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Central bank swap lines and cross-border bank flows

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Central bank swap lines and cross-border bank flows

Key takeaways

- *Central banks drew heavily on US dollar swap lines with the Federal Reserve in the first half of 2020, contributing to a surge in cross-border banking flows during this period.*
- *The large increase in cross-border claims on banks operating in the United States – in the form of cross-border interbank and intragroup positions – reflected an increase in dollar liquidity demand from non-US banks partly met through use of the swap lines.*
- *In a global financial system heavily reliant on the use of the dollar, the network of central bank swap lines centred on the Fed serves as a critical elastic backstop for the private provision of dollar liquidity.*

As the fallout from the Covid-19 pandemic reverberated through global financial markets in the first half of 2020, offshore US dollar funding costs rose sharply. In response, the Federal Reserve used its network of swap lines with 14 central banks to channel dollar liquidity globally. Use of the swap lines peaked at \$449 billion by May, and significantly eased global dollar funding conditions.¹ At the same time, and less appreciated, tapping the swap lines generated a sharp increase in global cross-border banking flows, particularly in cross-border claims on banks located in the United States. This rise was less a reflection of increased external funding needs of banks specifically located in the US, and more the result of a sudden increase in global demand for dollar liquidity – a symptom of a system under stress. In effect, the Fed provided a “grand dollar overdraft” to backstop the global dollar financial system.

This Bulletin traces the use of the swap lines and their impact on global banking positions. In doing so, it highlights the critical role that banks play in international payments, and capital flows more generally. The first section provides an overview of global banking flows in the first half of 2020, and links them to the uptake of the swap lines. The following section shows in a stylised framework how the use of swap lines affects central banks’ and commercial banks’ balance sheets, in the United States as well as in the recipient country. The last section provides a snapshot of these purely accounting relationships from the perspective of banks in the US, focusing on the affiliates (ie subsidiaries and branches) of non-US banks with headquarters in jurisdictions that drew most heavily on the swap lines.

¹ For details on the swap lines and underlying market stresses, see BIS (2020) and Aldasoro, Ehlers, McGuire and von Peter (2020). Cetorelli et al (2020a) and Bahaj and Reis (2020) discuss the impact of the swap lines on global funding conditions.

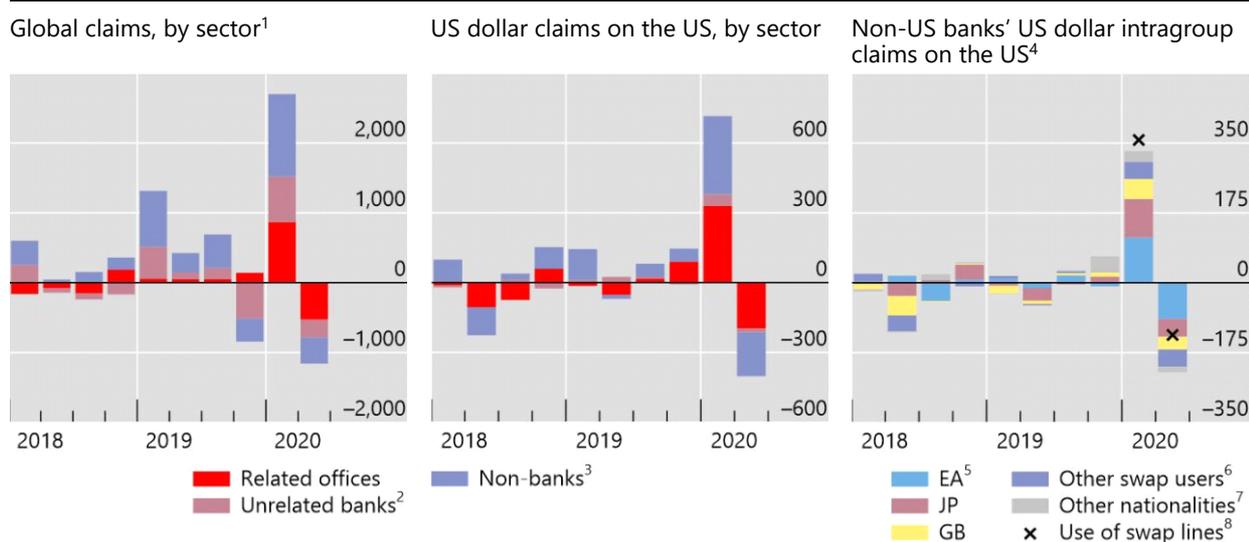
Global banking flows and the scramble for dollar liquidity

