The Fed: the global lender of last resort

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Pressure on dollar liquidity created an urgent need for action from the US Federal Reserve (the Fed). Assuming its role as the global lender of last resort - the consequence of its position as the issuer of the international trade and reserve currency - the Fed reactivated the permanent or temporary swap agreements that it established with 14 other central banks in 2008. In order to extend the reach of its dollar supply, the Fed has also created a repo facility for the central banks of countries that do not have dollar swap agreements. The high fees charged, however, will limit take-up, depriving the markets of what could be a significant calming influence.

"The dollar is our currency, but your problem." This famous line, from Treasury Secretary John Connally following the Nixon administration's unilateral decision to pull the dollar out of the Bretton Woods system in 1971, has probably never seemed less apposite.

The extreme financial tensions triggered by the Covid-19 pandemic resulted, in March, in a flight to the dollar, upsetting the dollar financing markets in the process. The higher dollar funding costs [1] both for advanced economies (Japan, Eurozone, Switzerland, the UK) and emerging economies (South Korea, China, Malaysia, Peru) reflected the increasing scarcity of the greenback. A recent study by the Bank for International Settlements (BIS)[2] set out the underlying reasons for the dollar's soaring value. In particular, it contrasts increased dollar refinancing needs for institutional investors [3] (insurance companies, pension funds, asset managers), especially in Asia, with the drying up in the supply of dollars from banks[4] and market intermediaries. In recent weeks, the dollar appreciation[5] and the drawing down of off-balance-sheet credit lines has reduced banks' abilities to offer currency risk hedging services, whilst the prime US money market funds, the traditional providers of dollar financing on the commercial paper market, experienced massive withdrawals.

Under normal circumstances, when a bank registered outside the USA and without access to the Fed's refinancing lines[6] needs dollars, either on behalf of a client (dollar loan, currency risk hedging) or on its own account (acquisition of a dollar-denominated asset, hedging a currency risk), it will turn to the market. It can issue debt (either secured or not) in dollars, or enter a currency swap (currency versus the dollar) on the foreign exchange (FX) swap markets[7]. In periods of pressure on the dollar financing markets, it can turn to the central bank of its country of registration. To supply dollar liquidity, the central bank can either draw from its currency reserves (dollars directly, or another currency which it can then use in an FX swap) or monetise dollar-denominated assets that it holds (by selling them or putting them in repo) – or, where it has a reciprocal agreement with the Fed, it can draw against an agreed dollar swap line.

Assuming its role as the global lender of last resort[8] - the consequence of its position as the issuer of the international trade and reserve currency - the Fed reactivated the permanent or temporary swap agreements that it established with 14 other central banks in 2008. So far, the central banks that have been the biggest borrowers of dollars from the Fed have been the Bank of Japan (BoJ) and the European Central Bank (ECB). In practice, the drawing down of central bank dollar swap lines contributes to a very large extent to the financing of US resident banks.

Complementing these liquidity swaps between central banks (which will have the effect of reducing demand for dollars on the FX swap markets), the relaxation of leverage constraints on US banks could also help ease tensions in the dollar financing markets (by increasing the dollar supply coming from banks and from hedge funds and asset managers who will benefit from easier access to broker-dealer liquidity). In order to extend the scope of its response to the need for dollar liquidity, the Fed has introduced some completely new measures. These give foreign central banks the option of putting their Treasuries portfolios into repo. The Fed thus stands ready, for the first time, to assume, to a certain extent, its role as the dealer of last resort on a global level. The high fees charged for this last facility, however, will limit take-up, depriving the markets of what could be a significant calming influence.

[1] According to BIS figures, outstanding amounts on the FX swap and forward markets have doubled over the past ten years: at the end of June 2019 they stood at USD 60,000 bn. In the vast majority of cases (90%), the dollar was one of the two currencies traded (rising to 96% for swaps between dealers). The dollar therefore has a much greater significance in the swap markets than would be suggested by its weight in global trade or in official currency reserves.

[2] S. Avdjiev, E. Eren and P. McGuire (2020), *Dollar funding costs during the Covid-19 crisis through the lens of the FX swap market*, BIS Bulletin

[3] Portfolios of dollar-denominated assets held by institutional investors have expanded rapidly over the past ten years.

[4] Since the financial crisis of 2007-2008, the pressure on margins from low interest rates and new regulatory requirements have cut into the banks' abilities to offer currency risk hedging services. See B. Erik, M. Lombardi, D. Mihaljek and H. S. Shin (2020), *The dollar, bank leverage and real economic activity: an evolving relationship*, BIS Working Papers, n°847

[5] See V. Bruno and H.S. Shin (2015), *Cross-border banking and global liquidity, Review of Economic Studies*, vol. 82, n°2

[6] Foreign banks with subsidiaries or branches in the USA can through these structures, borrow in dollars through the Fed's discount window, or take advantage of certain debt securities purchase programmes (notably the Commercial Paper Funding Facility) or lending facilities (notably the Primary Dealer Credit Facility) that are open to institutions holding an account with the Fed.

