between forward guidance and asset purchases?

SPEAKER: That's what Mike (inaudible)'s results suggest and it has to do with the effects on the term premium versus the expected future short rates. So we could talk about that during a coffee break or something. But the other alternative of which was not considered in the United States, but has been considered elsewhere is to have more direct credit programs to try to provide credits to entrepreneurs. And small businesses. And there are critical distributional issues here of the extent to which the easing monetary policy helps large corporations reduce their debt obligations and really has not helped -- we know this. The business start-up rate has really not improved since 2008. So again, this would be something you could compare as a clean comparison -- again it has to be monetary policy. We're not going to count on the fiscal authorities jumping in, there are a couple other possibilities that could be considered and what are the lessons for the future.

MR. BIVENS: So to be clear, it is in no way my contention that monetary policy satisfactorily filled the short fallen aggregate demand since the recession.

MR. WESSEL: Our third paper today is by Matthias Doepke and Veronika Selezneva -- how'd I do good -- of Northwestern and Martin Schneider of Stanford. They built an economic model that helps us think about and using actually some of the survey

of consumer finance data, John, that helps us think about, okay, if wealth changes it changes differently for different sets of people in the economy and when we think about the distributional aspect of quantitative easing, when we try and answer the question does it increase or decrease inequality you have to look at the different categories of people and how much their wealth changes because it's really a question of summing up the winners and comparing them to the losers. So, as you'll hear they find – they use a model of where they – say if the fed sets out to increase inflation which is kind of a proxy for QE what happens to different groups of people, different groups of homeowners. Matthias is going to give the initial presentation and then we're very pleased to have Jean Boivin who is the former deputy finance minister from Canada who has actually done a lot of thinking about these questions now at Blackrock to respond. Thank you.

MR. DOEPKE: Thanks for the introduction. It's good to be here. This paper touches on many of the same themes we've already talked about in the first two presentations. The difference is that we approach this more from the perspective of formal macroeconomic modeling. As we have already discussed monetary policy works in part by moving interest rates both the short term real rate by setting the federal funds rate, to some extent long rates if you think of quantity of easing having some impact on the slope of the yield curve and perhaps most importantly normal rates also through inflation and future inflation expectations. If people expect high inflation normal rates will go up to compensate for this high inflation. So, in this paper we want to document exactly how large this distribution would be for alternative policy scenarios and then use a formal macroeconomic model to figure out the consequences of those changes for macro-aggregates and also for welfare. Compared to the previous papers it's kind of the same question more applied to formal – more applied from a formal modeling perspective. The motivation for this paper, in fact, goes back some time. So now this is

a concern that is very wide spread with the recent change in the macroeconomic environment, but Martin and I both grew up in Germany and as you may know Germans have a pathological fear of inflation.

And so what was kind of interesting for us is that when you grow up in Germany, elementary school you learn that inflation is bad, they tell you this in second grade and they tell you it's bad because of redistribution. The reason you are told about is that if inflation is high grandma will lose her money because of a savings account that has a fixed interest rate. And so it's really about the redistribution effect. Then later you go to graduate school and then you have a bunch of monetary models, all monetary models that you see in graduate schools are models in only household, so only one person in there, there is no different household, there is no redistribution.

And so this kind of dissonance between what we learned about why inflation is bad and what the model can actually do is what the initial motivation was. So what we are trying to do here is to use a model that has different types of people where distribution can happen and then use this model to figure out whether what we learned back in elementary school actually makes any sense. That's the overall plan which of course has now become of more current importance.

The first step of this research program is to document in the data exactly who holds nominal assets and who has nominal debt. If you are a lender you are going to lose from high inflation, it's going to devalue the value of what you have. If you are a borrower you have a big mortgage and it's actually great for you to have inflation, because the revalue of the mortgage shrinks, the house appreciates with inflation and you are normative wealth gain. The first thing you have to do is document who has what in the economy. **And so for this view of house accounts and also to service consumer finances, you use the 2013 edition of this, so it's a very current picture of what the**

distribution of nominal wealth look like in the US economy. A key part of that work is to distinguish asset/liabilities by maturity because if you think about changes in inflation, expectation such as a new announcement of a high end invasion target this will effect short and long duration assets very differently. If you have money in an account with a daily changing interest rate you are really not that much exposed to change in future expectations because interest rates will adjust to this. On the other hand if you have a 30 year mortgage or 10 year government bond, the prices of those, the values of those will be highly reactive.

In this data we document not just who owes what, but also what the average duration is of assets/liabilities for different groups in the economy. I'm not going to talk about the data in too much detail just to show you one picture for the economic aggregates. This picture shows you as a fraction of GDP the overall asset position of the U.S. household sector. So we simply look here at the flow of funds and sum up all the nominal assets and all the nominal liabilities and nominal here means in terms of U.S. dollars because that's what's affected by changes in the inflation.

So the green line is the assets and then the solid blue line is the directly held debts, things like mortgages would be also a comfort if you had some indirect holdings. What we do mean by this? So the household sector owns firms through stocks and also through mutual funds and the corporate sector itself has debt also, so they are on the corporate side. And so if debt gets devalued through inflation you'd expect the revalue of holding the corporate sector goes up also. And so the total debt, the dashed blue line essentially consolidates the firm sector into the household sector to take account of this fact.

Two things you can see here is that there was a huge increase in the liabilities, in the debt of the household sector after about 1980, uh, and you can see in

fact that just before the crisis the dashed blue line and the green line coincide. For a short moment of time we had the U.S. household sector essentially being balanced in terms of assets and liabilities. And that's very unusual because traditionally the household sector was the net lender and the government was the net borrower.

The government debt was financed by the U.S. household sector and that changed massively from 1980 until 2006, 2007, so this reflected the huge inflow of, um, of funds from abroad. So, foreigners weren't really holding many U.S. assets previously but, uh, that changed after 1980 and, uh, by about 2006, um, essentially all, uh, all U.S. government debt, uh, on average was held abroad. Of course not every single bond because there's huge differences in holdings, but the overall normal investments of the foreign sector in the U.S. economy was essentially equal to government debt and therefore the household sector is roughly balanced.

That's kind of one thing that has changed massively and also is kind of relevant for potential redistribution implications of inflation. Then you see after the crisis huge leveraging, so both lines dropped very quickly and so now there's a new gap opening up between assets and liabilities. This is the aggregate picture we'd be more interested in -- is redistribution within the household sector. We see that the household sector as a whole has huge assets and huge liabilities. Of course, if you look at individual households there are different households who have the assets and different households who have the liabilities. So to distinguish those to see who gains and who loses from inflation or other changes in interest rates, so that's what the rest of the paper does.

You can do with this accounting framework but the modeling framework you can do many different experiments. The one I want to show you today for the most part is essentially an experiment of raising future inflation. This is a bit related to QE, but

it's more related to change the inflation target which is another policy option people have been discussing recently partly because of concerns about the zero law bond. We have now a period of, uh, zero interest rate not just here, but also in Japan for many years now which has raised to (inaudible) something that wouldn't be safer to have a somewhat higher inflation chart. And so here we would figure out what would happen if the fed were to announce a new inflation target as five percentage points higher than the previous target. Of course, you can scale this up and down anyway you want.

And so the experiment is that this announcement is made and what I'm going to show you is the outcome if after this announcement of the rest of the changed inflation is fully anticipated. So people believe what's going to happen and then everything ends up perfect for a sight. If there is a repeated surprise people don't quite believe or if there is changes in the future also everything is the same, only bigger, so repeated surprises lead to larger redistribution effect. In our experiment because everything is anticipated this change **will lead to part of the attribute years**, so that all horizons the interest rates will – the nominal rates will jump by five percent essentially to compensate for this higher inflation.

