

**GENERAL DISCUSSION**  
**Monetary Policy “Contagion” in the Pacific Basin:  
A Historical Inquiry**

**Chair: Reuven Glick**

**Mr. Glick:** Sebastian, do you want to take a few minutes and answer your discussants?

**Mr. Edwards:** Okay, thanks to both discussants. Let me clarify a few things and respond to their comments. The first thing is that in a previous paper on the international transmission of monetary policy I used the term “contagion,” which generated a great deal of resistance, particularly from central bankers. Stan (Fischer) said earlier today, “we don’t take orders from others” when he referred to Ragu Rajan of the Reserve Bank of India, Agustín Carstens of the Bank of Mexico, and others that had said, “the Fed should get it over with.” Central bankers hate the word contagion, and Linda suggested it may have been a provocation on my behalf. That’s actually why I put “contagion” in quotation marks throughout most of the paper for this conference; the quotation marks are there to protect me from being accused of being a provocateur.

I agree with both of the discussants that there are many reasons why central banks in emerging markets may want to react to what the central banks in advanced countries are doing. Consider a very standard Taylor rule, where domestic inflation is affected by the exchange rate through a regular pass-through channel, and the exchange rate in turn responds to interest rate changes in the foreign country. My empirical strategy was to estimate this relation between domestic and foreign policy rates with a simple bivariate regression and then control for other factors and see whether the estimated transmission effect persists, all without making any kind of statement about whether it’s optimal or not. I admit, as Linda says, that there is an implicit negativity to the term “contagion,” which is why I use quotation marks.

I do, of course, recognize that there were very important shocks throughout the period of my study, 2000–08, including real shocks. I try to control for real shocks through commodity prices, like the price of copper, the price of energy, etc. I also try to control for expectations about future foreign inflation with the U.S. Treasury Inflation-Protected Securities break-even inflation

rate. I also include the U.S. dollar future rate. Some of these variables are not in the regressions reported in the paper, but believe me, I have done a lot of the things the discussants suggested and the transmission effect persists, and the difference between the two regions is always there. Linda makes a very important point that there may be circumstances under which responding is optimal. In fact, there are countries like Singapore that for a long time engaged in exchange rate targeting. This policy approach may be optimal from some point of view, and I am not passing judgment on it.

Both commentators presented results from their own research, which I found very interesting. In a previous paper, I estimated regional panel VARs, and the results were similar to what I've presented here. But let me tell you a little bit about the difference between what both Woon and Linda showed and what I'm doing. The first thing is that my sample ends with the end of the Great Moderation period, and I stop two weeks before the beginning of the global financial crisis with the Lehman Brothers collapse in September 2008. I do that deliberately because there are structural changes and nonlinearities during and after the financial crisis that are included in the sample periods used by Woon and Linda that can complicate estimation. Now you may say I am throwing away the most interesting part of the period. That may be the case, but the benefit of restricting myself to the period of the Great Moderation is that during this period there weren't significant changes in monetary policy or targets in my countries, except toward the end when Malaysia decided to have a flexible exchange rate. That makes my estimates of international transmission more reliable. Of course, there will always be concerns about omitted variables, but we cannot control for everything.

So let me finish by just mentioning two more things. One thing that I want to emphasize, and this is different from what Woon did, is that my analysis estimates results for individual countries separately, rather than pooling them together. This allows me to argue that, to the extent there weren't major changes in monetary policy regimes during my sample, I have a better claim that my results are more robust. Finally, I did not report here very interesting seemingly unrelated regression results. What you find by looking at the covariance of the error terms is that there is a very high degree of positive correlation within regions. The Latin American countries are correlated among themselves, but if you look at the matrix of variance-covariances across regions, say between Mexico and Malaysia, there is absolutely no correlation, and this again calls for the separation of the two regions. They are very different, suggesting that there's going to be a very different effect in terms of the degree of

what you want to call either “contagion” or the transmission of interest rates across countries.

**Mr. Glick:** Okay, we have time for questions from the floor. I see a lot of hands up. I’ll do my best to recognize you in order, but I ask that once you are recognized, give your name and your affiliation. So, Andy, you’re the first out of the gate.

**Mr. Rose:** Given that you’re only using financial stuff in your weekly specification, I was struck by how low the coefficients were, and even more strongly by how poor was the fit of your regressions. And so, here’s my question: Why constrain yourself to weekly frequency? Usually, you care about the span of the data, not the number of observations. So, it strikes me that moving to monthly observations would be beneficial for you in a number of ways. You could expand the number of countries. You then need not worry about the preemptive interest rate changes such as South Africa just announced. You could add way more covariates, so you could get a plausible Taylor rule and, if everything works out, you could just confirm your weekly results. So, my view is you should move to a lower frequency, if possible.

