International Finance through the Lens of BIS Statistics

Goetz von Peter, based work with Patrick McGuire, Bryan Hardy, Sonya Zhu and Torsten Ehlers

The BIS launched a series on the use of statistics in international finance, published in the BIS Quarterly Review. Each article provides a compact explanation of key concepts in an area of international finance along with an introduction to the corresponding statistics compiled by the BIS. The aim is to promote broader use and understanding of BIS international financial statistics for research, teaching and policy work. The series will culminate in a volume of nine articles, edited by Hyun Song Shin to be published in the course of 2026.

As the Head of *International Banking and Financial Statistics*, G von Peter leads the group that compiles and analyses the BIS statistics on international banking, bond markets and derivatives markets (Bio). He presents an overview of the series and available data at the SI 2025 International Finance and Macroeconomics Data Session. The individual articles of the series, collated below, are:

Part I: **Residence vs Nationality** [March 2024]. Most international statistics are compiled on a residence basis. BIS statistics also group balance sheets by headquarters for a nationality view.
- Includes a Box on geographic dimensions in international finance, classifying benchmark statistical collections by residence and nationality.

Part II: **The Global Reach of Currencies** [June 2024] The use of key currencies in international finance far outstrips the issuing jurisdictions' share in global economic activity. The US dollar dominates globally, while the euro, yen and pound sterling have a smaller international footprint.
- Includes a Box with links to international statistics on banking, bond markets, FX and derivatives markets that feature a currency dimension.

Part III: **Bank Exposures and Country Risk** [September 2024] BIS international banking statistics help understand banks' exposures to country risk events like sovereign defaults, crises, wars, sanctions and natural disasters.
- Contains a Box on the structure of the BIS consolidated statistics.

Part IV: **The Geography of Banks' Operations** [December 2024] The BIS international banking statistics reveal banks' structure across home and host countries.
- with a Box on geographic dimensions in BIS international banking statistics.

Part V: **The International Dimensions of Credit** [March 2025] BIS statistics sheds light on various international dimensions of credit and their impact on financial stability in borrower countries.
- with a Box on tracking international credit with BIS international banking statistics.

Further articles for this series are in preparation, to be published in 2025 and early 2026:
- **Bond Markets, domestic and international** [September 2025] on BIS Debt securities statistics
- **Derivatives markets** [December 2025] drawing on the full range of BIS Derivatives Statistics, with a focus on the Triennial Surveys. The 2022 Triennial Survey was covered in December 2022.
- **Non-bank financial institutions** through the lens of BIS international financial statistics [March 2026], pointing all BIS statistics to NBFI to shed light on their growing importance in finance.

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International finance through the lens of BIS statistics: residence vs nationality[1]

Statistics used in international economics generally adopt a residence view, centred on an economy and the units located there. This is natural for understanding the geography of capital flows and other macroeconomic issues. However, the system of national accounts does not reflect the extent of globalisation and the rise of multinational firms and financial intermediaries. Their balance sheets straddle national borders, and their decisions affect many countries in ways that are obscured in residence statistics. This feature uses BIS statistics to show how a nationality view, which groups balance sheets by the country of headquarters, can provide insights on policy-relevant issues such as foreign currency debt, deglobalisation and financial openness.

JEL classification: E01, F23, F36, G15.

The unit of analysis in statistics used in international economics is "the economy". It comprises institutional units with a physical presence under a common jurisdiction, typically a country and its residents (United Nations (2008)). This is the basis on which economic activity is measured. In this *residence view*, anything outside a country's border is external, thereby defining international trade and finance. This geographical lens is appropriate for analysing many issues, such as capital flows. The system of national accounts (SNA), the balance of payments (BoP), the international investment position (IIP), the International Monetary Fund (IMF) Coordinated Portfolio Investment Survey (CPIS) and Coordinated Foreign Direct Investment Survey (CDIS) are all compiled on a residence basis.

In reality, firms' balance sheets straddle national borders. Balance sheets are the locus of financial transmission and thus relevant for financial stability analysis. Multinational banks and corporates have operations around the world, and their decisions affect multiple economies at the same time. Against this backdrop, the residence view can limit understanding of issues involving ownership and control. A growing literature recognises the value of adopting a *nationality view*, which groups (or consolidates) economic units with the affiliates they control abroad. The nationality view complements the residence view by revealing *who* drives changes in international assets and liabilities.

[1] This is the first feature in a series to showcase the BIS international banking and financial statistics and their uses. We thank Iñaki Aldasoro, Doug Araujo, Stefan Avdjiev, Claudio Borio, Gaston Gelos, Branimir Gruić, Bryan Hardy, Benoit Mojon, Andreas Schrimpf, and Hyun Song Shin for their helpful comments, and Swapan-Kumar Pradhan for excellent research assistance. The views expressed are those of the authors and do not necessarily reflect those of the Bank for International Settlements.

Key takeaways

- *Most international statistics are compiled on a residence basis. The alternative nationality view, available in BIS statistics, groups balance sheets by the country of headquarters.*
- *Moving from a residence to a nationality view shows the importance of multinational banks and firms in international finance and helps to reassess the role of financial centres.*
- *The nationality view provides insights about countries' foreign currency debt, financial openness and the drivers of cross-border financial positions.*

The nationality view has a long history in BIS banking statistics. The expansion of international banking activity in financial centres in the 1970s led central banks and regulators to ask banks to consolidate offshore positions with those of their head offices. Consolidated reporting also became best practice in G10 countries and forms the basis of the Basel Framework for regulating internationally active banks. These efforts led to enhancements to the BIS international banking statistics (IBS), which for decades have had the dimensions needed for both a residence and nationality view (in contrast to other benchmark statistical collections used in international finance).

This feature is a primer on how BIS statistics can be used to understand topics in international finance from both a residence and nationality perspective. Moving from residence (entities in Switzerland) to nationality (Swiss entities anywhere in the world) fundamentally alters the interpretation of international statistics. The difference in the respective financial positions can be large: a shift to nationality makes financial centres "disappear" as assets (and liabilities) are reallocated to the countries where the parent companies that own (owe) them are headquartered. This in turn reveals just how concentrated international finance is in large multinational lenders and borrowers from a handful of countries. A shift in their globally consolidated balance sheets has implications far beyond their home country.

The nationality view sheds new light on many topics of policy interest. It provides debt measures that are better aligned with what national issuers ultimately owe. The nationality view also reveals who drives changes in cross-border banking. For example, financial retrenchment in the wake of the Great Financial Crisis (GFC) of 2007–09 was seen by some as broad-based deglobalisation but in fact was largely driven by European banks scaling back their foreign operations. Lastly, measures of countries' "financial openness" that account for multinational banking show most countries to be more open than previously thought.

The rest of this feature is organised as follows. The first section covers definitions and concepts that distinguish the residence view from the nationality view. The second compares how much, and for which countries, measures of international assets and liabilities differ under these two views, using BIS statistics and vendor data. The third section describes three examples where the nationality view provides new insights: foreign currency debt, the post-GFC retrenchment in global banking and the financial openness of countries. The final section concludes.

Concepts and definitions

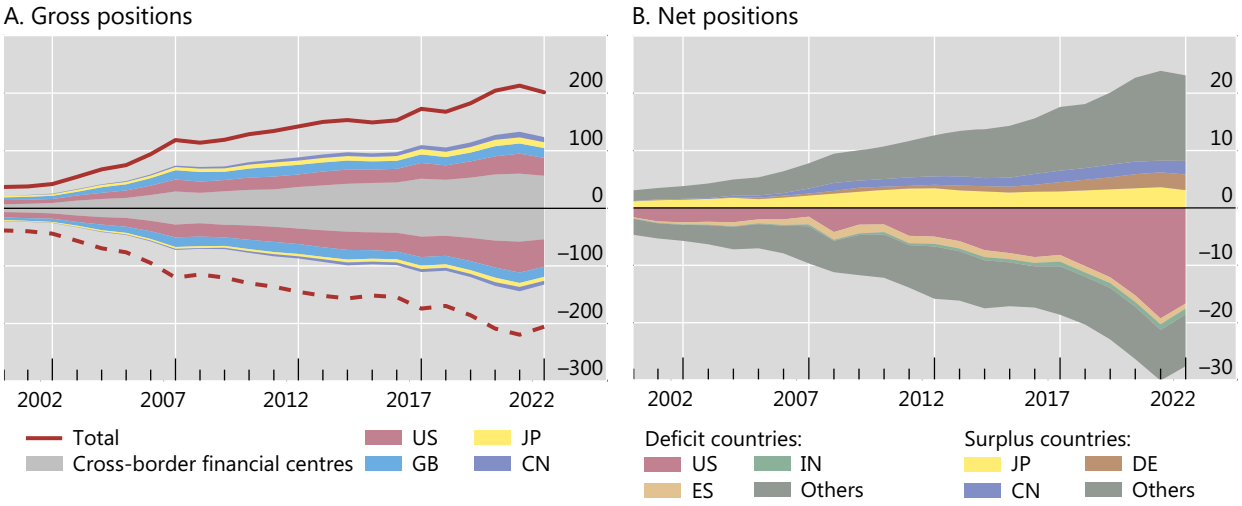
The residence view is centred on an economy, defined as the set of resident institutional units.[2] Residence is determined on the basis of physical presence and being subject to the jurisdiction of the government of a territory (United Nations (2008)). An economy is typically delineated by a country border and is the unit of survey on which the SNA is compiled. Many economic indicators, eg gross domestic product (GDP) or population, have long been measured on this basis.

What falls outside the country border is designated as external. The current account, ie the gap between domestic saving and investment, records flows of goods, services and income between residents and non-residents. The financial account shows the corresponding acquisition and disposal of financial assets and liabilities with non-residents. Capital flows between countries are in turn aggregated, cumulated and revalued every period, giving rise to the IIP, ie the outstanding stock of external assets and liabilities (Graph 1.A).

By referencing a particular economy, residence-based statistics relate international finance to macroeconomic developments in that economy, such as GDP, consumption and saving. Gross external positions yield measures of countries' financial development and integration (Lane and Milesi-Ferretti (2007, 2018), Broner et al (2023)). Countries' positive and negative *net* external positions (Graph 1.B), which reflect cumulative current account surpluses and deficits, underpin discussions about global financial imbalances (eg Bernanke (2005)). The geography of capital flows also

International investment positions, by country[1]

In trillions of US dollars — Graph 1



[1] See technical annex for details.

Sources: The external wealth of nations database (2022); authors' calculations.

[2] All institutional units are allocated to one of five sectors: non-financial corporations, financial corporations, general governments, households and non-profit institutions. Each institutional unit is resident in only one economic territory.

sheds light on a range of issues, including the flow of petrodollars, BoP crises and boom-bust cycles in emerging market economies (EMEs) (Borio et al (2011)).

In line with available statistics, academic work in international economics and finance tends to take the country as the unit of analysis. Furthermore, the perimeters of both currency use and balance sheets are often assumed to align with the country border, an analytical simplification known as the "triple coincidence" (Avdjiev et al (2016)). Accordingly, canonical models in international economics derive external positions from the macroeconomic analysis of individual countries (eg Obstfeld and Rogoff (1996), Tille and van Wincoop (2010)).

In reality, corporate balance sheets, and thus the impact of corporate decisions, straddle country borders. The mere existence of multinational firms violates the assumptions of the triple coincidence. Financial intermediaries, such as banks or corporate financing arms, strategically choose their location to take advantage of the benefits that come with concentration in financial centres (eg London) and/or secrecy, taxation and regulation (eg Caribbean financial centres) (Lane and Milesi-Ferretti (2018), Bertaut et al (2021), Pogliani et al (2022)). This reroutes capital flows via third countries, inflating global capital flows and gross external positions. The financial centres in Graph 1.A (grey areas) accounted for roughly a quarter of global external positions but for only 3% of global GDP (Pogliani et al (2022)).

As a result, residence-based statistics have limitations for analysing issues where ownership and control play a role. As multinational firms adjust their global balance sheets, they transmit shocks from one region to another. A country's external position does not belong to its nationals alone; it can be driven to a large extent by the activity of foreign-owned entities located there. On the flip side, policymakers take interest in the worldwide debt obligations of their domestically headquartered firms, regardless of where they borrow. In short, residence-based statistics obscure the international impact of multinationals' decisions.

Assessing such issues requires a view based on *nationality*, where the organising principle for economic units is *control*. This is the view most natural to multinational firms and intermediaries that manage their global balance sheets. The nationality view groups the balance sheets of resident units with those of the non-resident affiliates they control (with intragroup positions netted out); it excludes the balance sheets of resident units controlled by foreign entities (McGuire and von Peter (2009), IAG (2015), Avdjiev et al (2018)). Typically, the nationality of the consolidated group is the country of its headquarters; in the IBS it is the country of the supervisor of the global consolidated banking group (typically the country of its headquarters) (BIS (2019)).

The nationality view has a long history in BIS banking statistics. The expansion of international banking activity in Caribbean and other financial centres in the 1970s left offshore activity outside the purview of statistics. Central banks therefore asked banks in their jurisdiction to consolidate any positions booked by their offshore offices with those of their head offices. In 1977, the Basel Committee on Banking Supervision (BCBS) reviewed home-host information sharing and the need to consolidate bank balance sheets to capture the activity of subsidiaries everywhere, in line with what was becoming best practice in G10 countries (Goodhart (2011)). These efforts led to the introduction of a nationality breakdown in the BIS locational banking statistics (LBS) and to the collection of the BIS consolidated banking statistics (CBS) starting in 1983. While the nationality view has long been recognised in policy circles (Borio (2013), Tissot (2016), IAG (2015)), a growing academic literature now appreciates its importance (as surveyed by Florez-Orrego et al (2023)).

Even so, many benchmark statistics used in international finance lack the dimensions needed for a complete nationality view (Box A). The BoP/IIP are residence based, as are the key bilateral (country-to-country) CPIS and CDIS data sets. While the BIS LBS and CBS provide a nationality view for the banking sector, comparable data for the non-bank sector are partial at best. As shown in the next section, vendor data on the issuance of debt securities, used to compile the BIS international debt securities (IDS) statistics, and on syndicated loans can be used to consolidate non-banks' *liabilities* (although coverage is incomplete). However, non-banks' consolidated *asset* positions remain a blind spot, in particular for insurance companies, funds and asset managers with international operations.

