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FEDERAL RESERVE POLICY IN AN INTERNATIONAL CONTEXT

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P R O C E E D I N G S

MR. OBSTFELD: It's a huge pleasure and an honor to introduce Ben Bernanke as this year's Mundell-Fleming lecturer. It is also a daunting challenge to do that because of his immense accomplishments, both as a scholar and as a policy maker, that are so well known to all of you.

I haven't reviewed the entire list of past Mundell-Fleming lecturers, but it's a safe bet that Ben is the only one to have been Time Magazine's Person of the Year. (Laughter)

As Chairman of the Fed during eight eventful years, Ben took actions that stretched the envelope of monetary policy and arguably saved the U.S. and the world economies from a much worse recession than actually occurred, which might have been a second Great Depression.

Many of the subjects we are discussing at this conference flow directly from actions that Ben and the Fed took in the early months of the crisis.

Ben has recently published memoires of that exceptional service. One review that I read noted that Ben's predecessor, Alan Greenspan, titled his own memoires "The Age of Turbulence," and the same reviewer noted that Ben could well have entitled his memoires "You Want to See Turbulence." (Laughter) For navigating that turbulence, Ben deserves our gratitude.

And I'll call this for the sake of argument, and in honor of Minister Mantega, I'm going to call this the Brazil case. The Brazil case is one in which the country, Brazil, is worried not only about its relationships with the United States but it's also worried about its relationships with other emerging market economies that export. So there might be another economy, let's assume a third economy.

Call it, oh, what the hell, call it China. China has a fixed exchange rate which is perhaps undervalued and is very competitive in terms of its exports. So looking at the Brazil case, their concern

is that if they appreciate their exchange rate too much they're going to lose market share to China.

In terms of the model, if you go back to the previous page, you'll see that the sensitivity of exports to the exchange rate is the parameter little c. All right, so in the case of the Brazil-China story, little c is going to be very large. What does that tell us?

If you look at the bottom, you look at the constants, you'll see if little c if very large then K1 and K2 are very small. Or in other words, equation six is telling you that in this case where Brazil is worried about competition from other emerging markets, the exchange rate, the Real exchange rate is going to very stable. It's not going to respond much at all to US monetary policy. Instead, what you would find generally would be that the adjustment that Brazil does would be done via the interest rate rather than through the exchange rate.

All right, now, how is Brazil in this model, how is Brazil or the EME, more generally, how is the

EME going to feel about an easing of monetary policy by the Fed, by the United States? Well, of course in the very short run, it's going to depend a bit on the where Brazil is in terms of its business cycle. Generally speaking, in the short run you would expect a US easing to have expansionary effects on Brazil as well and that's, in fact, as I've explained, that's the empirical finding and so whether that's welcome or not would depend, I think, to some extent, on where Brazil is. Whether they're overheating or under heating at a given moment.

But this model doesn't have that. This model is looking at the slightly longer period where output is brought back to the target and what is important is what happens to the exchange rate and to exports. So going back here, looking at the loss function and looking at equations three and four, what you can see is that without output fixed, looking at equation four, what matters to Brazil or to the EME emerging market, what matters is what happens to their exports.

And looking at equation three, then you can see that the net effect on the EME has to do with how powerful the exchange rate appreciation is versus how much demand is generated by the increase in US output. All right? So in the end what's happening here is that EME does care about what US monetary policy does.

It cannot completely insulate itself from US policy. It's not because of any inability to set output at full employment but rather because they have additional objections for exports and the US policy can create effects in exports which cannot be offset by exchange rate policy in the emerging market.

Now, as we're going to see, the -- if you look at equation three again, there's going to be two effects on exports in the emerging market. There's the demand averting effect, the effect of the exchange rate and the demand on many effect. The effect of higher US output and those things tend to offset.

I would argue and I think we experienced this as a matter of practice that the effects, the many effects, the increase in US output which

ultimately shows through to higher emerging market exports takes time to materialize. It takes time for growth to materialize. And when it happens, the effect can be mixed with all kinds of other effects that are determining exports.

On the other hand, the effects of US policy on emerging market exchange rates in particular and on interest rates are instantaneous. So I would argue that even if these things are roughly offsetting, that there would be some tendency to react negatively to US policy for the reason that what you see initially is the adverse effect, the exchange rate effect, which is the one that you worry about in terms of affecting your overall export goals.

All right, now, let's talk a little bit about the empirical evidence that bears on this. You know, in particular, you know, what is the effect of a Fed easing on emerging market economies? There's a big literature on this as you might guess and to summarize it I'm going to talk a little bit about a presentation that Steven Kamin, who's the Director of

Internal Finance at the Fed, made recently at the Peterson Institute.

And he summarized research both at the Fed and elsewhere as saying that a Fed easing has three separate effects on emerging markets. The first the demand, diversion effect operating through the exchange rate, the second the demand augmentation effect operating through the higher level of US income and in addition, what he called the financial spillover effect which is the fact that lower US interest rates tend to be followed by lower interest rates abroad as well. And that tends to be stimulative to the emerging market economy.

That's something not really captured here. The empirical results, and these are representative, I think of the results in the literature, are that the demand augmenting and the demand diverting effects, equation three, are pretty much offsetting. Whereas, the financial spillover effect is expansionary, a cut in US interest rates tend to lead emerging markets to expand.

So overall, the net effect of easing monetary policy in the US is to have a limited effect on emerging market exports and perhaps an expansionary effect on output in emerging markets. So overall, I would say that the evidence on this issue suggests that the currency war effect is actually not very big and I'll come back to additional evidence on this in a minute.

But I think part of the problem is that the exchange rate effects are much more apparent to policymakers than are the indirect effects of higher US output. Let me go on for one more second here and ask the question, you know, all right, so let's suppose for the moment that we do have these additional motivations for emerging markets.

Is there any scope for cooperation, coordination, to address the problem of the currency war? So to do that, and I'll talk about this briefly, but to do that, I got to add the US economy to the model. So equation seven is just the IS curve, the United States. It says that output in the US depends

negatively on interests rates in the US and positively on exports of the US.

I'm going to have, equation eight, I'm going to have US exports depend on the exchange rate. Remember E is the emerging market exchange rate. So when the emerging market exchange rate increases, that means the dollar is weakening which means that US exports expand.

I'm going -- to get maximum conflict and therefore, maximum ability for coordination to get benefits, I'm going to assume, I'm just going to ignore the effects of foreign output on US exports and vice versa. So just to make it simple.

So the only thing that's affecting exports in both directions is the exchange rate. So we have a purer demand diversion effect. So this really does seem to have the flavor of a currency war.

And finally, we have this time a global loss function. The global loss function is, the first two terms are just what you saw before. It's the variance of emerging market output minus emerging market

exports. So that's exactly what the emerging market cares about.

We saw that before. In addition, we're going to allow for some interest weight on the variance of US output where θ and δ are just welfare weights. So the global loss function is the sum of the loss functions of the US and the emerging market. The two countries are asymmetric in that the emerging market cares, in addition to domestic stability, it cares also about exports. The US does not care about exports per se. It only cares about domestic stability.

All right, you can solve the -- you can find the social optimum and ask basically what combination of exchange rates and interest rates gives you the social optimum. And it turns out there is a small possible benefit which is -- which would involve essentially the US not easing quite as much as it would otherwise like to so that output in the US is actually a little bit below potential.

And in exchange, it turns out the emerging

market allows its currency to appreciate just a bit more than it otherwise would given the US interest rates. So there is a small potential gain from cooperation at least in this model. Now in this particular case it turns out, as you know from equation 10, that it's a one-way bet. That only the emerging market benefits because of the asymmetry because it cares about its exports.

The US always finds that because it's not allowed to ease quite as much as it would like, that output is below normal and therefore it suffers. It doesn't gain. It's not -- this is not a way to improving cooperation. The US is a little bit worse off than it otherwise would be. Now can you ima -- is there a possibility for a case where, in fact, the US could be made better off?

