General Discussion: Overview Panel on Labor Markets and Monetary Policy

Chair: Christina D. Romer

Ms. Romer: We've heard a lot over the last two days about the uncertainty over the fraction of unemployment that's structural versus cyclical, and over what's happening to labor force participation. Chair Yellen talked about all of the issues, particularly with regard to the United States. So the question I have for the three distinguished central bankers is, does the fact that we have a lot more uncertainty about labor markets perhaps change the fundamental way we need to be conducting monetary policy? It's often been said we've had sort of the triumph of flexible inflation targeting. And I suspect if we were to do a survey of the room, that would be what most people either do, or think monetary policy makers should do. So I'm wondering, do we get any votes for moving to a price level target, a pure inflation target, a wage target, a nominal GDP target? Do we need to be thinking more broadly, or do we just need to be tinkering around the margins—getting a better estimate of maximum employment, or sustainable unemployment? Anyone want to take a stab at it?

Mr. Broadbent: It's not necessarily tinkering, but I don't think it's the first order of significance; the particular nominal target. And certainly, the difference between an inflation target, and one for a flexible inflation target I should say, and one for the rate of growth of nominal GDP, that difference is pretty small in my opinion. A flexible inflation target will not, say, respond to a jump in the oil price in the first instance. So that sort of wedge is not respondent. So I don't think it's a first order of significance, and I think whatever nominal target one chooses, you're going to have to grapple with these same issues, even if you choose a nominal wage target. And if the supply is moving all around, that might have implications for the instability for economic growth, and you care about that as well. So, unfortunately, there's no shortcut to doing all the hard work we have to do to try and understand what's going on in the labor market, I suspect.

Mr. Tombini: Well, I do tend to agree with Ben Broadbent in the sense that I don't see the need for changing the framework, but certainly the uncertainty related to labor market developments has made our life a bit more difficult. And in the case of Brazil, as I was just mentioning, there are a number of trends that have happened that make the labor market perhaps seem tighter than it actually is, because of demographics, because of low participation of the youth in the labor force. They are studying longer now, mean years of schooling has increased—still low, but increased significantly. We have had many public policies that are outside the realm of the central bank, which incentivize investment in human capital, and this has had an impact on the labor market. So, if we use the same demographic and labor participation structure we had 10 years ago today, then perhaps the unemployment rate would be a bit higher than it is today. So, all those things make our life a bit more difficult. Of course, and having the kind of policies we have chosen to implement in Brazil, encouraging very large social mobility and putting a lot of pressure on the service sector and the nontradable sector, this flexible inflation target regime has been helpful in the sense of accommodating these large shifts in the social structure in Brazil. Of course, our goal shall continue being inflation, the inflation target, and we should continue, to my mind, to work under this regime going forward.

Mr. Kuroda: Yes, we in Japan are not seeing any clear sign of substantial increase in uncertainty surrounding the labor market, although we suspect that the simple Phillips curve may have shifted upward reflecting increased inflation expectations. That means that the inflation-expectations-augmented Phillips curve may have been fairly stable. Regarding the inflation targeting itself, as you may know, the Bank of Japan adopted a 2 percent inflation target in January last year. Before that, the Bank had kind of a price goal of 1 percent. But the clear inflation target, or 2 percent, was only introduced in January last year. And we have been faithfully implementing QQE to achieve the 2 percent target as soon as possible, basically in two years' time. We have just started the mission target, and so at this stage I don't think it's necessarily appropriate to change the target, although I do understand the logic, for instance, of price-level targeting. After a huge negative shock and price decline, central banks may wish to reach the past through higher inflation in the short term and so forth. And also nominal GDP targeting is quite reasonable, but again, GDP figures are available only quarterly and nominal GDP figures are not very easy to understand for the general public. The consumer price index is issued every month and is easy to understand. So maybe in the future we may discuss, elaborate on, or even try to adopt price-level targeting or nominal GDP targeting, but at this stage, I don't think we should change our target.

