Dollar debt in FX swaps and forwards: huge, missing and growing

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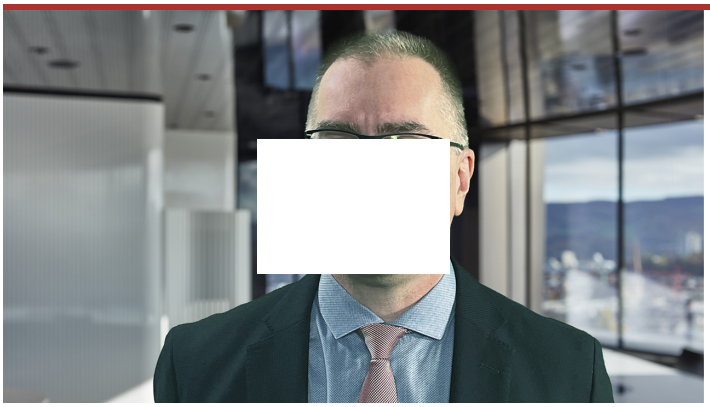
- **Data behind the graphs**



Dollar debt in FX swaps and forwards: huge, missing and growing (00:01:56)
by **Patrick McGuire**

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Patrick McGuire, head of International banking and financial statistics, explains how FX swaps, forwards and currency swaps create forward dollar payment obligations that do not appear on banks' balance sheets. Read more.

FX swaps, forwards and currency swaps create forward dollar payment obligations that do not appear on balance sheets and are missing in standard debt statistics. Non-banks outside the United States owe as much as $25 trillion in such missing debt, up from $17 trillion in 2016. Non-US banks owe upwards of

$35 trillion. Much of this debt is very short-term and the resulting rollover needs make for dollar funding squeezes. Policy responses to such squeezes include central bank swap lines that are set in a fog, with little information about the geographic distribution of the missing debt. [1]

JEL F31, F34, F41.

Embedded in the foreign exchange (FX) market is huge, unseen dollar borrowing. In an FX swap, for instance, a Dutch pension fund or Japanese insurer borrows dollars and lends euro or yen in the "spot leg", and later repays the dollars and receives euro or yen in the "forward leg". Thus, an FX swap, along with its close cousin, a currency swap, resembles a repurchase agreement, or repo, with a currency rather than a security as "collateral".[2] Unlike repo, the payment obligations from these instruments are recorded off-balance sheet, in a blind spot. The $80 trillion-plus in outstanding obligations to pay US dollars in FX swaps/forwards and currency swaps, mostly very short-term, exceeds the stocks of dollar Treasury bills, repo and commercial paper combined. The churn of deals approached $5 trillion per day in April 2022, two thirds of daily global FX turnover.

FX swap markets are vulnerable to funding squeezes. This was evident during the Great Financial Crisis (GFC) and again in March 2020 when the Covid-19 pandemic wrought havoc. For all the differences between 2008 and 2020, swaps emerged in both episodes as flash points, with dollar borrowers forced to pay high rates if they could borrow at all. To restore market functioning, central bank swap lines funnelled dollars to non-US banks offshore, which on-lent to those scrambling for dollars.

Key takeaways

- FX swaps, forwards and currency swaps give rise to dollar obligations that were backstopped in 2008 and 2020 by central banks acting on little information about who owed the debt.
- For non-banks outside the United States, dollar obligations from FX swaps, forwards and currency swaps have grown fast, reaching $26 trillion or double their on-balance sheet dollar debt.

- In mid-2022, non-US banks with direct access to Federal Reserve credit only in their US operations owed an estimated $39 trillion in dollars from FX swaps, forwards and currency swaps.

This off-balance sheet dollar debt poses particular policy challenges because standard debt statistics miss it. The lack of direct information makes it harder for policymakers to anticipate the scale and geography of dollar rollover needs. Thus, in times of crisis, policies to restore the smooth flow of short-term dollars in the financial system (eg central bank swap lines) are set in a fog.