A case I will discuss in the paper which is not yet available I'm sorry to say, but the case discussed in the paper shows -- considers the case suppose that there's a zero lower bound constraint on US interest rates. Imagine a situation where the US

is in recession and the Fed cannot lower interest rates because of zero lower bound. It turns out in that case, you can show that the social optimum involves the emerging markets appreciating more than they otherwise would in order to give a competitive advantage to the US to allow their economy to do better and get closer to full employment.

Now I hope all of this strikes you the way it strikes me as being pretty much pie in the sky here. You know, the idea that, for example, the US would not lower interest rates as much as it would otherwise do it because it's concerned about Brazil's export performance doesn't strike me as particularly realistic and it would be, in addition, very hard to actually police, monitor particularly if you had multiple countries involved because there would be strong incentives to defect.

So I put this up here to make the, you know, to explain, to look at the case. But, you know, despite the deviation from the usual Mundell-Fleming result, I don't think in practice there's a whole lot

of room here for coordination. And in fact, because the demand augmenting and demand diverting effects are more or less equal, the quantitative benefit of coordination would be extremely small.

All right, so that's the currency war case. Well, just to summarize what have we looked at here in this model, the reason I think that emerging markets care about currency wars and are simply not content to use the exchange rate to get their domestic goals is because they have objectives for the exchange rate over and above domestic stability. And one possibility would be promoting exports but there might be others as well, financial goals for example.

This is particularly striking in the case where you have the Brazil-China story where Brazil is afraid to lose market share to China therefore it has a very stable exchange rate. Therefore it will tend to respond mostly with its interest rate. In that case, you know, that can be -- that's the most dramatic case, I think.

But that said, I think that this doesn't

suggest to me that there really is much scope for international cooperation on the currency war problem, at least not given the empirical findings that we have. Because the demand augmenting and the demand diverting effects are more or less equal, the net effect of coordination would be very small, even if it could be achieved, it's very likely it could be achieved in any case because for a variety of reasons including the fact that it would require the US to put in its own loss function the export performance of the emerging market.

Now to conclude this section, let me just say a couple more things about the recent experience in terms of currency wars. I think whatever Minister Mantega's concerns might have been ex ante when the US undertook QE2; I think that as an empirical matter that the currency war was never fought. It was kind of a, you know, a phony war, if you will.

Make two observations. One is that the real US trade balance between 2009 and 2015 is roughly unchanged in terms of real dollars. So what that

means in terms of growth accounting is that the US recovery attributes about zero percent of its growth to trade factors.

Of course, that takes into account what other countries were doing but it doesn't suggest that the US was recovering on the back of other countries export markets. The other observation on the dollar is that like many domestic critics who are concerned that monetary ease would cause a dollar to lose lots of value, of course, as you know, although the dollar did fall in 2009, since 2010 it's been pretty stable. And since, of course, 2014 it's appreciated quite a bit. So there's not really much evidence also of systematic depreciation of the dollar.

Now --

As fascinating as the drama of the day to day policy crisis, and we certainly have dealt with our share in the Fund, we should not forget other contributions of Ben's, contributions that quietly strengthened the Federal Reserve as an institution,

and this is the kind of thing that we talk about and call "structural reforms."

I think of these as long term investments in the quality of the policy making framework, investments that are going to yield rich returns for a long time.

Ben promoted greater Fed transparency in a number of ways, including regular post-FMOC press conferences, the famous Dot Plots, introduced in 2012, and institutionalized "inflation target." Under his watch, the Fed also began tweeting. (Laughter)

His leadership maintained and enhanced the Fed's research function, something essential to informed policy making, and he provided -- I think this is something that is not emphasized enough -- he provided an unparalleled instance of non-partisan leadership in an increasingly partisan national capitol. Appointed by a Republican President, reappointed by a Democratic President, Ben's example shows what policy can accomplish when it is truly directed toward the public interest.

I would be remiss not to recall some of Ben's contributions as an academic because these really are on par with what he contributed to policy.

I went to grad school with Ben, and I first got some inkling of what he was about when I read his econometrics paper, which was one of the earliest papers to actually estimate a fully specified macro model of the U.S. economy with rational expectations. I still have that paper.

Since then, Ben's contributions have been incredible. He has illuminated the credit channel of banks on the economy, the Financial Accelerator. He's contributed to macro econometrics in several ways. He has helped us understand the Great Depression better, and he's been one of the leading thinkers on inflation targeting.

Ben's lecture today is on a topic dear to the IMF's heart, spillover's, and particularly the spillover's from domestic monetary policy onto foreign economies. You all know that this was a controversial topic during Ben's time at the Fed when some emerging

market leaders talked about currency wars, and it remains a controversial topic today as the Fed contemplates exit from the zero lower bound.

Without any further delay, here is Ben Bernanke to speak on Federal Reserve policy in an international context. (Applause)

MR. BERNANKE: All right. They lost my notes. (Laughter) Seriously. (Laughter) They are not there? I'm going to have to do this by heart? (Laughter) (Applause) Okay, Mauri, I see where you're coming from here. (Laughter) Thank you. I don't have that paper. You still have the paper? (Laughter)

MR. OBSTFELD: It's in a file cabinet back at Berkeley.

MR. BERNANKE: All right. That was the light moment of the afternoon. Anyway, I'm very pleased to be here. Thank you to the IMF. Thanks, Mauri, for giving me the opportunity to deliver the Mundell-Fleming lecture, which has always been a highlight of the year.

Of course, Mundell and Fleming, who both worked at the IMF, were very focused on the international dimensions of monetary and fiscal policy, and in that spirit, as Mauri said, I want to discuss the international context of Fed monetary policy.

Now, as a bit of background, as Mauri mentioned, a lot of these issues came up during my tenure at the Fed. During the crisis itself, the degree of international cooperation was extraordinarily high, and we worked very closely together, central bankers, finance ministers, to try to address the financial crisis and begin the process of recovery.

Indeed, I became a member of the central banking club, which is a very elite club, and one where there are a lot of close relationships that are built.

Now, as time passed and as the recovery commenced, the personal relationships stayed good, but the economic and policy interests began to diverge

between the United States and other economies. In particular, the United States, in the interest of pursuing economic recovery, continued to ease monetary policy in order to address both high unemployment and low inflation.

Now, as we did that, and again, I think it was a necessary step in order to help the U.S. economy recover, we got concerns or complaints from emerging market economies about the potential spillover's from our policies, our actions, to those economies.

There were two concerns in particular. They overlap somewhat, but I'm going to treat them as separate phenomena. The first is referred to by the phrase "currency wars." I credit Brazilian Finance Minister Guido Mantega with reviving this term. He raised it in the context of our QE2, our second round of quantitative easing in the fall of 2010, claiming that the effects of our policies on the dollar constituted aggression of some sort against other economies because of the competitive advantages that a

weaker dollar created. Currency wars was one of the accusations/complaints that we heard.

The other concern was what I'll call in this lecture "financial stability spillover's," the notion that Fed monetary easing or Fed monetary policy in general created financial stability risks for other economies, notably, emerging market economies. The example which I'll go back to was the famous taper tantrum of 2013, when even a speculation about changes in U.S. monetary policy led to volatility in markets, and some of the worse volatility was experienced in emerging markets.

Now, of course, the United States was not the only advanced industrial economy to ease policy during this period. Europe and Japan, of course, and others also did so. The U.S. got, I think, more criticism than others. Why was that? Of course, the size of the United States, but the United States is no bigger than the EuroZone.

I think as we talked to our colleagues, the fact that the dollar remains the dominant

international currency enhanced the perceived importance of what the Fed was doing, and often I would hear that because the dollar is so essential, that the options to respond to Fed policy were extremely limited. An additional aspect of all of this is the role of the dollar as global currency.

Let me be clear. I have tremendous sympathy for my colleagues in emerging market economies. They face tremendous challenges, both in terms of growth and development and in terms of navigating the financial stresses of the last few years.