[7] See footnote n°35, Box 2

[8] E. Carré and L. Le Maux (2018), *Financial globalisation and dollar swap lines: the Federal Reserve and the European Central Bank during the 2007-2009 crisis*, hal-01933930

How swap agreements between central banks work

A foreign exchange swap between two central banks incorporates, as with a swap between two private counterparties, a commitment to reverse the exchange at some pre-agreed future date and price. This facility allows a central bank to obtain dollars, without drawing on its own official reserves. The liquidity raised in this way can then be lent by the borrowing central bank to local commercial banks. In establishing this system, the Fed assumes the mantle of international lender of last resort, whilst the foreign central banks take on, to a certain extent, the role of the dealers of last resort in their local markets.

The creation of central bank money following the drawing down of swap lines

Box 1 shows, in the form of simplified double-entry accounts, the main accounting effects of a central bank drawing on a swap line and providing dollar liquidity to commercial banks in its jurisdiction. Before it matures, a dollar swap has the effect of expanding the Fed's balance sheet and increasing the monetary base.

The first stage sees the Fed give the foreign central bank a certain quantity of dollars in exchange for the equivalent amount of the foreign currency based on the exchange rate at the time of the transaction. The Fed undertakes to hold the currency received (neither lending nor investing it) until the swap matures. It recognises the quantity of dollars loaned to the foreign central bank as an asset and recognises as a liability the quantity of foreign currency received from the foreign central bank. The foreign central bank makes matching entries to its liabilities, with respect to the debt to the Fed (the dollars borrowed) and its assets in the form of its deposit with the Fed (currency deposited).

In the second stage, the foreign central bank makes a dollar loan to a commercial bank under its jurisdiction. The credit risk is borne entirely by the foreign central bank, which has sole control over the list of eligible financial institutions, the type of financing allocated, the list of assets acceptable as collateral and the haircuts applied. This loan results in a transfer of cash from the foreign central bank's deposit account with the Fed to the correspondent bank (responsible for the settlement of dollar transactions) of the foreign commercial bank borrower (step 3 in Box 1). Drawing against the swap line therefore results in an increase in central bank reserves of depository institutions in the USA[9] (which form part of the monetary base[10]).

When the swap matures, the Fed and the foreign central bank make a second exchange of currencies, in the opposite direction, at the exchange rate in force at the time of the initial transaction[11]; this wipes out the central bank reserves initially created. The foreign central bank pays to the Fed interest in an amount equal to the interest it earned on its tender operations.

Lending conditions correlate to market conditions

The conditions for lending the dollar liquidity received vary from one central bank to the next. In the euro zone, funds are allocated through a tender process at a predefined fixed interest rate; all applications are satisfied. Liquidity is made available through a securities repo arrangement; discounts are applied to the market value of collateral used.

Some central banks also make regular margin calls to cover the risk of loss of value of the securities provided as collateral or to cover exchange rate risks (an increase in the value of the dollar over the term of the swap). In the euro zone, for example, collateral is revalued on a daily basis and margin calls to cover currency risk are made on a weekly basis. These provisions help reduce the risk borne by the central banks and establish a form of market discipline. However, by their nature they increase the sensitivity of the borrowing of commercial banks to any deterioration of market conditions.

A monetary and financial tool

Initially, central bank swap agreements had a purely monetary function. They were used solely for the purposes of intervening in the currency markets. The swap agreements established in 2008, however, were distinctive, not only for their unprecedented scale, but also by their nature, which was essentially financial. Since then, they have provided a tool to help protect financial stability by facilitating access to dollars and thus reducing the risk of a fire-sale of dollar-denominated assets. In practice, they contribute to a very large extent to the funding of US resident banks (see below).

Back in 2008-2009, the triggering of swap lines, to complement emergency loans and the debt security purchasing programmes[12], helped reduce the risk of a cut-price sell-off by foreign commercial banks of their portfolios of US mortgage-backed securities, and thus helped to protect the financing of the American economy. The run on the liabilities of US money market funds with constant net asset value caused a drying up of the market for commercial paper, which such

[9] As the loan from the foreign central bank to a local commercial bank is, in reality, simultaneous with the drawing down of the swap line, the increase in the foreign central bank's deposits with the Fed is not visible in the statistics. Thus, at 22 April, the Fed's outstanding swap transactions (on the asset side of its balance sheet) were USD 409.7 bn, whilst foreign central bank deposits (liabilities) were only USD 16.3 bn. Because of the simultaneous nature of lending operations, an increase in the Fed's outstanding swaps finds its real counterparty in an increase in the reserves of resident banks held by the Fed.