Moving from residence to nationality

How far do BIS statistics go in providing a nationality view of international finance? As shown below, consolidation makes many financial centres "disappear", as it reallocates positions to the parent countries of the entities operating there. This, in turn, reveals the extent of concentration in international finance and underscores the significance of large multinational lenders and borrowers headquartered in a handful of countries. Consider the bank and non-bank sectors in turn, using IBS, IDS and vendor data on syndicated loans.

Box A

Residence and nationality in international financial statistics

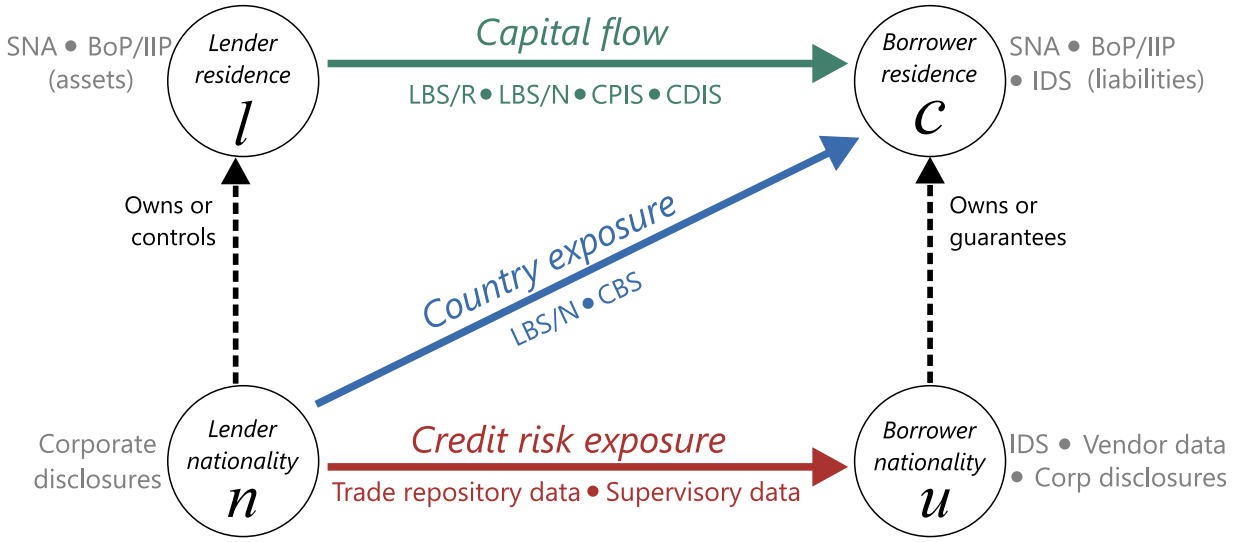
Statistics in international finance differ in how they link financial positions to individual countries. This box provides a simple framework for understanding the country dimensions in international data and classifies benchmark statistics accordingly.

The framework is based on two economic units that transact with each other, one as a lender and one as a borrower (Graph A1). The top two nodes relate to the *residence* view; they identify the country in which the lender and borrower reside. The arrow ($l \rightarrow c$) represents flows or positions between them. The key principle in the residence view is that financial positions of all units resident in the same country are aggregated, regardless of whether these units are controlled by, or otherwise connected to, parent entities located in other countries.

The bottom two nodes in Graph A1 relate to a *nationality* view. While nationality can be defined in various ways, the relevant criterion in international finance is often the location where corporate decision-making and control resides. The lender and borrower units in this case can be interpreted as consolidated corporate groups, each assigned the nationality of the country of their headquarters. The key principle in the nationality view is that the financial positions of all units controlled by the same headquarters are aggregated along the perimeter of their consolidated balance sheet, even if the units that comprise the group reside in different countries.

The residence and nationality views both have merit; the appropriate choice depends on the analytical question. To understand where funds are sourced and used, and how they relate to economic activity in particular countries, the geography of capital flows provided by the residence view ($l \rightarrow c$) is most natural. By contrast, a consolidated view of the lenders' exposures to a particular country ($n \rightarrow c$) is needed if the goal is to monitor the exposure to risks incurred there: *country risk* is the risk that borrowers do not fulfil their obligations for country-specific reasons beyond the counterparty's control; *transfer risk* stems more narrowly from policy measures such as capital controls, payment moratoriums and limitations on convertibility. Supervisory evaluation of counterparty credit risk between two entities in turn requires consolidating the borrower side too ($n \rightarrow u$) to account for parent company guarantees and other credit risk mitigants.

Country dimensions in international financial statistics[1] Graph A1



SNA = system of national accounts; BoP/IIP = balance of payments/international investment position; LBS/R and LBS/N = locational banking statistics by residence and by nationality; CBS = consolidated banking statistics; CPIS = IMF Coordinated Portfolio Investment Survey; CDIS = IMF Coordinated Direct Investment Survey; Supervisory data = bank supervisory data; IDS = international debt securities; Vendor data = eg syndicated loans (Dealogic).

[1] The nodes (*n, l, c, u*) represent lenders (left) and borrowers (right) on the basis of residence (top) or nationality (bottom). The arrows and text in large font describe how these country dimensions relate to each other; the small font lists data sets related to the nodes and arrows.

Source: Authors' elaboration.

How do benchmark data sets in international finance relate to the nodes and arrows in Graph A1? The small font lists data sets next to the nodes and arrows that they relate to. The SNA and BoP/IIP are compiled on a residence basis and cover the financial positions (assets and liabilities) of resident units. These statistics link units directly to economic activity in the same country and abroad, but without information about the allocation of their external positions across counterparty countries. These data sets are thus listed (in grey) next to the upper nodes in Graph A1 and not next to arrows. The BIS IDS are similarly unilateral in that they track only bond liabilities without information about lenders (bond holders). However, the IDS can be organised by both borrower residence and borrower nationality and thus are listed near nodes *c* and *u*.

Bilateral data sets, ie those that capture information about both lender and borrower units, link two nodes in Graph A1 and are thus listed next to arrows. The CPIS and CDIS are collected on a residence basis and track cross-border positions with counterparties in specific countries ($l \rightarrow c$). By contrast, the BIS CBS consolidate positions on the lender side (*n*) to track banks' claims on borrowers resident in particular countries ($n \rightarrow c$). The BIS LBS can be organised by both residence (LBS/R) and nationality (LBS/N) and thus are listed next to both the ($l \rightarrow c$) and ($n \rightarrow c$) arrows.

Few bilateral data sets consolidate on *both* the lender and borrower sides. This is the value of non-public supervisory data (eg that compiled in the BIS International Data Hub) used for monitoring counterparty credit risk exposures and funding dependencies. Some vendor data, eg syndicated loans from Dealogic, can also be consolidated by lender and borrower nationality, but the identity of lenders is typically lost once loans are traded in the secondary market. Full consolidation is also possible, in principle, in transaction-level data in trade repositories covering derivatives, repos and other financial instruments, although data aggregation remains a challenge (IFC (2017, 2018)).

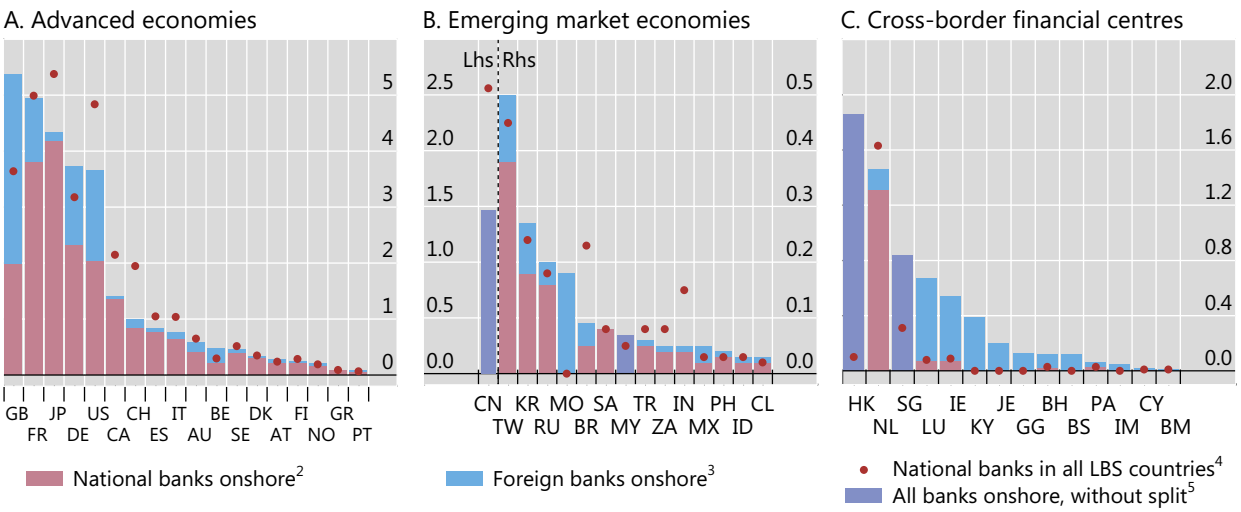
Banks play an important role in intermediating international financial flows.[3] Activity is highly concentrated in a small number of international banks. The 30 global systemically important banks (G-SIBs) headquartered in just 11 countries operate in more than 160 jurisdictions. The IBS reporting population includes far more than the 30 G-SIBs. Even so, banks headquartered in just five countries accounted for well over half of global cross-border claims; each of these banking systems recorded more than $3 trillion.

Multinational banks drive in part the differences between the residence and nationality views for individual countries (Graph 2).[4] In financial centres, the lion's share of cross-border bank positions is booked by foreign banks (blue bars) rather than by banks headquartered there (red bars). The flip side is that banks of a given nationality book cross-border positions from their offices around the world (red dots). Those positions booked outside their home country affect host countries' external positions. Going from residence (bars) to nationality (dots) makes financial centres shrink (eg Luxembourg, Cayman Islands). It also increases the prominence of those countries that are home to multinational banking groups (eg China, Switzerland, United States).

For non-banks, available data provide only a partial nationality view since comprehensive statistics on their consolidated financial holdings (assets) do not exist

Cross-border claims of banks[1]

In trillions of US dollars; as of end-Q3 2023 Graph 2



[1] See technical annex for details. [2] Banks headquartered and located in the country shown on the x-axis. [3] Banks located in the country on the x-axis but headquartered elsewhere. [4] Banks headquartered in the country on the x-axis; positions booked by offices in LBS reporting countries. [5] All banks located in the country shown on the x-axis (split is masked).

Sources: BIS locational banking statistics (LBS); authors' calculations.

[3] Banking is reflected in several functional categories of the IIP. Loans and deposits are recorded in "other investment". This category makes up a greater share in economies where banks have a more significant role. It accounted for 40% or more of external liabilities for 100 economies, with only 16 of these being advanced economies.

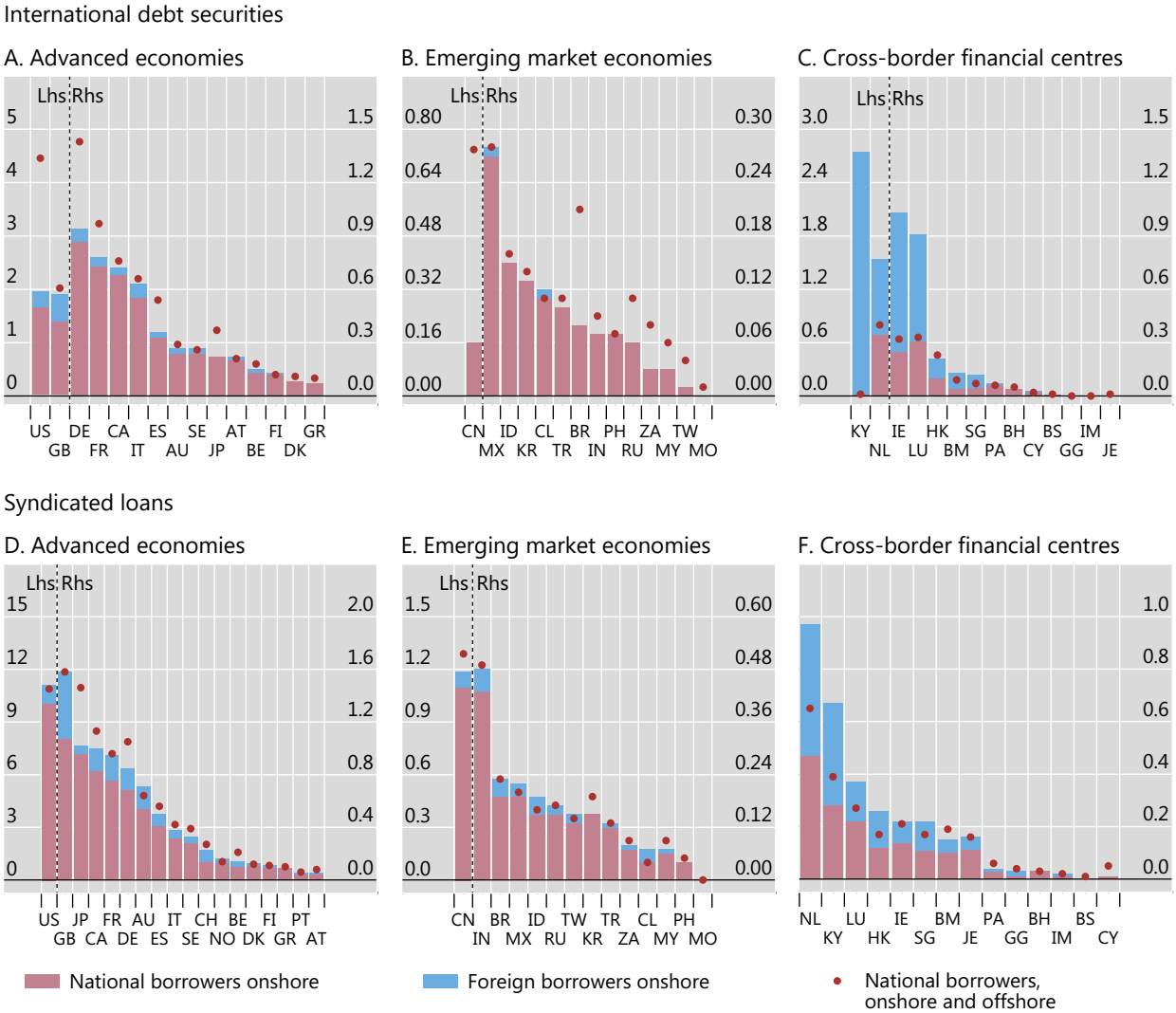
[4] Graph 2 shows bank sector claims; the IBS afford a similar view of bank sector liabilities.

for most countries. A portion of non-banks' liabilities, however, can be tracked using the BIS IDS and vendor data on syndicated loans (Graph 3). For example, corporates resident in the Cayman Islands issue bonds in international markets (Graph 3.C, stacked bars), but the obligors are predominantly subsidiaries of foreign firms (Graph 3.C, blue bars). Foreign obligors also owe the bulk of outstanding debt issued by residents of the Netherlands, Ireland, Hong Kong SAR, Luxembourg, Singapore and Bermuda. From a nationality perspective, the amounts owed by entities headquartered in these countries (except Hong Kong SAR) is considerably less than total resident issuance, and thus the red dots lie below the total of the stacked bars.