I would also say criticism of our policies in the United States was far from universal, and in more than one case, I had colleagues from central banks and emerging markets come up and say, you know, keep doing it, we want you to do that.

That being said, I do think there was a tendency among some foreign policy makers at least to represent themselves as sort of passive objects of what the Fed was doing. I think the truth is it should be more symmetric than that. I think both the

United States and the emerging market economies had responsibility and have continued ability to work together to make the international monetary system and financial system work better.

The message I want to leave you with in the end, as I talk about some of the phenomena, is that you need to have cooperation. The Fed by itself has no chance of addressing these concerns. You need to have both Fed, U.S., and emerging market policy responses if we are going to address these ongoing issues of so-called "spillover's."

Today, I want to talk about three linked issues. The first is currency wars, which I'll interpret as competitive depreciation. Is it monetary policy action that affects value of the currency? Is that somehow unfair or counterproductive? In particular, did the United States purchase its recovery in the last few years through competitive depreciation? What scope is there potentially for policy cooperation to address the beggar-thy-neighbour aspects of monetary policy?

That is my first topic, currency wars. The second topic I'll address is financial stability spillover's. I'll talk in particular about the prominent recent literature on this topic, which is exemplified by Elaine Ray's Mundell-Fleming lecture from last year; right? She talked about the global financial cycle. I want to talk about that literature, try to draw some lessons from it for policy, and in particular, related to things like the taper tantrum.

Finally, very briefly, I want to talk just a bit about the implications of the special role of the dollar. First, the dollar standard, if you will, what are its costs and benefits, are the benefits asymmetric, is it something that gives a special place to the United States, and how so. How does it affect the transmission of Federal Reserve policy, and in particular, how should emerging market policy makers respond to the increasing dollarization of some of their markets, particularly their credit markets.

To foreshadow my conclusions, on currency wars, I think there is frankly not much basis, either theoretical or empirical, to complain about currency wars on the part of the Fed. As I'll illustrate through some analysis, I think the reason emerging markets are concerned about currency wars is because ultimately they have separate goals for their exchange rates, over and above the goals of domestic stabilization.

As Mundell and Fleming, of course, showed in their discussion of the Impossible Trinity, the Trilemma, you can't have simultaneously free capital flows, independent monetary policies, and flexible or targeted exchange rates to the level that you want to choose.

In some sense, it was this Trilemma that I think creates the tension that emerging markets felt, which caused them to complain about currency wars.

On financial spillover's, I'm going to argue that the issues here are much more difficult. We are further from understanding exactly what's happening.

I do think that based on what we know, the right approach to dealing with financial stability spillover's is through regulation, supervision, macro prudential policies, and the like, rather than through monetary policy, per se. I want to get into that literature a bit and talk about some of the issues that it raises.

On the dollar standard, I'm going to conclude that the benefits of the dollar standard to the U.S. and to its trading partners are more balanced today than they were in the days of the Bretton Woods system, when I think it was an asymmetric standard that favored the United States.

I do think also that the existence of the dollar standard does not necessarily mean that emerging market economies should allow the dollarization to take place without oversight and attention, in particular, the decisions to dollarize made by individuals or private sector market participants are not necessarily the ones that will be

most consistent with financial stability in those countries.

I started off by saying my goal here is not to win an argument. What I'm trying to do is encourage basically a more symmetric perspective and to work and support enhanced cooperation between the advanced economies, the United States in particular, and emerging markets, as we think about these greater effects of global financial integration.

I should say now that I'm a civilian again, I can say with great relief that my views are my own. They don't represent the Federal Reserve. They don't represent the Brookings Institution. They don't represent my mom. (Laughter) They are just my own scratching's, so nobody else is responsible.

I thought before I got into some of the economics here that it would be a good idea to start by talking a little bit about the consultation process that goes on among central banks, and went on during my tenure at the Fed.

You sometimes get the impression based on public pronouncements that the Fed is high-handed, that it takes action without any consultation with the rest of the world. That could hardly be less true. I just want to say a few words about the consultation process, and how the Fed communicated with other central banks and with other economies in talking about potential policies.

Broadly speaking, the Chairman of the Fed or sometimes the Vice Chairman meets with emerging market economy representatives something on the order of 10 times a year. The most often that this happens is at the Bank for International Settlements, the BIS, in Basel, which as you may know, has six meetings each year of essentially all the major central banks plus many smaller central banks.

In particular, for example, the global economy meeting, which is the centerpiece of the BIS meetings, involves regular 30 central bank governors plus another 19 who are invited on a rotating/visiting

type basis. About 50 central bank governors gather for discussion six times a year in Basel.

This is of sufficient importance to the Fed that FOMC meetings are rescheduled to make sure they don't conflict with these meetings. There is a Fed Chair or Vice Chair at every one of these meetings.

How do the meetings proceed? At these global economy meetings, which are chaired by a senior governor, currently Agustin Carsten, previously Trichet, and then Mervyn King -- the first item on the agenda is typically the presentation by the Fed Chair.

In my experience, we would often take as much as 90 minutes whereby the Fed Chair would make a presentation, explain what's going on in the U.S. economy, discuss policy options for the Fed, and hear comments and questions from colleagues around the table. It was a very extension discussion and quite open discussion.

Other meetings at Basel were also quite extensive. A group called the ECC, the Economic Consultative Council, which was sort of the steering

committee for the global economy meeting, involved 14 major central banks, including four big emerging markets central banks, China, India, Mexico, and Brazil.

That group also met and also discussed various issues, and perhaps the most interesting and in some ways the most sequestered was a dinner that was held always at every meeting that was attended by those 14 central bank governors, the Federal Reserve Bank of New York President, and a few others.

Those dinners, and I have to say the food was excellent, the BIS is terrific in terms of food preparation (Laughter), those dinners were a tremendous opportunity for the governors to talk to each other on a very frank basis, in a way that even in the larger meeting would not have been possible.

The BIS does provide a framework for substantial consultation, but that's not all of it. There's more beyond that. The BIS meetings involve pretty much only central bank governors, some of them also involved regulators, like the Basel Committee

meetings, but there are also international meetings that involve both central bank governors and finance ministers, including the G20, which meets all around the world several times a year, G7, the other Gs, and also, of course, the IMF meetings typically here in Washington and sometimes elsewhere, where you gather together the policy makers from the finance ministries and central banks from around the world.

Once again, as those of you who have attended the IMF general meeting know, an important feature at every one of these meetings is a presentation by the Fed Chair and commentary and questions from the rest of the group.

I do remember a very let's say interesting meeting that occurred in Korea in October 2010, which was just before the Fed introduced QE2. At that meeting, I made my regular presentation, then I made a second presentation describing the policy options the Fed had, and explaining why we were looking at this option and how it would work.

Let's say I had a considerable amount of interest in that discussion. We took a lot of questions and a lot of comments. Again, the consultation was actually quite meaningful.

There are also many other forms of consultation, calls, conference calls, bilateral calls, bilateral meetings, staff meetings, and the like.

I just want to convey it's important to understand, and perhaps people here do understand, that these policies are not made in isolation. There really is an awful lot of discussion and information provided across different countries as these policies are contemplated.

During the crisis, of course, the actual coordination was quite extensive, including the coordinated rate cuts of October 2008, the swap lines, which I'll talk about later, regulatory cooperation, and the like.

That is just a little bit about coordination and consultation.

Let me turn now to the economics and start talking a bit about monetary policy and currency wars. Again, the phrase is not due to Minister Mantega, but he revived it and began talking about it when the Fed instituted the second round of quantitative easing, just after the Korea meeting, in November 2010.

His concern again was there was a competitive depreciation going on, that the dollar was being depressed as a way of advantaging U.S. trade.

From a certain perspective, from a classic Mundell and Fleming perspective, in particular, the concerns about currency wars, I think, are a little bit puzzling actually, for a couple of reasons.