The first quarter of 2020 saw an extraordinary expansion in global cross-border banking flows, driven primarily by a rise in banks' positions vis-à-vis other banks, both with related (intragroup) and unrelated (interbank) institutions (Graph 1, left-hand panel). As global banks have offices around the world, they spawn a large network of claims across countries. Such claims on related offices surged by almost \$1 trillion. Of particular importance were US dollar-denominated claims on bank affiliates located in the United States, which accounted for more than a third of this total (centre panel, light red bars). These flows largely reversed in the second quarter as financial conditions improved.

Swings in cross-border positions reflect banks' internal markets

Quarterly changes, in billions of US dollars

Graph 1



¹ Quarterly changes adjusted for breaks in series and exchange rate fluctuations. US dollar claims in the remaining panels require no exchange rate adjustment. ² Includes central banks and banks unallocated by subsector between related and unrelated banks. ³ Includes non-banks and unallocated by sector. ⁴ Changes in intragroup claims are derived from estimated stocks using mirror data reported by two or more jurisdictions for each observation. The approach reconciles banks' reported claims on related offices in the US with the intragroup liabilities of those same offices vis-à-vis related banks outside the US. ⁵ Banks headquartered in any of the 13 BIS reporting euro area countries. ⁶ Comprises AU, CH, DK, KR, MX, NO and SG (KR and MX started to use their swap lines in Q2 2020). ⁷ All other bank nationalities. ⁸ Use of central bank liquidity swap lines; quarterly change in the amount outstanding to 31 March 2020 (for Q1) and to 30 June 2020 (for Q2).

Sources: Federal Reserve Bank of New York; BIS locational banking statistics (by residence and by nationality); BIS estimates.

These exceptional movements reflect, in part, how banks manage liquidity across borders through their global network of offices. The use of the Fed's US dollar swap lines highlights these movements. By end-March 2020, a total of \$358 billion had been drawn, most prominently by banks in Japan, the euro area and the United Kingdom. Indeed, banks headquartered in these jurisdictions reported the largest increases in dollar claims on their affiliates in the United States (Graph 1, right-hand panel), probably motivated by precautionary liquidity or funding needs at those entities.² Moreover, the overall rise in these banks' dollar-denominated intragroup claims correlates with the uptake at their central banks' dollar auctions. These positions largely reversed by end-June, as outstanding swap line positions were unwound. All this suggests a close link between cross-border banking positions and the use of dollar swap lines. As

² Cetorelli et al (2020b) suggest that the dollar liquidity obtained through the swap lines was an important source of funding for many foreign banks in the US to meet a surge in utilisation of credit lines by their customers.

explained in the next section, such balance sheet movements arise in relation to the international flows of dollars associated with the Fed's actions to backstop global dollar liquidity.

A grand dollar overdraft

The use of the swap lines serves to illustrate the mechanics of cross-border capital flows as well as the "elastic" nature of the global banking system (central bank plus commercial banks) – a point stressed by Mehrling (2015).³ A fundamental feature of payment systems is their hierarchical nature. Firms and households rely on bank deposits (inside money) as a means of payment. Banks, in turn, settle through transfers of bank reserves – deposits held at the central bank. This two-tier setup has implications for how the system responds to liquidity shocks. Banks are the first line of defence. Their ability to create deposits by granting loans (or more generally, acquiring claims on non-banks) greatly facilitates economic activity and underpins their role as flexible nodes in the system to meet demand for liquidity. This is most apparent in the domestic context. During the Covid-19 crisis, for example, bank deposits (and balance sheets) expanded as firms drew on committed credit lines to meet heightened funding needs. Central banks, in turn, act as a backstop for banks in times of stress.