**Mr. Ostry:** Sebastian, I realize your data ends in 2008, but certainly over the period since 2008, emerging markets have been vocal, to varying degrees, about the transmission of U.S. monetary policy, and one of the things that’s clear in your results is that what you call policy “contagion” differs quite a bit across countries. So, I wanted to invite you to speculate about whether there’s any connection between the two. And I’m also very curious about the Brazil results you discussed at an International Monetary Fund (IMF) conference but which you didn’t present here, and what they suggest about policy “contagion”; and whether you accept what I think is the Federal Reserve’s view—I’m thinking of Ben Bernanke’s Mundell-Fleming lecture last week—that, by and large, the transmission of U.S. monetary policy to emerging markets is, on the whole, small. That is, there is an aggregate demand effect and there’s an expenditure switching effect, and they offset one another more or less. There’s a financial stability effect as well, but it’s also small. So the effects on the whole are small, but they may differ quite a bit across countries and maybe that accounts for the different degree to which countries were vocal and may be behind your results. A final, very brief question: you focused on short-term interest rates, but what we think is an important variable for the real transmission is how long-term rates are transmitted; and I think the evidence suggests that transmission is

lower for long-term rates than for short-term rates. I wondered whether you'd looked at that.

**Mr. Hutchison:** My first question relates to what Andy said in using weekly data over eight years. Do you really have enough interest rate cycles to pick up the effects that you're looking for? In particular, there was only one period of increasing Fed rates in your sample and two periods of rate declines. Are you picking up enough cycles with just a short period of time? My second question has to do with whether you have something to say about real as well as nominal linkages. I interpret nominal linkages as meaning the pass-through of inflation between countries. So, I'm wondering what were your thoughts on real interest rate linkages? How strong are these linkages, and is Asia still different from Latin America?

**Mr. Edwards:** Let me start by answering Michael's last question, which is the easiest one. Is Asia different from Latin America? The answer is, yes, it is. Also, there are two tightening cycles during this period, not one, and that's what restricts the analysis. Andy asked why I used weekly data. I started by being interested in what happens week by week. I found that after six weeks, for instance, there is full transmission of federal funds rate changes during my sample period. I've worked with monthly data and, as Andy suggested, I was able to add more covariates, but the results are very similar. You can reject that the individual countries can be pooled and that the individual country coefficients are equal, and you get a much higher response in Latin America than in Asia. On another point of Andy's, the fit of equations with interest rates in differences is usually very, very poor. I remember my discussion of a paper on Brazil at an IMF conference in which the authors were doing interest rates in first differences and they had R-squares of .8, which was impossible. In fact, the authors later discovered that they'd made a coding mistake. You don't get high R-squares with this kind of specification and data. As for expanding the sample, the problem, again related to Mike Hutchinson's question, is that if you go further back to the late 1990s, then you get into the East Asia crisis in 1997 and 1998, which is very difficult to handle, because there's no inflation targeting and there's no central bank transparency. It was a different world back then and that's one reason why I didn't include earlier data.

Regarding Jonathan's (Ostry) question about Brazil, there's almost no transmission to Brazil. Now, this was a complicated period for Brazil, with its Monetary Policy Committee (the Copom) setting the benchmark Selic interest rate at 10 percent, 15 percent. This is when Lula came into power in 2003 as the most left-wing president in Latin America since Allende in Chile, then decided

to follow Fernando Henrique’s policy and bring inflation to an end, which is what allowed the credit market to be revived in Brazil and led to the Brazilian mini-miracle of the 2000s. So, for Brazil I find no transmission.

As for long-term rates, there is not a very deep market for really long-term rates. I looked at transmission for rates up to one-year deposit rates and, though the effects are smaller, they are still there, with the same pattern of differences with East Asia displaying much less transmission—in fact, the transmission for longer-term certificate of deposit rates was almost zero for East Asia.

**Mr. Glick:** We have time for one more round of questions. I’ve got four people on my list, so Joshua?

**Mr. Aizenman:** I enjoyed the paper and the discussion. There’s an issue that you raised in answering Michael about what is the difference between Asia and Latin America. We know that one difference is that the saving rate typically is higher in Asia. We know also that dependency on external funding used to be higher in Latin America and balance sheet exposure was higher. So, I suggest adding these variables to your type of regressions in order to get some more insight about why there are different transmission effects across countries.

**Mr. Claessens:** In the conclusion of your paper, you give the list of countries in terms of order of pass-through as Colombia, number 1; Philippines, 2; Korea, 3; Chile, 4; Mexico, 5; and Malaysia, 6. If I have my geography right, I don’t see Asia and Latin American line up in the way you tell the story, so I’d appreciate some clarification.

**Ms. Shirai:** I found your presentation very interesting. I’m a member of the Bank of Japan’s Monetary Policy Board. As a policymaker, I have two questions about contagion between policy interest rates. First, some emerging economies use reserve requirements quite often as a policy tool, while keeping the policy rate constant. For example, my understanding is that Malaysia has often used reserve requirements as a monetary tool. How does that affect your results? That’s my first question. The second question is whether you have looked at the impact of the European Central Bank’s (ECB) monetary policy on policy rates in emerging markets. For example, Latin American economies depend heavily on the euro area, so ECB policies might have some effect on their monetary policies.