One, as you can see in any Mundell-Fleming model, monetary policy actions have both what I would call demand diverting and demand augmenting effects on foreign economies. So, for example, in a monetary policy easing, like the one that took place in QE2, it's true that tended to push the dollar down, and that would tend to be demand diverting, that is it

would tend to divert demand away from trading partners towards U.S. exports.

At the same time, if the monetary policy is successful and it strengthens the U.S. economy, increases income, then that is a source of increased demand for foreign exports. That is the demand augmenting effect. Those two things, at least partially, are going to offset, so the net effect on other countries should be moderate.

Moreover, again, in a standard Mundell-Fleming model, with flexible exchange rates, we know countries can achieve internal balance independent of the monetary policies taking place else where.

Just looking at it from that very simple perspective, you might ask what is the concern about the currency war aspect of monetary easing.

I think I know the explanation for why there is a concern, and the way I would summarize it is to say that emerging market economies tend to have more goals than just internal balance, in particular, they

tend to have goals independently of internal balance for their exchange rate.

When that happens, then they can run afoul of the Trilemma, the impossibility of having a target for your exchange rate, flexible monetary policy to achieve domestic balance, and capital flows to achieve growth.

I think, as I will talk about, that is the source of the currency wars concern.

I haven’t been doing any mathematical modeling for a while. I think I've lost a few miles off my fast ball. However, for the hell of it, I'm going to put up here a toy model of how the U.S., a country we will call the U.S., and another country we will call EM, or whatever.

I'm going to put up a little model of how these two countries interact when the EM country is concerned about its exchange rate as well as about other criteria.

Let me do that now. Here we go. Excellent. This is the whole model. Very simple one. It has

four equations. The first one is interest rate parity. It says that there is a relationship between the interest rate in the EM, "i," and the interest rate in the United States, "ius," and that relationship is mediated by the exchange rate of EM, which is the "e."

Interest rate parity, of course, normally says that the differential between the interest rates in two countries should be equal to the expected depreciation of the exchange rate. I'm going to be assuming here that there is a normal level of the exchange rate over time, so the higher the level of the exchange rate, 'e," the more expected depreciation there is. You can look at "e" as a measure of expected depreciation.

That is just the normal interest rate parity condition relating the EM interest rate to the U.S. interest rate, and to the EM exchange rate.

The second equation is the emerging market economy's EME IS curve, so "y," which is output in the emerging market economy, total output. Depends on

the domestic interest rate, the usual IS relationship, a higher interest rate depresses spending and output, but it is positively related to exports, the amount of goods the country sells abroad, "x." "a" and "b" are just parameters, and this is just a standard IS curve.

The third equation is the export equation. It says that the exports of the emerging market economy depend on two things. First, it depends on the exchange rate of the emerging markets, and all parameters are positive by definition, so "-c x e" says that when the exchange rate of the emerging market economy rises, then exports decline. That is just a competitiveness effect.

In addition, when output in the U.S., when the U.S. economy strengthens, that creates more demand for the emerging market exports, so that is a positive factor. That is the explanation for emerging market exports.

What makes this at all interesting is that we're going to assume that EME policy makers care about two things, so equation four is their loss

function. The first thing they care about is the variability of output, which is "y," so if we normalize full employment to be zero, then this variance term here is just saying they want to stabilize output around full employment.

That is their one objective. If that was all they cared about, we would be back in the standard Mundell-Fleming model, and everything would just be taken care of by floating exchange rates.

In addition, we're going to assume that emerging market economies care about their exports, maybe they believe higher levels of exports are good for development, they create more, they strengthen the manufacturing sector, they expose the country to international competition, so there is a desire to promote exports over and above achieving the stability.

That's the whole model. I told you it was simple.

Let's assume the Fed is setting U.S. interest rates, and that is determining American

output, so those things are just given, and given that, the emerging market policy makers are going to minimize their loss function, and we can treat either their interest rate or their exchange rate as the instrument.

For simplicity, let's say the exchange rate is their instrument, but the two are linked together. You can use either one. We are going to choose the level of the exchange rate to minimize the loss function.

Here's the solution. Basically, the results give you two things. One, the solution for the optimal level of output in the emerging market, and equation six tells you that the optimal exchange rate in the emerging market depends on the U.S. interest rate and the U.S. output level, where the "Ki" are positive constants which are functions of the parameters of the model, and they are written there at the bottom, just for the heck of it.

What does this elaborate model tell us? A few things. The first one, looking at equation five,

remember the potential output is zero, but "y*" is positive. There is a tendency, an incentive, for the emerging market economy policy makers to overheat the economy, to try to push output above zero, even though in principle they would like to have output at full employment.

Why do they do that? Well, the reason is that because they are also interested in exports, it tends to under value the exchange rate, and that has a side effect causing output to be greater than zero.

The second conclusion is not a very surprising one but it says that the exchange rate that will be set in the emerging market depends on U.S. variables. It depends in the way you would expect. In particular, suppose the United States eases monetary policy, which means the U.S. interest rate declines, and if the monetary policy is effective, that means U.S. output rises.

Looking at that equation, you can see that both of those influences would cause the EME exchange rate to appreciate, so as you would expect, easing

monetary policy leads to appreciation of the emerging market exchange rate.

Now, there's an interesting case, which I think is worth noting here, which is the following. I'll call this --for the sake of argument, and in honor of Minister Mantega, I'm going to call this the "Brazil case."

The Brazil case is one in which the country, Brazil, is worried not only about its relationships with the United States but is also worried about its relationships with other emerging market economies, so, there's not really much evidence also of systematic depreciation of the dollar. Now, so much for my immature modeling, let me turn to the second topic which will be in less detail, which is about the spillovers to financial stability. So, what I've been talking about so far, is the concern that monetary policy in the center, in the United States, creates unfair advantages in terms of competitiveness, in terms of trade. I have argued that is not really very realistic, and not very important.

Since, I think 2010, I think the focus, in a lot of the discussions, has been less on trade, and more on what I've called financial stability spillovers. And the example that everyone would point to would be the Taper Tantrum of 2013, which will always live in my memory I will have to say. Remember in 2013 we were still buying large amounts of assets every month as part of our QE 3 program, as were trying, again, to promote recovery in the United States, during that year, I began to -- in my capacity as Chairman, I began to talk about the possibility that later this year, i.e. in 2013, we begin a process of slowing our rate of purchases.

Tried very hard to explain that this was completely contingent on improvements in the economy, that it would be a very slow and gradual process, and that, in particular, it did not imply that short-term interest rates would be raised, you know, that even though we would be slowing our purchases, that short-term interest rate would remain low for a long time, which of course they have.

Notwithstanding all these assurances, evidently there were some folks in the markets who thought that quantitative easing would never end, the so called QE Eternity play. There were others who concluded from my comments and those of other -- my colleagues that the Fed was about to raise interest rates which, again, we are trying to say that we are not going to do, but nevertheless that concern was experienced. The result of all this was that -- was the so called Taper Tantrum which was a lot of volatility in markets, and some increase in important long-term interest rates, like mortgage rates.

Now, interestingly, the effects of this on the U.S. economy appeared to have been pretty much nil; the U.S. economy continued to do well in 2013, and we in fact began the process co-tapering in December 2013. In 2014 it turned out to be perhaps the strongest year of the recovery. So, the U.S. did not particularly suffer from the Taper Tantrum, it was more a market phenomenon. At the same time, a lot of emerging markets did experience volatility, and

considerable concern, and we heard a good deal from emerging markets about these financial impacts of the so-called Taper Tantrum.

So, you know, I would say now that the Fed is considering tightening again, a lot of the discussion you hear is not so much about trade effects, but rather about potential financial stability effects. So I would like to, sort of, address this question and see where we get.

Now, I think the best thing I can do, I don't have my new model in this one, but I think the best thing I can do, is talk a little bit about the leading research on this topic and I would assign that to the work of the Elaine Ray who presented this, I think last year, as I was saying before, at Mundell-Fleming, and also in 2013 at the Jackson Hole Meetings in Jackson Hole, Wyoming.