For many advanced and emerging market economies, this pattern is reversed (Graphs 3.A and 3.B). Due to offshore issuance, US, Japanese, Chinese and Brazilian obligors' global consolidated debt (red dots) is significantly higher than the amounts owed by residents of the home country (stacked bars). This reflects the reallocation

Consolidating non-banks' outstanding debt[1]

In trillions of US dollars; as of end-Q4 2023 — Graph 3



[1] The non-bank sector comprises non-financial corporations, non-bank financial institutions, households and general government. See technical annex for details. "Onshore" refers to entities located in the country and "Offshore" to entities located elsewhere.

Sources: Dealogic; Euroclear; LSEG, Xtrakter Ltd; authors' calculations.

of the debt of foreign obligors in financial centres (Graph 3.C, blue bars) to the amounts owed by nationals of advanced and emerging market economies.

In syndicated loans, the gap between the residence and nationality views is not as wide (Graph 3, bottom panels). Still, in financial centres, the bulk of loans are to foreign resident borrowers. Reallocating these by nationality again pushes the red dots above the stacked bars for several advanced and emerging market economies.

Insights from a nationality perspective

Adopting a nationality view helps in understanding many policy-relevant phenomena that are obscured in residence-based statistics. Consider three examples.

Foreign currency debt

The first example, which follows directly from the discussion above, shows that several countries have incurred more foreign currency debt than is evident in residence-based statistics. This is not a new point. Gruić and Wooldridge (2012), McCauley et al (2015) and Aldasoro et al (2021) examined the debt of non-bank borrowers in several large EMEs and found that the offshore issuance of corporate bonds significantly increased debt amounts in several cases. Coppola et al (2021) conduct a systematic reallocation of corporate bonds to the ultimate obligors, redrawing the global map of bond obligations.

BIS statistics go a long way towards providing a nationality-based view of countries' foreign currency debt. The BIS global liquidity indicators (GLIs) provide estimates of non-banks' US dollar-, euro- and Japanese yen-denominated debt on a residence basis, shown as black dots in Graph 4.[5] The stacked bars show estimated amounts on a nationality basis, constructed using the IDS and syndicated loans to reallocate obligations to the country of the ultimate obligor.[6]

Some countries owe more foreign currency debt on a nationality basis when debt incurred by offshore affiliates is taken into account. Among advanced economies, Japanese non-banks have considerably larger dollar liabilities than the residence-based measure indicates (Graph 4.A). This is mainly because of syndicated loans obtained by offshore affiliates of Japanese companies (contained in the red bar). Similarly, German non-banks' nationality-based measure is also larger, due to both bond issuance by and loans to corporate affiliates offshore. By contrast, for some countries, the nationality debt measure is actually lower than the residence measure. This is most obvious for Luxembourg, the Netherlands and Ireland, which host foreign affiliates that tap international debt markets (and which were treated as cross-border financial centres in Graphs 2 and 3).

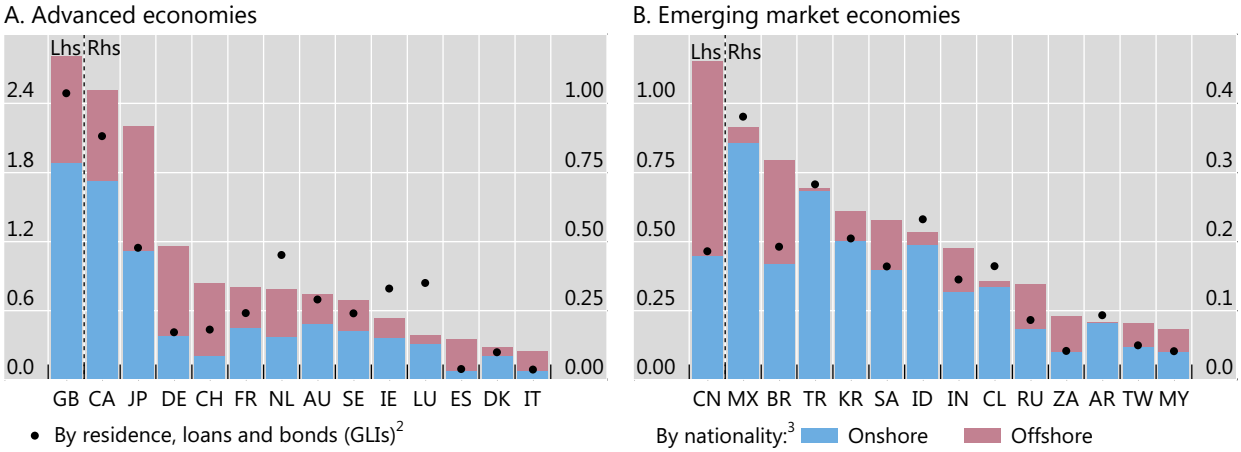
[5] The GLIs are compiled by adding cross-border and local loans to non-banks (from the IBS) to outstanding international bonds (in those currencies) issued by resident non-banks (from the IDS). The figures in Graph 4 include debt denominated in a foreign currency (eg euro-denominated debt is excluded in the figures for euro area countries).

[6] The adjustment of the residence-based loan portion of the GLI is done using syndicated loans, for which the residence and nationality of the borrower is available. However, not all loans are syndicated; no adjustment is made for non-syndicated loans.

In EMEs too, several countries stand out (Graph 4.B). Chinese non-banks have outstanding dollar debt in excess of $1 trillion when offshore issuance is included, more than double the residence measure (black dot). A similar picture emerges for Brazilian and South African non-banks (in terms of ratio if not size). Offshore debt also contributes noticeably to the dollar debt of Saudi Arabian, Indian and Malaysian non-banks. The greater liabilities of borrower countries in turn imply that lenders have larger exposures to those borrowers than is apparent from residence-based statistics. Coppola et al (2021) highlight the rise in exposures to BRICS countries (Brazil, Russia, India, China and South Africa) after including offshore bond issuance.

Non-banks' outstanding debt denominated in US dollars, euros and Japanese yen[1]

In trillions of US dollars; as of end-Q3 2023 Graph 4



[1] Foreign currency loans and bonds denominated in US dollars, euros and Japanese yen. The non-bank sector comprises non-financial corporations, non-bank financial institutions, households and general government. See technical annex for details. [2] Outstanding debt by residence, as tracked in the BIS GLIs. [3] Estimated loan and international debt securities liabilities of non-banks headquartered in the country listed on the x-axis. "Onshore" refers to entities located in the country and "Offshore" to entities located elsewhere.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS global liquidity indicators (GLIs); BIS locational banking statistics; authors' calculations.

Deglobalisation in banking?

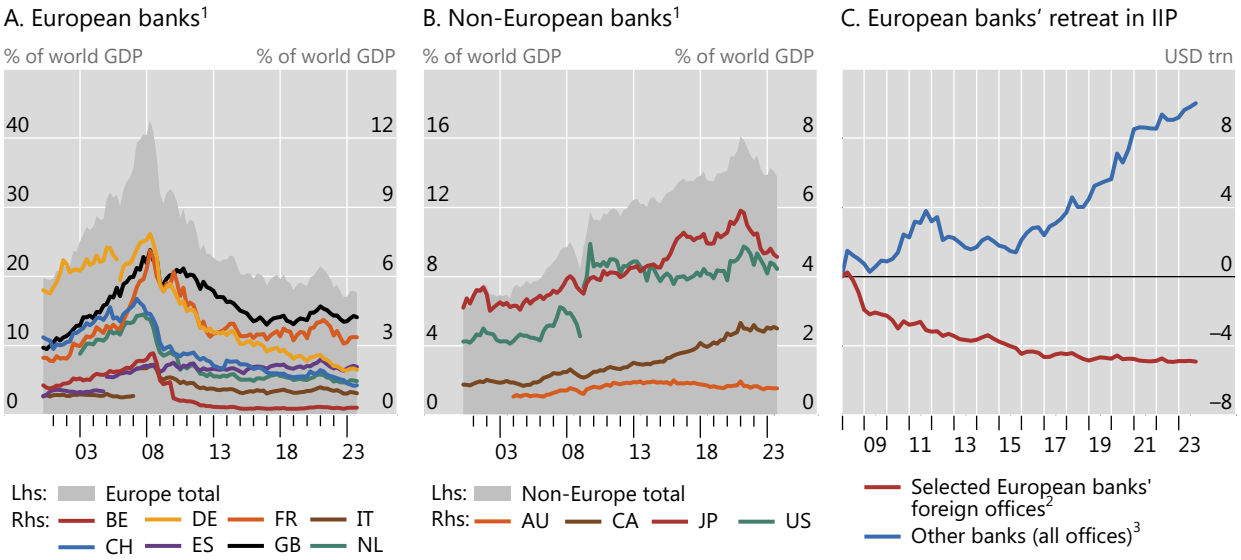
Consider next the evolution of international banking in the aftermath of the GFC. Some observers asserted that global finance had passed its high-water mark and that financial deglobalisation had begun.[7] The decline in cross-border banking positions from most major banking locations seemed to confirm this.

Viewing this through the lens of consolidated balance sheets reveals the banking systems driving these changes. McGuire and von Peter (2009), IMF (2015) and McCauley et al (2019) show that rather than being a general shift, the retreat of global banking was driven by a few banking systems. European banks cut their global operations as they deleveraged their unsustainably risky balance sheets (Graph 5.A). By contrast, US, Canadian, Japanese, Australian and other banking systems maintained or continued to grow their foreign claims (Graph 5.B). These patterns do not come to light as forcefully in the residence view.

[7] See Ghezzi et al (2009). Forbes (2014), Forbes et al (2017) and Eichengreen (2016).

Because European banks had offices of significant size in many countries, their post-GFC deleveraging affected many host countries' IIP positions. Between 2008 and 2016, selected European banking systems shed a cumulative $5 trillion in cross-border claims in their *foreign* offices alone (Graph 5.C, red line).[8] By contrast, other banks with offices in the same countries expanded their cross-border claims by more than $2 trillion. In short, changes in the balance sheets of European banks' foreign affiliates had a larger effect on the external bank asset positions of host countries than did those of all the other banks located in these host countries (including those with head offices in these countries).

Consolidated foreign claims and deglobalisation in banking — Graph 5



Gaps in the plotted series indicate breaks in series reflecting, for example, bank mergers or changes in the reporting population. Country codes denote the nationality of banks.

[1] By bank nationality shown in the legends. See technical annex for details. [2] Cumulative change since Q1 2008 in cross-border claims booked by AT, BE, DK, FR, DE, IT, NL and CH banks' offices outside the home country. [3] Cumulative change since Q1 2008 in cross-border claims booked by all banks other than the selected European banks; includes claims booked in home offices and offices abroad.

Sources: IMF, *World Economic Outlook*; BIS consolidated banking statistics; BIS locational banking statistics; authors' calculations.

Towards a consolidated wealth of nations

Finally, consider the financial openness of economies. How strong is the trend toward greater international financial integration, especially after the GFC? Lane and Milesi-Ferretti (2007, 2018) have addressed this question by tracking countries' external assets and liabilities as a ratio to GDP. Their work has sparked a line of research that examines country portfolios and valuation effects (Lane and Shambaugh (2010a, 2010b), Gourinchas and Rey (2014) and Bénétrix et al (2015)).

However, measures of financial integration need not start and stop at the border. Foreign ownership and control add a whole new dimension to financial integration, one that the residence perspective ignores. If Australians own banks in New Zealand,

[8] Moreover, European banks also shed local claims booked by their foreign affiliates around the world, which is not reflected in any country's external position.

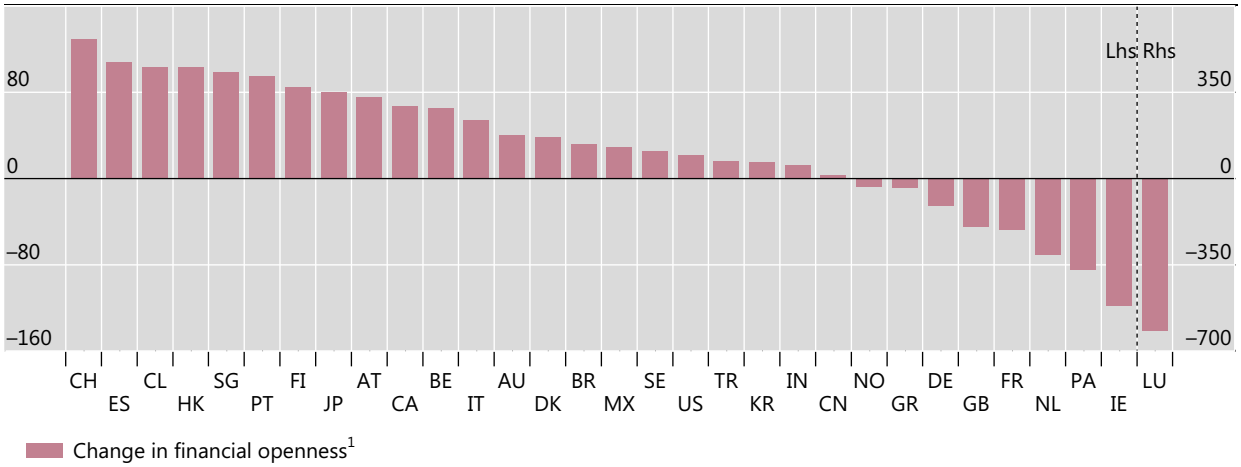
it makes both countries more open: Australia adds to its foreign assets through the local and cross-border claims of its banks in New Zealand; New Zealand adds to its foreign assets because residents' local deposits in Australian banks are claims on foreign entities. In general, banks' positions booked in affiliates abroad add to openness both at home and abroad.

