Commentary on Capital Flows and the Risk-Taking Channel of Monetary Policy

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Valentina Bruno and Hyun Song Shin (2012) present an elegant microeconomic model which shows that low policy interest rates at major central banks can increase risk-taking in other countries. They also show that exchange rate changes in the absence of actions by central banks in these other countries magnify that increase in risk-taking. They then back up their model with empirical findings linking policy rates in the United States to various measures of risk taking.

In my view their findings raise important issues related to the conduct of monetary policy in our increasingly globalized financial system. Their findings also raise questions about the causes of the recent financial crisis with general implications for international economic policy going forward. I focus on these policy issues here.

1. Interest Rates and Risk Taking in the Bruno-Shin Model

The Bruno-Shin paper derives a link between the dollar interest rate and the flow of dollar credit abroad. Their starting point is the assumption some foreign firms abroad want to borrow in dollars to finance some their projects even though the returns on these projects are denominated in local currency. In their model, they posit that these projects are inherently risky. Thus loans made to the firms by banks to fund these projects are subject to default risk in the event that the project earns less than the loan, including interest payments.

Banks lending to the firm take account of this default risk by using a "Value at Risk" (VAR) approach. Accordingly, banks increase the size of the loans on the project up to the point where the amount that must be paid back (including interest) results in a probability of insolvency of the bank that just equals a set value α. The amount to be paid back is $(1+f)L$ where f is the interest rate and L represents the size of the loans. The higher is $(1+f)L$ the higher is the default risk. Thus α depends on $(1+f)L$. For a given value of α, the lower is f, the higher is L. In other words, a reduction in the federal funds rate increases lending and encourages more risk taking on the part of these firms.

But this is just the first round effect. In an international setting this initial effect can be magnified by other changes. Bruno and Shin (2012) assume that the exchange rate θ varies inversely with L. Thus when f is reduced and L rises, it causes an appreciation of the exchange rate. The appreciation reduces the likelihood of default because local currency then converts into more dollars to pay back the loan. This enables the banks to lend more. Thus L increases further,

but this in turn causes θ to rise further. In other words there is an iterative feedback process with successive increases in L and θ responding to the initial change in the funding rate f. Since the process converges there is a well-defined solution, but the eventual impact is larger than the initial impact implying in a magnification or multiplier effect.

While the magnitudes of initial effect and the multiplier are uncertain, Bruno and Shin provide estimates of the overall effect on risk taking by estimating time series models. They find interest rate effects on risk taking as measured by the VIX, which are similar to the results of Bekaert, Hoerova, and Duca (2010). Thus the overall conclusion of the theory and the empirics is that a lower federal funds rate causes more lending and more risk taking abroad. This is the risk-taking channel of monetary policy.

Other Exchange rate Channels

Note that one of the end results of Bruno-Shin model is that a lower federal funds rate puts pressure on other countries' currencies to appreciate. This is also implied by open economy macro models with rational expectations and capital mobility where arbitrage forces tend to keep the rate of return in different currencies equal. Thus, a cut in the federal funds rate will cause a depreciation of the dollar by an amount that causes an expected appreciation of the dollar compensating for the lower dollar interest rate. The appreciation effect on other currencies exists in most empirical monetary models, as indicated by model data base constructed by Volker Wieland (2009).

2. Monetary Policy Responses

Now let me consider monetary policy.[1] There are three impacts to consider: currency intervention, interest rate policy, and capital controls. In my view relying on capital controls—even in these cases—runs counter to important international opening of markets that will eventually improve the workings of the world economy and raise economic growth. But here I focus on currency intervention and interest rate policy.

Currency Intervention and the Impact on Gross Flow

Currency intervention is one possible reaction of other central banks to the lower interest rate abroad. The central bank in the receiving country will likely intervene in the exchange market to prevent the appreciation of the currency. One motivation is to limit the risk-taking caused by the lower dollar funding rate. But there are other reasons, which have been

[1] Here I draw on research presented at conferences at American Enterprise Institute in November 2004 (Taylor (2004), at the NBER conference on international monetary policy in Girona, Spain in July 2007 (Taylor (2007a)), and at the June 2010 Norges Bank conference "On the Use of Simple Rules as Guidelines for Policy Decisions." (Taylor 2010)

emphasized in the literature, including the impact of the appreciated currency on the domestic economy and on the often politically powerful export businesses.