[10] The monetary base includes notes and coins and depository institutions' reserves at the central bank.

[11] The two counterparties make margin calls, receipts from which are booked to a separate account in the event of a depreciation of either currency before the swap matures. See IMF, *Recording of Central Bank Swap Arrangements in Macroeconomic Statistics*, Statistics Department

[12] Emergency loans introduced under the Term Auction Facility (TAF) and the programme of purchasing commercial papers (Commercial Paper Funding Facility, CPFF) also allowed foreign banks to refinance themselves in dollars from the Fed. 65% of loans under the TAF went to the US subsidiaries or branches of foreign banks. 60% of the commercial paper purchased under the CPFF was issued by the US subsidiaries of foreign banks. See United States Government Accountability Office (2011), *Federal Reserve System : Opportunities exist to strengthen policies and processes for managing emergency assistance*, GAO-11-696

Box 1: The creation of central bank money following the drawing down of a central bank swap line

A European bank wishing to make transactions in a foreign currency (for example in dollars) must hold an account with one or more 'correspondent' banks, registered in the country that issues this currency (one or more US banks for dollar transactions). Let us assume that a European company (EUR Company), a client of a bank established in the euro zone (EUR Bank), wants to settle a bill for 100 currency units denominated in dollars and issued by one of its US suppliers (USD Company). The EUR Bank has an account with a US correspondent bank, the USD Bank. For the purposes of simplicity, we have assumed that the USD Company also has an account with the USD Bank. Let us further assume that the EUR Bank's account with the USD Bank does not contain the funds to cover the transaction and that the supply of dollars on the FX swap markets has dried up. The EUR Bank turns to the ECB to obtain the dollar liquidity it needs to settle its client's invoice. The ECB will draw on the swap line that it has with the Fed in order to provide the necessary funding to the EUR Bank. To simplify the example we have assumed full and total parity between the two currencies, 1 euro = 1 dollar (this simplifying assumption is clearly not relevant in the event of disruption in the swap markets but does not alter the accounting entries set out below); we have also ignored the effect of interest payments on the loans taken out.

Stage (1): The Fed records the loan to the ECB as an asset (dollars loaned to the ECB) with a matching liability to the ECB (dollar equivalent of euros deposited by the ECB). The ECB makes matching entries to its liabilities, with respect to the debt to the Fed (the euro equivalent of the dollars borrowed) and its assets in the form of its deposit with the Fed (the euros deposited with the Fed).

Stage (2): The ECB lends dollars to the EUR Bank and credits its current account with this amount (EUR Bank reserves with the ECB).

Stage (3): The EUR Bank gives an instruction to the ECB to transfer the sums to its dollar account held with its US correspondent bank (the USD Bank). The central bank reserves created in the euro zone when the ECB's loan is made are immediately eliminated by this transfer. In the books of the USD Bank, the EUR Bank's account is a client account, known as the Loro account. The EUR Bank records in its books a mirror account of its deposits with the USD Bank, known as the Nostro account. In this example, a credit balance is added to the EUR Bank's account with the USD Bank (Loro account, a liability of the USD Bank); a debit account of the same amount is registered in the USD Bank's account with the EUR Bank (Nostro account, an asset of the EUR Bank). The transfer made by the ECB (on behalf of the EUR Bank) is accompanied by a transfer of cash from the ECB's deposit account with the Fed to that of the USD Bank (responsible for the settlement of dollar amounts for the borrowing EUR Bank). Thus, a loan of dollar liquidity from the Fed to the ECB, under a swap agreement, results in an increase in US resident banks' deposits with the Fed (in their role as correspondent banks).

Stage (4): The EUR Bank instructs the USD Bank to debit its account for the amount indicated by its customer (the EUR Company) in favour of the beneficiary (the USD Company): the USD Bank debits the EUR Bank's account and credits the account of the USD Company. The EUR Bank, meanwhile, debits the deposit account of the EUR Company.

On completion of the swap, the exchange of currencies in the reverse direction eliminates the central bank reserves initially created. For the sake of simplicity, let us assume that the swap markets are once again accessible. The EUR Bank exchanges euros for dollars on the swap markets and instructs its counterparty to transfer the amount to its dollar account with the USD Bank. Once its account has been credited it instructs the USD Bank to transfer its dollar holdings to the ECB. The elimination of its debt to the ECB is accompanied by a transfer of cash from the USD Bank's deposit account with the Fed (elimination of reserves) to that held by the ECB (rebuilding the ECB's deposit account). On completion of the swap, the respective credits and debits of the Fed and the ECB, created when the swap line was drawn down, are eliminated.