A partial measure of consolidated openness redraws the border around countries' banking operations. As a first step, cross-border bank positions in the IIP of a given country are replaced with the consolidated foreign claims of banks headquartered there. Consolidated foreign claims exclude interoffice positions but include banks' cross-border and local positions booked by their foreign affiliates abroad. In a second step, the deposits of the country's residents placed in foreign banks operating there are added, since these are claims on a foreign institution.[9] These steps transform a country's bank-related external assets to *foreign* assets. The same steps can be taken on the liability side, allowing openness to be defined as foreign assets and liabilities to GDP. Graph 6 shows how these steps contribute to financial openness, keeping other sectors' positions unchanged.

On a consolidated basis, most economies exhibit a greater degree of financial openness than on a residence basis (Graph 6). In aggregate, the consolidated measure is greater by 18% of GDP (weighted average) than the traditional measure based on residence. In addition, the measured openness rises for most economies (22 out of the 31 shown), with the median economy appearing more financially open by about 30% of GDP. Extending this exercise to the balance sheets of multinational

The contribution of banking to countries' openness

As a percentage of GDP — Graph 6



[1] Change in financial openness when shifting from a residence-based measure to a measure that consolidates bank-related positions. No adjustment is made to positions of other sectors. The consolidated foreign positions of CN banks are estimated using the BIS locational banking statistics by nationality.

Sources: IMF, *International Investment Position* and *World Economic Outlook*; BIS consolidated banking statistics; BIS locational banking statistics; authors' calculations.

[9] Existing statistics identify the immediate counterparty but do not allow us to pierce through possibly several layers of ownership all the way to the ultimate beneficial owner (see Box A). In practice, this means that the counterparties to local bank positions are assumed to be nationals of that location.

firms, where possible, would raise consolidated openness even further (BIS (2015), Avdjiev et al (2018), Sanchez Pacheco (2023)).

Conclusion

This feature presents how BIS statistics can be used to understand topics in international finance from both a residence and nationality perspective. The latter groups balance sheets by the country of headquarters, based on the organising principle of ownership and control. This is needed to assess the global impact of decisions taken by multinational firms and intermediaries.

The nationality view fundamentally alters our understanding of countries' and sectors' international positions. The bulk of the positions recorded in financial centres are reallocated to the countries where firms are headquartered. This reallocation yields new measures of countries' indebtedness and their financial openness and reveals the importance of multinational firms and intermediaries in international finance. Understanding *who* drives changes in international positions, and *whom* these changes ultimately affect, is crucial for monitoring financial stability.

This cannot be seen in most international financial statistics. BIS statistics are an exception. The BIS IBS provide a joint residence- and nationality-based view of banks' asset and liability positions as well as a similar picture for non-banks, but only for their international bond liabilities. A blind spot is the consolidated asset side of non-banks' balance sheets. The question of who ultimately owns the trillions of dollars' worth of government and corporate bonds traded across borders becomes increasingly salient as non-bank financial institutions gain a larger share in the global financial system.

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Technical annex

BoP = balance of payments; CBS = consolidated banking statistics; CDIS = Coordinated Direct Investment Survey; CPIS = Coordinated Portfolio Investment Survey; G-SIBs = global systemically important banks; IBS = BIS international banking statistics; IDS = international debt securities; IIP = international investment position; LBS/N = locational banking statistics by nationality; LBS/R = locational banking statistics by residence; SNA = system of national accounts.

Cross-border financial centres comprise the following 22 jurisdictions, as defined in Pogliani, von Peter and Wooldridge (2022): BH, BM, BS, CW, CY, GG, GI, HK, IE, IM, JE, KY, LR, LU, MH, MT, MU, NL, PA, SG, SM and VG. The names of jurisdictions corresponding to ISO codes are provided under the Abbreviations on page viii to x.

Graph 1: Cross-border financial centres comprise the 22 jurisdictions mentioned above.

Graph 2: Cross-border financial centres comprise the subset of 15 jurisdictions that report the BIS locational banking statistics: BH, BM, BS, CW, CY, GG, HK, IE, IM, JE, KY, LU, NL, PA and SG. Data for Russia (RU) relate to Q4 2021.

Graph 3: Data refer to the non-bank sector as immediate borrowers and all sectors as ultimate borrowers. Cross-border financial centres comprise the same 15 jurisdictions as in Graph 2.

Graph 4: Data for outstanding debt on a residence basis (black dots) are from the BIS global liquidity indicators (GLIs; see www.bis.org/statistics/gli/gli_methodology.pdf).

Stacked bars are estimates of outstanding debt on a nationality basis. Data for onshore and offshore bond liabilities are from the IDS. Onshore loans are estimated as the GLI measure of cross-border and local loans from the BIS locational banking statistics minus the syndicated loans received by foreign entities in that country; offshore loans are syndicated loans to foreign affiliates of non-banks headquartered in that country. No adjustment is made for loans that are not syndicated.

Graph 5: "Europe-total" comprises banks headquartered in 18 jurisdictions: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, NL, NO, PT, SE and TR. "Non-Europe total" comprises banks headquartered in 13 jurisdictions: AU, BE, CA, CL, IN, JP, KR, MX, PA, US, HK, SG and TW.

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International finance through the lens of BIS statistics: the global reach of currencies[1]

The use of key currencies in international finance far outstrips the issuing jurisdictions' share in global economic activity. The US dollar dominates globally, while the euro, yen and pound sterling have a smaller international footprint. The reach of key currencies becomes apparent only in statistics with a currency dimension. The BIS statistics on international banking, bonds and derivatives markets have had a currency dimension since their inception. This dimension is essential for assessing exposure to currency risk, squeezes in funding markets and vulnerabilities associated with foreign exchange markets.

JEL classification: F23, F31, F36, G15.

Countries can rise or fall on the soundness of their currencies. Monetary, fiscal and other policy decisions that affect the value of major international currencies – like the US dollar or the euro – have implications far beyond the currency-issuing jurisdiction. Firms and households *outside* these jurisdictions must navigate global forces transmitted via currencies in the financial realms in which they operate. Foreign currency borrowing has, in one way or another, been a flashpoint in every major postwar crisis. When key currencies move, or when their funding markets seize up, no country is left untouched. Tracking the use of currencies in international markets is critical in financial stability analysis.

What makes a currency "international", and how can its use across the array of markets in international finance be understood? Or, to put it another way, why are some currencies more international than others? A fundamental aspect is the invoicing of trade. It is not unreasonable to suppose that a currency's share in the international domain reflects the size of the currency-issuing economy and its share in international trade. At the extreme, the view that the perimeters of currency use and balance sheets align with the economic border is known as the "triple coincidence" (Avdjiev et al (2016)) – an analytical simplification often used in international economics. In reality, some currencies – the US dollar in particular – are used much more widely than that for reasons that are mostly financial.

[1] This is the second feature in a series to showcase the BIS international banking and financial statistics, following McGuire et al (2024). We thank Iñaki Aldasoro, Stefan Avdjiev, Claudio Borio, Gaston Gelos, Bryan Hardy, Swapan Pradhan, Andreas Schrimpf and Hyun Song Shin for their helpful comments, and Marjorie Santos and Jhuvesh Sobrun for excellent research assistance. The views expressed are those of the authors and do not necessarily reflect those of the Bank for International Settlements.

Key takeaways

- *BIS statistics have a currency dimension, enabling users to track how key currencies are used in international banking and bond markets, and in foreign exchange and derivatives markets.*
- *The dollar plays an outsize role in international finance mainly because of its use offshore, as a unit of account and medium of exchange among counterparties outside the United States.*
- *The currency dimension in international statistics provides insights about countries' external debt, banks' foreign currency funding needs and payment obligations from FX derivatives.*

This feature is a primer on how BIS statistics can be used to understand the role of currencies in international finance. The currency dimension has a long history in BIS statistics. The expansion of international banking in the late 1950s led to concerns that offshore activity could undermine control of monetary aggregates. This spurred the collection in the 1960s of the BIS locational banking statistics (LBS), which capture banks' international positions by currency. To track currency use beyond banking, the BIS later compiled data on bonds, foreign exchange (FX) and derivatives markets. Some statistical collections at other international organisations, eg the International Monetary Fund (IMF), and some vendor data sets also feature a currency dimension.

Taken together, these statistics highlight the pervasive use of key currencies – notably the US dollar – in the global financial system. In international banking, for example, the US dollar dominates because of its use in *offshore* transactions, ie transactions between parties that both reside outside the currency area. In international bond markets, dollar-denominated bonds account for the bulk of amounts outstanding. And in foreign exchange markets, the dollar is the vehicle currency of choice. As a result, off-balance sheet dollar payment obligations build up, much of them outside the United States, creating potential vulnerabilities. Other currencies – eg the euro, Japanese yen and British pound – have a regional role but a smaller international footprint.

Key currencies shape the pattern of global capital flows, and policy decisions taken in the currency-issuing countries spill over to the rest of the world. The growth in foreign currency credit is sensitive to changes in interest rates and exchange rates, which expose borrowers, especially in emerging market economies (EMEs), to global factors. When countries borrow heavily in a foreign currency, their debt burdens rise when that currency appreciates – a mechanism at the heart of many crises.

Recognising the international role of key currencies is crucial for understanding many policy-relevant issues. Some are macroeconomic in nature. For example, trade invoicing practices affect how exchange rate developments pass-through to inflation and economic activity. Whether depreciations are expansionary further depends on the currency composition of a country's external positions. Many issues also relate to international finance, a domain in which BIS statistics shed much light. This feature illustrates the usefulness of the currency dimension through three examples: foreign currency debt in financial crises, the geography of banks' foreign currency liabilities and the hidden dollar debt arising from FX derivatives.

The rest of this feature is organised as follows. The first section documents the role of currencies in international finance through the lens of BIS statistics. The second examines the implications for several policy-relevant issues. A box lays out the currency dimension in official international statistics. The final section concludes.

Currencies in international finance

Currency denomination is an intrinsic attribute of contracts and financial instruments that facilitate the exchange of goods, services and capital. Goods and services are generally priced in the domestic currency and agents assess their cash flows in that currency.[2] Loans and bonds used for extending credit are promises to pay back principal plus interest in a specified currency, usually the domestic currency. Most economic units in an economy therefore take domestic money as their reference currency. International trade, on the other hand, is often invoiced and settled in a major currency, most notably the US dollar (Boz et al (2022)).

The use of a currency in the international domain can be defined with respect to a currency-issuing area. *International* activity for any given currency consists of transactions or positions involving a non-resident of the currency area. It excludes those conducted in the domestic currency *within* a currency area, eg euro loans from France to Spain. The international domain thus comprises three segments: activity between non-residents and residents of the currency area (both *inward* and *outward*), and *offshore* activity between non-residents of the currency area.

Why are some currencies widely used in the international domain? Factors cited in the literature include (i) the weight of the issuing country in global trade and finance; (ii) the availability of safe assets denominated in the currency, with deep and liquid markets; (iii) stability based on sound fiscal and monetary policies; and (iv) exchange rate flexibility and a convertible capital account to accommodate capital flows.[3] Currencies that score high on these factors tend to have liquid government bond markets that serve as a basis for pricing other assets in that currency. Network effects in the adoption and use of a currency in trade and finance then tend to reinforce each other (eg Rey (2001), Gopinath and Stein (2021)).

Several major currencies fulfil these conditions, yet one currency – the US dollar – has been dominant in the post-World War II era. Graph 1.B presents currency shares in international activity (bars) and offshore activity (crosses) across several markets.[4] While the euro, yen and other currencies do play an international role, the US dollar occupies the top position in all markets (Graph 1.B, green bars). Trade invoicing in dollars begets dollar debt that needs to be financed. The depth of dollar capital markets creates thick market externalities that attract both investors and issuers.

Focusing on offshore activity puts the dominance of the dollar into even sharper relief (Graph 1.B, green crosses). The shares of the dollar in *each* market shown, and of the euro in all but one market, outstrip the issuing jurisdiction's share in global gross domestic product (GDP) (Graph 1.A). By contrast, the shares of the British pound, Japanese yen and Swiss franc exceed in only some markets the corresponding GDP shares. The use of the renminbi, which is not fully convertible, presently falls short of China's weight in the global economy.

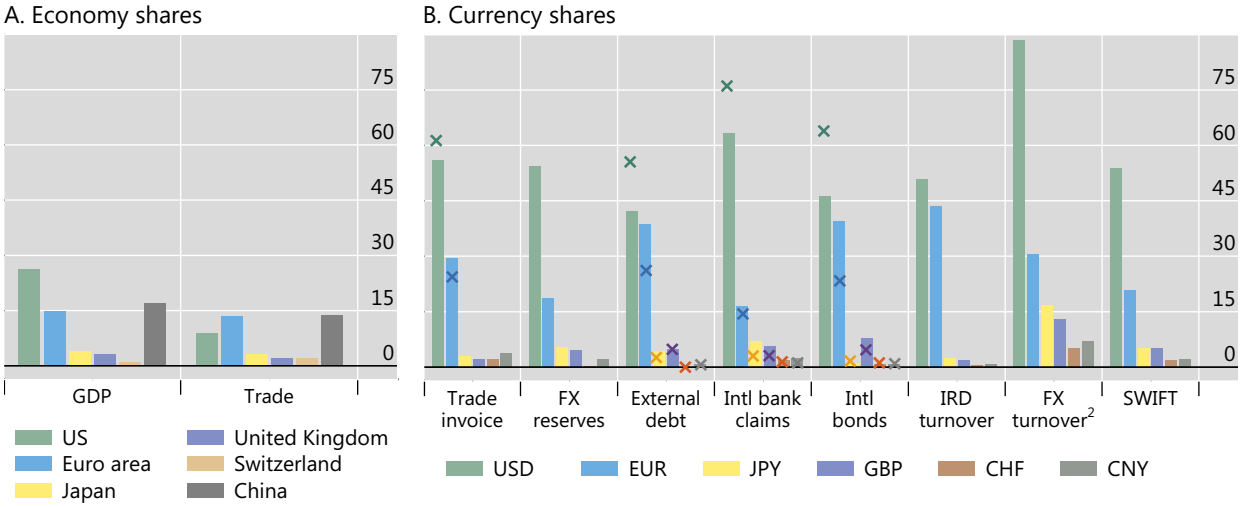
[2] Exceptions are economies that use another official currency (eg Ecuador and Panama use the US dollar and some European microstates use the euro). Some countries are unofficially dollarised.

