BANK FOR INTERNATIONAL SETTLEMENTS

Accounting for global liquidity: reloading the matrix

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It is a pleasure to share the stage with Stan Fischer, Philip Lane and Raghu Rajan to discuss cross-border monetary and macroprudential spillovers. I cannot think of a better panel for this topic.

Let me start by posing a question. Why do we need financial regulation at all? I throw this out as a rhetorical question. I cannot rule out that some of you in the audience would like to see a bonfire of all regulations, but I would guess that most of you would argue for *some* regulation rather than none.

Regulation, by its nature, is an interference in the workings of the economy, but the intention is to counter other distortions. This is a variant of the "second best" argument. Adding a distortion (regulation) results in a better outcome if it mitigates other, more serious, distortions that make the financial system vulnerable to much worse outcomes. For economists in the room, a snappier way to say this is that the optimum is an interior solution (*some* regulation), not a corner solution (*no* regulation).

In contrast to this consensus in the domestic context, things get much more contentious and difficult in the international context, especially when discussion turns to capital controls to deal with boom-bust cycles. Unlike for domestic financial regulation, the frictionless economy still exerts a powerful hold as the benchmark to aim for in the international context.

Why is there such a stark contrast? Is it justified? I will argue that the contrast is due to an outdated and misleading framing of the questions that makes us blind to some vulnerabilities, and too quick to condemn solutions. Instead, a proper framing of the issues puts the domestic and international dimension on a more equal footing. But emphasis on controls at the border is equally misplaced; it confuses outward symptoms and underlying causes. It perpetuates the flawed framing of the questions.

Here is the caricature. The global economy is a collection of islands where the exchange rate determines the trade balance. A weaker currency boosts one island's economy through higher exports. An island running a trade surplus would see its currency appreciate, unless something interferes with that adjustment. Capital controls are one such interference. Hence the stigma attached to capital controls.

However, this is only half the story. For one thing, exchange rates affect the economy not only through a trade channel but also through a *financial channel*. The financial channel goes in the opposite direction to the trade channel: a stronger currency goes hand-in-hand with a lending boom and buoyant investment activity on the back of strong capital inflows. The effect is particularly marked for emerging market economies, as we witnessed during the boom in the immediate post-crisis years. Unfortunately for

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them, the financial channel also works in reverse, as the recent period of dollar strength and growth slowdown has shown.

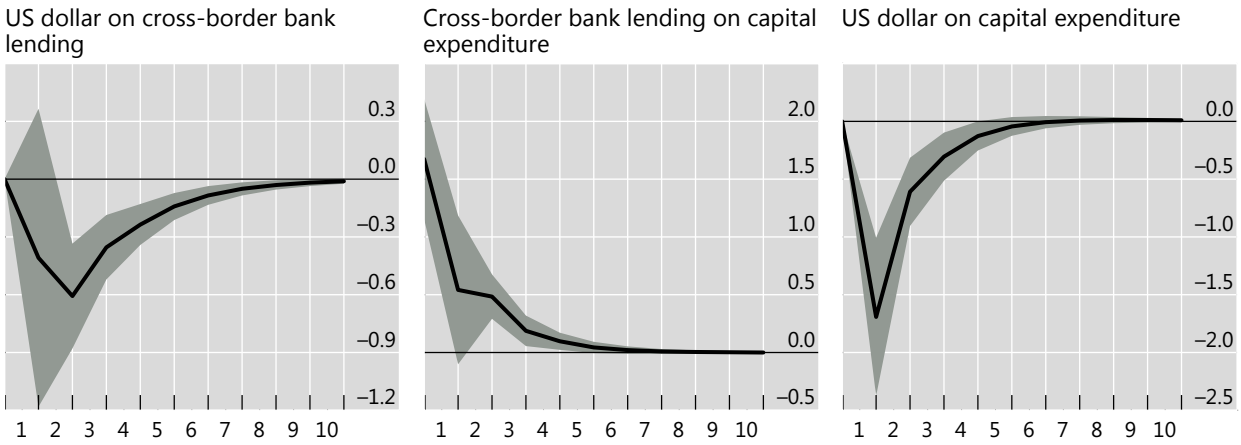
Financial channel of exchange rates

Let me present some evidence on the financial channel of exchange rates using BIS data on cross-border bank lending. I draw your attention to two notable findings. First, cross-border lending in dollars depends on the strength of the dollar. When the dollar weakens, foreigners borrow more in dollars. When the dollar strengthens, dollar lending contracts.