**Mr. Warjiyo:** Thank you for three excellent presentations. You ask if monetary policy in advanced countries affects policymaking in emerging markets. As an Asian policymaker, I think yes. I think that the transmission works directly

from foreign rates to domestic interest rates as well as through the effect of the exchange rate on domestic inflation. In Indonesia, we already see effects of the anticipated increase of the federal funds rate. For example, we are assuming a December increase of 25 basis points and four additional 25 basis point increases in 2016. But the real question is not about the influence of foreign shocks through the interest rate channel or the exchange rate channel on our interest rate policy. Rather, it is the effect of the risk-taking channel, which is very difficult to measure and anticipate, particularly because of the tendency of financial markets to overreact to the Fed's statements and actions. I think this is the most difficult challenge faced by policymakers in most emerging countries. Any advice on how we can anticipate possible market overreaction will be useful. Thank you.

**Mr. Edwards:** Thank you again to everyone. I'm delighted that we've generated this conversation. I don't know the answer to how to anticipate market reactions and risk-taking, except that we know that as the Fed starts to hike rates, we likely will see capital moving out of emerging markets, particularly the bond market, as Woon said in his very interesting discussion. We're seeing that happening already, with outflows in the last several months. The taper tantrum of a couple years ago generated massive capital outflows, something we should continue to examine and understand. Let me next respond to Stijn's (Claessen) question about the ordering of the degree of transmission across the Latin America and East Asia countries in my sample. Basically, the order is Colombia, Chile, Korea, and Mexico tied, then Philippines and Malaysia. If you look at averages by region, the effect of a federal funds rate hike of 100 basis points is about 60 basis points in Latin America and about 23 basis points in Asia, and the latter is not very different from what Woon had of up to 14 basis points.

Let me end with Joshua's question about how to explain the difference between Latin America and Asia. Joshua points out a number of differences, including saving rates and external borrowing. There are many other possible factors, including the location of the World Cup, the degree of authoritarianism of the political regime, and so on. But to concentrate on two of the variables that Joshua mentioned, the saving rate in Colombia is about 20 percent; the saving rate in Korea is higher at 27–28 percent. But they don't change over the period 2000–08. In Colombia it's 19 percent when you start, 19 percent in the middle, and 19 percent in the end. Now, the investment rate does vary a little over time but not too much. We know that current accounts did sometimes get out of whack; the average current account is 6 percent now and usually it's between 3 percent and 6 percent. So, what we could do, and this is maybe related to what

Andy said, is do a cross-country analysis, where we estimate the transmission coefficients and then we take the cross-section of these coefficients and try to relate them to country-specific variables, such as the saving rate or exposure to foreign debt, which don't change much during my sample period. I think that this is an interesting exercise. But as I said before, for the specific countries in my sample period, these factors don't change much. So one needs to have a longer sample period and maybe a broader cross-section of countries.

I want to end by going back to what Linda said: “Should we call this contagion, or not?” I'm going to stick to my view of “contagion,” which is a way of hedging my view, but I go back to the notion that, and the fact that, central bankers get so upset—like Jose De Gregorio, former governor of the Central Bank of Chile, who got very upset and said, “I never took into account what the Fed was doing when I was Governor. Never, ever, ever, ever. It didn't cross my mind.” And I looked him in the eyes and I said, “I don't believe you.”

**Mr. Choi:** Two points. The first is that it seems that with rising globalization, foreign interest rates are having an increasing influence on long-term rates in emerging markets. The second point is related to the impact of global risk sentiment that Mr. Warjiyo raised. As I mentioned in my discussant comments, in my work at the Bank of Korea we found that a global interest rate hike affected domestic monetary policy. We also showed that in a worst-case scenario, an increase in foreign rates could affect domestic rates through market liquidity and risk-aversion channels. That is, domestic market liquidity might dry up and risk aversion might increase. So if you add in these other factors, the impact of an increase in the federal funds rate on domestic GDP would be doubled.

**Mr. Edwards:** I think I tried to answer all of the questions from the floor, but I did not answer Sayuri's (Shirai) question. I did not add the ECB policy rate, since the ECB during most of the period in my study followed its multi-pillar approach. What I did include in my analysis were both the expected dollar–euro rate and the actual dollar–euro rate as additional controls. They do tend to be significant in the analysis, but they don't affect the main conclusions of the results. Europe has become more and more important over time, but during this period, which is the period of the Great Moderation, there was no particular impact. Latin America was very linked to Spain through the presence of the Spanish banks. It goes back to Linda Goldberg's research on the role of banks in the transmission mechanism. Santander and Bilbao were very important, but they sold their Latin American operations after the Great Recession. But my impression from what I did is that there was no significant importance from Europe at that time.

**Mr. Glick:** Okay, thank you. Please, everyone join me in giving a round of applause to our speakers.