Mr. De Gregorio: I have a question for Governor Tombini, which refers to some evidence from Brazil that is quite interesting and disturbing. Since the Great Recession, unemployment has been declining persistently to historically low rates. But at the same time, since 2011 until this year average growth is expected to be about 1.6 percent annual. There's a clear decline in the natural rate of unemployment, for most of the reasons that Governor Tombini pointed out, such as demographic factors and an increase in human capital. This is certainly a good development. However, this has also another potential and puzzling implication: Since the rate of unemployment has been relatively constant, according to Okun's law the long-run rate of growth of Brazil could be between 1 percent and 2 percent. Growing at potential could be the reason why we see a stable unemployment rate. Can this be plausible?

Mr. Tombini: Thank you for this question. But indeed we grew 2.7 percent in 2011, 1 percent in 2012, 2.5 percent last year, and this year's still an open issue. But, yes, we have had a market slowdown, and at the same time as you mentioned, unemployment continues to decline. We are now in a situation of close to full employment for Brazilian standards. I think going forward, we need to focus on using the labor factor more wisely, in the sense of qualification of the labor force. I think it is imperative in Brazil. There are programs now targeted in this direction to increase labor productivity going forward. It's a very large program, which is training 8 million people in four years, but those things we know take time to materialize in terms of higher growth. We also need to sort of support investment going forward. We need to increase the capacity in Brazil. We have a large infrastructure program, which militates in the direction of raising potential output. You know very well Brazil, there are obvious low-hanging fruits there that we can amass in the future. But the bulk of investment is private—machine equipment, construction. It's been low last year; it was a good year this year, no. And we need to sort of create the conditions for private investment to help in increasing potential output growth in Brazil. I don't think we will agree with the kind of potential output growth that you just mentioned between 1-2 percent. We think we can do much better than that and precisely in qualifying better the labor resources increasing investment in total factor productivity in Brazil. Through, for instance, a large program of infrastructure investment as we have now in place.

Mr. Fischer: Thanks, Deputy Governor Broadbent. You've changed the structure of the Bank of England since you got independence and now you have this financial stability, financial policy committee and this financial stability goal. Have the aims been changed correspondingly, and if so, what is the responsibility for inflation? What is the ordering, if there is an ordering between the inflation goal, the growth goal, and the financial stability goal?

And, sorry I'm going to ask Governor Tombini some of the same questions (almost) that José De Gregorio asked. The interesting question is, given the title and the subject matter of this conference, how much did labor market policies have to do with the success of Brazil in reducing unemployment, or should we think it was superior monetary policy that did the whole thing? I mean, it's really quite a remarkable achievement for your country. And how do you assign the responsibilities?

And then two more questions. Ever since I was a child, I've heard about how the real high interest rate in Brazil is a problem and many proposals for dealing with it. Is it still there and is there progress in getting it down? And then the last one, you've been very successful in many ways and yet you're not as independent, at least as far as I understand it, as formerly independent as other central banks. How does that work?

Mr. Broadbent: So as you say, we have this relatively new body (FPC) for setting what's called macroprudential policy. And they share only a secondary objective, so the MPC has a primary objective for inflation, secondary, as I said, to support government's objectives for growth and unemployment. And the financial policy committee has the same secondary objective. Its primary task is to ensure stability of the financial system. Now it potentially, therefore, there are coordination issues across the two and those would be particularly severe if each has significant effects on the other's primary goal. It's not clear to me that's the case actually. And I think we've got the right sort of assignment if you like the monetary policy, the inflation target and the macroprudential policy, whatever that turns out to be for financial stability. And I'd also say that it's not clear also that there's any sort of first move or advantage for either of these bodies. They both meet pretty regularly. They also share three members across both. So, currently, I don't think there's much likelihood, at least for the time being, of there being sort of a merger between the two. They just meet in some sort of overlapping contemporaneous fashion.