Elaine's argument, her empirical argument is that there is a, what she calls a global financial cycle. The global financial cycle she defines as the tendency for risky assets in different countries to

co-vary. In other words, when risk assets do well in the U.S. they also tend to do well in Ecuador and Turkey.

To quantify statement one of her papers shows that about 25 percent of the variance of returns to risky assets across the globe can be explained by single common factor, which she calls the global factor. So, the variance of risky assets in Turkey depends 25 percent on something that's affecting risky assets all around the world, and that's what she calls the Global Financial Cycle.

In addition to that she points out that not only did risky asset prices move together, but other indicators of financial stress move together, such as capital flow. So, at times when risky assets do well, there is also substantial gross capital inflows to emerging markets, there is -- financial volatility tends to be low, there tends to be increases in leverage, and vice versa when in periods of risk-off, capital outflows from emerging markets have a higher financial volatility, and declines in leverage.

So, this is, again, the Global Financial Cycle, and I see Pierre Gershon the first row who I know has worked with Elaine on some of these topics. Now, an important thing is that Elaine, and some of her co-authors, and other as well have found is that, this Global Financial Cycle is, although it depends on a number of things, one of the things that moves the Global Financial Cycle is U.S. monetary policy.

So, in particular, when the Fed eases policy, empirically you tend to see a reduction in volatility in financial markets, followed by these capital inflows to emerging markets, greater risk-taking and the like. So, U.S. monetary policy is one of the drivers of the financial cycle.

Now, because of this financial cycle Elaine argues that flexible exchange rates, unlike what Mundell-Fleming model would predict, she argues that flexible exchange rates don't insulate countries from Fed policy actions, because this financial cycle comes across the border. So to quote her Jackson Hole Paper, "Financial spillovers invalidate the trilemma

which postulates into a world of free capital mobility, independent monetary policies are feasible if and only if exchange rates are floating.

Instead, while it is certainly true that countries with fixed exchange rates cannot have independent monetary policies, in a world of free capital mobility. My analysis suggests;" she says, "That cross-border flows and leverage of global institutions transmit monetary conditions globally even under floating exchange rate systems." So, floating exchange rates do not protect you from the financial cycle.

Now, this is an empirical statement about the financial correlations across economies. What is the economic mechanism? Now, the different possibilities; Elaine supports ideas that have been developed by Hyun Shin who was my colleague at Princeton, he is now at the BIS, who, along with several co-authors has linked the so-called Global Financial Cycle to the behavior of investment banks and some other intermediaries.

So, what does Shin and his co-authors find? They find that, empirically, that the balance sheets of investment banks and other big intermediaries tend to be very pro-cyclical. In good times investment banks borrow aggressively, the load up on risk assets, they build up leverage including -- in their investments, including emerging market assets. And then, empirically when the economy slows, or volatility increases, they reverse this process, they shrink their balance sheets, they de-lever, they reduce the supply of credit, they reduce the demand for risky assets, and that creates a very powerful financial procyclicality that can threaten stability.

I add, parenthetically, that there's a little bit of relationship here between the book on *Financial Accelerators* that I did many, many years ago with Mark Gertler, although I have to say that this is a much more violent mechanism than the one we had in mind, so for whatever it's worth.

Now why, according Shin and co-authors, and Ray and others, why is it that you get this very

procyclical behavior on the part of investment banks? The story is that -- has to do with problems with risk management. So, in the Shin modeling of this phenomenon, the argument is that financial institutions for various reasons, tend to measure risk based on recent experience, so there's actually a risk management tool called VAR, value at risk, not vector autoregression, value at risk, which looks at the variability and covariances of different assets over the past, I don't know, eight years, and based on that makes judgments about the relative risk of different asset classes, et cetera,.

The problem, of course, with this myopic behavior is that if in fact the economy becomes much more volatile, then the bank will suddenly find itself very overextended, and will begin this contraction process. So it's myopic risk management, essentially, that's creating this very procyclical type of behavior.

By the way, Shin provided -- gave a lecture at Brookings recently, where he argued that currently

that the same phenomenon is happening, but not so much through investment banks, but now through the corporate bond market, a different vehicle, but nevertheless that risk has built as easy monetary policy has -- suppressed volatility, and the risk is that this will reverse and go into reverse gear when monetary policy begins to tighten.

All right, so what I've done now is sort of told you the story that Elaine, and Hyon Shin and others have put out there. So let me say I find this literature extremely interesting, it's obviously getting at something very important and, you know, I applaud the work in this area. But what I'd like to do is make a few somewhat critical observations and return to the policy implications of this approach.

I think the first and most important observation I would make is that the Global Financial Cycle as defined by Ray, et al, is not measured relative to any benchmark, it simply defined as the co-movement across assets, credit and capital flows in different countries. So, and that’s -- how do we know

that this is in some way excessive. What would you expect to see in terms of the global factor in financial prices in a world where there was no spillover, no problem of any kind; I think you would find that the global factor or the correlation across countries would not be zero, it probably be well above zero.

Now, why? I think the reasons are obviously. First, there is such a thing as a global shock. Global shock could be a factor that does affect many economies around the world, but even a shock to a major economy can be global. Think of the shock to China that we saw recently and the effects it's had on emerging markets via commodity prices and other mechanisms.

So global shocks do occur, and of course that can help explain some element of commonality across risky assets in different countries. Policy changes can also have global effects even without any kinds of spillovers. In the model we just looked at a moment ago, U.S. monetary policy affects exchange

rates and exports across countries. If you have economies where there is a concern about the exchange rate, then you'll see tactical behavior, interactions between Fed and other Central Bank policy decisions.

Also, policy actions can be signals, they can tell you something about what's happening in the economy. So policy actions are also a potential source of a global factor. Now, I think an important one, that I want to talk about just for a few minutes, is that financial markets themselves, because they provide a mechanism for insurance and risk-sharing, can create a global factor even if there is no common real factor between two economies.

And let me give you a simple example which, again, will be in the paper that will come out. But it's so simple I think I can explain it to you, without putting up equations. So, here is the story. So let's imagine two economies, and once again we'll call them U.S. and EME, and initially they have no real connection whatsoever. They don’t trade with each other, they don't have any common factors

whatsoever, just completely isolated; one of them is on Mars, and one of them is on Earth, as far as we know.

So there's no connection between these two economies, moreover they each have assets, maybe trees that drop apples, and each had domestic investors who own only their domestic assets. In this world there is no global factor, there is zero correlation between securities in U.S. and in EME.

Okay now, suppose -- in this world, we supposedly impose, and I suppose that suddenly that international financial market opens up, and suddenly it's possible for some of the investors in both countries to diversify their portfolios across both countries. Okay. So, the international investors, which are a subset of the investors in both countries can own some investments in U.S. and some investments in the emerging markets, and by doing that they get, you know, they can affect the total variance of their portfolio, even though there is no correlation between the two assets.

All right, so this seems like a good thing. I mean, this allows for more diversification across countries. Now, let's suppose for simplicity that the international investors have a variance -- a volatility target. So they pick a combination of assets in the two countries that has an overall variance equal to their target, and that could be because they really dislike variance above a certain level. Okay, so this is the new world.

Now let's suppose, again, a lot of supposes here, let's suppose that in the United States that the Fed eases policy which lowers the volatility of U.S. assets only; so only U.S. trees are affected by this factor, okay. Now, the international investors though want to have a constant amount of variance in their portfolio so what are they going to do?

Well, because U.S. assets are now less risky, they are going to sell U.S. assets, and they are going to buy emerging market assets, so their portfolio is going to shift, they are going to buy -- they are going to sell assets to domestic U.S.

investors, they are going to buy assets from domestic emerging market investors. What's going to happen? Well, you are going to see a big capital flow, you are going to see the assets in both countries move, in opposite directions in this particular case, but prices in both countries will move.