Here is just from the data and the assumed experiment via impact on the wealth of different types of households of this redistribution. We do it in the paper for many different groups but the most important ones to consider are these three so the first group is renters and on the (inaudible) of the age these households of different ages who are having to rent their home. At the bottom you see the rich and the rich are defined as the top 10% by net worth in each age cohort. We distinguish the rich because it's well known that the wealth distribution is highly concentrated so it's a small percentage group at the top that (inaudible) the most wealth holders. We looked at those separately. And

then what's left is essentially everybody else except people who are not rich and own their homes. So we call this middle class homeowners.

What you see in the picture is the change in wealth from the – the immediate change in wealth from this new inflation path for each group expresses a percent of GDP. Because the first thing you can see from this picture is the ranges and the effective – surprisingly they are renting a house in need of a mortgage – they also are not rich they don't have many assets so they are – the impact on their position can be very small. There is some but it's small. The losses are essentially coming all from one group which is the old rich. If you look at the negative numbers there it is the rich people over about 55 years of age who are taking this hit. And this is percent of GDP, but it is for a group that is only two and a half years in worth, so each group makes up only about one or two percent of the population. One percent change in wealth compared to GDP if only one percent of the population is actually a very large wealth change, so these older among the rich are losing a lot and this is because the old rich have a large portfolio of bonds and savings. We talk a lot about the rich being highly invested in equity and it's true that the ratio of equity to fixed income and investments is higher for the rich compared to the middle class but because the rich are so rich it's still true that they still account also for most of the holdings of nominal assets. So that's why – that's where their losses are. Versus the gains – the gains come from essentially from holding mortgages. The gains occur if you have debt, the main source of debt is mortgages and the people of mortgages are the middle class and middle age. If you are rich you are rich enough to have a mortgage, so the top 10 percent rarely have any debt at all. If you are very old you probably have paid back your mortgage, if you are very young you haven't bought a house yet. It's the middle income, middle age range and so you see from about age 30 to about 50 large gains close to 1 percent of GDP for those groups. And again

there are groups that are about two percent of households so for them compared to the income it's a huge change in wealth just because the mortgage typically is very large compared to household income. Many people have mortgage that are multiple of their annual household income. We see in the aggregate essentially a large flow from the old rich to the middle class, middle aged. Okay, and so that's going to be interesting on its own, but the next step is to figure out what is this flow of wealth just to the macro-economy. For that you need a model to understand how does the behavior of the rich or old differ from the behavior of these middle class households to see whether this effect – I'm going to cancel out in the aggregate or if there is something that is going to happen to the macro economy. This is where the model comes in. People built a fairly rich lifecycle model, with different types of households. The different wealth income, there is income shock so income is variable over time. Also preferences, we have preferences in there because we want to capture the fact that a fraction of households financial constraint. And certainly whether you are financially constraint, meaning you are close to borrowing concern or not will have some bearing on how your consumption is going to react to changes in your wealth. And then we also have, of course, difference in the asset position. A keeper of the paper which rhymes with many of the – with the two other papers in this session is that we really focus on the housing sector. We saw that margins of a very important part of the transmission of the shocks, so depending on how house prices react is going to be important. And so we have different types of houses in there, this is renting and buying decision and we also distinguish two segments of the housing market – small and large houses and I will show you how in a second this is relevant. The way the model works is a small opening is only as far as the interest rate is concerned, so think of this has being set in world markets, but the housing market clears inside the country. So there is going to be repercussions for housing prices. And

then, uh, so what we do the formally is we calibrate model to U.S. data, uh, we introduce this policy change as a shock and to an economy in a city/state. And we are essentially going to change the wealth position of each household based on what I've shown you from the data. So we are going to take the middle class, middle age, uh, in our model and make them richer or lower the debt in line with the data. We are going to take the old, uh, rich and our model and make them poorer compared to the same amount what is in the data. Let me just compute forward what is going to happen to this economy. Let me show you kind of the main points from the results. The first year is on housing prices, on the axis is years from zero to 25 years after the shock. On the vertical axis is the percentage change of the housing prices. So what we see is prices go up, but they go up, only for the large houses. They actually don't go up at all for the small houses.

That was something we were surprised by initially but it actually makes a lot of sense. So what is this? So the gains are from the shock go these middle class mortgage borrowers. And so this increase in wealth you would expect give you an increase in the demand for houses. They are richer, they are going to have more, one thing they have more of is houses. But the key thing about these borrowers is that they all ready have a house and so the demand that they have is going to be for upgrade houses. They at some point want to move to a bigger house and so the exchange of prices for the houses they want to move to not the house they are in right now. Versus the margin of demand for the smallest houses comes from people who don't have houses yet, they are starter houses and the demand for those comes from renters but renters don't gain from inflation. You do have an impact on housing values, but it's really for the upper distribution, it's not for the lowest level of houses.

If you are concerned about for example the very entry levels of the markets where we had kind of the biggest change in the crisis, this policy actually

wouldn't help you as much as what we perhaps initially would have expected. A bit of talk about macro-aggregates and so here is change in aggregate consumption, change in aggregate output over the 25 years after the (inaudible). So to say again a couple of things about this, the first thing to notice about these changes is that they are extremely persistent. Most of the time when we talk about monetary policy we impact in terms of quarters. You know what happens two, three quarters afterwards. This picture in terms of years, you see these effects are around for many years, so the impact on output peaks after two and a half years but it's kind of visible at least ten, fifteen years after the shock. And this is because these changes come through change in wealth and change in wealth are going to be effecting the economy until essentially courts are replaced by new courts. People have to age and die and young people have to be born for these things to go away. So these things aren't super large in impact, but they are extremely persistent. Sometime to keep in mind when thinking about redistribution effect. The other thing is in fact negative.

And so output fall and consumption falls and the reason this is happening is that first thing about consumption is that the losses go to older people and in the life cycle the older people have a higher propensity to consume because they are working over a small horizon, versus the young people have many years to consider and so they are going to save a larger fraction of their gain and not as spend as much. Again, this is natural for the life cycle, more over we would expect that initially it may go the other way around because of financial constraints. Now people have financial constraint if they are at the borrowing constraint getting a windfall would make you spend a lot of consumption right now. And we did design the model to capture this so we have people who are impatient who are at the borrowing constraint and still it wasn't enough.

It seems that because the gains go to essentially the people with the biggest mortgages and those are the poorest people that the age effect still dominates. Okay, so I think I will skip this one just to talk about welfare I would say two things about this. The welfare effects are modified to some extent because of your impact on housing prices. If you have a direct loss to your wealth, but the house that you go up – that you own goes up in value that would mitigate to some extent the direct effect. You kind of have to look at the model to understand the full effect in welfare.

But a more important thing is to look at the picture and just notice the scale, because everything else I've sold shown you to scale where at the upper end was like a 2 percent change you had the change that you see is a 10 percent change and the units here are units of consumption. So what essentially a five percent change means which is what our 50 year old middle class households gain is that this change innovation makes them as much better off as they would be if you increased the inflation permanently by five percent. And if you have seen any macro-models welfare change of five percent is just huge. Most policy changes to be considered have changes in welfare that are – that all of a fraction of a percent and here you get margin of percents.

What I'm trying to point out here is that the stakes for welfare of particular groups are just huge. The potential impact you will get from change innovation if you have a large mortgage completely outweigh any other policy change which to me suggests that thinking about the political economy of this is actually quite important because people have very much reason to be concerned about these changes, much more so than most of the macro policy changes. Okay, we also have an interest rate chart – I'm out of time so I won't go into that – let me just say that lowering interest rate in fact turns out to be quite similar in the implications than our inflation experiment even though the effect are large in magnitude. And this was touched on before so there is

some – some debate on whether changes interest rate is good or bad for rich or poor people and our model totally good for the middle class mortgage buyers just because mortgages get cheaper and cheaper it's bad for the old rich and there is some debate about change in asset prices. It's of course true that if you have a long term bond and interest rates fall that the value of the bond goes up at the short term but if you are a saver and if saving is what you do, interest rates aren't going to be good for you and this is what kind of comes out in the model. Okay, let me summarize the key points.

