

## Jeremy C Stein: Dollar funding and global banks

Speech by Mr Jeremy C Stein, Member of the Board of Governors of the Federal Reserve System, at the Global Research Forum “International Macroeconomics and Finance”, co-organised by the European Central Bank, the Federal Reserve Board and the Federal Reserve Bank of New York, Frankfurt am Main, 17 December 2012.

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Thanks very much. It’s a pleasure to be part of this panel on the future of financial globalization. I will focus my remarks on one important aspect of this issue – namely, the growing use of wholesale dollar funding by global financial institutions. I’ll begin by briefly discussing research I’ve been doing, along with my coauthors Victoria Ivashina and David Scharfstein, which examines some of the consequences of this funding model during times of market stress.<sup>1</sup> I’ll then touch on the policy implications of this and related work. But first, the usual disclaimer: The views that follow are my own and do not necessarily reflect the thinking of my colleagues on the Federal Open Market Committee.

By way of background, the dollar liabilities of foreign banks have grown rapidly in the past two decades and now stand at about \$8 trillion, roughly on par with those of U.S. banks.<sup>2</sup> A significant proportion of foreign banks’ dollar liabilities are raised via U.S. branches, most of which are legally precluded from raising deposits insured by the Federal Deposit Insurance Corporation. The main source of funding for these branches, therefore, comes from uninsured wholesale claims such as large time deposits, making the cost and availability of such dollar funding highly sensitive to changing perceptions of these banks’ creditworthiness.

In our work, we asked how shocks to the ability of foreign banks to raise dollar funding might lead to changes in their lending. We began with a simple conceptual model: Imagine a European bank that lends in euros to European firms and in dollars to U.S. firms. To finance its euro-denominated lending, it funds itself by issuing insured euro deposits to its local retail deposit base. By contrast, to finance its dollar-denominated lending, it raises funds in the wholesale dollar market.

Because the bank’s dollar liabilities are uninsured, an adverse shock to the bank’s perceived creditworthiness will result in a spike in its dollar funding costs. At the same time, the cost to the bank of funding in euros is unchanged to the extent that its euro deposits are insured. So we might expect such a shock to induce the bank to shift its funding away from the U.S. wholesale market and toward the European deposit market. But what are the consequences of this adjustment, both for the geographic distribution of its lending and for the functioning of foreign exchange (FX) swap markets?<sup>3</sup>

Note that if the bank wants to maintain the volume of its dollar-based lending, it will have to tap its insured deposit base to raise more euros and then swap these euros into dollars using the FX swap market. However, if the induced funding realignment is big enough, and if arbitrageurs have limited capacity to take the other side of the trade, this large swap demand can cause a breakdown in the usual covered-interest-parity (CIP) relationship – a breakdown of the sort that we have seen during times of extreme market stress. In this case, the

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<sup>1</sup> See Victoria Ivashina, David S. Scharfstein, and Jeremy C. Stein (2012), “Dollar Funding and the Lending Behavior of Global Banks (PDF),” Finance and Economics Discussion Papers 2012-74 (Washington: Board of Governors of the Federal Reserve System, October).

<sup>2</sup> For the dollar assets and liabilities of foreign banks, see Bank for International Settlements (2012), “[Locational Banking Statistics \(PDF\)](#),” December. For the assets and liabilities of domestically chartered U.S. banks, see Table H.8, Board of Governors of the Federal Reserve System.

<sup>3</sup> A foreign exchange swap is the simultaneous exchange of one currency for another in the spot market and an agreement to reverse this transaction at a later date at a pre-specified exchange rate.

direction of the deviation would be such that the cost of synthetic dollar borrowing – in other words, euro borrowing combined with an FX swap – would go up and would approach that of the now-elevated cost of funding directly in the wholesale dollar market.

And given that any method of dollar funding – direct or synthetic – has become more expensive relative to euro funding, it then follows that an adverse shock to a global bank's perceived creditworthiness leads to a decline in its dollar-denominated lending relative to its euro-denominated lending. So, two principal effects of the dollar funding shock are intimately connected: a widening of the so-called CIP basis in the FX swap market, and a reduction in credit supply to firms that borrow in dollars.<sup>4</sup>

To test the model's implications, my coauthors and I focused on events in the second half of 2011, when the credit quality of a number of large euro-area banks became a concern and U.S. prime money market funds sharply reduced their lending to those banks. In a span of four months, the exposure of money funds to euro-area banks fell by half, from about \$400 billion in May to about \$200 billion in September.<sup>5</sup> Coincident with this contraction in dollar funding, the CIP basis widened in the direction predicted by our model, increasing the cost of obtaining synthetic dollars via the FX swap market.