And if you do the test of the global financial markets you will find that the global factor underlying both risky-asset prices, and credit -- capital flows in both countries that the global factor explains 100 percent of the variance. There is still no connection whatsoever between the assets in the two countries, there is no connection in terms of trade or anything like that.

But all that’s happening is that financial markets themselves are creating risk-sharing across the two countries, and that, in turn, is inducing a common shock, essentially, to those securities. Now, interestingly -- So, of course, by construction there is no irrationality, there's no market imperfection, nothing like that is happening, but you are still

getting the 100 percent effect.

Now, to be clear, it's not obvious whether introducing the international investors into this model increases or reduces welfare. On the one hand, you are creating more diversification, more opportunities for international investment on the part of some investors, but on the other hand, you are also adding this volatility where there was none before, and depending on how the macro economy responds to changes in assets prices and so on, you could be actually be making things worse off.

This is an example of the second-best theorem which says that when you have incomplete markets, adding a market doesn't necessarily make it better off, and here is an example of that. Okay. So, basically what I'm trying to argue here is that the fact that there is an important global component statistically speaking across risky assets in different countries, doesn't necessarily mean that -- you know, that exchange rates aren't relevant, that doesn't mean that there is a global financial cycle

that is in some way excessive relative to the benchmark.

And I would note, just parenthetically also, that what Elaine finds is that the covariance of U.S. and European assets, that’s just as big or even bigger than the covariance of U.S. and emerging markets assets. If you think that Europe is not subject to the same kinds of problems that emerging markets have, that doesn’t really -- is not in itself really very supportive of the idea that these externalities are important.

So, again, very clear, I like this literature, I'm not claiming that there are no such things, financial spillovers, I'm sure there are. But I'm just arguing that the fact that there is this common factor across countries in terms of risky assets and capital flows doesn’t tell us that much, we need to have a benchmark to compare it to.

A second observation about this literature which I make, is that there's in fact a lot of heterogeneity in the responses of emerging markets

countries to do changes in U.S. monetary policy. There is large literature on this, shows for example, that countries that have different trade exposure, different financial exposure, react differently to U.S. monetary policy, countries that have different macro policies react differently.

So, during the Taper Tantrum period, there was often reference to the so-called Fragile 5, of Turkey, Brazil, India, South Africa and Indonesia, which were countries that were particularly vulnerable to the Taper Tantrum. Presumably their macro policies made them riskier, and therefore made them the marginal investment that got left out when international investors were trying to withdraw from risk. And in particular there is actually some empirical work that finds that the exchange rate regimes also matters for your sensitivity to the U.S. policy. So that’s actually contrary to the claim.

The third point, very briefly is that both Elaine's work, and Shin's work, is really about very long-term phenomena, long-term buildups of risks. And

in particularly, for example, the empirical work that shows that monetary policy actions initiative the United States were followed by changes in volatility, credit, leverage, and the like, are empirically found to take place over 12, 16 quarters, very long periods of time. So these models don't really have much to say about the very high-frequency type phenomena of capital inflows and outflows, that seem to be a very important part of this.

So, where does this take us? I think that in terms of research, I do think that we do need to look more carefully and try and establish what would be the reasonable baseline for measuring financial instability, and financial co-movement. In particular a lot of the co-movement that Elaine identifies occurs during periods of very sharp crisis, like 2007, or during the Russian debt crisis. So we need to figure out, really how important this phenomenon is.

Secondly, we need to look more at this heterogeneity among countries in terms of their sensitivity to global shocks. In particular, how much

of this sensitivity is due to cyclical position, how much is due to structural features, and how much is due to financial market conditions.

And finally, the third objection is that in order to understand what the concerns are currently, and in a lot of this debate, we need to pay more attention to the short-term flows, and not so much to the buildups of credit over long periods, which are important, but don't address, I think, the very short-term phenomena that we've been talking about.

Now, from a policy perspective, let me just -- we have about 5 -- we have about 20 more minutes, right? Yeah. Yeah. So let me just say a few words about policy, and I will dispense with some of the discussion on the dollar. I think that if you look at this research, I don't think that any of it really provides a basis for not using monetary policy to pursue macroeconomic objectives.

Even Elaine, herself, talks about this. She does suggest that the U.S. and other large countries do more to co-internalize the effects of their

policies, and that it will be more consultation among central banks. So, already there is a lot of consultation as I discussed at the beginning, more is always good. I think there's also a lot of regulatory financial stability meetings, the Basel Committee, the Committee for Global Financial Stability, the Financial Stability Board, but I think, you know, more can be done there.

On internalizing the effects of monetary policy, the Fed does pay attention, let me be very clear about this, the Fed does pay attention to global conditions in thinking about monetary policy, because for the very reason that the U.S. is part of the global system, and financial instability affects the U.S. as well as other economies. I do think that the responses to these financial stability spillovers are best managed in terms of financial, regulation and structural reform of various kinds.

For example, just to take an example from the literature, the story that Shin presents of myopia and looking at risk only over a short period, there is

a direct way to address that which is stress-testing and which many countries now do, and the United States does and the purpose of stress-testing is to make sure that financial institutions consider the tail risk and not just the most recent average risk in some sense. So that’s an important example of financial regulation that can address some of these risks.

Financial liberalization, I really want to emphasize again, the example I gave of adding an international market to an otherwise, our (inaudible) system which could make you worse off. It's important to think about sequencing, it's important to think about reforms, and what kinds of risk they actually create. Elaine, in her Jackson Hole Paper, talks about the possibility of using capital controls or macro-prudential policies to mitigate some of the effects of flows.

I think that, you know, I mean the IMF, right, I think it's becoming a much more -- a less-taboo subject than it was some years ago. You know seven years ago people were willing to entertain the idea that

sometimes some friction might be useful. And, again, economics is perfectly consistent with that. The economics tells us that when you have a lot of imperfect markets that liberalization doesn't necessarily make people better off, unless it's very carefully though through.

Now, what I'd like to do is just end by talking just for a minute about the dollar standard. And I just want to make just a couple comments about it. I'm not going to go through my discussion of the dollar standard's benefits and costs in the global economy. Maybe there'll be questions about that, but let me just say something about how the dollar's role in the global economy affects the transmission of Fed monetary policy. I'm going to make two observations.

The first has to do with the frequent statement that because there's a lot of borrowing in dollars, which we know to be the case, a lot of countries both banks and corporates, borrow substantially a large fraction of their credit is obtained in dollar financial markets. And it's

sometimes said, even economists sometimes say that because there's a lot of borrowing in dollars that the Fed is the central bank to the world. I just want the good economists here to understand, this is not an obvious statement. I don't think it's actually quite right. Let me explain why.

So let's imagine once again that you have an EM, emerging market corporate that can borrow in either dollars or in its local currency. But it borrows in either dollars or local currency, but it operates in local currency. That is, it has a business domestically. It pays workers in the local currency and the like. They may borrow in dollars, because those markets are more liquid perhaps. You know, there's more people willing to lend to them in terms of dollars. But, again, it earns local currency. That's where it puts the money to work, so to speak.

And so what's the true cost of capital for this firm? What I think it's important to understand is that it's not the interest rate set by the Fed.

And the reason is basically at the simplest level it's because of uncovered interest parity. Interest rates across assets, across countries, adjusted for exchange rates need to be moved in the same direction. So if you can imagine, for example, that the Fed eases monetary policy in the U.S., and that lowers dollar interest rates, does that mean that a corporate in an emerging market now faces a lower cost of capital? Not necessarily, because one of the things that the easing the monetary policy by the Fed will do is depreciate the dollar, which increases expected appreciation of the dollar, which means that because the borrower in the emerging market operates in the local currency, that expected appreciation is a cost of borrowing.

So if there's uncovered interest parity, then in fact the Fed does not control the interest rates paid for by corporate borrowers in emerging markets. Now, the quick response is well we know uncovered interest parity doesn't work that well. And that's true. But it is also not the case that the

deviations from uncovered interest parity are that predictable. And if they're not predictable, then it's not the case that you can reliably think the borrowing in dollars is going to be cheaper. So I want to make that point. I think that's a mistake that is commonly made. People just seem to ignore the fact that interest rates are in different currency, that it does make a difference.

