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Commentary

The paper by Linda S. Goldberg, Craig Kennedy, and Jason Miu is part of a growing literature investigating the causes and effects of the recent global financial crisis and the appropriateness and effectiveness of various policy responses. The paper specifically analyzes the adoption of swap lines by central banks in fall 2008. The financial crisis reduced the availability of dollar funds in foreign financial markets to varying degrees. Central banks responded by implementing reciprocal currency arrangements (RCAs), or swaps, which quickly increased in size and with some becoming unlimited. As the central banks intended, RCAs affected the levels and differentials of dollar interest rates in various markets.

Besides offering the motivation for the foreign exchange (FX) swaps, the paper provides many facts associated with the timelines of actions and the institutional aspects of the swaps mechanisms. This alone makes the study very valuable as a reference source. Importantly, it explores the consequences of the FX swaps and their effectiveness by presenting comprehensive data on volumes, spreads, interest rates, and arbitrage conditions over time. The specific spreads examined are the spread between the London inter-bank offered rate (Libor) and the overnight indexed swap rate, the foreign-exchange-swap–implied basis spread, and the intraday federal funds rate (morning over afternoon), as well as the variation in interest rates among commercial banks in Europe.

The main question investigated is, did the RCAs reduce interest rates (spreads) and, if so, by how much? Goldberg, Kennedy, and Miu document that the RCAs were established because of sharp differences in the dollar cost of funding in fall 2008. They show that volumes peaked at the end of 2008 and that RCAs started unwinding in 2009; they also explain that the arrangements are planned to be phased out by February 2010. The study provides support for the argument that RCAs operated as designed. Specifically, it demonstrates that the European premium abated by year-end 2008 and largely normalized over 2009. It also shows that spreads in the first half of 2009 reflected pockets of dollar shortages owing to continued credit tiering by lenders and potentially some self-selection by weaker banks. The study highlights the fact that the costs of accessing different official liquidity facilities varied as designs and collateral policies differed. It concludes with a positive view of the FX swaps while questioning simple interpretations based on, say, event studies.

My primary question regarding this issue is whether the root cause of the problem was the "simple" lack of dollar liquidity in some foreign financial markets or whether it reflected concerns about the solvency of major financial institutions at the time. The challenge, in my view, is therefore to separate the effects of liquidity provision through the FX swap lines from the (largely concurrent) provision of guarantees, recapitalizations, and other forms of public support.

Answering this question requires answering the separate question of what causes deviations of dollar interest rates. My general observation is that it is hard to imagine liquidity factors

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alone as causing such a spike in interest rates as we saw in fall 2008. Rather, a shock to solvency that varied around the world was more likely the cause. In this commentary, I therefore suggest more detailed empirical analysis, which could help make this distinction. Needless to say, my suggestions are subject to data limitations, but I would hope that the Federal Reserve Bank of New York would have access to a wider range of data than other researchers do.

Analysis of differences in interest rates requires a conceptual framing. Goldberg, Kennedy, and Miu make it clear that dollar rates can vary for several reasons: differences in liquidity availability, for one, but also differences in credit risk and transaction costs. One can use an event study to "test" whether the availability of liquidity through RCAs affects interest rates or spreads. For example, we can look at spreads before and after the use of RCAs, possibly differentiating markets that had limited arrangements from those with unlimited ones. The general finding reported in the paper is one of lower spreads with RCAs in place. The study also reports a lower foreign exchange premium, which is a lower deviation from covered interest rate parity.

But with these tests come problems of anticipation and identification, as the authors explain. First, RCAs could be anticipated, especially after the first arrangement, which might make it harder to detect any effects and thus create a bias *against* finding significant results. A more important problem is the difficulty of identification. Because many other events were occurring at the same time—changes in monetary policies, implementation of financial policies (guarantees, recapitalizations)—we cannot be sure that the results are attributable solely to the establishment of the RCAs.

This brings me to the second category: credit risk, which may have been a cause of the increase in interest rates before the introduction of the RCAs as well as a trigger for the drop in spreads when public support measures were being established. There are various types of credit risk, each of which differs in its implications. One type is bank credit risk. This type of risk is investigated by the authors using the variation in European bank ratings, with some support found for it affecting spreads. Another type is country risk, which is not specifically tested.

Regardless, tests can correct, but only to some degree. For example, it is not easy to control for perceived bank credit risk because bank ratings (as assigned) may not be that reliable and because they are also influenced by factors such as "too-big-to-fail." Country risk could be proxied by sovereign and credit default swap spreads and ratings, but such risk is affected as well by many similar factors, such as large government recapitalizations and guarantees.

Still, a simple test would be to look at the same bank in different markets. The use of interest rate data for the same bank could show whether differences in liquidity matter, keeping credit risk similar. Of course, this too is not a perfect approach. The same bank does not necessarily pose the same credit risk in every market—for instance, a foreign bank subsidiary may present a different risk than that of the headquarter bank. And, as liquidity affects solvency risk, credit risk can vary over time because of liquidity provisioning.