Second, to give you a taste of how global investment activity is closely tied to dollar lending and dollar strength more generally, here is what we find in some yet-to-be released research. When the dollar is weak, investment is buoyant across the emerging market economies. But when the dollar strengthens, investment turns weaker.

Let me illustrate these effects with the following charts from a paper currently being prepared for the IMF Annual Research Conference this November. The paper is with my BIS colleagues Stefan Avdjiev and Cathérine Koch, together with Valentina Bruno.[2]

Impact of a dollar appreciation shock on emerging market economies — Graph 1



Black lines show the estimated impulse response functions using a Cholesky decomposition with five endogenous variables ordered as (1) US interest rate, (2) US dollar-denominated cross-border bank flows, (3) gross capital formation, (4) bilateral US exchange rate and (5) the VIX. Confidence bands reflect 95% confidence intervals using a Gaussian approximation based on 1,000 Monte Carlo draws from the estimated structural panel VAR. Period covered: Q2 2001–Q2 2015.

Sources: IMF *International Financial Statistics* and *World Economic Outlook*; national data; BIS locational banking statistics; authors' calculations.

Graph 1 presents the impact of a dollar appreciation shock for 24 emerging market economies.[3] It shows the financial channel of exchange rates in action and how it goes in the opposite direction to the trade channel. The left-hand panel shows that a strengthening in the dollar is associated with a fall in dollar-denominated cross-border bank lending. The right-hand panel is the key finding. A rising dollar

[2] Avdjiev et al (2017). The theoretical basis draws on the mechanism studied in Bruno and Shin (2015a, 2015b). Bussière et al (2015) and Kearns and Patel (2016) show that currency appreciation can be expansionary.

[3] Impulse responses from a five-variable panel VAR. See Graph 1 legend for further details on sample and method. Qualitative results are unchanged in six variable VAR with global activity variable ordered first.

also affects investment, but in the opposite direction to the trade channel. When the domestic currency weakens against the dollar, there is a sharp *drop* in investment. A stronger dollar dampens economic activity, rather than stimulating it. The effect is pretty much immediate and is statistically significant for close to one year.

The centre panel fills in the missing step in the economic mechanism. The cross-border dollar lending goes hand in hand with the investment activity. This effect has to do with more than simply financing real investment with dollars. The financial channel of exchange rates generates broader incentives to take risks through currency fluctuations, especially when currency movements mean that borrowers' assets and debts grow or shrink due to currency fluctuations. But the dollar also determines the risk premium of local currency sovereign bonds (Hofmann et al (2016)), and hence domestic financial conditions more generally.

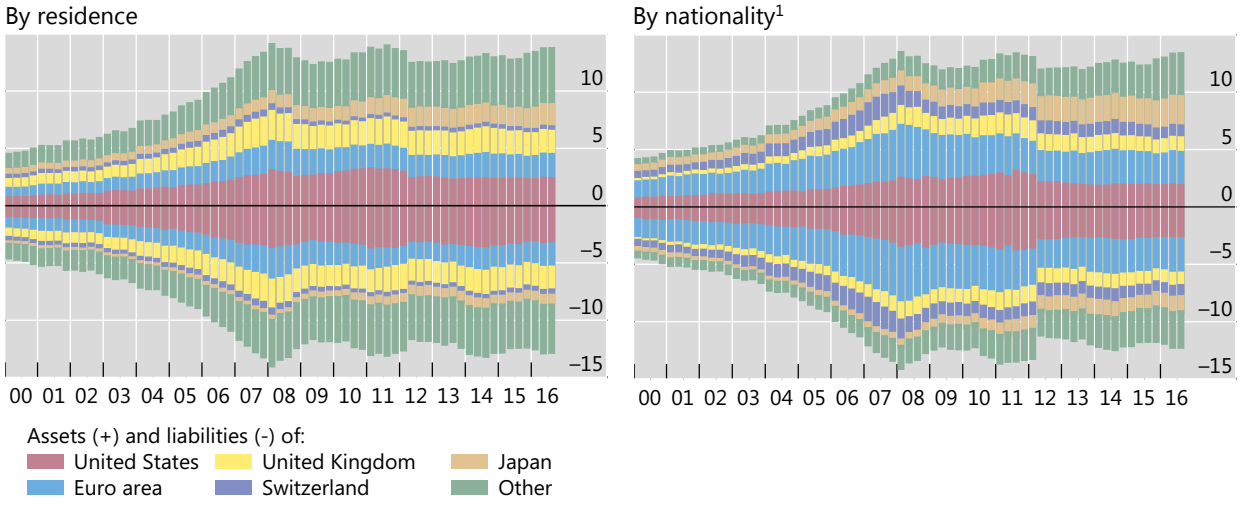
The valuation changes on borrower balance sheets are most obvious if the borrower has local currency assets and has borrowed in dollars. Even if assets generate dollar cash flows, a stronger dollar goes with weaker cash flows, as in the case of oil firms. For these and other related reasons, a weaker dollar flatters the balance sheet of dollar borrowers. From the standpoint of creditors, the borrowers appear to be better credits, and lending expands. Bruno and Shin (2015a, 2015b) have labelled this the "risk-taking channel of currency appreciation". Everything goes into reverse when the dollar strengthens, with the effect magnified when the dollar rises after a long period of dollar weakness.