I think the most important point to notice is the change in welfare from inflation or other (inaudible) change is huge. In that sense the German's had some reason, I think, to be concerned about that because that's really what dominates if you think about a personal perspective what you should think about inflation. The effect on aggregates are highly persistent because it's determined by wealth and they don't away as long as the core that they effect area around. The effect in aggregates tend to be downward so a downward shift in labor supply and output, but different from what we may have expected. And there is an effect on housing prices but the housing price is more effected upper distribution as opposed to the (inaudible) level amount. Thanks.

MR. BOIVIN: So thank you very much for having me here and giving me the chance to talk about these issues and to spend some time on this very interesting piece of work. So I have a few comments to make and maybe as a way to start I will just start with some initial considerations. So the – I took the topic and the question of what we are trying to address today and maybe literally and I want to preface my comment by saying that because I think there is a lot of interesting result from the paper, uh, and that have implications beyond the questions we are trying to tackle with today. But, I'm going to try to see what the paper tells us about the question we're trying to do today and I think the question is about, QE monetary policy on conventional policies and their impact on

inequality. I think that raises the question of what do we mean by monetary policy and I'll make a couple of comments on this and trying to think about what they have presented here in terms of result and whether this is – what aspect of monetary policy this is really talking about. And I think at the end of the day the essence of my comment are about a distinction I think in terms of what we mean by countercyclical policies, monetary policy versus what we think should be design feature of monetary policy itself. And I think this paper speaks more about framework and the design featured and countercyclical policies and whether QE conventional policies are bad or good for inequality.

That's the set up, I think Matt just did a fantastic job describing the paper. I prepared a slide in case he had not done that, but I will just – just now show that I think I understood the paper. So it starts from the observation that we have large gross nominal positions which means that inflation could potentially have a very important implication in terms of welfare distributions and the experiment that is being considered here is what if the fed were to increase its inflation target from two percent to seven percent for 10 years. I am making it as explicit as I can because I'm going to come back to that and try to think about, okay, how do we think about this experiment?

Then we have an environment in which they are going to be carrying out this experiment and the design ingredients are – we have a world where there is borrowing constraints. That's going to explain part of the result. We also have households that are different and they are different in terms of their age, their patients and also we assume that there is some inequality at the outset. These households are exogenously different in terms of the inequality outcome or the income/outcome that they'll be facing during their life. And then I think there is a lot of great work being done in calibrating very carefully this (inaudible) to the flow fund account and the survey of

consumer finance. And this is based on what they have done before and I mean there is a considerable contribution being made there.

What did they find? Well, they found that I think this is pretty intuitive. It's not obvious that all of these results would have carried out dramatically as I was mentioning in the presentation, but I think if you boil it down we see that inflation distributes well away from the asset rich elderly in this set up towards the more indebted middle age, middle class owners which have typically large mortgages. Doing that it pushes the price of larger house higher or the more higher and of the – of that segment because these middle income people now that have been receiving this windfall are trying to upgrade their house.

Again I think this is pretty intuitive and finally inflation reduces aggregate consumption and ultimately because the middle class households have a lower propensity to consume, they have a longer lifespan ahead of them allowing them to be more patient. Based on that the others I think the (inaudible) conclusions are that inflation has quantitatively large distributive effects and this is an important result because we haven't been exploring the implication into distribution of military policy that extensively and having mechanism where you can see that in action I think is very important and the author's suggest that this makes changes in monetary policy contentious from a political point of view. They also conclude that inflation may have a contractionary impact on activity which is again interesting and maybe intuitive and finally we have some implication for the housing market which we've been discussing and I won't dwell on that. What do I take away from this in terms of how I think about monetary policy and I think this has implications for the design of policy frameworks. At the Bank of Canada in 2001 we went through the process of our inflation target and we had to think about questions like should we move to a price level target

instead of an inflation target or should we think about changing the level of that inflation target? Interestingly at the time the question was to lower that inflation target as opposed to increase it, so we went to this and the distributional questions like kind of models that have been displayed here were part of the kind of analysis that we've done at the time and I think this is very relevant. I think that the paper by itself speak to the question of what's the right level of the inflation target as was mentioned during presentation this was a relevant question, it's on the table right now. I don't think personally it should be on the table, I think it's the wrong moment to be thinking about this but I think we should first achieve our inflation target collectively around the world and then talk about changing them, but it is on the table, I mean it started at the out – I think a few years during the crisis with (inaudible) I think raising that the bank of Canada in fact has been doing a couple of speeches recently where they have mentioned that this is a question that they are studying as part of their renewal for 2016 and there was a loan FC member in the last minute that has raised that as well I believe from the last minute so this is on the table and I think this paper shows another (inaudible) potentially why it could be costly to do so if the intent is to stimulate the economy it seems to be working in the opposite direction because it would be contractionary in terms of output if you just look at the output implication.

But in that context I have to say that paper – we were talking about the inequality here and I wasn't sure where the others were coming down in terms of what it means for inequality, so we have in the setup people are born unequal by construction, you either can be born rich or as part of the masses as they put it in the paper and inflation created some redistribution in that context from the elderly to the middle income people. And so should we think of that and I don't think that this is what given my German upbringing. I'm not sure this is what was in the mind here, but I think it might

suggest if you just look at the result on the face of it that it might not be a bad thing for inequality if this is what you are looking after and inflation might be redistributing progressively well. It's an obituary, potentially redistribution of wealth but some people could see that as maybe an outcome of that. I think a question is what do they make out of this implication for inequality and more general point is in this case for monetary policy to have something to do in terms of distribution and equality you need to have inequality to start with, so you have to assume that and I think that as – that's maybe something for the panel but I think it begs questions about when we are talking about QE effecting inequality or any conventional policies what is really behind the in equality that we are exacerbating potentially.

I think I have a couple of minutes so let me make a couple of more points, even if the question is about the inflation target I'm wondering if this is the right experiment to look at and let me just explain and again taking things literally here we have a 500 basis points increase in inflation target which means 65 percent increase in the price level over 10 years, so I think this is huge. People are talking about potentially raising the inflation target but I think one of the reasons is because the neutral rate might be lower now for reasons that were mentioned in the first session. I think if you look at the survey of the economic forecast for (inaudible) it's a few basis points lower now from when they were taken a few years ago, Doug made a comment back in February that he thought that the long run (inaudible) was three and a half as opposed to four and a quarter.

I think we're talking about something in the order of 75 basis points and maybe you show the price of showing us that on top of that likelihood of hitting zero bound is significant so you want to add some cushion, so maybe 100 basis points, 200 basis points maybe? But I think 500 basis points is out of the realm of at least the

question and level of sufficient target I would consider seriously and so then the question is if that's the question we're after, um, are the result quantitatively important and I think there are questions around that because we are cutting the shock it's 2/5 of the shock now. I think this is a nominal model which would tend to make a bigger shock have even a bigger impact. I think we end up with a much smaller impact on consumption and output and also there is another question about the increase being permanent as opposed to being only for 10 years. These are design questions of the framework, the model may allow it do more, but based on the design I think the question is we need to think about. I'm out of time so I just want to finish with a couple of thing, I think this experiment is useful to think about the 1970's style of situation where you have inflation that goes up by 500 basis points and I think this is kind of the order of magnitude that you would want to calibrate for the 70's, but then in that case I think I would see the implication. It's not being really about monetary policy and its implementation but about the consequences of doing policy mistakes. I don't think any central banks are intending to reproduce the 70's outcome, I hope at least and in that case I think this is really about inflation, the cost of inflation which is important and it's a design of policy but less about whether policy itself and its implementation as a distributional impact. I would – this is getting into G-20 where we are submitting type of things. If I had to negotiate that task I would say that changes in inflation target should be policy contentious. It's not really the policy regime because and in fact I think this is why we think in Canada that the agreement of the level of inflation is a political decision and it should be jointly decided by the government and the Bank of Canada which is a separate question from the implementation of policy and unconventional policies. That's where I'm going leave it with minus two minutes and again I want to reiterate that this is about the question – this forum but I think this is a very important piece of work.