Fed

Asset	Liability
(1) Swap line (USD loan to the ECB) +100	(1) ECB account (EUR deposits) +100
	(3) ECB account (EUR deposits) -100
	(3) USD Bank reserves +100

Balance sheet size: +100

ECB

Asset	Liability
(1) Account with the Fed (EUR deposits) +100	(1) Swap line (USD borrowed from the Fed) +100
(2) Loan to EUR Bank +100	(2) EUR Bank reserves +100
(3) Account with the Fed (EUR deposits) -100	(3) EUR Bank reserves -100

Balance sheet size: +100

USD Bank

Asset	Liability
(3) Reserves at the Fed +100	(3) EUR Bank deposit account +100
	(4) EUR Bank deposit account -100
	(4) USD Company deposit account +100

Balance sheet size: +100

EUR Bank

Asset	Liability
(2) Reserves at the ECB +100	(2) ECB loan +100
(3) Reserves at the ECB -100	
(3) Deposit account at USD Bank +100	
(4) Deposit account at USD Bank -100	(4) EUR Company deposit account -100

Balance sheet size unchanged

funds provide with liquidity, thus closing the traditional route to dollar access for European and Swiss banks in particular. Outstanding dollar swap lines peaked at USD580 billion in December 2008, and represented nearly a quarter of the Fed's balance sheet between October 2008 and January 2009 (Chart 1). The ECB, BoE and SNB between them accounted for nearly 95% of the dollar liquidity loaned by the Fed (80% for the ECB alone). Ultimately, the dollar liquidity made available by the Fed to foreign central banks, then distributed to local commercial banks, was eventually re-lent to US resident banks. Between 17 September and 31 December 2008, in particular, the total value of outstanding currency swaps against the dollar increased by USD 490 billion. Over the same period, US resident banks (US registered banks and the US branches of foreign banks) took on more than USD 500 billion in additional net debt from affiliated entities registered abroad (parent companies, subsidiaries or branches – Chart 2)[13].

The Fed reactivates its dollar offering through swap lines

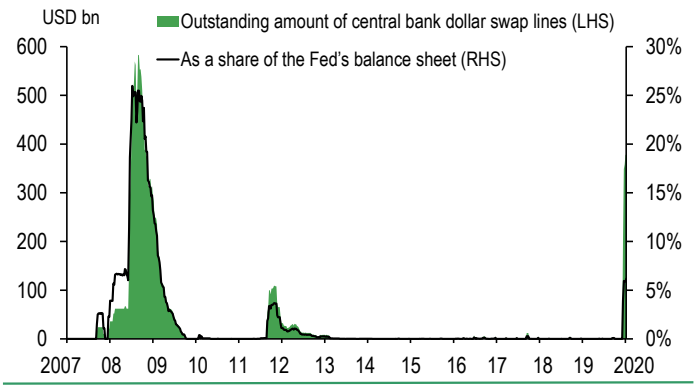

Chart 1 Source: Federal Reserve (H.4.1)

Dollar swap and financing of US resident banks

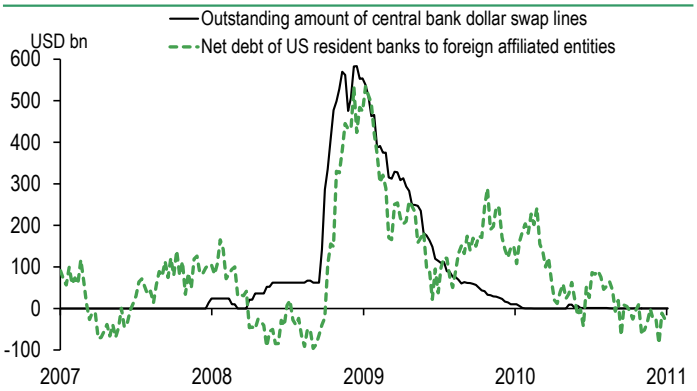

Chart 2 Source: Federal Reserve (H.4.1& H.8)

[13] The net debt of banks established in the US (US banks and US subsidiaries of foreign banks) to foreign-registered affiliated entities increased by more than USD 100 bn whilst the net credits of US subsidiaries of foreign banks relative to foreign affiliated entities fell by more than USD 400 bn. For an analysis of the net debt accumulated by US-resident banks with foreign-registered affiliates since the beginning of the 2000s, see C. Choulet (2015), *QE and bank balance sheets: the American experience,* BNP Paribas, Conjoncture, July-August 2015

Liquidity swaps for some, repos for the rest

As in 2008, the Fed has focused on establishing swap agreements with foreign central banks issuing the main currencies useful in financing US institutions, major financial centres and/or those of major trading partners. Since the end of March, drawings against these arrangements have eased pressure on certain FX swaps (the dollar against the euro, yen, sterling and the Swiss franc)[14]. A relaxation of leverage constraints on US banks could also help ease the pressure. The creation of the FIMA repo facility (for foreign central banks that do not have swap agreements with the Fed) will, however, only bring benefits if the associated costs are reduced.