The intervention causes an accumulation of international reserves—mostly in the form of dollars. These dollar reserves must be invested somewhere and a logical place is in the United States in, for example, mortgage backed securities, which drives long term interest rates down. Thus, the gross outflow of loans is matched at least in part by a gross inflow of funds from central banks and sovereign wealth funds into securities. It is important to note that these flows occur without any change in the current account. That too much focus on the current account can take attention away from these gross flows has long been a concern to me as I pointed out when I served as in the U.S. Treasury from 2001-2005.[2]

One example of this phenomenon, pointed out by Borio and Disyatat (2011) and Beckworth and Crowe (2012), is how the low federal funds rate in the U.S in 2003-2005 may have led to such gross inflows of funds. This is in contrast to the view of Bernanke (2010) who argued that the low federal funds rate was not the reason for the boom in the housing market as I had found in Taylor (2007b). Rather Bernanke argued that the low long term rates were due to a savings glut by which the current account surpluses around the world caused the increased demand of U.S. mortgage securities. This is the sense in which the Bruno and Shin paper is "related to the debate on whether monetary policy was "too loose" in the run-up to the crisis" as the authors point out.

Interest rate Response

Another important reaction to the lower federal funds rate is that central banks in other countries will lower their interest rate relative to what it would otherwise be. The motivation is similar to the exchange market intervention: to keep the exchange rate from appreciating. There is indeed considerable evidence of this effect. First consider an example which I draw from the Norges Bank. See Røisland (2010) and OECD Survey (2010).

In Figure 1, I use two charts which show a decision by the Norges Bank to raise the policy interest rate. The top chart shows the increase from the black dashed line to the red dashed line. The lower chart shows that the main reason is the higher interest rates abroad. In Figure 2, I show two similar charts corresponding to a cut in interest rates from the black dashed line to the red dashed line. Again the main source is the decline in interest rates abroad as shown in the lower chart.

[2] For example, in Taylor (2004), I stated that "it is important to put the current account in the perspective of the total amount of financial flows crossing U.S. borders in large, open and flexible markets." In his recent Ely at the American Economic Association Obstfeld (2012) provides an excellent treatment of the importance of gross flows.