MR. WESSEL: I want to keep this short but come please sit up here for a minute. Sit down. Matthias I wonder if you could start by if you wanted to respond at all to what Jean said.

MR. DOEPKE: Thanks for your comment. I basically agree with most of what you say and it's of course true. The experiment we do is large, change not exactly what we would expect to be implemented in the next few years. At this stage it's more exploring what the model does and then kind of drastic experiment makes it a little more easier. We can use the same framework to access all kinds of policy (inaudible) some of his work has to be done. I think though it goes slightly the other way because the thing that makes things look linear is borrowing constraints essentially, so if people are up against borrowing constraints they behave differently compared to being away from it because of the experiment that we do that it's one that relieves borrowing constraints. It moves people away from the maximum because it lowers debt. It would in fact be I think like in the other direction. It would certainly be smaller so I don't think more than proportionally smaller in terms of the impact. That's just in terms of the experiment, in terms of the aggregate it's true, the output affect or aggregate is relatively small and I think it's fair to say that this is probably not the main reason that monetary policy or inflation trends would affect output. As (inaudible) put out however in this paper we have only looked at one aspect which is the distribution within the household sector.

And another thing that is a bit visible from the very first picture is that one thing that is also going to be important is a redistribution between the broad sector but also the households and also the government and the foreign sector. And this is a picture that has completely changed because as I mentioned with this picture by this point we have a huge amount of assets being held by foreigners and other huge government debt. And so some of the potential benefits from inflation would come from

deflating some of the government debt at the cost of foreigners. And you can think of this very differently depending on whether you are a foreigner or not. But this is something that would also effect the picture. If you think for example about the debate in Europe it's not so much about rich Germans versus poor Germans it's to some extent about relieving to some extent the pressure of high sovereign debt around the EU zone and that's something that we would also have to factor into the houses. Just to say that even though the output effect are small I think there is a bit more to the aggregate effects than we show in this partial analysis.

MR. WESSEL: Let me see if there is a question or two and if not we'll go right to the panel. Yes, Eric?

MR. HURST: Is there the quest mode of the model? How we think about the fact that parents have kids and if they get worse off than maybe they could just save a little less and transfer to the kids.

MR. DOEPKE: The model has a bequest motive although the one I have shown you doesn't have that operative yet, that's just the -- a function of how far we've gotten with this. We had an earlier version where the bequest motive as there and in fact we do need the bequest motive to make the rich, rich enough. Now we do it in slightly different model way, but we know the bequests are highly concentrated just like wealth is and so getting a bequest is a big reason why the rich have so much wealth. And so putting that back in there will make the declining consumption among the rich smaller. Some of this effect will go away. In the past when we had it in there and used that reproduce wealth it wasn't really enough to do much of an impact. That's true as a concern but based on what we've done previously I'm kind of confident that it will not be a crucial issue for the overall effect.

MR. WESSEL: The two gentleman here.

SPEAKER: I'm a little bit puzzled by the last paper. In my long life in economic by the way I'm Vitale Tansig from the IMF, formerly from the IMF. I've heard statement by Friedman that the right – right rate of inflation is minus two. Then where the (inaudible) at one point it said 40 percent would be okay, then we are at the seven percent inflation we worry about indexation of taxes. First of all does it make sense to say that really the Fed can bring about a seven percent inflation and keep it there, do they have the tools to do that and second can they – make this an announced statement? I mean people were dreaming how can you one day wake up and say we are going to bring seven percent and nobody else anticipated it? It makes no sense to me.

MR. DOEPKE: Let me say a couple of things about this. There's certainly a long debate about whether the target should go up and I think the ability to maintain the higher target is a big part of that. And so that's there and our paper is not about that. It's about a different part of this debate. I would say however that certainly in history we have observed large changes and inflation – we're driven by policy, so you have in the 70's where inflation went up in many countries, by the way differentially in many countries and in German much less so than the United States for example. There was some impact, military choices. And there was also the disinflation in the 80's which was kind of the same experiment in reverse. If you look what disinflation did to U.S. households it's the same thing just with a negative sign. I think if you think of this as applicable to analyzing episodes of large change in inflation I think we have seen many of those and so it's very relevant from that perspective. There's a policy – what's kind of crucial here is of course this is something that has to be effective to be surprising because if everything is completely anticipated it illustrates would adjust ahead of time and there would be no redistribution. Everything – inflation and redistribution is about surprises. And so you could do this as a policy maybe as a one-time windfall or it's not

about systematic policy that you could do under that basis. What you could do in a most sophisticated policy which we haven't talked about yet, but is to have something that is systematic but it's linked to the business cycle, where you do some kind of pro or counter cyclical variation in inflation to try to alleviate the burden of debt for example in a most strategic matter. There are some steps to be taken for sure in the analysis that we've done so far to something of that kind.

MR. HURST: Can you just clarify to make out of the paper to make sure I understood the conclusion are you advocating actually this experiment as something that should be considered? If so is it because it reduced inequality, and how do you look at the inequality implication versus the contractionary impact on output? Where do you land with this?

MR. DOEPKE: Given that it's a paper and a partial effort of a policy I wouldn't take this paper as an ultimate recommendation for policy. I'm simply trying to have one tool to access the implication of a policy like this in one dimension. In terms of my personal view I do think that the impact and output is there but it's not particularly large and so I think whatever the decision is going to be it's not going to be drive by this output effect. I think of the potential desire to increase inflation is driven by something else. I think it's driven by some extent certainly in Europe and by the desire to lower the burden of a debt of governments and also partly of the private sector which is not here, but I think it's an important consideration and I think that's kind of the linking aspect is to understand what are the implications of that. In a place like the United States you could also think about increasing inflation as a potential tax on foreigners who hold – U.S. efforts and it's somewhat mischievous I guess but it's certainly something that for aggregate welfare would be relevant.

SPEAKER: Someone will take you up on that.

MR. DOEPKE: I think it's more in terms of the consequences.

MR. WESSEL: Do you want to weigh in on that or anything?

MS. SELEZNEVA: I would consider that as a side effect of monetary policy rather than direct it at the target.

MR. WESSEL: Meaning inequality?

MS. SELEZNEVA: Yes, exactly.

MR. WESSEL: Okay, I think we're going to move to the panel although we don't have enough chairs up here for everybody. If Don and Kevin and Susan could come up, Jean you stay here. I'm going to ask the authors to feel free to participate from the floor. (Inaudible) former vice chair of the Federal Reserve. Kevin I want to start with you. I think somebody quote you without attributing it that quantitative easing is like, "reverse Robin Hood" you once said. So what I've heard this morning is a whole bunch of people say maybe quantitative easing doesn't have the effect on inequality that a lot of us thought when we just thought about this crudely as lifting stock prices. You think it did. Defend your position.