[3] Eichengreen (2011) discusses these factors with respect to the renminbi's prospects as an international currency.

[4] Financial transactions are bilateral, but not all statistics capture the residence (or nationality) of both counterparties. Hence, the measurement of international and offshore currency shares differs across markets (see technical annex). Currency shares are thus more comparable within than across markets.

The use of currencies in international finance[1]

Latest available data, as a percentage of total, by indicator — Graph 1



[1] Trade invoice = weighted average of export and import currency invoicing shares; Intl bank claims = international bank claims (cross-border and local claims) in foreign currencies; Intl bonds = international debt securities outstanding; IRD = interest rate derivatives; FX = all FX instruments; SWIFT = global payments delivered via SWIFT. See technical annex for details. Bars in both panels show shares in international transactions, including those that involve residents of the currency area on one side. Positions within a currency area are excluded where possible. Crosses in panel B indicate shares after excluding (to the extent possible) amounts that involve residents of the currency area, leaving only the offshore segment. [2] Spot and FX derivatives. Shares add up to 200% for FX turnover because transactions involve two currencies.

Sources: Allen et al (2023); Boz et al (2022); IMF, *Direction of Trade Statistics*; IMF, *International Financial Statistics*; IMF, *World Economic Outlook*, April 2024; Bloomberg; SWIFT; BIS international debt securities statistics; BIS locational banking statistics; BIS Triennial Central Bank Survey, 2022; authors' calculations.

International banking

The currency dimension is at the core of BIS banking statistics (see the box). Deposits of US dollars began to accumulate in banks outside the United States in the late 1950s, giving rise to concerns over their impact on the transmission of US monetary policy at a time when policy frameworks focused on control of monetary aggregates. This led to the collection, in the 1960s, of the BIS LBS, to track banks' international claims[5] – the complement to domestic monetary aggregates. The LBS have since been expanded to capture how key currencies are used in international banking across countries and sectors.

The boom-bust cycle in banks' international claims largely reflects dollar flows, given the dollar's outsize role in international banking (Graph 2.A). In the three decades before the Great Financial Crisis (GFC), claims grew by more than 10% per year on average, but with considerable variation around crisis events (vertical lines). Variation in dollar claims accounted for most of this. Claims growth collapsed after the GFC and has been subdued since, as banks restructured their balance sheets and non-bank financial institutions gained ground in international finance.

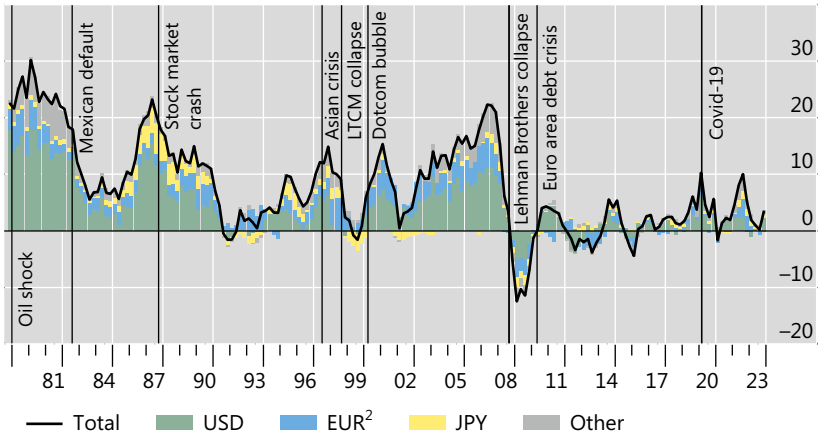
[5] International claims (assets) comprise cross-border claims in all currencies and local positions vis-à-vis residents of the host country in foreign currencies. Claims comprise (i) loans and deposits; (ii) holdings of debt securities; and (iii) derivatives with a positive market value and other residual instruments. The sum of (i) and (ii) can be considered "credit".

Currencies in international banking

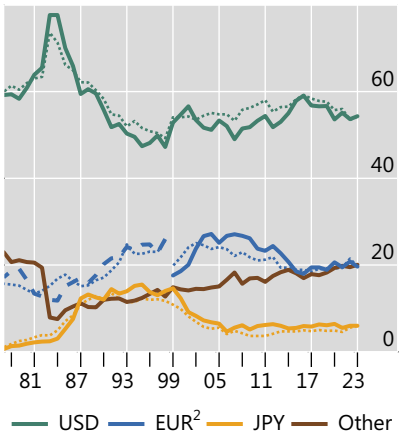
In per cent

Graph 2

A. Year-on-year growth of banks' international claims[1]



B. Currency shares[3]



[1] Currency contributions to growth. [2] Euro legacy currencies before 1999; intra-euro area cross-border claims excluded from 1999 onwards. [3] Dotted lines show shares at constant end-2023 exchange rates.

Source: BIS locational banking statistics.

The dollar's share in banks' international claims peaked at almost 80% in the mid-1980s, after which it gradually lost ground (Graph 2.B). Yen claims gained share in the late 1980s, when Japanese banks expanded their global footprint amidst a domestic banking boom. Similarly, claims denominated in European currencies grew ahead of the introduction of the euro in 1999. And euro-denominated international claims rose rapidly after the currency's launch, propelling the euro's share to around 25% in the mid-2000s. It subsequently retreated in the wake of the euro area sovereign debt crisis of 2010–12, yielding ground back to the dollar.

The *offshore* use of the US dollar underpins its dominance in international banking. Traditional international banking typically involved cross-border positions in the domestic currency of either the lender or the borrower – for example, a dollar loan from a bank in the United States to a borrower abroad (Graph 3.A, tan area), or a dollar loan from a bank in Europe to a borrower in the United States (grey area). However, more significant for the dollar is the offshore segment (red area), ie dollar positions that *do not* involve residents of the United States (McCauley et al (2021)). Offshore dollar claims peaked at two thirds of total dollar claims in 2018. That share has since retreated as higher dollar interest rates have attracted investment in US securities, driving up cross-border claims on the United States (grey area).

Offshore use of the euro is small by comparison (Graph 3.B). Inward and outward claims involving euro area residents have long been the largest euro segments, mainly reflecting the euro business of banks in London with counterparties on the continent.[6] Offshore positions have accounted for only about a quarter of the total. The rise since 2020 in cross-border positions booked by banks in the euro area (tan area) in part reflects revised reporting of derivatives positions on a gross basis.

[6] This had included the clearing of euro-denominated repos at LCH Limited in London as repos are recorded as loans/deposits in cross-border banking positions. The shift of this business in 2019 to LCH SA, a subsidiary in France, has curbed offshore euro activity (red area). At the same time, the effect of the shift on the other euro segments is ambiguous. See Demski et al (2022) for more on how the shift in repo clearing affected cross-border bank claims.

Box A

The currency dimension in international financial statistics

Patrick McGuire, Marjorie Santos, Goetz von Peter and Sonya Zhu

Several benchmark statistics used in international finance provide a currency breakdown. Table A provides an overview of how currencies are treated in BIS and other official statistics. Some BIS statistics stand out by providing a currency breakdown with a long history.

BIS statistics have had a currency dimension since their inception. The locational banking statistics (LBS) track international banks' claims and liabilities in five currencies plus the domestic currency of the reporting country. The international debt securities (IDS) track issuance and outstanding amounts of international bonds with a complete currency breakdown. By contrast, the consolidated banking statistics (CBS) and debt securities statistics (DSS) only distinguish between domestic and foreign currencies. The BIS global liquidity indicators (GLIs) combine credit from banks and bond markets to capture credit denominated in three major reserve currencies: the US dollar, euro and Japanese yen. In the BIS statistics for foreign exchange (FX) spot and over the counter (OTC) derivatives markets, the breadth of currency breakdowns depends on the metric. The BIS Triennial Survey (TRI) publishes average daily *turnover* in these markets for 39 currency pairs and totals for 39 currencies. The OTC derivatives (OTCD) statistics and exchange-traded derivatives (XTD) statistics, on the other hand, track *outstanding amounts* for seven and 24 currencies, respectively.

Other official statistics also have a currency breakdown, with varying levels of coverage. The International Monetary Fund's Currency Composition of Official Foreign Exchange Reserves (COFER) statistics identifies eight currencies, but only the breakdown for the global aggregate is published. The Coordinated Portfolio Investment Survey (CPIS) encourages the reporting of a similar currency breakdown by country. The international investment position (IIP) statistics cover positions in domestic currencies and three major currencies.

Coverage of currencies in international statistics

Table A

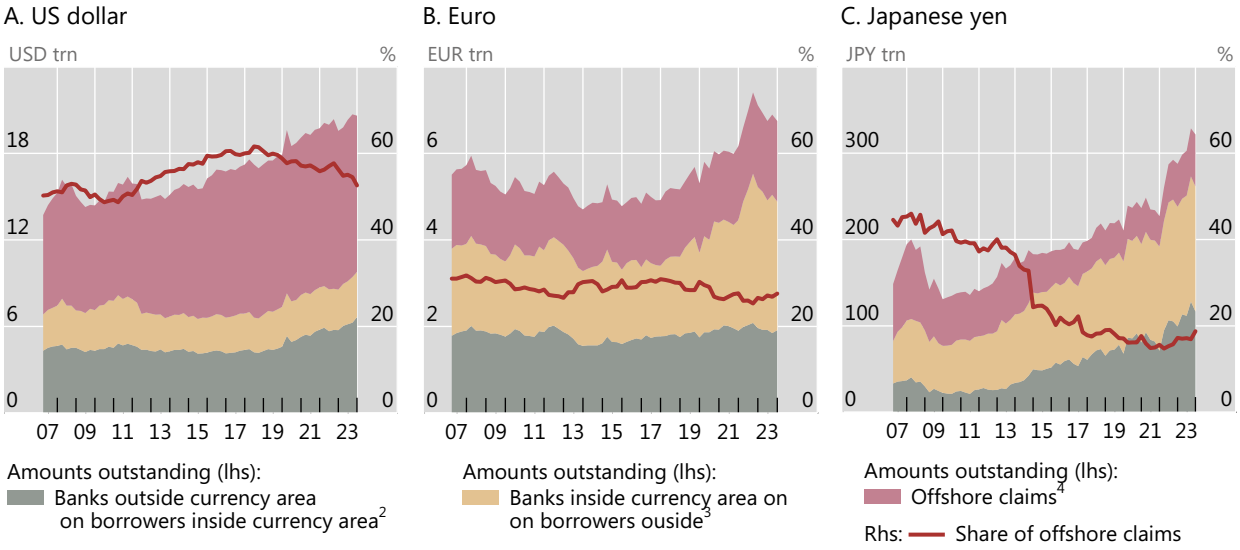
	BIS statistics									Other official statistics			
	International banking		Debt securities		GLIs	FX and derivatives[1]				IMF			World Bank
	LBS	CBS	IDS	DSS		TRI FX	TRI IRD	OTCD	XTD	COFER	CPIS	IIP	QEDS
USD													
EUR													
JPY													
GBP													
CHF													
CNY													
AUD													
CAD													
SEK													
No of curr[2]	5		All		3	39 pairs	39	7	24	8	8	3	3
DC[2]	Y	Y	Y	Y		Y	Y				Y	Y	Y
Collected[3]	1963	1983	1980s	1990	2011	1986	1995	1998	1993	1960s	1998	1993	2004
Available[3]	1977	1983	1970	1989	2000	1986	1995	1998	1993	1995	2001	2015	2012

Dark green indicates country-level data and light green indicates global or regional aggregates.

[1] For TRI interest rate derivatives (IRD) and TRI FX, turnover. For OTCD, outstanding amounts. [2] No of curr is the number of named currencies; DC = Y if domestic vs foreign currency positions are reported. [3] "Collected" is the year when the data were first collected. "Available" is the date from which a currency breakdown is available in the official statistics which can be downloaded conveniently for a reasonable number of countries or indicators. Information as of May 2024, based on published data.

Sources: IMF, *Coordinated portfolio investment survey (CPIS)*; IMF, *Currency composition of official foreign exchange reserves (COFER)*; IMF, *International investment position (IIP) statistics*; World Bank, *Quarterly external debt statistics (QEDS)*; BIS consolidated banking statistics (CBS); BIS debt securities statistics (DSS); BIS exchange-traded derivatives statistics (XTD); BIS global liquidity indicators (GLIs); BIS international debt securities statistics (IDS); BIS locational banking statistics (LBS); BIS OTC derivatives statistics (OTCD); BIS Triennial Central Bank Survey (TRI).

International bank claims by currency and market segment[1] Graph 3



[1] International claims comprise cross-border claims and local claims (on residents) in foreign currencies (including intragroup claims). Panel B excludes intra-euro area cross-border claims. [2] Cross-border claims on residents of the currency area reported by banks abroad. [3] Cross-border claims booked by banks in the currency area on counterparties outside the currency area. [4] Claims booked by banks located outside the currency area on counterparties outside the currency area.

Source: BIS locational banking statistics.