As a means of payment, bank deposits also underpin cross-border capital flows. An agent – whether bank or non-bank – wishing to acquire assets in another country first needs to obtain the means of payment, typically a bank deposit in the currency of that country. These deposits represent an indirect claim on bank reserves in the currency-issuing country since that is what needs to be transferred when the deposits change hands across banks. Contrary to popular belief, cross-border flows of dollars for the most part do not actually involve any flows of currency across *physical* borders but merely changes in ownership of dollar bank deposits between a US resident and non-resident.⁴

The mechanics of the dollar swap lines make this clear. Under this facility, central banks can obtain dollar liquidity from the Fed to meet underlying demand from banks in their jurisdictions for a fixed period of time at a pre-specified interest rate, providing their own currency as collateral.⁵ The recipient central bank, in turn, distributes these dollars to local financial institutions typically at the same maturity and rate, and subject to similar collateral requirements as on other domestic liquidity operations (ie domestic currency collateral can be pledged). The transfer of dollars occurs through the global network of affiliates and/or correspondent banks. Graph 2 shows a stylised illustration using the Bank of Japan (BoJ) as an example of a recipient central bank.

In the first step, the BoJ conducts a dollar auction for domestic banks and then draws on the swap line, receiving US dollar reserves at its account at the Fed. In return, it credits the Fed's account at the BoJ with JPY reserves. The balance sheets of both central banks expand. In the second step, the BoJ transfers the ownership of dollar reserves to banks in Japan. To "obtain" these dollars, a bank in Japan must rely on an affiliate (branch or subsidiary) or a correspondent bank *domiciled in the US* to acquire a claim on those reserves (Graph 2, centre panel), since banks outside the US do not have an account with the Fed. The BoJ instructs the Fed to transfer the reserves to the affiliate's account. In the process, the parent bank in Japan acquires a cross-border intragroup claim on its US-based affiliate (or correspondent bank). Since the BoJ

³ See Borio and Disyatat (2011) for a discussion of the elastic nature of the financial system. Frost et al (2020) provide a historical account of the importance of the elastic nature of the payment system.

⁴ For non-banks, dollar bank deposits booked at banks *outside* the US (so called "offshore dollars") can also serve as means of payment. These deposits, nonetheless, are ultimately settled among banks through reserves at the Fed. See Borio and Disyatat (2015) on this as well as a broader discussion of the importance of gross capital flows.

⁵ An FX swap contract consists of two legs: an immediate spot exchange of currencies and an agreement to exchange them back at a pre-specified rate when the contract matures. It is functionally equivalent to collateralised lending, with the currency exchanged acting as collateral. Since the exchange rate at maturity is predetermined, there is no exchange rate or interest rate risk.

has onlent the dollar reserves, it now holds a dollar claim on the Japanese borrower bank instead.⁶ The right-hand panel of Graph 2 depicts the final positions. The use of the swap lines expands the balance sheets of the central banks *as well as* those of the commercial banks in both countries.⁷

The stylised balance sheet mechanics of central bank swap lines¹

Bold font indicates cross-border positions

Graph 2

Step 1 BoJ draws swap line after auction				Step 2 USD transferred to JP bank				Final positions			
Federal Reserve		Bank of Japan		Federal Reserve		Bank of Japan		Federal Reserve		Bank of Japan	
Assets	Liab	Assets	Liab	Assets	Liab	Assets	Liab	Assets	Liab	Assets	Liab
↑ JPY reserves at BoJ	↑ USD reserves to BoJ	↑ USD reserves at Fed	↑ JPY reserves to Fed		↓ USD reserves to BoJ	↓ USD reserves at Fed		JPY reserves at BoJ	USD reserves bk in US	USD claim on bk in JP	JPY reserves to Fed
					↑ USD reserves bk in US	↑ USD claim on bk in JP					
Bank in US ²		Bank in JP		Bank in US ²		Bank in JP		Bank in US ²		Bank in JP	
Assets	Liab	Assets	Liab	Assets	Liab	Assets	Liab	Assets	Liab	Assets	Liab
↑ USD reserves	↑ USD due to bk in JP	↑ USD claim on bk in US	↑ USD to BoJ	USD reserves at Fed	USD due to bk in JP	USD claim on bk in US	USD to BoJ	USD reserves at Fed	USD due to bk in JP	USD claim on bk in US	USD to BoJ

¹ The graph shows underlying assets exchanged. Matching colours indicate corresponding balance sheet entries. Actual entries will be in the domestic currency (eg the Fed's balance sheet will show holdings of JPY reserves valued in USD terms). ² Banks in the US can be affiliate banks (branches or subsidiaries) or unrelated banks. In the former case, positions in the red boxes are intragroup; in the latter case, they are interbank with unrelated offices.