Mr. Tombini: I think without the robust macro framework, which stabilized the country, we wouldn't have any progress in social policies. I think we have made great progress. And you know the story quite well. In the mid-90s until the mid-2000s, sorting out our fiscal problems in terms of putting together, on a consolidated basis, these 27 states we have in Brazil and 5,500 municipalities and having a way to control fiscal excesses in this very complex environment. This was a 10-year program and I think we've been successful in regaining control on the fiscal side. Also the implementation of the stabilization of the Brazilian economy as far as inflation's concerned, together with the implementation of the inflation targeting framework, late

1990s, has helped us to maintain macroeconomic stability in Brazil and allow the rest of the government to work on social policies, on labor policies. And I think they have been very successful, in particular, very targeted conditional transfers to the poor, like the Bolsa Família, which reaches 24 million families in Brazil, so it's low cost for what it gets, this program. So are other policies, like large incentives for young people to study, among other social policies that are in effect in Brazil today. With respect to the high real interest rates, that's the situation on the ground. I mean, we don't do monetary policy by analogy so the policy rate is where it needs to be to secure stability or to bring inflation toward our target. But of course, if you look at our credit markets, they are a bit segmented. We have a large portion of the market, of the credit market, which is not sensitive to the policy rate, so its workings are different. So this is part of the issue related to why our real rates are in the level they are today, around 4 ½ percent, close to 5 percent real rates for the policy rate right now.

With respect to the independence question, I think you need to operate at least with de facto operational autonomy. I think that's what we have at the Central Bank of Brazil. So, it's been working and we enjoy the latitude to implement hard policies as far as monetary policy is concerned. So, I think at least you have to have this de facto operational autonomy as is the case in Brazil today.

***Mr. Carstens*:** I want to place a question for Ben Broadbent. You mentioned in your very complete presentation, the use of forward guidance and the incorporation of unemployment in the specification of forward guidance. The question is, and one thing you mentioned that you were surprised by the Bank of England, you were surprised about how rapidly unemployment decreased. How endogenous do you think the unemployment rate was to the forward guidance? And from the point of view that forward guidance, basically what you are trying to say is that as long as certain things happen, interest rates will remain low and stable and as a matter of fact, what you pretend with forward guidance is precisely to incentivize more risk taking, more investment, consumption, and so on. So do you have a sense of how forward guidance and unemployment will interact?

Mr. Broadbent: My guess is not that much, because for one thing the first phase of forward guidance didn't last that long. And in addition, as I pointed out, there do seem, at least in U.K. data, to be these lags between the cyclical movements in output and unemployment in which case at what happened between a year ago and March this year, a lot of that would have already been baked in a cake if that were true. I do think it had some helpful effects and I also think that what we've done since is important. It's not tied to any specific variable, but we have tried to communicate that the path of the instrument, the path of the interest rates is likely to be necessary to meet our mandate, is going to be materially different from that of the past for various reasons. But in the first phase, I think it probably helped, but my guess is that this endogeneity was quite small and that what happened, happened just because of the weakness of productivity essentially.

Mr. Taylor: My question is mainly for Ben Broadbent, and I'd like you to look at Chart 6 when I ask the question from his very helpful handout. This is the chart that has inflation stability, or price stability, on one axis and output stability on the other. And it illustrates this remarkable improvement in performance from the dot up in the upper right hand to the lower left hand. This is a really good chart. I liked your mention of Milton Friedman. I talked about this type of chart with him many times. And so the question is why that happened? Was it just magical? Was it divine coincidence? Or was it really an improvement in monetary policy? He agreed and I agreed that it was monetary policy doing that. And you can see the same change if you put the U.S. in that chart as well. And the U.S. would be not quite a situation where U.K. is, but close. So my question is, why don't you have a dot for the more recent experience? If you put it in, it would show a marked deterioration in output stability. It'd be about the same on price stability. So basically you'd be moving almost directly in the right hand direction in that chart. And really the question is, what's going on? Mervyn King gave a lecture on this just before he stepped down as governor; he used this chart, and argued that what happened is that the trade-off curve shifted. I've argued that it actually has to do with monetary policy. In other words, the same forces that led to an improvement in policy kind of got reversed and provide at least partly the explanation for the deterioration of performance. I think the initial improvement is related to inflation targeting or more broadly focusing more on inflation as a purpose of the central bank. And I think that has led to a reduction in the amount of other kinds of interventions. It made policy simpler. I like to say more rule-like, but it doesn't really matter. So there was less discretionary intervention going on. And, if you think that's the case, then maybe what's happened as you moved in the other direction is that central banking became, as you've described quite well, and many others have, much more complicated and discretionary, doing many other unconventional things and really moving far away from a limited-purpose institution. A lot of discussion here reflects that. So my question more broadly is, how would you explain that really disappointing shift in the diagram and how does it relate to the idea of inflation targeting?