From islands to nodes

Behind the financial channel of exchange rates is an intricate map of dollar flows. The domain of the currency (the dollar) extends beyond the borders of the currency's home country (United States). Graph 2 shows the dollar-denominated cross-border positions of the global banking system. Upward-pointing bars indicate assets and downward-pointing bars indicate liabilities. The striking feature is how the dollar is everywhere, not just to and from the United States.

Cross-border US dollar denominated positions of BIS reporting banks

In USD trillion — Graph 2



[1] The break in series between Q1 2012 and Q2 2012 is due to the Q2 2012 introduction of a more comprehensive reporting of cross-border positions (for more details, see www.bis.org/publ/qtrpdf/r_qt1212v.htm).

Source: BIS locational banking statistics, Tables A5 (by residence) and A7 (by nationality).

The global economy is not a group of islands, but a set of nodes connected by a dense network of financial claims. The image is of a matrix, not a collection of islands – hence the title of my speech today. In Graph 2, the left-hand panel shows dollar-denominated cross-border bank lending by residence, while the right-hand panel is by nationality, meaning the location of the headquarters. So, for instance, the cross-border dollar claims of a German bank branch in London would be classified as "UK" in the left-hand panel, but as "euro area" in the right-hand panel.

The dense network of nodes does not respect geography. Think of a European bank lending dollars to an Asian corporate by drawing dollars from a US money market fund. The bank has liabilities in New York, assets in Asia, but with headquarters in London or Paris. This new world is a million miles away from the picture of islands separated by oceans.

But complexity need not deter clear thinking. In fact, some things are made easier. A dollar is the same whether it is in Asia or in Europe, and we need only track the network of flows to see the impact on real and financial variables. Monetary policy spillovers are more reliably documented when the currency dimension is taken on board, as the currency dimension is what matters for the financial channel of exchange rates (Rey (2013, 2016), Bruno and Shin (2015b)).

Macroprudential frameworks

The island economy sketched at the outset was a caricature, but not much of a caricature. The traditional approach to international finance is built around the national GDP area as islands. A country running persistent current account deficits is told to be wary of a "sudden stop" when the currency falls sharply as foreign creditors pull out. Although this narrative fits many cases, it does not fit all, and the failures reveal the blind spots in our current macroprudential frameworks.

Take one example. In the mid-2000s, the US current account deficit widened to a historically large share of output, and commentators warned of a sudden stop in capital flows to the US accompanied by a "Wile E Coyote moment" for the dollar,[4] named after the hapless cartoon character who runs off the cliff in pursuit of the Road Runner, only to hover in mid-air before crashing to the ground. The argument at the time was that the dollar would crash when foreign investors look down, realise the inevitability of the dollar's depreciation, and rush for the exit.

In the event, so far from crashing, the dollar soared with the onset of the financial turmoil in 2008. European banks who had used short-term dollar funding to invest in long-term dollar assets were stampeded into bidding for dollars to repay their dollar debts. Dollar appreciation fed on itself, as the stronger dollar piled further pressure onto these banks' balance sheets.