Source: Authors' illustration.

Two things are worth noting.

First, the uptake of the swap lines results in an increase in liquidity (reserves) of affiliated (or correspondent) banks in the US. Thus, even though a key aim of the swap lines is to ease global dollar liquidity strains, they can also alleviate liquidity tensions of banks in the US. For some banks, such as foreign banks/branches without direct access to all of the Fed facilities (ie not a primary dealer), the cost, including collateral requirements, may be lower through the swaps when the pricing is relatively favourable. The Fed, in turn, effectively outsources the credit risk, collateral management and other monitoring functions to the foreign central bank overseeing the borrowing bank.

Second, the global supply of US dollars expands on account of both the Fed's injection of reserves into the US banking system *and* the increase in non-resident dollar deposits in US-based banks. In this way, the swap lines leverage on the "elasticity" of the Fed's and commercial banks' balance sheets to offset rising demand for dollar liquidity. This "grand dollar overdraft" reflects the Fed's critical role as a backstop for the dollar-based global financial system.

⁶ The graph assumes that the Japanese bank obtains the dollars from the BoJ through a collateralised loan in which the currency denomination of the funds and collateral may differ – here borrowing US dollars and using yen-denominated collateral. With such transactions, the balance sheet expands. This need not be the case with alternative funding methods. For example, if instead the bank utilised its initial holdings of local currency reserves to obtain the dollars through an FX swap with the central bank, its balance sheet would not expand.

⁷ An FX swap between central banks expands their balance sheets because reserves are created and exchanged under the contract. Hence, assets and liabilities increase. In contrast, when commercial banks engage in an FX swap, they typically utilise existing holdings of currency as collateral. The result is a change in the composition of assets with no impact on overall balance sheet size.

Following the money trail

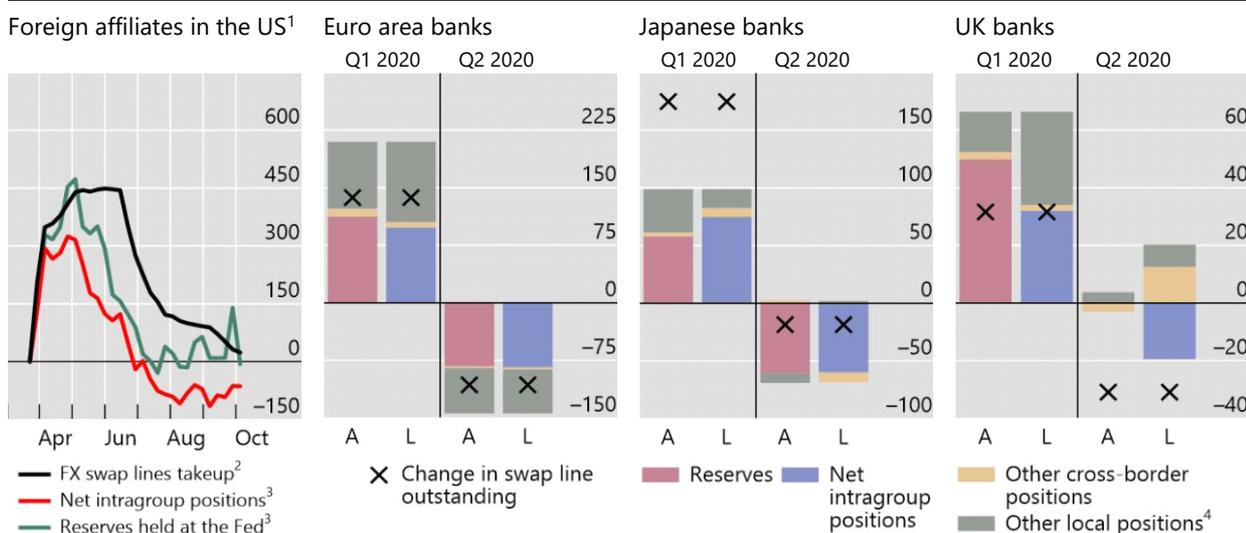
For banks in the US, the balance sheet mechanics set out above suggest that use of the swap lines results in an increase in liabilities to banks abroad, predominantly in the form of a net due position vis-à-vis a parent bank, in tandem with an increase in reserves at the Fed. As alluded to in Graph 1, intragroup liabilities did indeed move closely with swap line usage. Focusing on *foreign* banks in the US, the first panel of Graph 3 confirms this and shows that these movements also aligned closely with changes in banks' holdings of reserves at the Fed.