MR. WARSH: Sure. Thank you and thank you for having me here. I appreciate my security blanket and Don can agree with me. Don sat next to me at the Fed for five and a half years, so to the extent we disagree I'm sure he's right. He used to pass me a note but now with Susan here it's going to be more difficult. I'll begin I think by just trying to frame David's question. David and Brookings called together this conference I think says that distributional consequences matter to the conduct of public policy and we central bank types some of who were supportive of QE at different phases some of whom weren't should not be defensive about this question. And the idea that distributional consequences should be somehow beneath our central bankers or we wouldn't talk about it is wrong. We talk about the efficiency and efficacy of any policy,

fiscal policy, monetary policy, et cetera. We also talk about the distributional consequences. David if someone rolls out a new fiscal policy or a new tax reform plan the newspapers will say well who were the winners and who were the losers? I give you and Brookings enormous credit saying this matter and we shouldn't sort of treat it as somehow not right for central banks to take into consideration. At the end of the day we should all be very modest about our conclusions, both from Josh's paperwork which I thought was terrific and my own judgments on this. Quantitative easing was created by Don and others and myself including me in the depths of the crisis. I was a huge supporter of QE1 and ended up being quite a bit of a different view by the time of QE2 and beyond, but it was created to deal with a certain problem that was in the markets. And I would say that it has become such a long life product and is a product now that is used by virtually every central bank around the world tells us that even if our judgment on the risk and reward and the depths of the crisis were one thing we should be thinking about it in a different context now. As a first approximation I do think that what we did was radical or new or novel and unprecedented so none of us should think that we've got the answers on it. However, it does strike me as though quantitative easing is fundamentally different than cutting interest rates. And that it appears to be working through fundamentally different transmission channels.

No longer credit channels and lending channels appear to be the dominant way in which it impacts the economy, it appears much more to be working itself through asset prices whether you think about housing stocks or financial stocks. I think that is the dominant channel and as a first approximation if three quarters of our fellow citizens get 96 percent of their labor from labor income it strikes me we ought not be dismissive in saying everybody wins. We talk about trickledown economics and the conduct of fiscal policy and we should ask ourselves as Brookings is today what are the

impacts here? At the end of the day my view is because the asset transmission channel is the dominant channel and because those assets are held not so much in and of itself by rich people, but it's held by big balance sheet, a lot of sophistication and openness to liquidity, a sophistication about what central banks are trying to target and a view that they have liquidity so that they would react differently versus those that are at lower quintiles of income strikes me as something that is quite plausible and when I look at the wealth creation across the financial asset world post crisis, I view that wealth creation as being significantly above what my former colleagues predicted.

When I look at what they expected in the real economy I look at the real economic performance as markedly worse than the predicted and so that's what I think raises these questions, makes them absolutely germane to today's discussion and I very much do worry as I'm sure many in this room do that we've created a product not with bad intent but we've created a product that may or may not turn out to be counter-productive and we are in the middle of this experiment as we are now, but where the gains have been extracted by the most well to do, by the most sophisticated who see that the central banks are to one degree or another trying to get asset prices up to drag up the real economy. They get the joke, they have been willing to play the game and it does strike me as though we have to think about not just the efficacy of these programs but really who are the winners and the losers.

And because we are in the middle innings of this game, it reminds me David a little bit when you came to visit Don and me and you were doing a book on Behr Stearns and the financial crisis was among us it was hard to judge the prudence of any individual decision. Having this discussion now is great, but I think either Josh or I or Don want to give you definitive answers.

MR. WESSEL: Don, definitive answer?

MR. KOHN: I agree with the last part of what Kevin said and I agree with the first part. I think this is a good discussion to have. I do not think that the federal reserve should target particular income distributions. The fed has been given jobs by congress, maximum employments, stable prices and financial stability is part of it. And there are certainly intersections between what the fed has done and those things and the distribution of income effects the channels by which these things as Kevin was noting can be affective but I would be – I think it would be wrong for the federal reserve to say we are going to steer away from our maximum employment stable price to our target or take longer to get there because we think getting there as rapidly as we can will have effects on income or wealth distribution that are adverse. Those are decisions for congress to make through taxes and transfers, not for the fed to make. I thought today's discussion was really good and really interesting because – and this goes to the last point Kevin made because it really illuminate the channels that were working and that weren't working in order to make monetary policy effective and the fed need to understand that so it can make a determination about how much monetary policy need to do to hit its primary goals, to get aggregate demand up to aggregate supply and to keep prices at its objective and it might inform a conversation between – this is Josh's point – between the federal reserve and the congress so if the federal reserve said here is what we are doing and it's having these effects on income distribution and we're – it's up to you the Congress whether you are comfortable with this and there are other ways of approaching this and you might want to use fiscal policies. Josh was discussing. That conversation never occurred. In fact the people who were uncomfortable with quantitative easing often said it relieved the congress, they didn't like the "moral hazard" because they said it would cause congress not to tighten as much as it should.

In fact the people opposed to quantitative easing were saying we want less quantitative easing and more fiscal restraint which I think would have been a disaster for the U.S. economy.

MR. WESSEL: Susan, so Kevin made a couple of interesting assertions one of which is that asset purchases quantitative easing is fundamentally different from lowering short term interest rates, do you agree with that?

MS. SELEZNEVA: Well, for that to be true you have to believe in the wealth effect and consumption and so we've talked about equity prices and home prices and economists debate the extent to which there is a wealth effect from consumption particularly in this period of time where you have equity prices rebounding but from very low levels which may weaken any kind of wealth effect on consumption from rebound and equity prices and the same with home prices. I mean we are talking about recovery from very low levels. I am more skeptical that there was a lot of wealth effect from consumption and that the much more direct and measurable impact is simply on interest and debtors who are saving money on interest payments versus holders of cash and other deposits that are losing money.

MR. WESSEL: That's more like conventional monetary policy.

MS. SELEZNEVA: More like conventional monetary policy.

MR. WESSEL: Kevin I thought the fed always worked through the housing channel, when they cut short term interest rates that's where they looked for things to happen so how is buying mortgages different than cutting interest rates?

MR. WARSH: I'll answer that two ways, first, in order of magnitude what the fed has done during this cycle makes our predecessors look like pikers. So that's one, two I would say that asset purchases find their way into asset prices through our actual purchases but also through signaling. And I think that the federal reserve in the

depths of the crisis and to this day remained aggressive in quantitative easing is a signal to sophisticated financial markets that asset prices are more than ever the predominant channel to which policy will find its way into the real economy. Did the old days – the good old days 2007 – did the fed believe that by changing short term rates they would have an impact at the long end of the curve, that that would find its way into asset prices, you bet. But if you take what central bankers here in the U.S. take seriously about the problems of the zero lower bound in so doing what they are really saying is that this is a step change in our reaction function we are trying a new tool, it isn't easy and we are not sure of the transmission mechanisms and my judgment is that is the fed dated dependent as they are thinking about policies, you bet, but rightly or wrongly I have also come to the judgment that they are asset dependent too.

MR. WESSEL: Jean you can respond to anything you want but let me offer one thing. Kevin had this very clever observation that the real economy has done worse than the fed had hoped and asset prices have done better than the fed had expected QED. Is that the useful way to look at it?

MR. BOIVIN: Yeah, and actually I think this is speaking directly to something that is a bit puzzling from the discussion that we are having today, I think that – my prior is the opposite in terms of QE the opposite of the presentation in terms of I think QE had a massive impact on asset prices. And the way I get to that conclusion, it's very simple, I mean, I've looked at all the and at the Bank of Canada we went through the analysis and did all of that. It's very difficult to get a clean measure of the impact of QE on asset prices and in particular when you look at these windows around announcement which would be the nice way of looking at an event, you have to assume some kind of market efficiency or that everything gets to be priced in very quickly. I think what I see and you can look at the ECB that's this year what we see is a portfolio rebalancing

channel that takes time to play out. I think it's very difficult to decide to advise – the next experiment will allow us to really see the impact, but I do see a massive thesis out there that, I mean, if you look at the investment in Japan or in Europe it's entirely driven by a QE kind of thesis. We think that. And the way you can actually see that is this kind of narrative that bad news is good news because bad news means more QE and that supports asset prices so I think we see – this is suggestive of a pretty significant impact on asset prices. And if I can go from there, I think on that I am very sympathetic to the starting point Kevin was putting on the table. Where I'm not sure I reach the same conclusion or I'm not sure where the conclusion is because you've ended up saying we have to be humble about there's a lot of uncertainty where I'm sure I'm not reaching the same conclusion is I think it's very difficult to get out of the argument that what's the alternative. I don't see an alternative that would have created something better at this stage and it doesn't take away the inequality sequences, but it's difficult to undermine this argument. But to me it's another issue of framing the question, which is we take the crisis as given. All of the discussion has been like a crisis has occurred, policy has responded, what's the impact on inequality?