The third category of the causes of differences is transaction costs. As one might expect, there are many transaction costs that can give rise to differences in interest rates. Differences in transaction costs specifically related to RCAs can include the following: the (fixed) pricing may vary; the pricing rules of central banks may differ (for example, the auction types used by central banks vary); the maturity of the facilities varies; differences exist in collateral requirements and in eligible assets; and banks may face legal and other administrative challenges that limit access to the facilities.

It is possible—but difficult—to correct for each of these factors. Nevertheless, the paper gives some examples showing that the differences can lead to large spreads. I think more could be done here. One thing to bear in mind is that some of these transaction costs are policy induced and vary over time. For example, central banks wanted to increase or reduce the use of RCAs (and other liquidity facilities) and consequently priced them below or above market conditions.

These considerations lead me to suggest possible further work for the paper, or in this area. Let me start with some suggestions for aggregate-spreads analysis. Here I would look more across markets that varied in the use of RCAs. For example, we could compare interest rates in emerging markets without RCAs with those in advanced countries with them. Or we could look at advanced countries to determine whether the levels of RCAs mattered. In this case, I would like to see if one could somehow scale the RCAs according to the size of the problem. Clearly, some markets had much greater liquidity needs, which suggests considering the net funding gaps by market in one's analysis.

Within the same market, it may be worth using interest rates in other currencies since one can control for nondollar, nonliquidity factors, such as policies and risk. For example, one might expect dollar interest rates relative to nondollar rates to decrease more when an RCA is announced, even when credit risk decreases (or increases). Perhaps one could also conduct joint tests of arbitrage across currency pairs vis-à-vis dollars. Within the same currency, it may be useful to consider the interest rate or spreads for banks based in, say, different European countries to analyze the role of country factors. It could also be valuable to use the yield curve or futures to derive expectations and check for arbitrage opportunities (futures, for example, are affected less by credit risk).

Recall that because interbank spreads increased in most markets and most currencies, credit risk is likely important. Here I would suggest exploiting more individual interest rates. A suggestion is to use interest rates on specific (collateral) assets. One could check for arbitrage conditions, which would require making corrections for haircuts. While we would still need to control in some ways for bank credit risk (as there is recourse to the bank), lack of arbitrage could perhaps show more clearly whether RCAs had an impact. For those banks that had access to multiple markets, one could also compare rates across those markets.

Detailed rates of individual banks can be useful as well, because credit risk could then be differentiated more effectively from liquidity demand. One way would be to use banks' offer rates in the auctions, especially when combined with the volumes demanded by the types of banks. This approach presumably would require data from foreign central banks, but the data would be very valuable; they would allow one to study the effect of various bank characteristics, such as too-big-to-fail, foreign versus domestic, subsidiaries versus branches. Changes in the size of individual commercial banks' access over time could be especially interesting to study. Here one could investigate the moral hazard of some facilities. For example, by examining a bank's borrowing interest rate, we could determine whether access over time is evolving toward weaker borrowers.

I raise a few minor issues to consider as well. For instance, I was surprised to find that the paper did not use the bid-ask rate when looking at the FX premium. More generally, it might be interesting to know what happened to bid-ask spreads over this period; presumably, spreads widened more in markets with greater dollar liquidity problems. There were also problems reported during this period with the measurement of Libor. Since Libor is based on the quotes of various banks, it need not be actual lending rates. This could have suggested a bias when transactions were few or not occurring. What role could this measurement issue have played in the data used by the authors?

Clearly, there are many policy questions that have come to the fore with the financial crisis. In this regard, the paper could expand its analysis, even if it does not answer all the questions—which is understandably very hard. Some of the big questions are: should there be regular, standing RCAs? Since RCAs have shown to be of value, yet were not put in place immediately at some cost, the question arises as to whether they should become permanent features of the international financial architecture. If they are to become permanent, however, how large should they be? And what about moral hazard—can it be controlled? Or are there other mechanisms that can facilitate cross-border liquidity as well, but do not present the same moral hazard problems? For example, Continuous Linked Settlement is a private sector solution. Could it suffice? What about other clearing and settlement mechanisms?

Another set of questions relates to macroprudential rules. The financial crisis has presumably taught us that these rules need to be tightened for liquidity—besides rules in general, those for open FX positions in particular. Is it useful, however, to add liquidity and foreign exchange risk to capital adequacy requirements? Could or should there be exceptions to such rules in times of stress? Another set of questions, mostly beyond the scope of the paper, relates to the need to improve cross-border banking resolution, both for branches and subsidiaries. Indeed, differences in these rules across countries have played a role in the spread of liquidity and solvency problems—and, as such, improvements are called for. But which improvements are needed and in what specific ways of implementation are they most useful from this perspective? Are there lessons here from integrated markets, such as the European markets? Quite a few questions, but the authors have demonstrated the ability to address complex issues. So I am confident we can expect more from them.