We used data from the international syndicated loan market to test the model's predictions about the reaction of lending to this type of funding stress. We found that dollar-denominated lending by euro-area banks fell relative to their euro-denominated lending, while this result did not hold for U.S. banks. We also found that, even holding fixed the identity of the borrowing firm, a syndicate formed to make a dollar-denominated loan during this period was less likely to include euro-area banks, while the same was not true of syndicates making euro-denominated loans. Finally, euro-area banks that relied most on funding from U.S. money market funds also cut back most sharply on their dollar-denominated lending.<sup>6</sup>

This last result is similar to one in recent work by my Fed colleagues Ricardo Correa, Horacio Sapriza, and Andrei Zlate.<sup>7</sup> They documented that the U.S. branches of foreign banks that experienced the most shrinkage in their dollar-denominated large time deposits – funding that had been mostly provided by money market funds prior to mid-2011 – cut their U.S.-based commercial and industrial lending by more than banks that fared better on this score.

Taken together, these findings have two types of policy implications: one for central bank responses to dollar funding pressures and another for measures to regulate foreign banking firms that rely heavily on short-term wholesale funding.

This analysis underscores that the Federal Reserve's temporary dollar liquidity swap lines with the European Central Bank and other central banks are an effective response to stresses in dollar funding markets. Last week, the FOMC approved the extension of these swap lines through February 1, 2014. These lines have helped avert fire sales of dollar assets and maintain the flow of credit to U.S. households and firms. Although we documented cutbacks in dollar lending in the latter half of 2011 by foreign banks reliant on

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<sup>4</sup> The CIP basis is typically measured as the difference between the interest rate differential embedded in FX swap prices and the differential implied by foreign- and domestic-currency Libor rates.

<sup>5</sup> See U.S. Securities and Exchange Commission (2012), "SEC Releases Money Market Fund Portfolio and 'Shadow NAV' Information to the Public," press release, January 31.

<sup>6</sup> Money-fund reliance is defined as liabilities held by money funds divided by total short-term debt plus deposits.

<sup>7</sup> See Ricardo Correa, Horacio Sapriza and Andrei Zlate (2012), "Liquidity Shocks, Dollar Funding Costs and the Bank Lending Channel During the European Sovereign Crisis (PDF)," International Finance Discussion Papers 2012-1059 (Washington: Board of Governors of the Federal Reserve System, November).

wholesale dollar funding, those cutbacks likely would have been more pronounced in the absence of the swap lines

I will now turn to regulation. It is useful to bear in mind that our current regulatory regime evolved during a period when the U.S. operations of foreign banks were largely net recipients of funding from their parents. However, their reliance on less stable, short-term wholesale funding increased significantly in the decade leading up to the financial crisis, when U.S. branches of foreign banks began borrowing large volumes of dollars to send to their foreign parents. Such activity increases the vulnerabilities I described earlier. And it may not only pose the risk of a cutback in lending, but could also threaten the safety and soundness of the foreign banks themselves – and of the U.S. entities exposed to those banks.

The regulation of U.S. branches of foreign banks has changed little over the past decade, even in the face of these significant changes in the global banking landscape. However, last week, the Federal Reserve Board proposed new rules for foreign banking organizations that would address some of the concerns that I've discussed and thereby mitigate the attendant risks to U.S. financial stability. These proposed rules apply enhanced prudential standards to foreign banking organizations and are designed to increase their resiliency. Importantly, the rules will not disadvantage foreign banks relative to domestic U.S. banking firms, but rather the rules seek to maintain a level playing field. To avoid or mitigate potential disruptions in wholesale dollar funding markets, the proposed rules require foreign banking organizations to hold sufficient high-quality liquid assets to meet expected near-term net outflows in a stress scenario. These rules should reduce the pressure on foreign banks that rely heavily on short-term dollar funding to either sell illiquid dollar assets or cut back on dollar lending in times of financial stress. By helping to alleviate disruptions in dollar funding markets the rules should also reduce the reliance on swap lines in a future stress episode.

Finally, the central role played by money market funds in the 2011 episode is a reminder of the fragility of these funds themselves – and of the risk created by their combination of risky asset holdings, stable-value demandable liabilities, and zero-capital buffers. The events following the Lehman Brothers bankruptcy in 2008 provide even starker evidence of the risks that money market funds pose for the broader financial system. In light of these vulnerabilities, I welcome the recent proposed recommendations by the Financial Stability Oversight Council for further money market fund reforms.<sup>8</sup>

To conclude: Financial globalization undoubtedly brings with it substantial benefits. At the same time, it creates important challenges for financial stability and for the appropriate design of regulation. The research discussed in conferences such as this one will help us better understand and respond to these challenges. Thank you, and I look forward to your questions.

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<sup>8</sup> See U.S. Department of the Treasury (2012), "Financial Stability Oversight Council Releases Proposed Recommendations for Money Market Mutual Fund Reform," press release, November 13.