But there's another debate out there which is lean versus cleaning. Should central banks play a role in avoiding the buildup of imbalances? And to me when I think about inequality I would tend to think of the culprit is more the crisis than the response to the crisis and then the question is was there anything we could have done to prevent or mitigate the buildup of imbalances before the crisis.

I think that's why we have the push on reform agenda – the financial sector – that's why we're doing a lot of revamping of policy frameworks. I think one question that we don't have fully completely grasped is the extent to which monetary policy in the first part of the crisis is actually might have something to do with that. And

that might be where there is a bigger question for monetary policy than the response after the fact.

MR. WESSEL: Do you want to respond to that Don?

MR. KOHN: That's a very legitimate question and my personal preference would be to keep the fed focused on maximum employment, stable prices, their inflation target and use other tools to deal with the buildup of imbalances if at all possible. And one of the tools that occurred to me as I was listening particularly to the regionals things was LTVs. One of the lessons of the regional paper was that the easing of monetary policy has been less successful. The shortfall on demand comes in part because the transfer from lenders to borrowers from low MPC to high MPC spenders has been short circuited or cut off or less effective because of people who are under water on their mortgages. By the same token I think part of the build up into the crisis was a leveraged build up in the household as well as the financial sector and wouldn't it make monetary policy more effective as well as help financial stability if as these asset prices – the house prices were rising LTVs were regulated and they came down.

Loan to value ratios for mortgages and then as house prices feel they would – first of all people would have more equity. They could use the lower rates and you might allow even higher loan to value ratios so it struck me that these guys had come up with another reason for using LTV ratios as a counter cyclical tool.

MR. WESSEL: And that's not currently in the fed.

MR. KOHN: No.

MR. WESSEL: Susan, you looked like you wanted to say something.

MS. SELEZNEVA: No, I completely agree. Macro prudential policy is to be a counter-cyclical force to prevent the buildup of excessive debt is the right policy tool, not monetary policy, conventional or unconventional.

MR. WESSEL: Kevin you didn't speak to the question. You made clear that you thought QE3 did not – the benefits were not great enough to compensate for the cost and you've been very eloquent about how some of those costs are the rich got richer. But what Josh Bivens pointed out is well if you are a monetary policy maker you can't say I wish we had more fiscal policy, so is it your, well you can say it but you can't do anything about it, of course that seems to be true of the President of the United State too, you shouldn't feel so bad, but so is it – what is your view of the political economy on this, if the fed had done less do you think the congress would have done more and then we would have had less inequality?

MR. BIVENS: I know I don't know isn't very compelling but a couple things, one is there is no QED in QE. We are in the middle of this, so I don't mean to be saying that there is any proof of this.

MR. WESSEL: I've got to write that down. There is no QE, that's very good.

MR. BIVENS: In the unwind of this we are all speculators. And if the unwind were as simple as it is in an academic model, then who knows maybe the federal reserve would have felt quite comfortable already moving off of zero. There are plenty of risk associated with that. I can't help but think that those that are last into the housing markets, last into risk markets like the stock markets are going to be the ones who get caught holding the ball. I know there are distributional consequence or there is sophistication consequence we should care about.

Your question about the political economy so I don't know, but I would just suggest this. If you are democrat, republican doesn't matter in the congress and for six or seven years your neighborhood central bank says based on our projections the economy next year will be materially stronger that is in 2009 and 2010 we'll have four

percent GDP, even if 2014, 2015 next year will be a percentage point stronger, because in part of the prudent monetary policy being taken tell me what's the willingness, the courage, the interest in making a really tough choice because things are going to be swell if you continue to sit on your hands.

My view is imagine that the federal reserve, Don Kohn and a big testimony in front of the congress or the chairman of the fed and Humphrey Hawkins gets a bunch of mean questions from 100 senators about why is the economy in my district so weak and what are you doing about it imagine if Don or the chairman said well with all due respect senator to you and your 99 colleagues we pulled a rabbit out of the hat in the financial crisis. That is what the federal reserve was born to do. We were born coming out of the panic of 1907, respond in the 2007 panic, and we think on balance we did a pretty good job.

On the margin we could have certainly done things better but if you are asking us to take an economy whose growth rate is unchanged three the last three trillion dollars of QE where if you showed up here from Mars we would have shown up at exactly the same growth rate four quarter basis in spite of promises what we'd be doing much better what if we leveled with the political authorities and said two percent is about what we can do by ourselves and if you want this economy to be growing at historic trend, if you want this economy to be growing at three percent plus there is precious little your central bank can do.

Now if there is a shock to this economy we remain a powerful group and there are things but to get the next level of growth we need you, so when I come back in front of this committee six month from now you would say – your Humphrey Hawkins testimony – if the economy is not better let me be clear whose responsibility that is. I think that's a very different dynamic. I don't know what the results will be in the political

climate, but if the central banks continue to overpromise and under deliver there will not be a burden no our elected representative and I just as soon having taken the burden on ourselves and the depth of the crisis as we were born to do that we come to share the burden come 2015, seen an a half years later.

MR. WESSEL: You want me to believe that members of congress looked at the fed forecast and decided they didn't need to do something and that was the factor in the sequester and all that?

MR. BIVENS: Let me start again with I don't know.

MR. WESSEL: Good answer.

MR. BIVENS: But I do think on balance that the central bank and the OMB and the congressional budget office and the World Bank and the IMF said we were always a few quarters away from escape velocity. On balance makes politicians, not all but some unwilling to sign up for a very tough choice where there's going to be winners and losers and tough constituencies. This is not to suggest as some of my friends would that there's no role for central banks. There's a powerful role for central banks. The central bank role that strikes me and this might be unpopular in the room is a powerful role but it's a narrow central bank. And it's a central bank that shows its wings and panics, but in benign times after chronically missing its forecast maybe a little burden sharing should be in order. And if the politicians take us up on it that would be a wonderful thing and if they don't it would still be a good thing because the truth is when I joined the Federal Reserve around the time that Chairman Bernanke did and Don had been there for a long time, when all those new folks showed up the central bank had a lot of institutional credibility. It had nothing to do with us. And I worry about overpromising. I worry that we can singlehandedly do this by ourselves and I just assume we try to crowd in some other policies and you're right it might not work.

MR. WESSEL: Jean how does this look to you from outside the United States?

MR. BOIVIN: I think it's very difficult to get this coordination right. I have a – we've been spending quite a bit of time at the G20 table discussing what the world need to get out of this and 2013 was a U.S. story and an important part in terms of uncertainty around the politics on the fiscal side and I think it's a valid question to ask and as a result the central bank hasn't been overburdened and could be going deeper into some of these central policies as a result of that. I think it is a better question, what is the right policy mix? At the same time you get this coordination I truly believe that central bank should be independent so you need to get this kind of an outcome driven kind of coordination and I can see why politics would trump that in even more short term efforts and for a significant amount of time.

MR. KOHN: It's interesting that the Bank of Japan tried Kevin's approach right for five years, they lectured the rest of the government about what they needed to do both on the supply and demand side of the Japanese economy ended up with a new government and a new program that was part of the new government so that doesn't mean it wouldn't have worked in the United States but it didn't seem to work in Japan. They had to turn the central bank and the government over and embark on a new set of policies. I think the fed has to do – I agree that perhaps I don't know I'm not in the minds of the politicians who are listening that the optimism by the Federal Reserve about future growth took a little pressure off the congress and perhaps enabled them to engage in – more easily in restrictive fiscal policy.