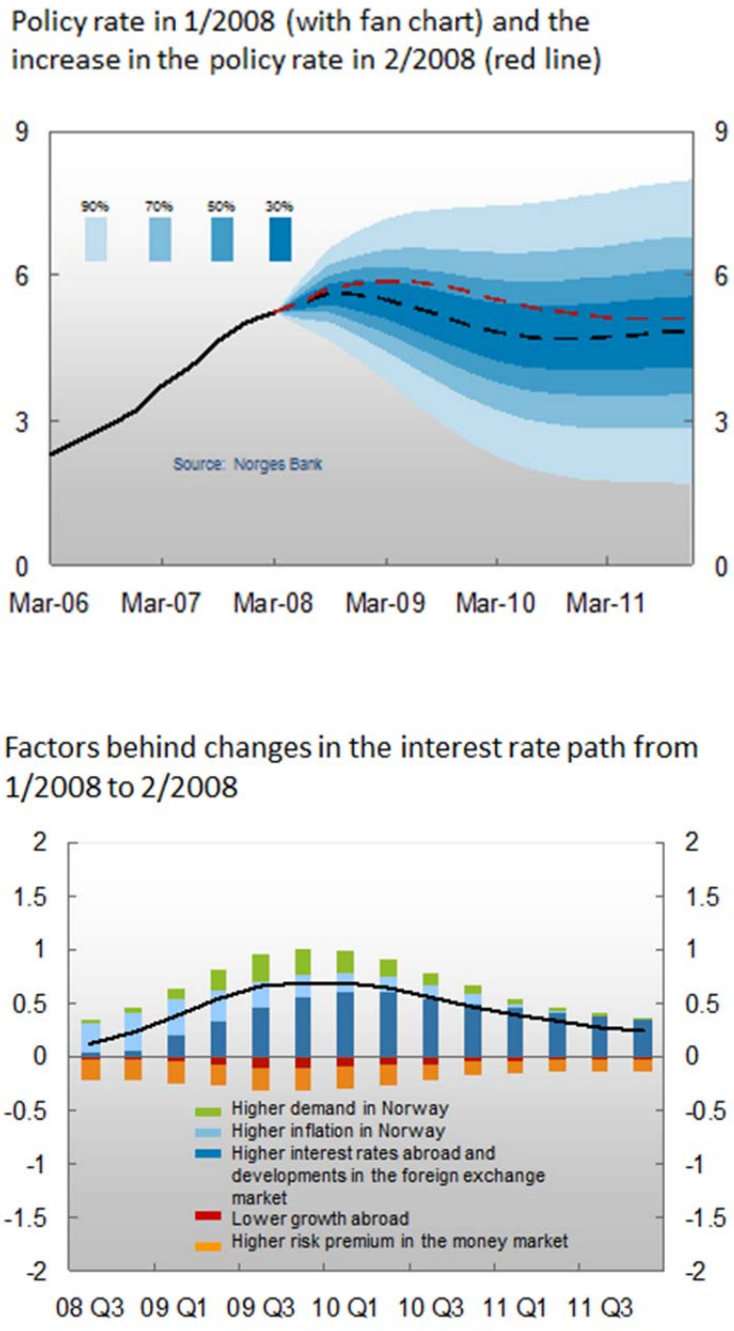
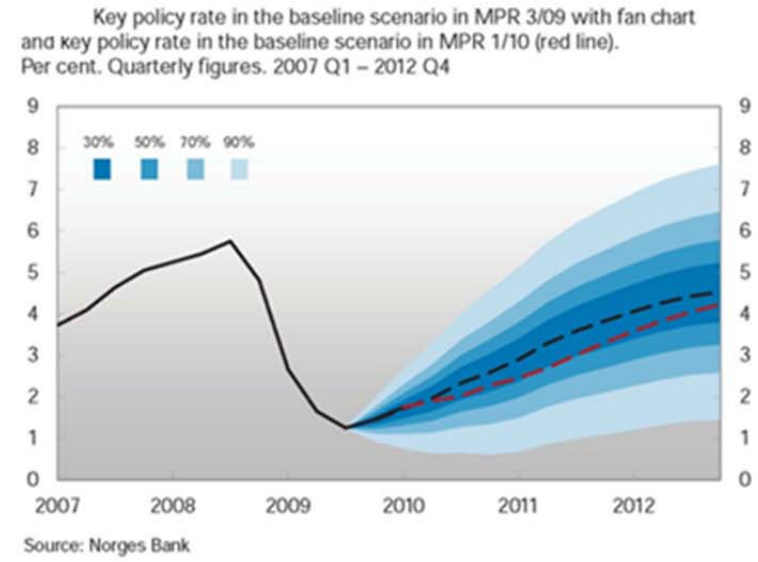


Figure 1. How an Increase in Policy Rates is Influenced by Other Central Banks.
The top chart shows the increase in the interest rate by the Norges Bank in early 2008 and the bottom chart shows that the major contributor to the decision was the increase in interest rates abroad.