Where was the current account, that mainstay of textbook economic models, in all this? The current account revealed little about the underlying vulnerabilities. European banks recycled dollars from US money market funds back to the United States by purchasing mortgage-backed securities. In this "round-tripping", the outflows to Europe were matched by the inflows from Europe. The change in *net* flows were negligible, so that the current account revealed very little about the rapid increase in leverage and balance sheet size.[5]

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[4] Edwards (2005), Obstfeld and Rogoff (2005), Setser and Roubini (2005), Summers (2004). The "Wile E Coyote" reference is from Krugman (2007).

[5] McGuire and von Peter (2012), Borio and Disyatat (2011, 2015) and Avdjiev et al (2015). My 2011 Mundell-Fleming lecture goes into further details (Shin (2012)).

The lesson is to distinguish underlying causes from outward symptoms. Yes, the 2008 financial crisis was in large part a cross-border phenomenon, but focusing on capital flows confuses the symptoms (capital flows) from the underlying causes (excess leverage and funding risk). If the problem is excessive bank leverage and funding risk, then address these risks directly with traditional *microprudential, or regulatory* tools. Applying these microprudential tools with *macroprudential* intent, or the intent to work on the whole financial system, is what makes them part of a macroprudential framework.[6]

Let me mention a thought-provoking piece by Matt Klein (2016), with the title "If Spain didn't need capital controls, why would anyone?". The title says it all, and Matt's argument is that Spain's financial crisis could have been avoided with capital controls. When I debated this with him last summer, my point was that capital flows and the current account deficit should be seen as symptoms, not the cause. We can go a long way with traditional tools, and what matters is the perspective. There is a video of our debate.[7]

To the extent that new tools are needed, they too should be aimed at the underlying causes, not the outward symptoms, by addressing procyclicality and funding risks. The currency dimension is less relevant for Spain, but can be important in other contexts (FSB-IMF-BIS (2011), Bruno and Shin (2014)).

Concluding remarks

In setting the accounting framework, we, as economists and policymakers, can go in one of two directions. The first is to drill down to firm-level micro data. This is now the trend in empirical work in international finance, as exemplified by the excellent work done by the International Banking Research Network (IBRN). The second is to go in the opposite direction, and "drill up" to global aggregates such as the BIS's global liquidity indicators.[8] Both strategies are useful, and yield complementary insights. The rationale for "drilling up" is that no matter how complex is the mapping between balance sheets and GDP areas, all variables add up to the same number at the global level.[9]

Doing justice to global liquidity means moving from the islands view of the global economy to that of the dense network of connected nodes. Exchange rates have a financial channel, not just a trade channel. Monetary spillovers follow the network of banking flows and are a cross-currency phenomenon, not just a cross-border one. We need to reload the matrix.

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[6] Crockett (2000), Borio (2015), IMF-FSB-BIS (2016) describe macroprudential frameworks. A recent paper by BIS colleagues examines the international dimensions of macroprudential frameworks and scope for cross border coordination (Agénor et al, 2017).

[7] *FT Alphaville*, https://live.ft.com/Events/2016/FT-Festival-of-Finance?=&v=5033604492001.

[8] www.bis.org/statistics/gli.htm. See Cohen et al (2017) for a fuller description.

[9] Bruno and Shin (2015a, 2015b) develop a global model of the banking sector, and Tarashev et al (2016) explain how the BIS Global Liquidity Indicators can be interpreted as indicators of global conditions.

References

Agénor, P-R, E Kharroubi, L Gambacorta, G Lombardo and L Pereira da Silva (2017): "The international dimensions of macroprudential policies", mimeo, Bank for International Settlements.

Avdjiev, S, V Bruno, C Koch and H S Shin (2017): "The dollar exchange rate as a global risk factor: evidence from investment", paper prepared for the IMF Annual Research Conference, November, forthcoming.

Avdjiev, S, R McCauley and H S Shin (2015): "Breaking free of the triple coincidence in international finance", *BIS Working Papers*, no 524, October, www.bis.org/publ/work524.htm.