I don't know, I don't really think they pay a lot of attention to the fed's forecast but I'll grant that hypothetical possibility, but I do think the fed needs to do everything in its power to hit the goals that the congress gave to it. That's what it's

supposed to do in a democratic society so when it falls short on its forecast, when the unemployment rate isn't falling or it's falling for the wrong reasons – the forced participation is going down, I think whatever – it's got to guess what fiscal policy is going to be and then double down on the monetary policy to hit its goals. There's got to be an agency in the United States governmental structure that takes its goals seriously and does everything it can to hit those goals and to say I'm not going to do more to hit those goals because it's your responsibility. That would not have been comfortable to me as a member of the federal market committee.

MR. WESSEL: John you mentioned in your slide something that I'd like you to elaborate on, you said that the bank of Canada thought about the distributional implications of monetary policy regimes. What was that conversation like and is it consistent with the direction of the effect on inequality consistent with what we've been hearing this morning or different?

MR. BOIVIN: Back in 2010, leading up into 2011 in Canada every five year we have to renew our inflation target. And in the lead up to 2011 renewal there was a lot of work being done on thinking about what have we learned from the crisis, does it require change in a policy framework and what would those be. One thing that was on the table at the time was whether our price level target might not be appealing. And there is a lot of theoretical argument to make it appealing. You would have in the current environment a lot more to go in terms of catching up on the price level so that would suggest more easing. You might think that people can be convinced of more things coming so there will be expectation in effect as well and in that context one of the questions was what are the distributional impact of this. That's one angle, I think there is another Canadian angle that I will just offer and that is pertinent for the conversation is

the fact that we didn't go into unconventional policy but we had low interest rates like everybody else for a while now.

And we've seen a buildup in the housing sector building up and as a result of that the government took some measure and it tightened up the mortgage rules as you were suggesting before as a counter-cyclical policy and then those rules were mainly targeted for a high loan to value ratio which were where we were seeing more vulnerabilities and those are people that typically don't necessarily have high income so if you follow that train of logic I mean you have to realize or to conclude that monetary policy does have maybe indirectly but it does have distributional consequences and I think this is about trying to get the right mix between macro-prudential policies and monetary policy.

Again I agree with what Don was saying before, I think the primary objective and what Susan was saying as well, primary objective of monetary policy should be the inflation target and stabilizing the economy. I think the financial stability aspect of it should be first and foremost on the macro-prudential authorities and I think these are the first line of defense.

I do think that we have a remaining residual question which is to the extent that monetary policy is actually contributing to excess risk-taking, when does it become something that we need to take into account and that's about preventing crisis and the like which I think is the first order for (inaudible) inequality.

MR. WESSEL: Absolutely. Susan one of the things that Matthias had said which I hadn't actually thought about is that the world has changed in many ways in the last quarter century, but one is that the U.S. government is increasingly financed itself from abroad and he had the kind of flip thing that maybe a little more inflation here would be good and we just have to export the cost to the rest of the world, so when we think

about the questions of the impact of quantitative easing and low short term rates forever, how do we think about the global side of this and how does the distributional implications work if we think of ourselves as the U.S. versus the rest of the world. And you can't say I don't know.

MS. SELEZNEVA: Then I'll try to know. You can look at the same interest income thing that I talked about for U.S. households, you can look at the rest of the world sector. They've been clear losers from very low interest rates. Foreign creditors to the tune of several hundred billion dollars a year or over the course of this period have lost out on interest they would have already otherwise earned.

It's already a good deal for the U.S. to have extremely low interest rates on government debt. It's good for the government they can borrow more, they could have undertaken even more fiscal stimulus or conversely that we've undertaken less austerity and the rest of the world has paid. It's interesting, I think that his paper pointed out now if we go for some inflation, which is a big if, how can we even get to the 2 percent target much less beyond. That would be another way of essentially helping the U.S. and we benefit from having the world's currency and as David eluded to earlier you can say what you want about the U.S. dollar and the U.S. economy but we are blessed by our competition.

MR. WESSEL: Gentleman here in the aisle?

MR. KHANA: My name is Kannal Khana, the last time inequality in the U.S. was at this level was just before that major depression in 1929 and following the depression there were a lot of inquiries, commissions and policy changes that lead to eventually less income equality. This financial crisis there were similar inquiries but all they had was two parties and responses and one hypothetical question I have is what if

department of justice had put 50 to 100 Wall Street executives, banker, mortgage bankers in jail would it have had any impact on the economy?

MR. WESSEL: I'll answer it, because they don't have the guts. I think it might have had a big impact on the political economy of the thing, but it wouldn't have had much impact on income inequality. Did you have a question, tell them who you are.

MR. UBIDE: Sorry Anthony Ubide from the Peterson Institute. For those who think that QE has a differential impact with respect to interest rates and QE has an impact on asset prices wouldn't it follow that the time of (inaudible) and the feds shouldn't start selling assets rather than raising rates and if not why?

MR. WARSH: I think we knew who that question was directed towards. I take each of those assumptions on board. As I recall Don when we adopted a balance sheet expansion regime and we were confronted with the zero lower bound, parenthetically, not obvious the world's central banks think that the zero lower bound is the problem now that they thought it to be then in light of negative interest rates but we could come back to it, my recollection was that our original exit strategy of QE was that we would shrink out balance sheet back to something like normal. That is after all we cut rates to zero first and then we increase the size of our balance sheet to get more accommodation, that there'd be a certain symmetry to then shrinking the balance sheet first and raising rates, so that is certainly not the exit principles that our former colleagues have adopted.

Now I'm not sure I really understand why. A cynic of which I am not – a cynic would say that in some sense one of the signaling mechanisms of QE was we are buying assets as central bankers and you should too and the signaling could work in the opposite regard. We're selling assets and we sure hope you don't follow us, so a cynic would have that as a supposition as to why normalizing the balance sheet first is no

longer considered prudent. I don't really know the reasons for it. I think that there is a certain symmetry to it. I think that there is a certain view that most central bankers that are incumbents and has-beens like us that are awfully worried about this first rate rise. That they – one substitute to that which again is an imperfect substitute if you believe what I do which is interest rates in QE are cousins but they are not identical twins, that it would be prudent to signal that the exit regime has begun not by any sort of fire sale but by announcing the time that upon which we would be shrinking the balance sheet and it turns out the assets that the federal reserve has treasuries and high quality mortgage backed securities are the assets that the world's financial markets are dying to hold on that.

That that would be a very prudent step and could at least take them out of the situation which they might find themselves in now. The situation which I supposed I find themselves now I'm speculating is in fact if they get bad data they'd say well we can't raise rates now look at how weak the data is. And if they get good data the dollar strengthens and long term yield increase and asset prices continue to move up in which case they could argue well financial market conditions have just tightened so we don't have to.

I kind of like your idea of using the balance sheet in a symmetrical basis and frankly if asset prices fall even 10 or 15 percent that would take us not back to crisis levels, they'd be back to where we were last June. Strikes me asset prices are going to be worth what they are going to worth and the sooner that a bunch of authorities somehow think that they can manage that the better off the real economy would be and to Josh's paper the better off that labor would be too. I think the uncertainty around this is holding back labor markets and labor income not in the way that we can prove but given the novelty of what we are trying, every reason to believe that the world's big

corporations are not investing in real assets, they are investing in financial assets because on the financial asset side of the government seems to have their back.