So does it matter then that dollar borrowing takes place? It does matter. The reason it matters is because after the fact, unexpected movements in currency values, if they're not hedged, and often they're not hedged, can affect the ex-post cost of capital. And a strong dollar appreciation, for example, as the IMF has discussed, makes it much more costly for emerging market corporates and banks to repay. And that in turn can create wealth effects. It can create financial accelerator effects, balance sheet effects, and other kinds of financial stress. And I think that is meaningful, and that is not eliminated by uncovered interest parity, or any

similar consideration.

So let me just end by making the following policy observation, which is that as I tried to illustrate in my earlier example, there's many reasons why in laissez-faire that individual borrowers might choose to borrow or invest in a foreign currency. Because financial stability's a public good, it is not the case that whatever the private market decides on this score is necessarily the right mix for the country as a whole. And I think there's a very good case for regulators in individual emerging market countries, particularly bank regulators, to pay attention to these potential currency mismatches both for banks and also for the bank's customers, the corporates they lend to, because they do create a risk that it's not fully internalized by the borrowers, in my view.

Again, I think that is a policy implication which I do take seriously. It does make me feel a little better that the dollar has appreciated an awful lot in the last couple years. And we haven't seen too

much, you know, haven't really seen any major financial crises yet, but I think it is a source of risk and I do think that there is a case for policy to address that.

So let me conclude by saying that I've discussed currency wars, financial stability spillovers, and a little bit about the dollar standard. I don't think currency wars is a very viable topic frankly. I don't think there's much evidence that they're important. There's not much argument for coordination to address so-called currency war concerns. And in particular, I think that the frustration felt by some countries about currency wars is more to do with frustration with the trilemma, the Mundell-Fleming trilemma, than it is frustration with foreign monetary policy.

Spillovers to financial stability are much more concerning. I think we don't really understand them that well. But I do think that based on what we know now, that there's a limit to what monetary policy can do about them, that we do need to work -- and here

going back to my original theme, that there needs to be a symmetric effort. Not just the Fed. Not just the U.S. But a symmetric effort to try to improve institutions, to try to improve regulations to limit the financial risks associated with changes in interest rates, or changes in asset prices.

Okay, Maury, I'll stop there. I have just a few minutes for questions.

MR. OBSTFELD: Great. (Applause) Am I mic'ed up? Yeah, let me abuse my position as Chair of this session to have a leadoff question. And if others want to ask questions, please come to the microphones and get in line. This is related to the role of the dollar and something you mentioned at the beginning, which is the currency swaps. In the midst of the crisis the Fed very usefully initiated a network of currency swaps, which was widely emulated. And eventually came to comprise four emerging market economies on a temporary and limited basis. Years later these have been more institutionalized among some big central banks. So my question to you is, is

there a case for trying to expand such a network to a larger group of countries including some large creditworthy EMEs? And do you see a potential role for the IMF in this?

MR. BERNANKE: So I think there is a case. If not a permanent swap arrangement, then at least a contingent swap arrangement of some kind that could be activated. To be quite honest, I think the main barriers are political rather than economic. I mean you have to persuade legislatures that this is totally safe lending and the like. But given one of the advantages of the dollar standard, which this is not material I was able to talk about because of time, but is that the Fed has served a lender of last resort. It's demonstrated conservative lender of last resort to dollar creditors. So I think there's a case for it under some circumstances.

I don't think the IMF is a perfect substitute because the SDR is not the dollar. The dollar is more liquid than the SDR. And there's good reasons for that. Nevertheless, I think that if the

U.S. can't fulfill that role, that the IMF obviously has opportunities to do that. One of the problems which needs to be addressed, is that the flexible credit lines, at least initially, were somewhat stigmatized. In contrast the Fed swap lines were sort of Good Housekeeping seals. And so it was easier to get countries to take the Fed swap lines. That needs to be addressed in a way that can make countries comfortable with taking the credit lines.

MR. OBSTFELD: Okay. Jonathan?

QUESTIONER: Thanks. So I really enjoyed this talk, Jonathan Ostry from the IMF. I wanted to come back to you on the first part of your talk about currency wars. And basically ask you in a world where every country has more policy objectives than instruments, why you're so pessimistic about the scope for coordination? That's the first part of the question. And secondly, what really is your explanation for the findings of your model, and the survey of the empirical evidence, for why emerging markets were so critical, at least some of them,

during QE2 of Fed policy? Is it that emerging markets misunderstood the empirical evidence? You conjectured at the end that it's frustration with the trilemma, but I mean the trilemma only really is an issue when there's perfect capital mobility. And I think many emerging markets that's not the case. So what really is behind the criticism?

And then final part of the question is you said at the end, or sort of at one point in your talk, that for the Fed to really internalize the concerns of emerging market countries, they would need to put in some policy objective like their exports into their own mandate. But, again, in a world where are more policy objectives than instruments in all countries, the scope for coordination really rests on something that the other country can do to allow the Fed to fulfill its own mandate, rather than having to have the Fed adopt some part of the mandate of another country. So that's basically the issue.

MR. BERNANKE: Well, so I gave an example with a particular problem of instruments and targets.

You can imagine, I think a richer model would have one where you also cared about domestic asset prices. Yet another goal, you're worried -- if you stabilize exchange rates and you get a big interest rate move, and that gives you problems with your asset prices. And so the more targets you have, the more in you're in some sense relying on your trading partner, the Fed, whatever, to give you settings that are consistent with your own goals. And so that's difficult.

Now, coordination requires essentially that you agree on the objective function and the example I gave with Brazilian exports, so to speak, is part of the Brazilian objective function. Just thinking about it a little bit you'll see that the U.S. would never agree to making that part of the global objective function.

I also thought, you asked me about QE2 in particular, I think that it's possible that -- politics does play a role in this. And if you're a politician and you see your currency depreciating a

lot, and nobody can quite yet see the improvements in the U.S. economy that will help compensate for that, it's easy enough to blame someone else for your problems, frankly. So it's a difficult thing to coordinate. And the details depend on the specifics about what the additional objectives are. In the trade case, again, it doesn't seem like the empirical evidence suggests that there really is much scope for coordination. But there is scope for complaining, but there's not much scope for coordination, unfortunately.

MR. OBSTFELD: Lady, back there.

QUESTIONER: Hi. Thank you so much for a brilliant lecture. I was actually thinking maybe the first and the third part of your lecture should be probably -- there might be a reason to look at them simultaneously. Because you several times quotes the Jackson Hole lecture of last year, and this year there was Gita Gopinath lecture on the international payment system, which was actually discussing the fact that the organization of international trade of the

countries is actually making is so that the depreciation of the dollar is actually increasing inflation in the rest of the world.

MR. BERNANKE: That was my student Gita Gopinath. I advised her thesis. Go ahead, sorry. (Laughter)

QUESTIONER: No, no, but that was -- I just wanted to draw your attention to.

MR. BERNANKE: Yeah. No, that's right. It does have -- so in my discussion of the costs and benefits of the dollar standard, I think probably the biggest benefit for the U.S., frankly is the fact that it actually insulates American companies to some extent from exchange rate risk. I think that some of the other things like the senior rich arguments, and so on, are actually in practice not all that important quantitatively.

QUESTIONER: Coming back to your argument that within those countries they're actually paid in their local currency, so when the American exports, which is their imports, are depreciating it's also

their exports, which are losing in value, so they actually have pressure on their exchange rates to get the same revenue, and then they're losing --

MR. BERNANKE: Part of that is invoicing, part of it might have to do with pricing to market type behavior. But, thank you, yeah.

MR. OBSTFELD: The gentleman in front.