Mr. Broadbent: Well, it's possible, it's partly that. I mean five years is not that long to determine the sort of variances with any precision, let alone to separate what might have caused them to move. Of course, over the last five years, if anything, inflation in the U.K. has been slightly above, not below target. My main conclusion would be that during a great moderation, a great stability, that there weren't many supply-type disturbances. Of course, the regime, and, as you say, the rule-like nature of policy, must have helped bring us in from a dot in the top right hand corner. But equally, where we got to, over the following 15 years, up until the crisis, may itself have been exceptional. It was a period with very few supply-type disturbances, and it was just a relatively, I say that with all due respect to Mervyn, and my predecessors, a relatively easy time in which to conduct monetary policy. It did seem to be this divine coincidence you could happily stabilize everything real with one simple inflation target, and I just don't think that's been the case over the last five years with its unprecedented behavior of productivity and of other costs. So it's just a tougher task, I think.

Mr. Romer: With apologies, my question is also for Deputy Governor Broadbent. You've twice slipped a derivative, and I wanted to ask you about that explicitly. In your presentation, you said that Milton Friedman said we can target the price level and we're doing that.

But you're targeting the inflation rate. And then, Christina Romer asked you about targeting a price level path or a nominal GDP path, and you discussed targeting the growth rate of nominal GDP. So, my question is, do you think this distinction is innocuous? As a philosophical matter, targeting a nominal quantity is more of a nominal anchor than targeting its derivative. And as a practical matter, there's a potential stabilization that comes automatically if you credibly target a path. I took Governor Kuroda to say that if he thought there weren't a limit on the frequency of regime shifts, he might be sympathetic to targeting the path of some nominal quantity.

Mr. Broadbent: The price level target, and the nominal GDP target, the level of nominal GDP would indeed be quite different. And in some circumstances, again a very big, big demand shocks, it might behave better. But again, I'm not convinced it would be better faced with say the big productivity shock we had. We've been in the position where in 2009 and 2010, inflation was higher than target. So supposing we'd been on that price level target at the beginning of that period, we would since have had to have much tighter policy in order to undershoot the level of inflation and get us back to that price level. So I don't think that any single regime of that sort is universally better. It sort of rather depends on constellation of shocks you're facing and if ultimately the goal is to minimize the variance of GDP growth and ensure maximum employment, it doesn't seem to me that the performance during most of the inflation targeting period suggests that we could have done better with some other nominal target, in particular one for the level. So my hunch would be that there's no single universally dominant regime across all sort of variances for the various shocks we've faced.

Mr. Lam: I have a comment and question for Governor Tombini. I think everybody's very impressed with this Brazilian experience. I've done a lot of research on inequality in Brazil back in the '80s. I wanted to flag the inequality part in particular as one of the most remarkable changes. Inequality, as most people know, in Brazil, it was sort of the highest in the world, and has been going down. And I know when I worked on it, people thought it would never go down, and it really has been. But the question I had is that it isn't just

Brazil. Actually it's happening all over Latin America and I'm not sure everybody realizes that. So these things that we think are happening everywhere in the world of rising inequality, rising skill premium, have actually started to go the other way in Brazil, but also in much of the rest of Latin America. The Inter-American Development Bank has done these reports about declining inequality in Latin America for 15 years. And so my question for you, as it relates to the question of your role in monetary policy and other government policy, if this is happening all over Latin America, are there common themes to explain it? Personally, I think it's all explained by your graph 4, which is this big decline in the education wage premium, which is in turn explained by basically supply shifts in the distribution of education playing a huge role. But, I just wanted to ask you, how common are the monetary policy in general central bank policies around Latin America that might be related to this pretty common trend?