The missing dollar debt from FX swaps/forwards and currency swaps is huge, adding to the vulnerabilities created by on-balance sheet dollar debts of non-US borrowers. It has reached $26 trillion for non-banks outside the United States, double their on-balance sheet debt. Moreover, it has grown smartly since 2016, despite the often significant premium demanded on dollar swap funding (Borio et al (2016)). For banks headquartered outside the United States, dollar debt from these instruments is estimated at $39 trillion, more than double their on-balance sheet dollar debt and more than 10 times their capital.

This feature revisits Borio et al (2017), drawing on the comprehensive data in the 2022 BIS Triennial Survey. First, it updates the stylised facts concerning FX swaps/forwards and currency swaps. Second, it measures the missing dollar debt for non-banks resident outside the United States, and for banks headquartered outside the United States. Third, it highlights policy challenges.

FX swaps/forwards and currency swaps: some stylised facts

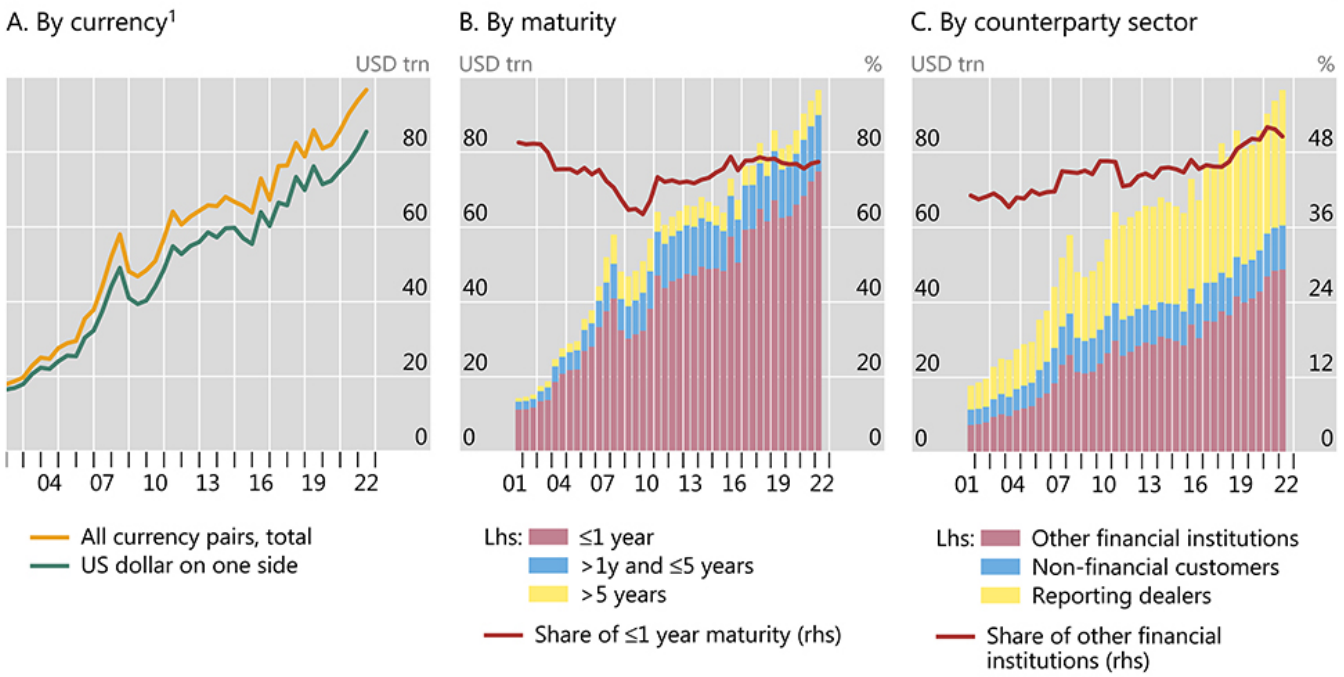
Payment obligations arising from FX swaps/forwards and currency swaps are staggering. Considering *all* currencies, outstanding amounts at end-June 2022 reached $97 trillion, up from $67 trillion in 2016 (Graph 1.A). This matched global GDP in 2021 ($96 trillion) and was three times global trade ($29 trillion). And it exceeded both global external portfolio investment ($81 trillion) and international bank claims ($40 trillion) at end-2021.