The match is not perfect, nor should one expect it to be. Given the vast daily volume of cross-border capital flows, mapping our stylised depiction of the swap lines to actual data is challenging. One possible source of discrepancy is that not all dollars from swap lines outside the US may have been transferred to affiliates in the US. If users of the swaps did not have US operations, the dollars drawn abroad would instead be booked with a correspondent (non-affiliated) bank. Such cross-border flows would not be captured in the graph, which shows only positions vis-à-vis parent banks. Moreover, intragroup liabilities can change for reasons unrelated to the swap lines. For example, if the foreign parent bank uses the dollars to buy a security from a US resident, then the affiliate pays (on behalf of the parent) by transferring reserves to the US bank of the seller, extinguishing the intragroup liabilities.⁸ Nonetheless, given the relatively large amounts drawn in a short period of time, traces of the swap line money trail are evident.

US operations of non-US banks: balance sheet positions and swap lines

Cumulative changes (left-hand panel) and quarterly changes (other panels), in billions of US dollars

Graph 3



¹ Branches and agencies, edge corporations only. Other panels also include US-chartered subsidiaries. ² Central bank liquidity swaps outstanding, from the H.4.1 Release. ³ Cumulative weekly changes since 18 March 2020 at foreign branches and agencies in the United States, from the H.8 Release (excludes subsidiaries). ⁴ Includes all reverse repos on the asset side and repos on the liability side.

Sources: Federal Reserve (H.4.1 and H.8 Releases); US Call Reports (FFIEC002, FFIEC031/041, FR2886b); BIS calculations.

⁸ More generally, the dollars could be transferred globally. For example, if a Japanese bank uses the dollars to buy a security from a German bank, then the dollar bank deposit (along with the dollar reserves) at its US-based affiliate would be transferred to the US-based affiliate of the German bank instead. The swap lines would then not be reflected in Japanese bank claims on US-based banks. In addition, amidst a generalised scramble for dollars, intragroup claims can move substantially as non-US banks source dollars through a variety of means (eg through asset sales) and subsequently reverse them as tensions subside.

Delving a little deeper, we make use of data from US Call Reports to analyse the operations of foreign banks *in the US* by nationality. The remaining panels of Graph 3 show changes in key balance sheet items of foreign banks headquartered in the euro area, Japan and the United Kingdom, the jurisdictions that drew most heavily on the swap lines. For each set of banks, the black cross indicates the amount drawn (or repaid) during the quarter, and the blue bars reflect changes in intragroup positions. Even at this more disaggregated level, movements in both line up closely.⁹ The expansion of intragroup liabilities was also associated with a commensurate increase in reserves, resulting in a grossing-up of bank balance sheets. Much of this was reversed in the second quarter as the swaps matured.

Conclusion

The dollar-based global financial system needs a dollar backstop in periods of stress. The Federal Reserve has provided that backstop through its extensive network of swap lines. The elasticity of the Fed's balance sheet also enables commercial banks to flexibly respond to liquidity shocks. Such injections of liquidity flow across borders and show up in the form of a rise in cross-border interbank and intragroup claims. These represent the increase in non-resident holdings of the means of payment that helps to stabilise global dollar liquidity conditions.

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⁹ Some large Japanese banks do not have US affiliates and hence are not captured in Graph 3. To the extent these banks tapped the US dollar swap line, this drives a wedge between the change in total assets and the change in swap line uptake for Japanese banks' affiliates in the US.

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