Mr. Tombini: I think the most regressive tax we had in Latin America was inflation. And since the 1980s when you were there, between then and now, we have made great progress in stabilizing prices in Latin America. Of course there are differences, but certainly the bulk of countries have been successful in eliminating or mitigating this very pervasive and regressive tax on the population, which was inflation. So I started my answer to Stan Fischer's question by saying that, I think, without inflation stabilization, without macro stabilization, there was no way progress would have been made in reducing poverty, bringing more people into the consumption market. In the case of Brazil, and, you're right, other Latin American countries, I won't speak for them, but many of my colleagues here, we have also seen a significant formalization of the labor market as you know quite well. And this has allowed for the development of new sectors of the economy, such as the credit market. So people have an incentive to formalize, people have an incentive to be part of this process, and I think at the origin I will put inflation stabilization, which has been a central achievement across the region between the 1980s and today. And second, some, of course, social policies, which in the case of Brazil have been quite successful, I believe, in setting very well targeted cash transfer programs which can have a lot of impact for the fiscal cost that they impose, which is very affordable.

And I think yes, a combination of monetary policy, of macro policy more broadly, in stabilizing inflation, bringing down inflation and also the targeted policies that you know well, I think are responsible for this reduction in poverty, reduction in inequality, which has been a central achievement in Brazil, but in other Latin American countries, as you said, as well.

Ms. Groshen: I'm going to ask a very different kind of question that reflects where it is I'm coming from. One thing that was really very striking to me as I heard each of you speak, was how reliant good monetary policy is on having appropriate, accurate, objective, relevant, timely data. So, three very related questions.

First of all, what other information is it that you would like about the labor market and prices? Secondly, what role have you taken in ensuring that you have access to the quality and usefulness and the continuity of labor market data and price data? And then, has your access been at any point compromised by fiscal austerity measures? Knowing that how have you been able to react to this while respecting the separation between fiscal and monetary policy?

Mr. Kuroda: In Japan, we have certainly various data related to the labor market, although not so many as in the United States. For instance, unemployment statistics in the U.S., I understand, are six from U1 to U6, or something like that. In Japan, basically there are only two. And for wages and so on and so forth, we have quite a lot, but again, compared with the U.S., we may have fewer statistics. At this stage, we are not so much concerned about the lack of statistics or anything like that since our economic and financial situation is relatively clear. And, anyway with consumer price inflation of about 1.25 percent, we are still halfway. Although the labor market is becoming tighter and tighter and wages have started rising, the inflation rate is still 1.3 or 1.4 percent. So as I said, some statistics related to the labor market may be useful, but at this stage, we do not think these are a vital model for managing our policy. Of course, when we come close to the 2 percent inflation target, then there are many things we will have to consider further. And that could complicate monetary policy management in the sense that we need more and more statistics related to the labor market, but at this stage we're not so much concerned.

Now on fiscal austerity measures. These measures are useful, and we of course use various fiscal austerity measures calculated by the government, the IMF, OECD, and so on and so forth. These are not the sort of hard data, or first-hand data. Rather, they are kind of measurement statistics based on some economic theory. Although there may be some difference of opinion, I think at this stage those measures are quite useful and we always carefully monitor the fiscal position of the government and the policies taken by the government.

Mr. Feldstein: Question for Governor Kuroda. You've given us a very reassuring set of charts and good news happening in Japan. The great anomaly is of course this very low interest rate, which you didn't focus on, where the 10-year rate is the lowest of all the countries at essentially a half of 1 percent, despite the fact that you keep telling the world and the Japanese public that you're going to get the inflation rate to 2 percent. So I have two questions.

First is, is there survey data on what the Japanese public believes will be the inflation rate a year from now, five years from now? And second, do you think that when you have achieved and held the inflation rate at 2 percent, the long-term interest rate will remain so very low, so close to zero.