The Fed reactivates its dollar offering…

On 15 March, the Fed and five central banks -- the ECB in the euro zone, BoE in the UK, BoJ in Japan, SNB in Switzerland and BoC in Canada -- agreed to reduce the cost of their reciprocal swap agreements (to OIS+25bp) and opened the possibility, on a weekly basis, of 84-day dollar loans (in addition to the existing 7-day arrangements which have been in place since 23 March 2020)[15]. On 19 March, the Fed also announced the creation of temporary swap agreements (for at least 6 months) with an expanded list of central banks. This list is identical to that put in place in 2008, but the potential transaction volume has been doubled. The central banks of Australia (RBA), Brazil (BCB), South Korea (BoK), Mexico (BdM), Singapore (MAS) and Sweden (Riksbank) can draw on lines of up to USD 60 billion each. The central banks of Denmark (DanNB), Norway (Norges B) and New Zealand (RBNZ) can draw on lines of up to USD 30 billion each.

The BoJ is the main counterparty for the Fed's swap agreements

On 23 April, drawings of dollar liquidity from the Fed had reached USD 432.3 billion (Chart 3). Half of the total took the form of borrowing dollars against yen; one third was in dollars against euros. Two observations can be made. First, as in 2008, a large proportion of dollar liquidity lent by the Fed to foreign central banks (+USD 378 billion between March, 11 and April, 15), then distributed to non-resident banks, has eventually been re-lent to resident banks, as shown by the increase in their net debts to affiliated entities located abroad (+USD 336 billion)[16]. Swap lines are used as substitutes to the discount window. Second, the position of foreign central banks towards the Fed has to be appreciated in net terms. The copious requirement for dollar refinancing at Japanese banks and institutional investors warrants the high level of the BoJ's participation in the scheme. However, the BoJ is probably also one of the main counterparties in the Fed's Foreign

[14] IMF (2020), *Global Financial Stability Overview : Markets in the time of COVID-19*, Global Financial Stability Report, April 2020

[15] Since October 2013, the network of swap lines agreed between the Fed, the ECB, BoE, BoJ, BNS and BoC has been permanent and unlimited.

[16] A means to avoid the stigma associated with the use of the discount window

Reverse Repo Pool (FRRP)[17]. Data about Japan's official reserves, as published by the Ministry of Finance, show that the volume of the BoJ's deposits "with foreign central banks and BIS" was USD127.2 billion at end-March. These figures are not sufficiently granular to evaluate in detail the level of cash that the BoJ has deposited with the Fed, particularly under FRRP. However, the very similar paths (at least between 2014 and 2019) taken by total BoJ deposits with foreign central banks from Japanese national statistics, and outstanding amounts under the FRRP facility on the Fed's balance sheet, suggest that the BoJ represents a major counterparty for the Fed (Chart 4).

The BoJ, the main borrower of dollars from the Fed

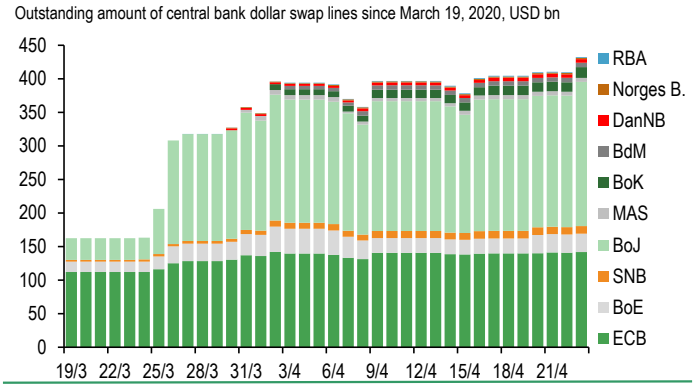

Chart 3 Source: Federal Reserve Bank of New York

The BoJ, the main counterparty in the Fed's FRRP ?

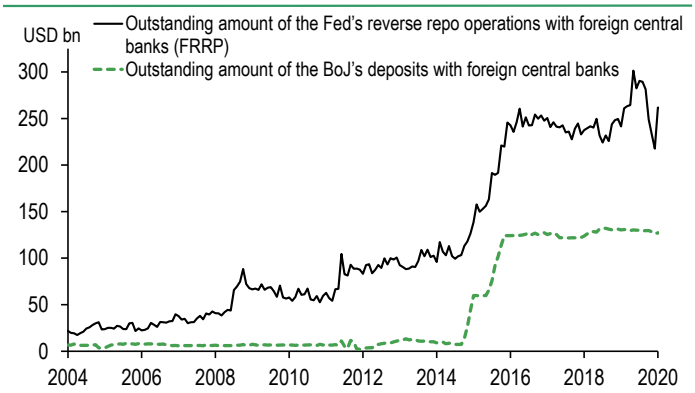

Chart 4 Source: Fed, Japanese Ministry of Finance

If this interpretation of the data is correct, it would suggest that at the end of March the BoJ had borrowed nearly USD 175 billion in dollar cash from the Fed under swap agreements (USD 215 billion on 23 April), whilst at the same time lending it the equivalent of USD 127 billion under FRRP. Theoretically, drawing against a swap line is neutral for the borrowing central bank as the cost is entirely borne by the borrowing commercial bank and the profit is received by the Fed, provided always that the borrowing commercial bank does not default. It is likely that the Fed's remuneration of FRRP[18] is still sufficiently generous[19] to offset the exposure to credit risk taken on by the BoJ.