QUESTIONER: I'm Evan Tanner, from the IMF, for the Institute for Capacity Development, but my remarks reflect my own views. (Laughter) Thank you so much. I really liked your talk and I'm very glad that you opened the door to making your model a little bit more complex, because I'm wondering if you shouldn't also put fiscal policy into your model. Because I'm thinking about let's say a reduction in government spending that permits lower interest rates and depreciates the currency, and you could even think of an objective function that has, we like exports, but we like government spending more. And I can tell you about a country that has been reluctant to actually reduce its government spending. And if we

fast forward, you were referring to 2010, but actually go to 2012, 2013, when the inflation rate became a little bit more binding for this country. It was going above the target and the trade balance was becoming even worse. And let's say all the way until let's say late last year, they announced a sort of refusal to do anything about the fiscal, and now they're trying to do it, but I'm not really up to date on, and we could call that country Brazil, too. I think mostly you figured that one out.

MR. BERNANKE: Yeah. Let me jump in. I totally agree. I totally, totally agree. And I'll even tell you a story which is, again, Minister Mantega, who I actually enjoy talking to, once in a while he said to me, he said, "My problem with you," he said in Portuguese, "is that the U.S. economy is a duck with one wing. One wing is the Fed. It needs the other wing, the fiscal policy wing, so it could fly in a more balanced way." And I agree with that. And in my abbreviated notes I have, you know, fiscal policy would help here a lot. But unfortunately the

reason I don't put that in, is because what we've learned is that fiscal policy is not a very flexible tool, unfortunately.

QUESTIONER: Yeah, no, it's not what central bankers worry about, but the IMF worries about.

MR. BERNANKE: IMF absolutely, yeah. I want to hear Pierre's question, please. Go ahead.

MR. OBSTFELD: Last few questions, start with Pierre Olivier.

QUESTIONER: Thanks. I thought it was a really brilliant lecture. And touching on topics that are very close to my heart.

MR. BERNANKE: I know, yeah.

QUESTIONER: I wanted to come back to the first point about currency wars. And you framed the discussion in terms of currency wars between advanced economies and chiefly the U.S. and emerging market economies, so Brazil. And that's how the discussion emerged in 2010 and after that. But I wonder if the relevant discussion for currency wars now is not between advanced economies, and in particular what I

have in mind is the fact that the argument by which exchange rates are largely irrelevant and we don't need to coordinate too much, relies a lot on the ability to stabilize the economy at its natural interest rate. Otherwise when we have enough flexibility we can do that. But we're in an environment where most advanced economies are now at the zero lower bound for a variety of reasons that have pushed natural rates below zero. So the gains from this sort of expenditure switching effect, become much more relevant in an environment like this. And I sort of wonder if you have any views on whether that's more relevant now when we think about Japan and the Eurozone versus the U.S., as opposed to the argument with which I agree largely that when we're looking at the emerging economies in the U.S., it's maybe not as important.

MR. BERNANKE: Well you need two things for the currency war argument to be valid. One is that the expenditure switching effect is much bigger for whatever reason than the expenditure augmenting

effect. Not obvious to me why being a zero -- I mean it seems magically the case that monetary policy at zero does affect exchange rates even though we may not think it affects domestic demand so much. It's not clear why that would be the case. You would think in general it would affect both more or less the same.

But you're right. So that's one question is whether or not those two effects are balanced. And one of the complaints about Japan, for example, has been that somehow it seems like there's a much bigger effect on the exchange rate than there is on domestic activity. But the other part is the other thing you need for the currency war argument to work is also that the trading partner has to have more objectives, because without the extra objective the emerging market economy can still get itself to full employment through its exchange rate policy.

QUESTIONER: (inaudible) and Brazil are zero lower bound.

MR. BERNANKE: If you're zero low bound, if everybody's zero low bound then we're just kind of

stuck. But if one is a zero low bound, as I mentioned briefly, there's actually a social optimum argument for the country that's not constrained to take action to help the global demand.

MR. OBSTFELD: Okay, Sebnem.

QUESTIONER: Thank you. I'm Sebname Kalemli-Ozcan, University of Maryland. I really enjoyed your lecture. I would like to come back to your financial stabilities floor argument. I fully agree with you, it's very important to view this relative to a benchmark, and you know what is the benchmark, what is the right amount of correlation. But at the same time, the emerging market's central banker's dilemma is very obvious and you said you sympathize with that, reducing the credit cycle moving the credit boom during the low periods of weeks when the U.S. monetary policy is loose. And in terms of linking this to dollar borrowing versus the local currency borrowing, you said it can go either way given the local interest part of the (inaudible) but if you look at the data in detail, for example, I will

give an example from Turkey, because Turkish case I know very well, they definitely have the credit boom and the credit cycle during this QE period. And when you look at the corporate effects borrowing versus TL borrowing, they do pay less, the interest rates are lowered, the collateral they put down is lower, so it is clearly cheaper. Yes, the Fed fund rate is not directly supporting, but somehow it spills over and they do borrow cheaply. So in that sense, what is the ultimate solution to this dilemma? What Turkey central bank did is of course macro-prudential policy which is not so straightforward, and they're talking about corporates. So what are your views? Is the only way to get around that is either some sort of capital control or macro-prudential policy?

MR. BERNANKE: Yes. So first of all on the cheaper borrowing. Yes, it could be that because of equity premium and so on that it's definitely a bit cheaper to borrow in dollars, yes. But think about the delta. Supposed the Fed lowers its interest rate by one percentage point, I would argue that the

effective cost of capital to the Turkish borrower measured in lira, is not really a point less, maybe a little bit less, but not a point less. That's the one thing.

The other thing, so this is very parallel to my general views on financial stability which is that monetary policy is in practice not a very good tool, but you have to address the fundamental -- you have to have a targeted policy that addresses whatever the source of the problem is.

And what I'm trying to say is I'm trying to help the IMF make the case that more liberalized markets is not always better. And that there can be situations, Elaine, I hope I gave the impression I really like her work. I really do. She talks about in her Jackson Hole paper, she says the evidence that open capital flows, hot money capital flows is really good for growth is not that strong. So some friction in that, or some restrictions, capital controls, or micro-prudential policies, or some particularly attention to the currency mismatch, I think those

things are not necessarily antireform. It can be carefully thought through. It's not always better to have a more liberalized capital market, until you're in some sense ready for it. And that's my main point.

That means in the very short run, you may have a great deal of difficulty managing the situation, but that's just because you got more goals and instruments.

MR. OBSTFELD: Okay, one last one. But no more.

QUESTIONER: Hi. I'm Nia. I'm a business student from Switzerland. I really enjoyed your talk. I understood much more than I normally understand in scientific conferences. (Laughter) So in your toy model with the Mars and Earth you were arguing and suggesting that what creates movements across these two planets, or two countries, is not necessarily an existent of global component, but probably a change in the relative riskiness of assets in one of these two countries would create fiscal movement. So my question is in your view what would be the possible

ways to measure this change in the riskiness of assets in the country?

MR. BERNANKE: Well the standard measure is things like the VIX, which is measure of the expected volatility of the stock market.

QUESTIONER: I mean like for all the countries.

MR. BERNANKE: Right. So you've got different measures for different countries. That's right. But the problem is trying to identify the source of the shock. And what I'm trying to illustrate is that even if U.S. monetary policy has no important direct effects on Switzerland, that Swiss assets may still respond to changes in U.S. monetary policy, or U.S. domestic conditions, because it induces investors to switch their portfolios around. And that in turn involves buying and selling Swiss assets as well as others.

So how you measure that that's difficult. Because intrinsically you're seeing movements in assets all across the world. What I'm trying to argue

is you need to identify in some way the initial shock and control for sort of what the fundamental effect is. And then try to identify how much is it really induced by these portfolio switches. It's not easy. Although I think an idea -- here's an idea for anybody who wants to do it, which is you could look across asset markets in the same country versus those across countries, and see if the spillovers are the same and if you can identify the common factors.

QUESTIONER: Thanks.

MR. OBSTFELD: Okay. Let's thank Ben, for an insightful, wide-ranging talk. (Applause)

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