Mr. Kuroda: On the first question, yes, we do have various survey data as well as a so-called break-even inflation rate calculated from the market data. And all of them show that gradually, slowly, inflation expectations have been rising, but at this stage still between 1 percent and 1.5 percent or something, even three years ahead and five years ahead. Still, people appear to believe that the 2 percent target is unlikely to be met. So there's certainly some difference of opinion or difference of expectations between the central bank and the market or general public. Having said that, that difference cannot explain the extremely low interest rate of 10-year government bonds, which is less than 50 basis points. I don't remember the current figure, but anyway, less than, slightly less than 0.5 percent. And of course, once the 2 percent target is met in a sustainable manner, people's expectations, inflation expectations, would adjust to the reality, then the 0.5 percent long-term interest rate could not be sustained. At this stage, we have not shown any sort of medium-term sustainable level of long-term interest rates under the 2 percent inflation expectations, but certainly 0.5 percent or less than 0.5 percent would not be sustainable and interest rates would rise accordingly. We would like to manage our QQE so as to avoid any abrupt shock to the financial market or economy, and anyway, our intention is to achieve the 2 percent inflation target sometime in the next fiscal year. And approaching the target, probably we would see some gradual, gradual interest rate increase, but we have committed ourselves to continue the current extremely accommodative monetary policy stance until the 2 percent inflation target is met and maintained in a sustainable manner. That means that inflation expectations are also anchored around 2 percent. So that may take some more time.

Mr. Furman: I originally had a question for Deputy Governor Broadbent, and I'll get back to that. But listening to John Taylor, I had a comment on him that I wanted to do first.

Fortunately, both of them are on the same page that you have here. So, I'll start with Chart 6. If you look at the U.S. dot for 1993-2007, and ask what's happened since then, it's actually moved down and to the left, it's moved closer to the origin. The volatility of output has fallen and the volatility of inflation has fallen. So I think some of the premise of the question you had wasn't necessarily accurate and we've seen the Great Moderation, if anything, become more moderate post-Great Recession. And so I think what that says to me at least is when thinking about these types of things, and I only comment on fiscal policy of course, it's really the first moment that we're much more worried about than the second moment. We've done a great job on the second moment, but it's the rate of growth and the level of unemployment that still have further to go.

To get to my original question for Deputy Governor Broadent, it's Chart 8, so you just need to look one down. You tossed out a bunch of explanations for the surprisingly low wage growth. You didn't cover two though and I just wanted to ask you what you thought about them. The first is productivity growth is about 2 points lower than it was before, so you expect wage growth to be lower by about 2 points, which looks like it explains some of that discrepancy. And the second was, the hypothesis that Chair Yellen raised yesterday, of pent-up deflation. And in particular, do you see points earlier in the recession that are above that line, and if you looked at it cumulatively, it would be more on the line. Do you see evidence for that hypothesis in the U.K. data?

Mr. Broadbent: Let me take the first question first because I had actually tried to get that across. I think that possibly was the explanation. If it's true that there's real wage resistance, at least for a while, then low productivity growth might initially just move you along, given Phillips curve. In other words, you need in the face of weak productivity, if people are still expecting a certain rate of real wage growth, you might need higher unemployment to ensure stable inflation. And as I say, I think it's possible that this weak productivity initially meant a rise in both, unemployment and inflation. But, I think you're absolutely right that as people sort of get adapted to that, it's quite possible that things shift down. In other words, the question would be, and I think that it's empirically probably very difficult to answer given how stable productivity growth has been in the past, is suppose you were permanently to weaken that rate of growth, would you thereby affect the natural rate of unemployment? And what I'm suggesting here is possibly not that people would resist for a while, but in the end, they just accept the lower rate of real wage growth, and the implication as you say, would be that you'd just have lower rate of growth at a given level of unemployment. And I think that's precisely what I was trying to suggest might happen. I hadn't considered, until Chair Yellen raised the possibility yesterday actually, of pent-up weak wage growth, and I think it's very interesting. And not for the first time, I would learn something to go and look up when I go home.

Mr. Spriggs: So I think the great uncertainty that surrounds this conference and understanding the state of the economy is really reflected in Japan. And the sense that obviously Japan did not plan to have this prolonged period of deflation. No one woke up one morning and said let's do this for decades. So what strikes me as the uncertainty is an understanding at which point does the deflation become intractable and at which point have we overshot worrying about prices and not about growth and not about wage growth in particular, as you have seen your prime minister put emphasis on raising wages in his three arrows to try and improve things and get out of the deflation.