Easing of leverage constraints should help boost the supply of dollars

Complementing these liquidity swaps between central banks (which will have the effect of reducing demand for dollars on the FX swap markets), a number of regulatory relaxations could also help ease tensions in the FX swap markets (by increasing the dollar supply). The relaxation of the leverage requirement for custodial banks (such as Bank of New York Mellon, State Street and Northern Trust) could have a particularly significant effect[20]. This rule[21], introduced on 1 April 2020, excludes from the definition of their leverage exposure (the denominator of the Basel leverage ratio) a proportion of the excess reserves held with the central bank[22]. This exclusion covers not only deposits with the Fed, but also those with central banks in other OECD countries. Assuming that the gain on dollar loans on the FX swap markets exceeds the remuneration differential on excess reserves, this relaxation could encourage big US banks specialising in security custody and management services to transfer their excess reserves from the Fed (stimulated by the quantitative easing programme) to their deposit accounts with other central banks, thus increasing the availability of dollars on the FX swap markets.

The relaxation in the leverage constraints for very big banks, introduced by the Fed on 2 April 2020[23], could work in the same way. For the period up to 31 March 2021, this change allows US Bank Holding Companies and Intermediate Holding Companies [24] subject to the Supplementary Leverage Ratio [25] to exclude from their leverage exposure reserves held at the Fed and Treasuries. This relaxation seeks, in particular, to reduce the balance sheet constraints faced by primary dealers (the subsidiaries of these big groups), whose portfolios of Treasuries have grown constantly. The exclusion of Treasuries

[17] Through the FRRP, the Fed puts securities into overnight repo with foreign central banks, which lend it cash in return.

[18] The Fed does not provide regular information on the interest rate paid on the FRRP facility. It only provides for each year the average rates for the first quarter, first half and first nine months when it publishes its (unaudited) quarterly financial statements. Its (audited) annual financial statements, by contrast, contain no information on the average annual rate. Reconstituting the rates offered allowed us to highlight very attractive rates on the facility from mid-2018 to September 2019. See C. Choulet (2019), *The Fed's new role under Basel 3*, BNP Paribas, EcoFlash, October 2019

[19] The Federal Open Market Committee, which oversees monetary policy, announced a cut in the rate on the FRRP facility last December, a cut that seems to be reflected in the fall in outstandings between end-September 2019 and end-February 2020.

[20] Z. Pozsar (2020), *US Dollar Libor and War Finance*, Credit Suisse, Global Money Notes #29

[21] Department of Treasury, Office of the Comptroller of the Currency, Federal Reserve System, Federal Deposit Insurance Corporation (2019), *Regulatory Capital Rule: Revisions to the Supplementary Leverage Ratio to exclude certain central bank deposits of banking organizations predominantly engaged in custody, safekeeping, and asset servicing activities*, Final rule, November 2019

[22] In accordance with section 402 of the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA), passed into law in May 2018.

[23] Federal Reserve System (2020), *Regulatory Capital Rule: Temporary exclusion of US Treasury securities and deposits at Federal Reserve Banks from the Supplementary Leverage Ratio*, April 2020

[24] US subsidiaries of foreign banks

[25] Those with consolidated assets of over USD 250 bn

should allow dealers to make greater use of repo loans[26] (with private counterparties or the Fed) and to make higher volumes of repo loans to hedge funds and asset managers, which are significant suppliers of dollars, alongside US banks, on the FX swap markets[27].

...and extending its scope

To ensure broader access to dollar liquidity, the Fed announced on 31 March that it had created a repo facility for foreign central banks and international monetary authorities with a FIMA account at the Federal Reserve Bank of New York (Foreign and International Monetary Authorities Repo Facility). Since 6 April, and for at least 6 months, foreign central banks can place the US Treasuries they hold into a repo arrangement with the Fed in exchange for dollar liquidity[28]. Transactions are on an overnight basis and are charged at the rate on reserves (IOR, which has been 0.1% since 16 March), plus a premium of 25 basis points. No limit on the amount has been specified, but requests must be approved by the Fed.