MR. BOIVIN: A couple things that I have in mind. I do think that unconventional policies either looking for guidance or QE they differ from other policies because of the impact that they have on the curve itself. And that has differential impact on pension funds, life insurers and so on and so I think that this is how – the difference that matters. The other observation I would make is that in my view we've seen – it's well known but we've seen a massive compression of term premiums around the world to the point where there is a puzzle. You see basically very little compensation for risk across the curve in a world where I would argue that risks are pretty high over the next 10 years or 20 years. I mean we are talking about inflation, talking about rates, we're talking about liquidity issues on the bond markets, we are talking about a whole set of issues that for some reason you would think would be risk and you would want to be compensated and yet we don't see that happening. What is that? One way to reconcile that is a massive size of balance sheets around the world is maintaining those term premium compressed beyond imagination. But at some point you might wonder what is going to happen so if you start to raise rates first if those remain compressed you won't get the normalization across the curb that you would expect to see and that's going to at some point raise some question about what do we do next? That leaves you to think about a sequential approach given the communication we've heard where raising rates is the first thing, but then eventually questions about what we are doing with the balance sheet might become more relevant or more immediate in my view.

MR. KOHN: Two points, I think Kevin our original plan was not to start selling before we raise rates but it was to allow the natural run off of the balance sheet so there were three stages, allow the natural run off, then raise rates, then sell and what's

changed is the natural run off has been postponed until after the increase in rates, so it's like not quite as radical a change as you suggested. And I think there is a decent reason for that, we can discuss and differ on it but there is a desire to get the federal funds rate up in part to have space to lower it if bad things happen. Because you might plan on – obviously you wouldn't raise the rate unless you thought the economy was on solid footing and things would progress naturally but we know we live in an uncertain world in which bad things can happen, now if you are selling off that portfolio the fed funds rate is still at zero or 10 basis points or whatever right, now something bad happens, not anything you did, not anything that might be external to the United States, a deep recession in Asia for example. In order to stimulate the U.S. economy and insulate it from those bad influences you would need to resume purchasing securities. That would be very difficult and there would be lots of people out there that would – both in the political and economic sphere that would resist it. I think you do need before you run down your portfolio you need to get some space to guard against things you don't anticipate. It makes sense to me.

MR. WESSEL: Andee?

MR. FUSTER: Mike's coming.

MR. WESSEL: You look like you're in pain over there.

MR. FUSTER: I'll be brief and I was originally late, because it's 12:30.

And just to come back to the point that Don made that connects actually to the session you had with Larry Summers a few months ago. Let's suppose that QE at the zero bound has crucial political elements to it. That is has real income distributional consequences, that could be an argument that would strengthen the case that Larry Summers made there really isn't any fundamental reason that you couldn't delegate that

responsibility to the treasury. That they would participate in sale of longer term treasury securities at NPS.

Or alternatively you could change the Federal Reserve act and say if the Federal Reserve is contained by the zero bound than it needs to do large scale asset purchases, that in doing so it should consider the income inequality. I just don't think that over time that the public broadly is going to be willing to accept the argument that Don made which is it's just not part of our mandate. In that case the mandate probably needs to change.

MR. WESSEL: You think the mandate should be changed to make inequality part of their agreement.

MR. FUSTER: I think that there...

MR. WESSEL: Unelected, independent policy makers have some responsibility for income distribution? He forgot the part where he want the open market committee to be popularly elected.

MR. FUSTER: No, the point here is that if we agree and I think the papers here this morning I thought made a fairly strong case that there are some implications of QE at the zero bound for income and equality. Those are not trivial.

MR. WESSEL: Right.

MR. FUSTER: Okay, then I think there is only two solutions, one is move that responsibility to the treasury so that the secretary of the treasury work with the President of the United States and works with the congress and makes political decisions as they do on many other things or leave it with the fed and adjust the mandate at the zero bound. But, any rate maybe there is a third option but at any rate it seems to me that this is again just tying back to the issues -- the kind of issues that Larry Summers raised which I think are very closely connected to today's discussion.

MR. WESSEL: Just so people know you are talking about Larry Summers talking about the relationship between the treasury, debt management and the federal reserve where the federal reserve was taking duration of the market and the treasury was putting back in and Larry suggested that was somewhere between idiocy and lunacy in the usual diplomatic fashion of Larry Summers. Did any of the authors want to weigh in here? Please, Josh.

MR. BIVENS: I'll try to be quick, in the short term I'm clearly an extreme pessimist on the fed had pulled back fiscal policy. I just don't think they would have stepped in. I do totally agree that over the long run we need to rebalance how we approach macro-stabilization and give a bigger role for fiscal policy. I think we have trained a generation of policy makers that the feds control over short term interest rates is all you need and everyone else can just rely on them and that's a huge problem and then just one other quick thing, it's true that if you look at asset markets right now they look a lot healthier I'd argue than say the labor market and other parts of the real economy, part of that is still just a function of how early we are in the economic recovery not in time, it's been a long time 2000 but if you look across economic recoveries, early recoveries see a big increase in the profit share and you see that. Corporate profitability is off the charts and it's only in 2014 that that increase in profit share in the nonfinancial corporate sector has actually started to moderate and the labor share is calling back and so I hate to sound like an optimist here but give it a little time. I think we actually will if we allowed the recovery to continue as it's going -- assuming the first quarter data is a blip -- hopefully, we actually will see some of that call back and so part of that is the recovery is really early in a broader sense not just time sense.

MR. BOIVIN: To that point I think this is the reason why I think there's been an impact of Q and asset prices but I think you're right this recovery has been

unusually weak by it's in line with post financial type crisis recoveries and yet the S & P is 60 percent -- the S& P has not only recovered in the whole it's 60 percent above the pre-recession peak.

MR. WESSEL: 6-0 percent?

MR. BOIVIN: Sixty percent and we have -- so that's -- the way I think about is we've made massive progress on the financial cycle side ahead of the economic cycle and that begs question as to what's next after. I think you are right, we are early in the stage of the economic recovery. I think we've made quite a bit more progress on the financial recovery. I think that could be evidence of QE having an impact on that side and not on the real side, it begs question of what's next in the other phase of that economic recovery. There might be less financial performance to be expected as a result.

MR. WESSEL: Kevin.

MR. WARSH: So the one entity, so I agree with a lot of what Josh said, I think the one entity that has in some sense in front of them as we speak in 2015 this choice between investing in financial assets and real assets are corporate CEOs that is the S & P 500 with massive cash flows that have profit margins that may well have peaked and so they can sort of capture in their own decision making matrix whether these two assets are equally attractive. I think again if you look at the data over the last seven years what you find is they find buying their own shares back quite attractive as opposed to investing in long live assets -- property, plant and equipment which is illiquid, where they are not sure about the global economy, where they are worried about aggregate global demand, so they keep showing a preference.

As we speak today shareholder buy backs are running at about a trillion dollars run rate in 2015, a record and an A some of which might be strategic some of

which we might call quite rudely financial engineering is running well above any recent trend so I'd be sharing the idea that if we just wait that labor is going to get their fair share but it looks to me as though financial chiefs and CEOs and boards have sort of figured out this as well and they are willing to support their own financial assets, debt financed at very low levels, because in some sense there may or may not be a central bank put but the world is trying to get their share prices to be higher versus the uncertainty of investing in long live assets that could match with long term gains in employment and have productivity that booms over time.

If I look at them as the illustration of the conundrum we are in I'm not overly optimistic that labor incomes are going to meet capital on the factory floor and we are going to have this surge because again it seems to me as a final thought we seem to be savoring financial assets over real assets as a matter of public policy without any bad intent but by effect.

MR. WESSEL: That's depressing. Let me make two advertisements before we end, one is that this afternoon in on this room at 3:00 Raj Chetty of Harvard is going to be here to talk about his latest work on mobility and inequality which will be live cast as this was and then I can't remember when in November or October we're going to do an event that raises some of the issues that Susan mentioned about - what is happening to the long term interest rate and why is it down and whether we should expect it to go up or are we in some long term trend? October 30, I knew if I gave you enough clues, I failed on the most important one, but with that please join me in thanking our paper presenters, the respondents and the panel.

* * * * *

CERTIFICATE OF NOTARY PUBLIC

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.

Carleton J. Anderson, III

(Signature and Seal on File)

Notary Public in and for the Commonwealth of Virginia

Commission No. 351998

Expires: November 30, 2016