So my question is over that. I mean in the United States, just two years ago, our payroll employment finally got back to 2001. So that means for over a decade, essentially we just got back to where we were in payroll employment. People are now celebrating because just last month we got back to our peak of in January 2008, six years ago. And that's considered a major achievement. So, I mean, our labor market isn't doing very well. Median household income is still lower than it was in 1999. A big boost in our consumption that has helped to fuel this recovery has been the automobile sales correction from its record-breaking fall during the downturn. We now know that most of automobile purchases have been from borrowing using subprime loans. So, we are not by any means in a stable situation. Real job growth, as we saw yesterday in David Autor's paper, this has been low-wage employment. The modest net that we have achieved has been low wage occupations, not a broad thing. So Governor Kuroda, looking back and sort of giving advice to folks about where things can go wrong, the real uncertainty it strikes me is at what point do things go so bad that you can't correct them? And what in hindsight might have been some indications that things should have been done differently so that you can give some advice about what the real risks are here that we're discussing?

Mr. Haltiwanger: At a conference at the Federal Reserve earlier this year, I talked about evidence for the United States about the Great Recession being a time where we have seen less productivity-enhancing reallocation. And in presenting that work I received some interesting feedback about the evidence for the U.K. and Japan in the current and prior financial crises. So this is a question for Governor Broadbent and Governor Kuroda.

The evidence I presented showed that for the United States, that prior to the Great Recession, recessions were times of accelerated productivity in enhancing reallocation. That is, the evidence was largely consistent with the cleansing effect of recession models. But it's easy to write down models where because of distortions recessions are periods of time where reallocation slows down and becomes less productivity enhancing. This alternative argument has been made in recessions associated with financial crises. In response to my presentation at the Fed conference, a representative from the Bank of England noted that there has been the large productivity decline in the U.K. during and after the Great Recession and this seems to be associated with the decline in productivity-enhancing reallocation. That is, the evidence suggested that there had been a decline in reallocation and this was associated with the decline in productivity. And then there were also representatives from Japan at the conference, including Nobu Kiyotaki. Nobu noted that the financial crises in Japan have also been associated with dampened reallocation and less productivity-enhancing reallocation. So it's sort of a two-part question. One is, do you agree with that assessment that in the U.K. and Japan, financial crises have distorted reallocation and lowered productivity? Second, if so, this suggests the type of indicators to look at following a recession induced by a financial crisis are different. So, I'd like to hear your thoughts about the U.K. and the Japan experiences on these issues.

***Mr. Broadbent*:** Very quickly, I would wholeheartedly agree with that and indeed I've been pushing that line quite strongly in the U.K., and I think there's quite a bit of evidence that that's the case, both within the labor market, but also in the allocation of capital. We've seen extreme increase in the dispersion of prices, which suggests to me that there's a lot of dispersion of marginal costs and missed opportunities from reallocation of capital. So I think that's absolutely right. On the other hand, I had expected, or at least hoped, that once the financial system began to improve and it has begun to happen, post-Mario Draghi's whatever it takes. Big collapse in the funding cost of the bank, some more credit beginning to flow that we were beginning to see an improvement in productivity growth and as of yet, that's not happened. But I completely concur with your diagnosis.

***Mr. Kuroda*:** Japan's experience of 15 years of deflation is a little bit complicated, of course. Initially, after the bursting of the bubble, the banking sector had serious problems about the program. And banks tried to dispose of bad assets through various means, but by 1997, the situation deteriorated so much so that we had the banking crisis in November 1997. And at the same time, we had the Asian currency crisis, and since 1998 we have had deflation until 2013. So, the causes of deflation are complicated and not simple, but the central bank is responsible for price stability. So whatever caused deflation, or disinflation, the central bank must counter such situations. Unfortunately, in the late '90s and early 2000s, the Bank of Japan was not so active, not so determined to eradicate those deflationary pressures from the economy. So, whatever caused deflation or whatever is likely to cause deflation in other parts of the world, I think central banks in those economies must respond to such risks by all and any means that they have.