The effect of the FIMA repo facility on the Fed's balance sheet

In common with the reverse repo transactions between the Fed and foreign central banks (FRRP), these repo transactions are made through US correspondent banks. The Fed recognises, as a balance sheet asset, a credit against the foreign central bank that has put securities into repo, and credits the same amount, as a liability, to the current account of the commercial bank that is acting as an intermediary for the transaction (reserves with the Fed). The latter then credits, in its own books, the dollar deposit account of the foreign central bank. As with the swap deals and repo transactions carried out with primary dealers, this repo facility will swell the Fed's balance sheet and increase the monetary base. Through these transactions, however, the Fed does expose itself to a market risk (from a fall in the value of Treasuries), which seems minimal given the purchases of Treasuries that it is also making under the quantitative easing (QE) programme.

A structure that is too costly to bring benefits

The opening up of this access to dollar liquidity for many countries (particularly emerging economies) that do not have bilateral swap agreements with the Fed aims to reduce the risk of a fire-sale of Treasuries[29] (to meet domestic demand for dollar financing or to ease pressure on the foreign exchanges). In February 2020, foreign central banks held USD 4,260 billion in US Treasury securities[30], one-quarter of the USD 16,000 billion of marketable Treasuries. Japan (USD 1,268 billion) and China (USD 1,092 billion), taking all economic agents together (official and not, financial and not), are the US federal government's two biggest creditor economies. There are many statistics for the holdings of foreign central banks of securities issued by the US and/or denominated in dollars[31]. Unfortunately, however, they do not provide a national breakdown of holdings of Treasuries. In addition, they are updated relatively infrequently. The change in the value of Treasuries that foreign central banks put in custody with the New York Fed does give a rough[32] order of magnitude of their likely sales of securities (Chart 5): this shows that portfolios shrank by USD 150 billion between 26 February and 22 April.

Offloading

Outstanding amount of Treasuries held in custody at the Fed of New York for foreign official and international accounts, USD bn

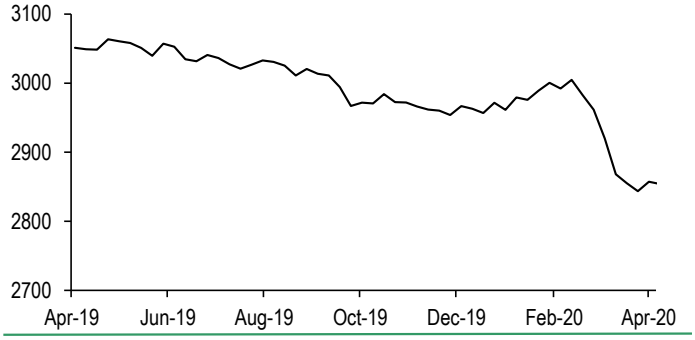

Chart 5 Source: Federal Reserve (H.4.1)

For the time being, the high cost of this repo facility has discouraged foreign central banks from taking advantage of it[33]. By charging at a rate of IOR+25bp, the Fed implicitly treats this as a quasi-swap line (charged at IOR+25bp), whereas in fact it remains a repo facility. By way of comparison, the median lending rate on private repo markets, the SOFR, was 0.02% on average in April; meanwhile, for repo transactions with primary dealers, the Fed charges only the IOR rate (of 0.1%). Reducing the cost of this facility would, however, bring benefits. It would do more than just meet the main purpose of this facility: to give foreign central banks that do not have swap agreements with the Fed the ability to provide low-cost dollar liquidity to their national economies. It would also help ease tensions on the FX swap markets. Used more widely, the FIMA repo facility would help reduce repo borrowings by foreign central banks from dealers, and particularly US dealers. As with the relaxation of the leverage constraint on dealers, this would free up room on dealers' balance sheets to allow financing of hedge funds and asset managers and thus help boost the supply of dollars on the FX swap market.

[26] This exclusion should also help primary dealers absorb the deluge of Treasury issues made with a view to financing the US stimulus package.
[27] C. Borio, R. McCauley and P. McGuire, *FX swaps and forwards: missing global debt?*, BIS Quarterly Review, September 2017
[28] The same discounts apply as applied at the discount window.
[29] For an analysis of the considerable disruption to the Treasuries market in mid-March, see A. Schrimpf, H.S. Shin and V. Sushko (2020), *Leverage and margin spirals in fixed income markets during the Covid-19 crisis*.
[30] https://ticdata.treasury.gov/Publish/mfh.txt
[31] There are eleven data series.
[32] This figure has the advantage of being published weekly. However, it only shows a share of the Treasuries held by foreign central banks (those held in custody at the FRBNY). It is also based on the principle of legal ownership: securities sold (acquired) temporarily through a repo (reverse repo) arrangement are excluded (included).
[33] On 22 April (the most recent figures available at the time of writing), outstanding repos by foreign central banks with the Fed were nil (having been just USD1 million on 8 April).