Dollar dominance is striking in this FX market segment, greater than in any other aspect of dollar use. As a vehicle currency, the US dollar is on one side of 88% of

outstanding positions – or $85 trillion (Graph 1.A). An investor or bank wanting to do an FX swap from, say, Swiss francs into Polish zloty would swap francs for dollars and then dollars for zloty.

Graph 1 Close all

FX swaps, FX forwards and currency swaps outstanding Graph 1



[1] The gold line is the aggregate of FX swaps, FX forwards and currency swaps. The green line is contracts in which US dollars are exchanged.

Source: BIS OTC derivatives statistics.

The very short maturity of the typical FX swap/forward creates potential for liquidity squeezes. Almost four fifths of outstanding amounts at end-June 2022 in Graph 1.B matured in less than one year. Data from the April 2022 Triennial Survey show not only that instruments maturing within a week accounted for some 70% of FX swaps turnover, but also that those maturing overnight accounted for more than 30%. When dollar lenders step back from the FX swap market, the squeeze follows immediately (Correa et al (2020))

Financial customers dominate non-financial firms in the use of FX swaps/forwards. Non-bank financial institutions (NBFIs), proxied by "other financial institutions[3] in Graph 1.C, are the biggest users of FX swaps, deploying

them to fund and hedge portfolios as well as take positions. Despite their long-term foreign currency assets, the likes of Dutch pension funds or Japanese life insurers roll over swaps every month or quarter, running a maturity mismatch. For their part, dealers' non-financial customers such as exporters and importers use FX forwards to hedge trade-related payments and receipts, half of which are dollar-invoiced (Boz et al (2020)). And corporations of all types use longer-term currency swaps to hedge their own foreign currency bond liabilities (McBrady et al (2010), Munro and Wooldridge (2010)).

Missing dollar debt: mostly outside the United States

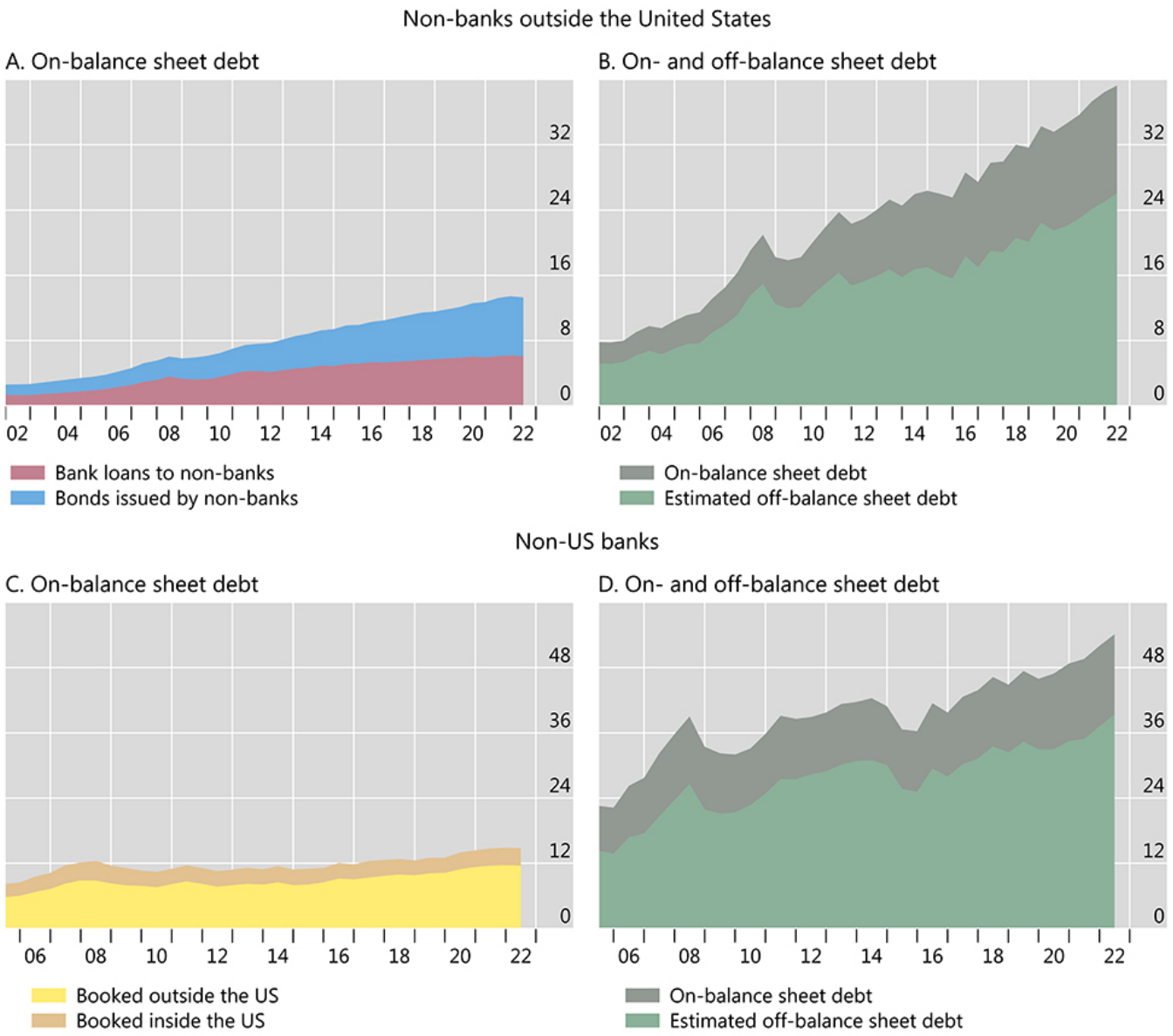
Just how large is the missing *dollar* debt from FX swaps/forwards and currency swaps? At end-June 2022, dealer banks had $52 trillion in outstanding dollar positions with customers. Non-banks had dollar obligations of half of this amount, $26 trillion.[4] This sum has been growing strongly, from $17 trillion in 2016 (Graph 2.B).