Offshore yen claims are smaller still, and their share in total international yen claims has fallen since the GFC (Graph 3.C). The decline in part reflects the contraction, in absolute terms, in the offshore use of the yen since 2008. At the same time, cross-border lending by banks in Japan (tan area) expanded after the GFC as these banks attracted new borrowers with low yen rates. In addition, banks elsewhere have bulked up their claims on borrowers in Japan (grey area). This in part reflected off-balance sheet FX derivatives transactions whereby banks swap dollars for yen and then park the yen proceeds in safe yen assets recorded on the balance sheet (ie the cross-currency basis trade).

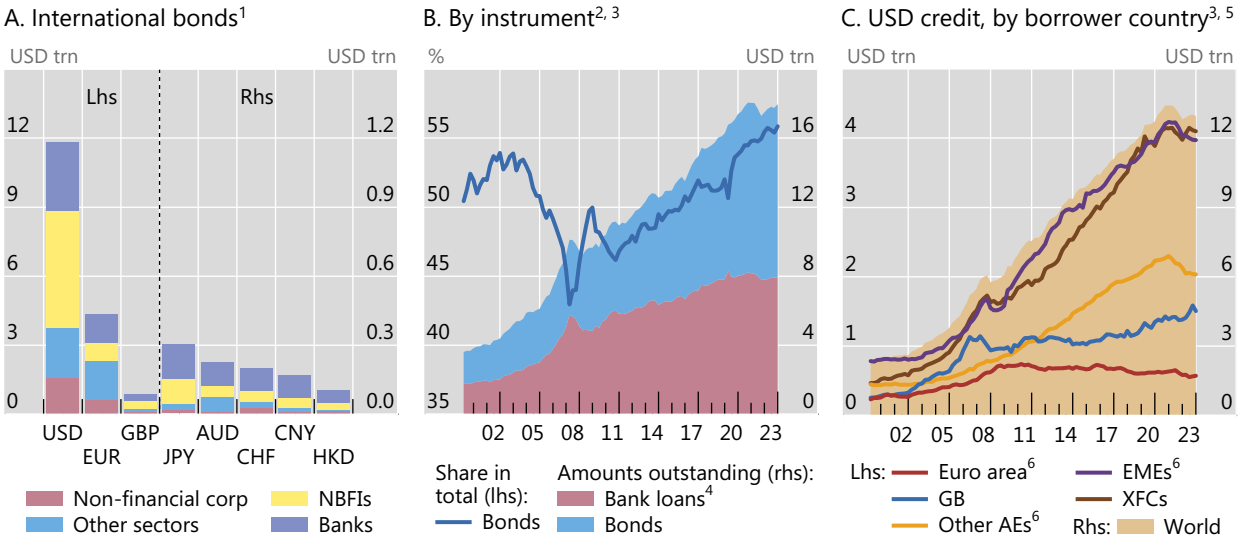
Foreign currency credit

Borrowers have options beyond international banks for raising foreign currency funding. International debt securities (IDS) are issued outside the local market of the country where the borrower resides (Graph 4.A), unlike domestic debt securities.[7] The BIS global liquidity indicators track *total* credit – ie both loans and bonds – denominated in US dollars, euro and yen to non-bank borrowers located outside the respective currency areas. These statistics reveal how borrowers' mix of loan and bond financing responds to borrowing costs and international market developments. Indeed, bond markets have eclipsed banks in the post-GFC period as a source of funding (Graph 4.B).

[7] A debt security is included in the IDS statistics if the residence of the immediate issuer differs from the location of the issue's registration, the governing law or the listing location. The classification does not depend on the currency of denomination or on the nationality of the issuer.

Foreign currency credit to non-banks

Graph 4



[1] Amounts outstanding at end-2023. [2] Foreign currency credit denominated in US dollars, euro and yen to borrowers outside the United States, euro area and Japan, respectively. [3] Credit to non-banks, as estimated in the BIS global liquidity indicators. Non-banks comprise non-bank financial entities, non-financial corporations, governments, households and international organisations. [4] Loans by LBS-reporting banks comprising cross-border and local loans. [5] Foreign currency credit denominated in US dollars to borrowers outside the United States. [6] Excluding those in the cross-border financial centres (XFCs) group; see technical annex. Other AEs = other advanced economies.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS global liquidity indicators; BIS locational banking statistics (LBS).

Prior to the GFC, foreign currency credit expanded rapidly, mostly to borrowers in advanced economies in the form of dollar- and euro-denominated loans (Graph 4.B). Light regulation of banks' leverage and accommodative monetary policy facilitated this expansion, which saw the share of bonds fall.

In the aftermath of the GFC, overall foreign currency credit growth slowed, and borrowers shifted to bond market credit (Graph 4.B). This came as banks retrenched after the GFC and remained constrained by tighter regulation and the drag from the euro area debt crisis. The expansion in dollar credit after 2010 was mainly to borrowers in EMEs and financial centres (Graph 4.C), amidst loose US monetary policy and strong incentives for investors to search for yield.

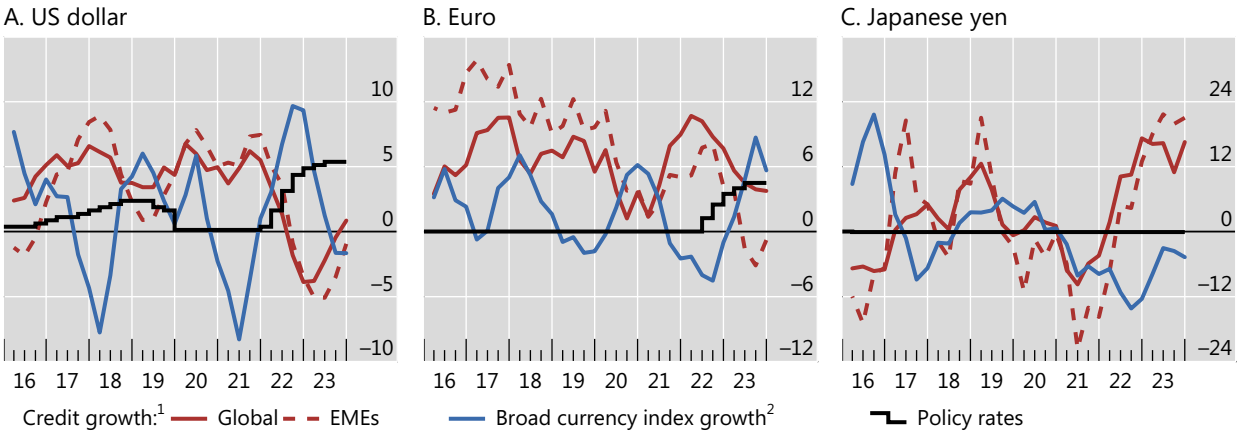
The macro-financial environment has recently undergone another major shift. The global surge in inflation since 2021 triggered a rapid monetary tightening worldwide, which ended the post-GFC low-for-long regime. US interest rates rose earlier and faster than those of other major currencies, and the dollar reached new heights (Graph 5.A). The euro also appreciated after the European Central Bank embarked on its tightening cycle (Graph 5.B). By contrast, the Bank of Japan's commitment to monetary easing and protracted depreciation have made the yen a preferred funding currency (Graph 5.C).

The growth in foreign currency credit has responded to these policy and exchange rate changes, exposing borrowers, especially in EMEs, to global factors (Graph 5). Since 2016, dollar credit to borrowers outside the United States tended to slow by 0.8 percentage points (ppt) when the federal funds rate rose by 1 ppt, or by 0.5 ppt when the broad dollar index appreciated by 1% (Graph 5.A). These co-movements have strengthened since end-2021, with credit to EMEs becoming more sensitive. Dollar strength can hurt dollar borrowers through the financial channel of exchange rates (Bruno and Shin (2015), Obstfeld and Zhou (2022)).

Credit growth, exchange rates and policy rates

In per cent

Graph 5



[1] Foreign currency credit denominated in the specified currency to non-bank borrowers outside the United States, euro area and Japan, respectively. Year-on-year growth based on changes adjusted for breaks in series and exchange rate fluctuations. [2] Year-on-year growth rate of nominal effective exchange rate index for dollar, euro and yen. An increase indicates appreciation of the currency.

Sources: BIS effective exchange rates; BIS global liquidity indicators; BIS policy rates.

Foreign exchange markets

The largest market for borrowing dollars is the FX derivatives market. Outstanding FX derivatives – comprising mainly FX swaps, currency swaps and outright forwards – surpassed $100 trillion at end-2023 (Graph 6.A).[8] This roughly matched global GDP in 2023 ($105 trillion) and was four times global trade ($24 trillion). The churn of new deals surpassed $5 trillion per day in 2022. The dollar is the vehicle currency of choice – it was on one side of 90% of all FX derivatives trades.

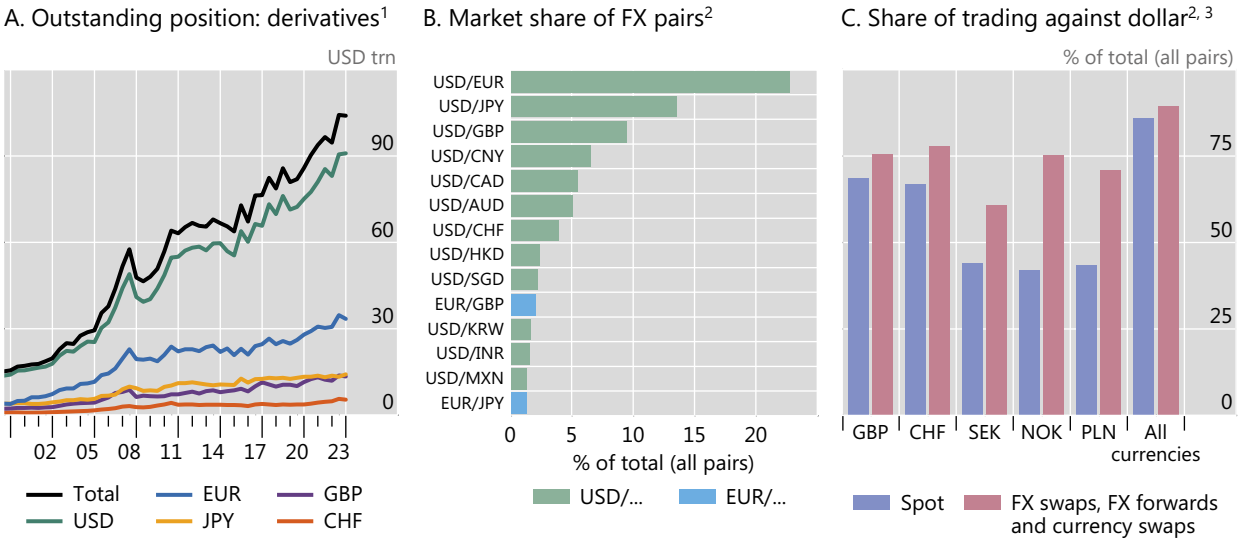
Dollar dominance in FX derivatives is associated with the role of the dollar in international trade and as the main funding currency in global capital markets (Shin (2023)). Financial firms that manage asset portfolios and many non-financial corporates involved in international trade have a structural demand for dollar borrowing via FX derivatives to hedge exchange rate risk in their dollar portfolios and trade receivables (Borio et al (2017)). The bulk of the $56 trillion in dealers' outstanding positions with customers at end-2023 were with other financial firms, mainly non-bank financials such as pension funds and insurance companies.

The dollar's unrivalled dominance in FX markets is evident in the way it trades against specific currencies. The dollar was on one side of the top nine currency pairs, with USD/EUR trades alone accounting for 23% of global turnover (Graph 6.B). Notably, the dollar is dominant even in trades that involve the currencies of countries that border the euro area (Graph 6.C). These currencies trade substantially against the euro in the spot market, so that their dollar shares are lower than the global average (purple bars). Even so, for each currency shown, the dollar share in FX swaps/forwards trading (red bars) is more than half and higher than in the spot market.

[8] In an FX swap, two parties exchange currencies in the spot leg and reverse the trade at a future date at a pre-agreed exchange rate. Once the spot leg occurs, the remaining leg of the FX swap is indistinguishable from an outright FX forward. Currency swaps are FX swaps with a maturity longer than one year in which coupons are also exchanged.

Currency pairs in FX markets

Graph 6



[1] Outstanding FX swaps, outright forwards and currency swaps with the currency listed in the legend on one side. Sum of outstanding positions across currencies equals twice the overall total. [2] Shares of average daily turnover of FX instruments in April 2022; adjusted for local and cross-border inter-dealer double counting (ie "net-net" basis). [3] Selected European currencies, with the US dollar on one side.

Sources: BIS OTC derivatives statistics; BIS Triennial Central Bank Survey, 2022.

The international use of currencies – implications

Currency composition shapes the interplay between exchange rates, balance sheet valuations and vulnerabilities in countries' external positions. Some implications are macroeconomic in nature. For instance, when trade is invoiced in dollars, it is the dollar exchange rate rather than that with other trade partners that determines pass-through to inflation (Boz et al (2022)). Trade invoicing practices also shape the composition of official reserves (Ito and McCauley (2019)). Other implications are financial in nature, eg when foreign currency debt in key currencies exposes debtors and creditors to policies and exchange rates in major economies.

This section discusses policy-relevant topics in international finance where a currency dimension in the statistics is essential. It covers the role of foreign currency debt of emerging markets, the geography of banks' foreign currency liabilities and the hidden dollar debt arising from FX derivatives.

Foreign currency debt of emerging markets

Exchange rate movements impart large valuation effects on amounts outstanding, swaying countries' external positions. A currency breakdown is thus crucial for assessing movements in countries' external positions.[9] For most countries, the currency composition of external assets and liabilities differ. The United States, for instance, holds foreign currency assets but borrows mainly in dollars; its net external position thus improves as its currency depreciates. Countries that are net dollar

[9] Changes in external positions arise from changes in holdings, asset prices or exchange rates.