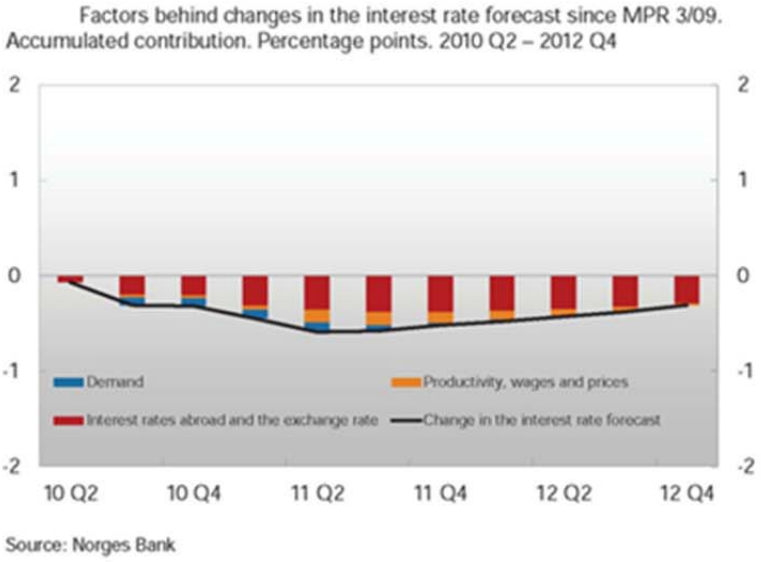


Figure 2. How an Decrease in Policy Rates is Influenced by Other Central Banks.
The top chart shows the decrease in the interest rate by the Norges Bank in 2010 and the bottom chart shows that the major contributor to the decision was the decrease in interest rates abroad

Yet another way to see the influence of central bank decision in other countries is to look at the reaction function (policy rule) of the Norges Bank. Figure 3 shows the interest rate setting along with several policy rules. The rule with external interest rates comes much closer to describing the actions than the policy rules without external interest rates.

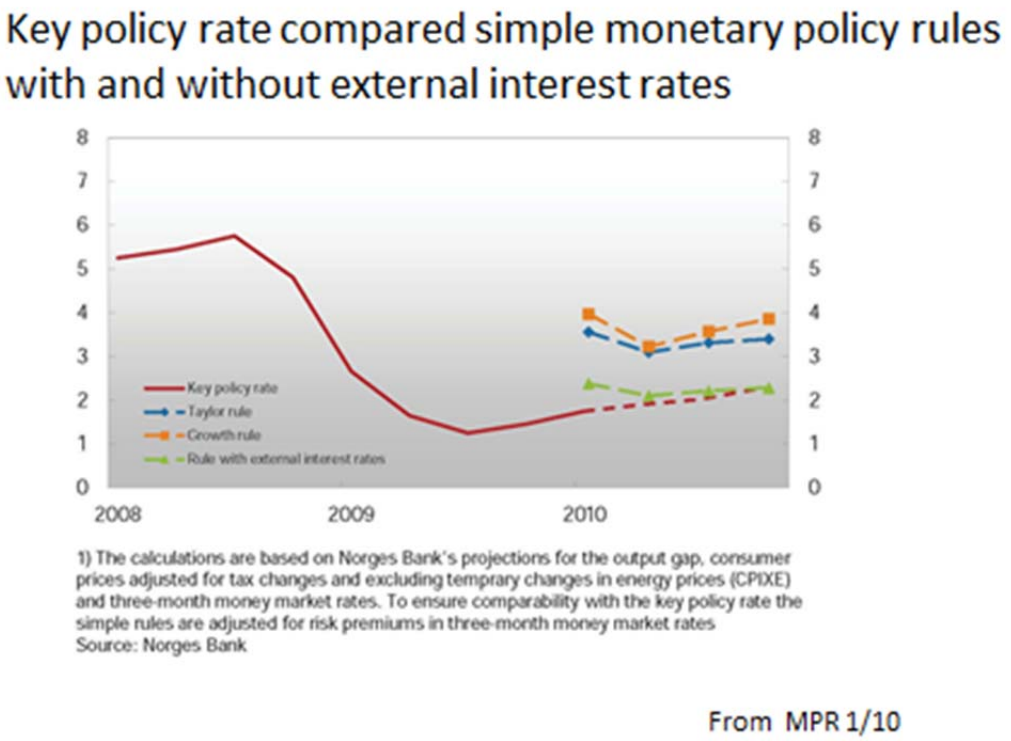


Figure 3. Policy rule with external interest rates more closely describes policy rates

There is also econometric evidence. Using panel data from 12 central banks (Australia, Canada, South Korea, the United Kingdom, Norway, New Zealand, Denmark, Israel, Brazil, the Eurozone, China, and Indonesia), Colin Gray (2012) estimated policy rate reaction functions where the federal funds rate or other measures of foreign interest rates entered on the right hand side. He found that the average reaction coefficient on the foreign rate was large and significant and as high as .75. In Taylor (2007a) I estimated reaction coefficients and found that the ECB coefficient on the federal funds rate averaged.21 during 2001-2006.