Borio, C (2015): "Macroprudential policies: what have we learnt?", speech at the Bank of Italy Conference "Micro and Macroprudential Banking Supervision in the Euro Area", Università Cattolica del Sacro Cuore, Milan, 24 November 2015, www.bis.org/speeches/sp151124.htm.

Borio, C and P Disyatat (2011): "Global imbalances and the financial crisis: link or no link?", *BIS Working Papers*, no 346, May, www.bis.org/publ/work346.htm.

——— (2015): "Capital flows and the current account: Taking financing (more) seriously", *BIS Working Papers*, no 525, October, www.bis.org/publ/work525.htm.

Bruno, V and H S Shin (2014): "Assessing macroprudential policies: case of South Korea", *Scandinavian Journal of Economics*, vol 116, no 1, pp 128–57.

——— (2015a): "Cross-border banking and global liquidity", *Review of Economic Studies*, vol 82, no 2, 2015. Also published as *BIS Working Papers*, no 458.

——— (2015b): "Capital flows and the risk-taking channel of monetary policy", *Journal of Monetary Economics*, vol 71, April 2015, pp 119–32. Also published as *BIS Working Papers*, no 400.

Bussière, M, C Lopez and C Tille (2015): "Do real exchange rate appreciations matter for growth?", *Economic Policy*, January, pp 5–45.

Cohen B, D Domanski, I Fender and H S Shin (2017): "Global liquidity: a selective survey", *Annual Review of Economics*, forthcoming.

Crockett, A (2000): "Marrying the micro- and macro-prudential dimensions of financial stability", remarks before the Eleventh International Conference of Banking Supervisors, Basel, 20–21 September, www.bis.org/speeches/sp000921.htm.

Edwards, S (2005): "Is the US current account deficit sustainable? If not, how costly is adjustment likely to be?", *Brookings Papers on Economic Activity*, no 1:2005, pp 211–88.

FSB-IMF-BIS (2011): "Macroprudential policy tools and frameworks – progress report to G20", October, www.bis.org/publ/othp17.htm.

Hofmann, B, I Shim and H S Shin (2016): "Sovereign yields and the risk-taking channel of currency appreciation", *BIS Working Papers*, no 538, January, www.bis.org/publ/work538.htm.

IMF-FSB-BIS (2016): "Elements of effective macroprudential policies – lessons from international experience", August, www.bis.org/publ/othp26.htm.

Kearns, J and N Patel (2016): "Does the financial channel of exchange rates offset the trade channel?", *BIS Quarterly Review*, December, pp 95–113.

Klein, M (2016): "If Spain didn't need capital controls, why would anyone?", *FT Alphaville*, 15 July, https://ftalphaville.ft.com/2016/07/15/2168347/if-spain-didnt-need-capital-controls-why-would-anyone/.

Krugman, P (2007): "Will there be a dollar crisis", *Economic Policy*, vol 22, no 51, pp 436–67.

McGuire, P and G von Peter (2012): "The US dollar shortage in global banking and the international policy response", *International Finance,* vol 15, no 2, pp 155–78.

Obstfeld, M and K Rogoff (2005): "Global current account imbalances and exchange rate adjustments", Brookings Papers on Economic Activity, no 1:2005, pp 67–123.

Rey, H (2013): "Dilemma not trilemma: the global financial cycle and monetary policy independence", in *Global dimensions of unconventional monetary policy*, proceedings of the Federal Reserve Bank of Kansas City symposium, August, pp 285–333.

——— (2016): "International channels of transmission of monetary policy and the Mundellian trilemma", Mundell-Fleming Lecture at the 2014 IMF Annual Research Conference, *IMF Economic Review*, vol 64, no 1, pp 6–35.

Setser, B and N Roubini (2005): "Our money, our debt, our problem", *Foreign Affairs*, vol 84, no 4, Jul/Aug, pp 194–98.

Shin, H S (2012): "Global banking glut and loan risk premium", Mundell-Fleming Lecture at the 2011 IMF Annual Research Conference, *IMF Economic Review*, vol 60, pp 155–92.

Summers, L (2004): "The US current account deficit and the global economy", Per Jacobsson Lecture, International Monetary Fund, October.

Tarashev, N, S Avdjiev and B Cohen (2016): "International capital flows and financial vulnerabilities in emerging market economies: analysis and data gaps", August, www.bis.org/publ/othp25.htm.