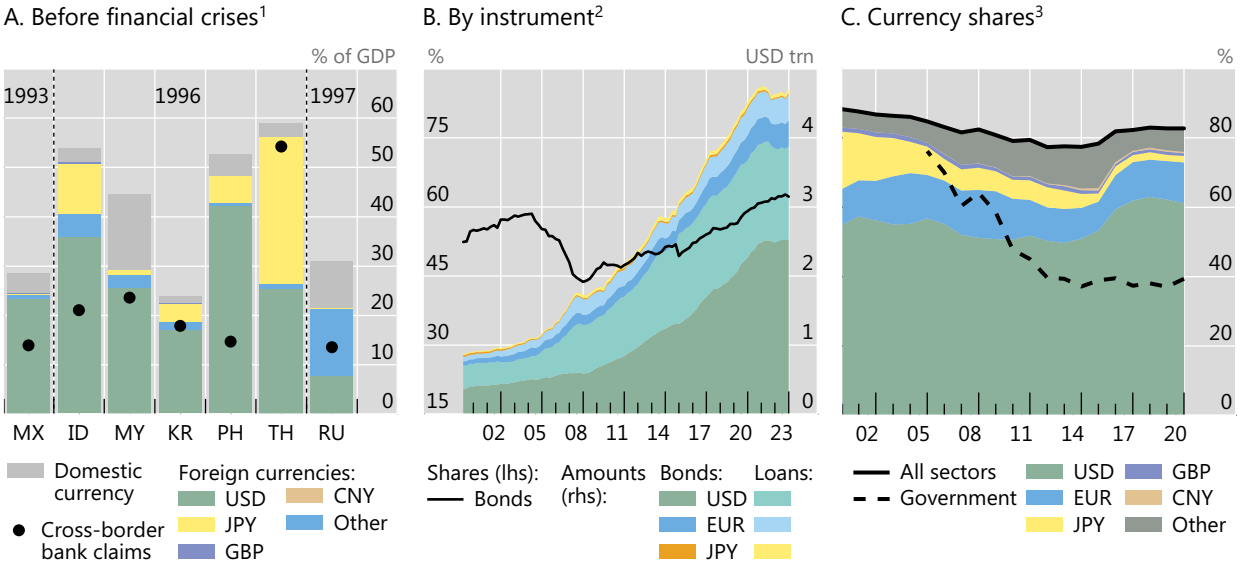
lenders, on the other hand, see their external position deteriorate when the dollar weakens. Dollar strength, eg due to the flight to safety in crises, reverses these valuation effects, hurting net dollar borrowers.

Countries borrowing abroad in major currencies are most exposed to currency risk, ie the risk associated with exchange rate movements. The cost of borrowing in foreign currency depends not only on interest rates set by the currency-issuing country, but also on exchange rates: borrowers face the risk of their currency depreciating against the funding currency.[10] Given the dollar's prominence, a stronger dollar tends to raise the burden of debt. Many EME crises have occurred during periods of dollar strength.

The perennial vulnerability of foreign currency debt has morphed over the decades. In the 1980s, dollar lending to governments fuelled the Latin American debt crisis. Reliance on foreign currency debt was similarly central to the crises of the 1990s (Graph 7.A), with corporate borrowing playing a greater role. Prior to the Asian financial crisis, foreign currency debt accounted for about 50% of GDP in Thailand, Indonesia and the Philippines. Several EMEs in Asia borrowed heavily from banks (black dots), as Latin America had in the 1980s. In the GFC, banks' own foreign currency funding needs took centre stage (see below). After the GFC, non-banks in EMEs increasingly met their foreign currency needs from bond markets (Graph 7.B).

External debt of emerging market economies

Graph 7



[1] External debt liabilities in the year before crisis, from Allen et al (2023), with adjustments for Thailand. Cross-border bank claims are claims of LBS-reporting banks on all sectors in the countries shown on the x-axis. [2] External debt of non-banks, estimated from the BIS global liquidity indicators. Shares of bonds refer to the share in the total amounts of foreign currency debt denominated in USD, EUR and JPY. [3] Shares of foreign currency debt in external debt are aggregated across 29 EMEs covered by Allen et al (2023). The dashed line measures the foreign currency share for government bonds held abroad (weighted average), from Onen et al (2023).

Sources: Allen et al (2023); Onen et al (2023); BIS global liquidity indicators; BIS locational banking statistics; authors' calculations.

[10] In principle, expected currency movements should offset interest rate differentials – a relationship known as uncovered interest parity (UIP). In practice, UIP often fails due to various factors such as risk, uncertainty, transaction costs, market inefficiencies and behavioural factors.

Since the 1990s, many countries have made efforts to reduce their dependence on foreign currency funding. The sovereigns in major EMEs, in particular, have increasingly borrowed in their own currency (Graph 7.C, dashed line) by attracting foreign investors to their domestic bond markets (Onen et al (2023)). Other sectors continue to depend on foreign currency debt (solid line).[11] Overcoming this dependence, or "original sin", hinges in part on sound policies, deeper domestic markets, and strong institutions and fundamentals in EMEs. But progress has been hampered by global factors as well as by lenders who prefer to hold assets in dollars or in their own currency to avoid exposure to currencies that are costly to hedge (Maggiori et al (2020)). Indeed, "home bias" often reflects "home currency bias".

Foreign currency funding in international banking

Global banks manage currency risk by funding foreign currency assets with foreign currency liabilities or via FX derivatives. In either case, banks incur foreign currency payment obligations that must be repaid or rolled over into new contracts. The LBS has some of the breakdowns required – by currency, by bank nationality and booking location – for monitoring banks' on-balance sheet foreign currency assets and liabilities at the global level. Banks' foreign currency needs can be assessed from a nationality perspective, ie by grouping their operations based on the country of headquarters (McGuire and von Peter (2012), McGuire et al (2024)).

The dollar positions of non-US banks are a case in point. Their on-balance sheet dollar liabilities surged ahead of the GFC and later plateaued below the 2008 peak until 2016 (Graph 8.A). This mainly reflected a global retrenchment by European banks – they accounted for roughly two thirds of the total at end-2007 but for less than half by end-2023. The growth in non-US banks' dollar liabilities since the GFC has been driven mainly by banks from Canada, Japan and EMEs.[12] By end-2023, non-US banks' combined dollar liabilities had reached $21 trillion. Their off-balance sheet dollar obligations via FX swaps are estimated to be roughly double that (see below).

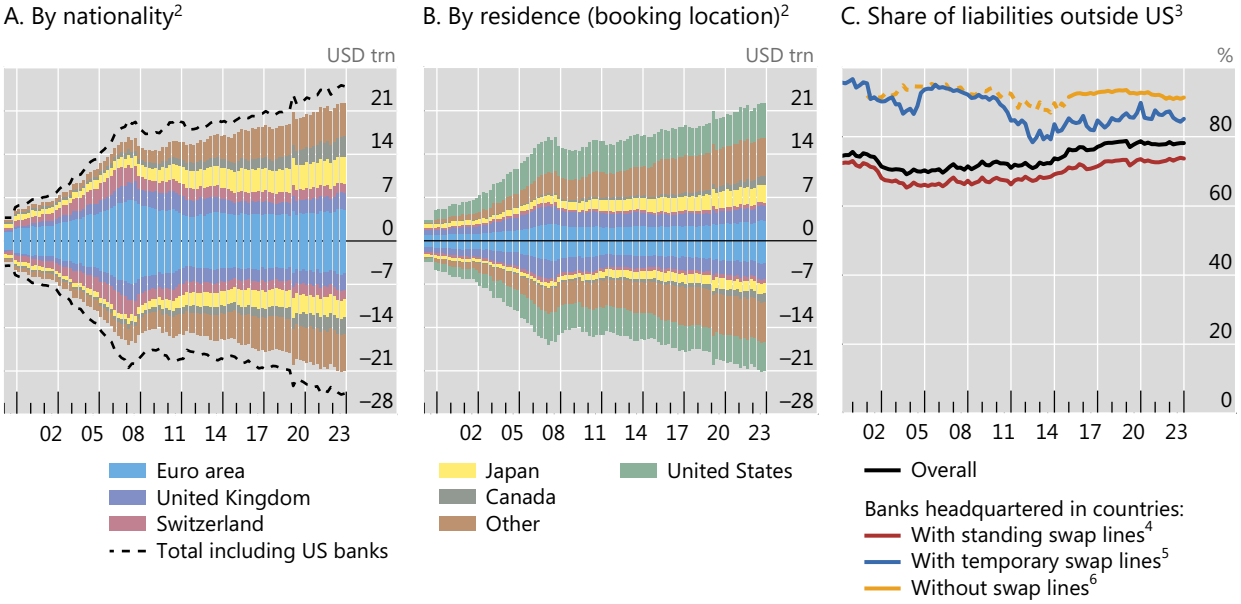
Non-US banks use their offices around the globe to source dollars and transfer them where needed using internal markets (Graph 8.B). Just under a quarter of their dollar liabilities are booked at their affiliates in the United States, where dollar funding markets are deep and banks have access to facilities at the Federal Reserve (Graph 8.C). The other three quarters, or $16 trillion, are recorded on the balance sheets of offices outside the United States where direct access to dollar liquidity is more limited.

Short-term funding markets, eg for commercial paper, repos and FX swaps, are subject to squeezes, as happened during the GFC and again in March 2020. These episodes were particularly acute for non-US banks, as the US dollar is a foreign currency for them. Such banks had to pay a premium to roll over their short-term dollar funding, if they could borrow at all (Baba et al (2009), Eren et al (2020)). Extraordinary policy measures in the form of central bank swap lines were needed to restore market functioning. These enabled the Federal Reserve to provide dollars to

[11] The share of domestic currency in external debt has risen over the past two decades, but 80% of external debt was still in foreign currencies as of 2020. External liabilities more broadly exhibit a greater shift towards domestic currency, mainly due to the expansion of non-debt liabilities (with equity and FDI equity both treated as domestic currency instruments in Allen et al (2023)).

[12] Chinese banks' worldwide positions are only partially captured; China reports banks' cross-border positions but not local positions vis-à-vis residents of China.

Non-US banks' US dollar-denominated positions[1] Graph 8



[1] Banks' intragroup positions are included. [2] Claims (positive bars) and liabilities (negative bars) vis-à-vis all sectors. For US banks in Panel A, includes cross-border positions and local positions booked outside the United States. [3] Share of banks' liabilities booked outside the United States in their total liabilities. [4] Banks headquartered in euro area, CA, CH, GB and JP. [5] Banks headquartered in AU, BR, DK, KR, MX, NO and SE. [6] Banks headquartered in other jurisdictions as reported in the BIS international banking statistics. The break in Q4 2015 is due to the inclusion of China and Russia in the BIS reporting population.

Sources: BIS consolidated banking statistics; BIS locational banking statistics; authors' calculations.

select central banks (in exchange for their currencies) to be on-lent to borrowers in need of dollars. This framework provided access to dollars to banks accounting for roughly $11 trillion of dollar liabilities booked outside the United States.

FX derivatives and missing dollar debt

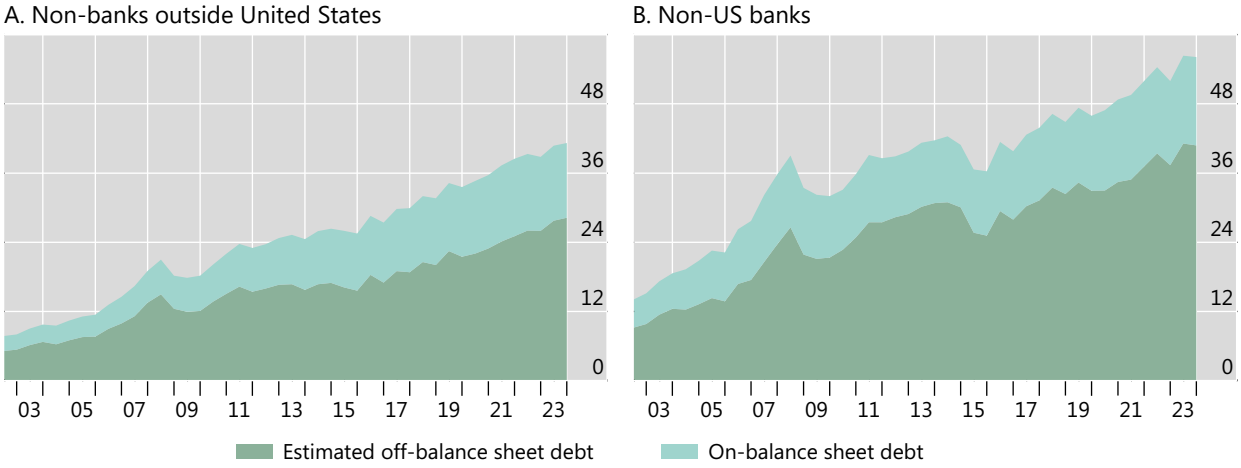
Dollar dominance in FX derivatives implies that off-balance sheet dollar payment obligations build up, which can contribute to maturity mismatches and thus liquidity strains. Unlike most other derivatives, FX swaps and forwards involve large payments, because the contracting parties exchange the full principal (notional) value. And in contrast to other forms of collateralised debt (eg repo), these payment obligations are not reflected on the balance sheet and are thus "missing" in standard debt statistics (Borio et al (2017)).

The dollar obligations from FX derivatives are staggering, yet the location and identity of the obligors remain opaque (Borio et al (2022)). Dealer banks had $91 trillion in outstanding FX derivatives positions with the dollar on one side at end-2023, of which $56 trillion was with customers. Allocating these obligations to particular countries is not possible with the available data, leaving measures of countries' external foreign currency debt incomplete. However, estimates following Borio et al (2017) suggest half of that (ie $28 trillion) is *owed* by customers, mostly non-banks outside the United States that borrow dollars to hedge trade receivables and investments. This amount is roughly *double* their on-balance sheet dollar debt (Graph 9.A). For their part, banks headquartered outside the United States had an

Missing US dollar debt in FX derivatives[1]

In trillions of US dollars

Graph 9



[1] Estimates of the off-balance sheet debt derived as in Borio et al (2017, 2022). Positions are corrected for inter-dealer double-counting but do not factor in any bilateral netting of payment obligations allowable under supervisory and/or accounting methodologies.

Sources: US Office of the Comptroller of the Currency; Dealogic; Euroclear; LSEG; Xtrakter; national data; BIS consolidated banking statistics; BIS locational banking statistics; BIS OTC derivatives statistics.

estimated $41 trillion in off-balance sheet dollar debt, compared with $15 trillion on their balance sheets (Graph 9.B).