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Dollar refinancing has acquired a much greater importance than it had in 2008. This is due to the rapid growth in dollar debt outside the US over the past decade (Box 2) and the nature of the indebted parties. In 2008, stress on dollar liquidity was attenuated by the financing of troubled banks, the purchasing of assets or debts held on the balance sheets of highly indebted financial institutions. Today, other mechanisms seem to be required. By slamming the brakes on global economic activity, the current crisis has directly weakened the real economy. Constraints on the production and delivery of products, resulting from the unprecedented lockdown measures introduced in nearly all countries, have increased the dollar working capital requirements of non-financial firms, which are exposed to each other through global supply chains and in many cases are highly dependent on market financing [34]. It seems clear that the swap and repo arrangements introduced by the Fed and other central banks will only be fully effective if they are backed by local measures to postpone fiscal charges, guarantee loans or purchase debts.

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[34] Z. Pozsar and J. Sweeney (2020), *Covid-19 and Global Dollar Funding*, Credit Suisse, Global Money Notes #27

Box 2: A massive hidden debt

The scale of dollar debt owed by economic actors resident outside the USA is very hard to quantify, as part of this debt is raised on the derivatives markets (FX swaps[35], currency swaps and outright forwards) and thus recorded off balance sheet. However, FX swaps, currency swaps and forwards differ from other types of derivative contracts: they entail a debt obligation for the full face value of the contract. On maturity of an FX swap, the full notional amount of the contract must be repaid, rather than just its fair value (cost of replacing the position). Borrowing dollars on these markets therefore represents a form of 'hidden debt', as described by Borio, McCauley and McGuire (2017)[36].

From an economic point of view, an FX swap is comparable to a repo agreement. Like repo operations, FX swaps are essentially secured loans (cash against securities for the former, currency against currency for the latter) coupled with a commitment to repurchase the collateral at an agreed price on maturity. However, their accounting treatment is different. A repo agreement increases the size of the borrower's balance sheet. This results from the fact that the securities submitted in a repo arrangement stay on the borrowers' balance sheet. The borrower's liabilities increase by the amount borrowed under the repo, and its assets by the cash received (or the asset acquired using this loan). Conversely, a swap has no effect on the borrower's balance sheet: the currency borrowed simply replaces the local currency put into the swap. In other words, the repo form of secured loan creates additional debt, which is not true of the swap form, due to its nature as a derivative instrument[37]. Granted, this hidden debt serves to hedge currency risk, which in principle helps maintain financial stability. However, it exposes borrowers to increased liquidity risk in periods of market stress: positions are renewed on a very short cycle (sometimes a week or just a few days), whilst the maturity of the hedged assets is generally longer.

Based on BIS statistics[38], Borio, McCauley and McGuire (2020)[39] estimated that the total outstanding dollar debt on the FX swap and forward markets of non-US banks stood at USD 30,000 billion at the end of June 2019[40], more than double their gross dollar-denominated balance sheet debt of USD 13,000 billion. Non-US and non-bank dollar debt (non-banking financial companies and non-financial agents) on these markets stood at USD 18,000 billion (compared to USD 11,900 billion of dollar-denominated debt on balance sheets). Foreign central banks are very active on the FX swap and forward markets: the central banks of South Korea, Singapore, Japan and Thailand in particular are net lenders of dollars against their own currencies on the forward markets[41], or against other currencies (yen or euro) in the case of the central banks of Australia[42] and China[43].

[35] A foreign exchange swap consists of a double currency transaction: an exchange of currencies at the spot rate and a forward exchange in the reverse direction at a pre-agreed exchange rate. A currency swap is similar to an FX swap, except that the two parties agree to exchange both principal and interest payment streams over a longer term. A forward contract is an agreement to exchange currency on a future date at an agreed exchange rate (the forward leg of an FX swap). FX swaps are the derivative of choice for hedging currency risk (75% of transactions), ahead of forwards (22%) and currency swaps.

[36] Borio, McCauley and McGuire (2017)

[37] Another reason relates to the definition of control, which in the case of cash requires the control of the cash itself, but in the case of securities relates to the corresponding cash flows. A repo gives rise to a transfer of the legal ownership of the securities used, but not their economic ownership; they therefore remain on the balance sheet of the borrower of the cash.

[38] A. Schrimpf and V. Sushko, *Sizing up global foreign exchange markets*, BIS Quarterly Review, December 2019

[39] C. Borio, R. McCauley and P. McGuire, *Foreign exchange swaps: Hidden debt, lurking vulnerability*, VOX CEPR Policy Portal, February 2020

[40] The market-making activities of major banks (accumulating short and long positions on the same security) and the dollar's status as an international currency (a European institution wishing to invest in an asset denominated in Thai baht will trade euros for dollars and then dollars for baht) automatically increase these figures.

[41] Borio, McCauley and McGuire (2017)

[42] Borio, McCauley and McGuire (2017)

[43] Pozsar and Sweeney (2020)

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