This $26 trillion dollar debt is likely owed by entities *outside* the United States, for which the dollar is a foreign currency.[5] They borrow dollars largely to hedge their dollar receivables and investments in a world in which the dollar is the dominant international currency. By contrast, NBFIs in the United States hedge their modest foreign currency assets by *lending* – not borrowing – dollars via FX swaps. And businesses in the United States have scant foreign currency payables to hedge by borrowing dollars off-balance sheet.[6]

Graph 2 Close all

US dollar-denominated debt

In trillions of US dollars Graph 2



Sources: US Office of the Comptroller of the Currency (OCC); Dealogic; Euroclear; Thomson Reuters; Xtrakter; national data; BIS consolidated banking statistics (CBS); BIS locational banking statistics (LBS); BIS OTC derivatives statistics (OTCD).

The off-balance sheet US dollar debt of non-banks outside the United States substantially exceeds their on-balance sheet debt and has been growing faster. At end-June 2022, the missing debt amounted to as much as double the *on-balance sheet* component (Graph 2.B), which was estimated at "only" $13 trillion (Graph 2.A). Moreover, the missing debt was "only" 1.6 times larger in 2016.

For their part, banks headquartered outside the United States, including some dealers in FX swaps, have even larger missing dollar obligations.[7] These banks deserve focus because of their limited access to the Federal Reserve's discount window for dollars. Their estimated off-balance sheet dollar obligations of $39 trillion at end-June 2022 were much higher than the $15 trillion in on-balance sheet dollar debt (Graph 2.C) and almost half as big as their combined total liabilities.[8]

Further reading:

- **FX swaps and forwards: missing global debt? (bis.org)**
- **Covered interest parity lost: understanding the cross-currency basis (bis.org)**
- **Outward portfolio investment and dollar funding in emerging Asia (bis.org)**

Policy challenges

The market turmoil during the GFC and in March 2020 highlighted the central role of the US dollar in the financial system. In each episode, disruptions in dollar funding markets led to an extraordinary policy response in the form of central bank swap lines, whereby the Federal Reserve channelled US dollars to key central banks.