These close policy connections suggest the need for more research and discussion of the international aspects of monetary policy. To illustrate the kind of issues that are involved, consider a very simple two country framework with policy spillovers. Let i be the interest rate in one country—perhaps the United States—and i^* be the interest rate in the other country, or the rest of the world. Let z and z^* symbolize domestic factors (a weighted average of inflation and real GDP, for example). Then the policy rules can be written

$$i = z + \alpha i^*$$
$$i^* = z^* + \alpha^* i$$

Observe that central banks follow each other to some degree with α and α^* both positive and less than or equal to one. Solving these equations in terms of z and z^* gives:

$$i = \frac{1}{1-\alpha\alpha^*}(z + \alpha z^*)$$
$$i^* = \frac{1}{1-\alpha\alpha^*}(z + \alpha^* z^*)$$

Note that there is a multiplier effect which is caused by the banks reacting to each other. Figure 4 illustrates this. It graphs the two equations with i on the vertical axis and i^* on the horizontal axis in the case there $\alpha = .5$ and $\alpha^* = 1$. If the Federal Reserve cuts its interest rate by 1 percent for example, the equilibrium is a 2 percent rate cut once other central banks and the Fed in turn react.

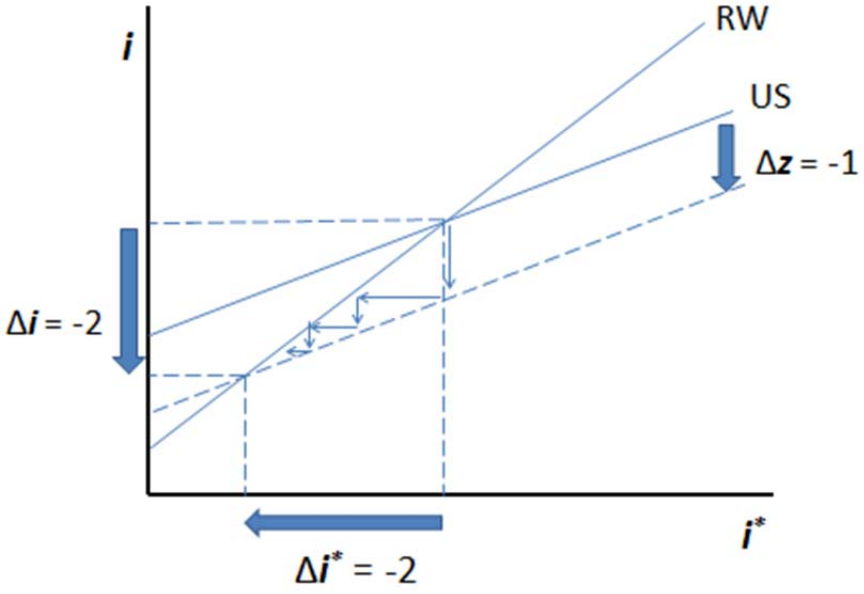


Figure 4. Equilibrium when central banks react to other central banks' interest rates

Conclusion

The paper by Bruno and Shin makes an important contribution to the literature on the impact of central bank decision on risk taking abroad. The paper also has important implications for the spillover of monetary policy between countries and thereby for international policy coordination as I have emphasized in this commentary. Very low policy rates in major central banks can create pressures on emerging market central banks to hold rates lower than they would be otherwise or to intervene in currency markets. This can lead to poor economic performance, which can feedback to the major countries. In my view this implies that "monetary rebalancing" should be a subject for research and international discussion as much as "current account rebalancing."

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