These episodes point to a need for statistics that track the geography of outstanding short-term dollar payment obligations. Currently, in order to assess the level and maturity structure of foreign currency gross and net debt, analysts tend to rely on benchmark international statistical collections,[9] which generally cover only the on-balance sheet positions (McGuire (2022)). It is not even clear how many analysts are aware of the existence of the large off-balance sheet obligations. This makes it difficult to anticipate the scale and geography of dollar rollover needs.

Off-balance sheet dollar debt may remain out of sight and out of mind, but only until the next time dollar funding liquidity is squeezed. Then, the hidden leverage[10] and maturity mismatch in pension funds' and insurance companies'

portfolios – generally supposed to be long-only – could pose a policy challenge. And policies to restore the flow of dollars would still be set in a fog.

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Technical annex

Graph 2.A: Figures from the BIS Global Liquidity Indicators (GLI). Non-banks comprise non-bank financials, non-financial corporations, governments, households and international organisations.

Graph 2.B: Off-balance sheet liabilities estimated as one half of outstanding dollar FX swaps with non-banks; assumes that non-banks inside the United States are not dollar borrowers via these instruments.

Graph 2.C: The estimate of US dollar-denominated debt of banks headquartered outside the United States excludes intragroup positions but includes liabilities to other (unaffiliated) banks. From end-2015, it includes liabilities of banks in China and Russia; local positions of banks in China are estimated as 80% of local foreign currency deposits (national data).

Graph 2.D: Off-balance sheet debt estimated as (a) one half of global outstanding FX swaps with all counterparties (BIS OTCD statistics) less (b) one half of US banks' outstanding FX swaps (OCC data) plus (c) US banks' estimated net provision of US dollars via FX swaps (derived from the LBS and CBS; see Aldasoro et al (2020)).

[1] We thank Stefan Avdjiev, Stijn Claessens, Mathias Drehmann, Hyun Song Shin, Nikola Tarashev and Goetz von Peter for useful comments. Branimir Gruić provided excellent research assistance. All errors are our own. The views expressed in this article are those of the authors and not necessarily those of the Bank for International Settlements.

[2] FX swaps and outright forwards cannot be distinguished in stocks data. Currency swaps are FX swaps with a maturity longer than one year in which coupons are also exchanged. Ideally, we would exclude from our analysis non-deliverable forwards (NDFs), which entail just a fractional payment, but they are not identified individually in the stocks data. This is unlikely to weaken our conclusions, as turnover data show that NDFs account for less than 10% of the average daily turnover of FX swaps, forwards and currency swaps.

[3] The counterparty group "other financial institutions" comprises mainly non-bank financial institutions such as pension funds, insurance companies and hedge funds, but also includes non-reporting banks.

[4] We follow Borio et al (2017, 2020). Aldasoro et al (2020) shows that, at the global level, the banking sector is nearly balanced in FX swaps with a dollar leg. Since dealer banks and customers make up the entire market, a balanced banking sector implies that non-bank customers are balanced in dollars.

[5] BIS derivatives statistics do not have a counterparty country breakdown, and thus do not reveal the location of the non-bank users of FX swaps/forwards. See McGuire (2022).

[6] Non-banks in the United States had $866 billion in foreign currency debt in 2021 (US Treasury et al (2022)). About 5% of the $3.4 trillion in US imports were foreign currency-invoiced (Boz (2020)). Compared with $26 trillion in dollar debt, any borrowing of dollars in swaps/forwards to hedge these payables may be considered as a rounding error.

[7] Positions are corrected for inter-dealer double-counting. However, the figure does not factor in any bilateral netting of payment obligations allowable under supervisory and/or accounting methodologies, which could more than halve *net* interdealer payment obligations.

[8] Total liabilities were $92 trillion as reported by internationally active banks from 26 (of 31) jurisdictions that report the BIS consolidated banking statistics.

[9] These include the *International Investment Positions* (IIP) statistics, the *IMF Coordinated Portfolio Investment Survey* (CPIS), the *BIS locational banking statistics* (LBS) and the *BIS OTC derivatives* (OTCD) statistics, each of which has at least a partial currency breakdown.

[10] Dafermos et al (2022) argue that repos allow more leverage than swaps. Even so, the larger stock of swaps/forwards entails more dollar obligations than dollar repos.

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