Conclusion

The use of a few key currencies in international finance far outstrips their issuer country's share in global economic activity. The US dollar dominates in both absolute and relative terms in most international financial markets. This stems mainly from its use *offshore*, ie in transactions involving parties outside the United States. Other major currencies such as the euro, yen and pound have smaller international footprints.

Since currency denomination shapes capital flows, policy decisions taken in key currency areas spill over to the rest of the world. This has implications for the sustainability of foreign currency debt in emerging markets, for the stability of global funding markets in key currencies, and for the build-up of off-balance sheet foreign currency payment obligations. These pose policy challenges related to the provision of foreign currency liquidity in jurisdictions that lack direct access to central bank liquidity facilities in key currencies.

Identifying and addressing these challenges requires global data that have a currency dimension, covering both on- and off-balance sheet positions. BIS statistics provide good coverage in some areas of international finance, particularly for global banks' currency positions. Yet key data gaps remain, in particular the geography and currency denomination of off-balance sheet payment obligations and the role of non-bank financial institutions in the international domain. The BIS is working with central banks and other authorities to close these data gaps.

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Technical annex

Graph 1: Computation of currency shares: A currency's *international share* is its share in inward, outward and offshore activity as a percentage of all currencies' activity in those segments. A currency's *offshore share* more narrowly measures its use in activity between non-residents of the currency area. The estimates and interpretation of these shares differ for each data set, depending on which segments are visible in the available data. For instance, the BIS LBS have the dimensions needed to measure these shares. In statistics with less bilateral information, the currency shares have to be approximated (or omitted) in Graph 1.

- **Trade invoicing** is based on estimated invoicing shares of imports and exports in 2022 (based on Boz et al (2022)), scaled by trade flows from IMF Direction of Trade Statistics. Data are available for USD, EUR, other foreign currencies and the domestic currency of each country.
- **FX reserves** from IMF COFER are official reserves holdings at end-2023, available for eight major currencies and all other currencies combined. International shares are percentages of a currency in allocated reserves.
- **External debt** from Allen et al (2023) is external debt liabilities, comprising portfolio debt, FDI debt and other investment liabilities, at end-2020. Data cover USD, EUR, GBP, JPY, CNY and the domestic currency of each country.
- **Int'l bank claims** are from the BIS LBS by residence, end-2023, namely international claims reported by banks in BIS reporting countries on all counterparty countries, covering five key currencies (Box Table A) and CNY.
- **Int'l bonds** are from the BIS IDS statistics, amounts outstanding at end-2023.
- **IRD turnover** is the average daily turnover in OTC interest rate derivatives, in April 2022, from the 2022 Triennial OTC Survey (net-net basis).
- **FX turnover** is the average daily turnover in all FX instruments (spot and FX derivatives) in April 2022, from the 2022 Triennial OTC Survey (net-net basis). Shares add up to 200% since FX transactions involve two currencies.
- **SWIFT** is the 2023 average of currency shares in international payments excluding intra-euro area payments.

Graph 4: Cross-border financial centres comprise the following 23 jurisdictions, as defined in P Pogliani, G von Peter and P Wooldridge (2022): "The outsize role of cross-border financial centres", *BIS Quarterly Review*, June, pp 1–15. BH, BM, BS, CW, CY, GG, GI, HK, IE, IM, JE, KY, LR, LU, MH, MT, MU, NL, PA, SG, SM, VG and VU. The names of jurisdictions corresponding to ISO codes are provided under the Abbreviations on page iv to vii.

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International finance through the lens of BIS statistics: bank exposures and country risk[1]

The BIS consolidated banking statistics (CBS) are one of the few data sets to provide banks' consolidated exposures to individual countries. The consolidated perspective shifts the focus from where *banking activity takes place to* who *drives this activity and bears the risks. Originating after the Latin American debt crisis of the 1980s, the CBS provide the most comprehensive measures of banks' consolidated exposures to countries and sectors. They have helped policymakers, market participants and researchers understand bank exposures, country risk, and how financial stresses spill over from one country to another.*

JEL classification: F23, F31, F36, G15.

Sovereign defaults, sanctions, payment moratoriums, financial and economic crises, wars and natural disasters: all such events have macroeconomic consequences that expose creditor banks to potential losses. The largest global banks operate in scores of countries; their balance sheets straddle national borders. A bank's capital will be affected by losses no matter where they happen. Moreover, losses on exposures to one country can have implications for borrowers elsewhere, as banks adjust their global balance sheets in response. Understanding how stresses propagate through banks' balance sheets across countries is a key aspect of financial stability analysis. Data on the geography – ie country and sector – of banks' global exposures are a critical input that is unavailable in most bank disclosures.

This feature is a primer on how BIS international banking statistics can be used to understand the geography of banks' country exposures. Examples include Japanese banks' global expansion in the 1980s; European banks' retrenchment after the 2007–09 Great Financial Crisis (GFC) and the 2010–12 euro area sovereign debt crisis; and, more recently, banks' unwinding of exposures to Russia after the sanctions imposed in 2014 and 2022.

Understanding such developments requires statistics that capture the *geography* of banks' *consolidated* worldwide exposures. These should reveal the countries to which banks are exposed, and the countries in which they operate. The long list of

[1] This is the third feature in a series showcasing the BIS international banking and financial statistics, following McGuire et al (2024a, 2024b). We thank Iñaki Aldasoro, Douglas Araujo, Stefan Avdjiev, Claudio Borio, Gaston Gelos, Robert McCauley, Swapan-Kumar Pradhan, Andreas Schrimpf and Hyun Song Shin for their helpful comments, and Jhuvesh Sobrun for excellent research assistance. The views expressed are those of the authors and do not necessarily reflect those of the Bank for International Settlements.

Key takeaways

- *The BIS consolidated banking statistics (CBS) track banks' exposures to country risk, ie the risk arising from macroeconomic events or policies in a given jurisdiction.*
- *The CBS are compiled following supervisory practices, and thus provide information about on-balance sheet positions as well as other potential off-balance sheet exposures.*
- *Consolidation in the CBS shifts the focus from where banking activity takes place to who drives this activity. The CBS reveal the size, type and evolution of banks' exposures to countries.*

credit events and crises since the 1970s are recurrent reminders of the need to measure banks' exposure to *transfer risk* – the risk of non-payment by obligors in a particular jurisdiction due to policies taken in that jurisdiction – and to *country risk* more generally – the risk associated with the economic, business, political and social environment in which the debtor operates.

While supervisory authorities monitor the geography of individual home banks' exposures, the BIS consolidated banking statistics (CBS) provide a global view. Consolidation follows the contours of the banks' global balance sheets, including those of affiliates abroad, and allocates all positions to the country of banks' headquarters (ie home country) where decisions that affect the whole balance sheet are made (eg *French* banks). Intragroup positions are netted out, leaving only positions with unaffiliated entities. This makes the CBS ideal for measuring banks' financial exposures. The CBS thus complement residence-based banking statistics (eg banks *located in* France) by revealing *who* drives changes in global banking positions.

The CBS are a key input for various areas of policy interest. First, for more than four decades, they have been a primary tool to assess banks' aggregate potential losses. They complement micro-level supervisory data and facilitate analysis of how crises spill over across borders. Moreover, the CBS have in some cases yielded early warnings of perceived changes in borrowers' creditworthiness. As concerns about country risk mount, banks may seek third-party guarantees before rolling over maturing credits, hedge their exposures in derivatives markets or curtail credit to borrowers that lack corporate parent guarantees.

Second, the CBS record the *maturity structure* of banks' claims. This helps in assessing the flexibility banks have to unwind outstanding positions and provides critical information for national authorities about the risk of a sudden stop to countries' external debt flows. When global banks retrenched in the wake of the GFC, countries that had borrowed mainly short-term saw outsize contractions in credit.

The CBS thus shed light on the way banks adjust their exposures in response to material changes in country risk. For instance, as Greece's credit rating fell in 2010, banks shed exposures to borrowers in Greece and transferred risk out of the country. In 2022, cross-border claims and guarantees on entities in Russia also declined substantially, more so than the local operations of foreign banks in Russia.

The feature proceeds as follows. The first section covers the origin of the CBS and the underlying concepts (further detailed in a box and the annex). The second and third sections examine concentration in banking and the measurement of country risk. The fourth section explores how the CBS are useful in analyses of policy-relevant topics. The final section concludes.

Origin and evolution of the CBS

The origin of the CBS lies in the expansion of international banking activity in the Caribbean and other financial centres in the 1970s, when little information was available about such activity. Many central banks had for decades collected residence-based data to compile the BIS locational banking statistics (LBS). They directed banks to report claims – ie loans, holdings of debt securities and other financial instruments – booked at offices abroad with those of their head offices. Banks began reporting claims with maturity and geographical breakdowns, although only vis-à-vis emerging market economies (EMEs).[2]

The evolution of the CBS has followed the lessons from the history of financial crises (Caruana (2017)). The collection was formalised in response to the Latin American debt crisis in the 1980s. At the time of the Mexican sovereign default in 1982, attention was focused on **transfer risk**, ie the risk associated with policy measures with a territorial scope that prevent the withdrawal of funds from a country, such as capital controls and payment moratoriums (McGuire and Wooldridge (2005)). Banks were asked to fully consolidate their *foreign claims* – ie claims on borrowers residing outside their home country – with inter-office positions netted out. This measure includes cross-border claims as well as *local claims* – ie claims of a bank's foreign affiliate on residents of the host country. This approach differs substantially from the LBS and other data sets used in international finance that aggregate balance sheets from a (residence-based) national accounts perspective rather than (consolidated) supervisory perspective.[3] The BIS first published the CBS on an *immediate counterparty basis* (CBSI) in 1983 based on data reported by 15 countries (see technical annex), with claims broken down by the country where the contractual borrower resides.

With the Asian financial crisis of 1997–98, attention shifted from transfer risk to the broader concept of **country risk**, which refers to country-wide events (eg economic, political, social) that could expose banks to losses. Measurement of country risk exposures requires more comprehensive data than for transfer risk exposures. For example, guarantees and collateral received that offset exposures can lower banks' exposure to country risk. At the same time, banks' have *potential* exposures which are not included in claims that can increase exposure to country risk.

The CBS were thus adjusted to provide more information that better reflected banks' approach to risk management. This included reporting of guarantees received and other credit enhancements that result in the reallocation of exposures from the country of the immediate counterparty to that of the ultimate obligor (see box).[4] In addition, in response to banks' growing derivatives and asset management business,

[2] To be precise, banks reported their claims on borrowers residing in non-reporting countries, most of which were EMEs. This feature uses "emerging market economies (EMEs)" as a short form for *Emerging markets and developing economies*, the set of economies not classified as advanced economies (AEs) in the BIS country grouping convention.

[3] Banks' public financial statements usually itemise their consolidated balance sheet by instrument but often lack information on country exposures. By contrast, the EU-wide transparency exercise conducted by the European Banking Authority details banks' sovereign exposures by country.

[4] In addition, efforts were made to improve the timeliness, frequency and coverage of the CBS. In 2000, quarterly rather than semiannual publication began, the reporting lag was shortened, additional banking systems joined the reporting population and the counterparty country breakdown was expanded to include (from Q2 1999) all countries instead of only EMEs.

they began to separately report their derivative exposures.[5] Finally, banks began to report their potential exposures to countries in the form of undisbursed credit commitments and guarantees provided. The BIS in 2005 began publication of the CBS on a *guarantor basis* (CBSG), which captures these elements.

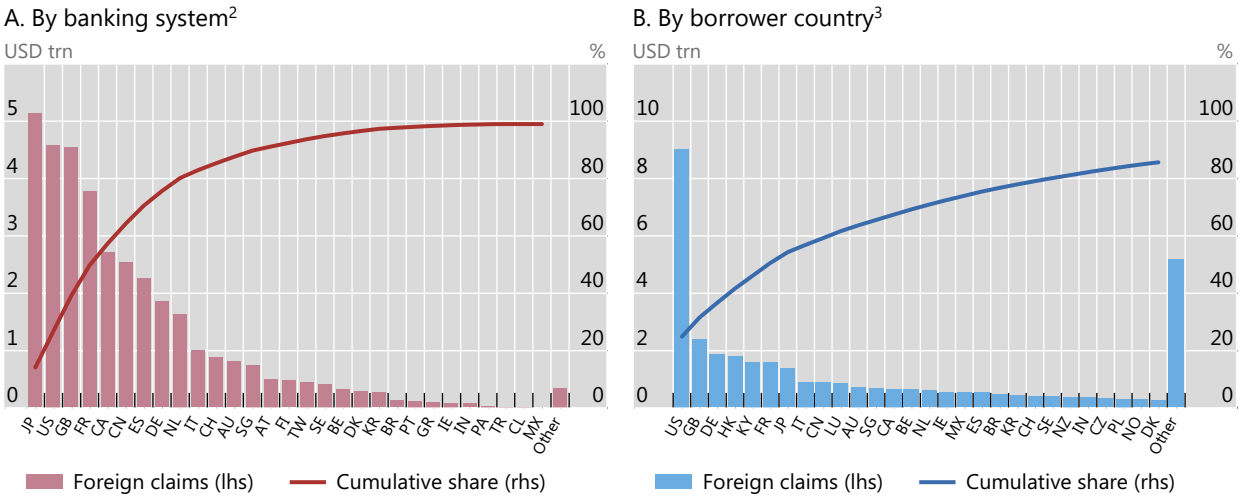
Further enhancements were introduced in the wake of the GFC, which highlighted the need for better data on major banking systems' funding and lending (Avdjiev et al (2015)). Coverage of banks' balance sheets was expanded to include their domestic positions, ie positions vis-à-vis residents of the home country. And additional granularity on the sector of banks' counterparties was added, notably banks' exposures to non-bank financial counterparties (García-Luna and Hardy (2019)). Successive rounds of expansion thus resulted in the structure of the CBS available today (see box and annex).

Concentration in banks' country exposures

The consolidated perspective of the CBS shifts the focus from *where* banking activity takes place to *who* drives this activity. Multinational banks, like corporates, have operations in, and exposure to, countries around the world, and their decisions affect multiple economies at the same time. Thus, the country exposure of banks and the impact of corporate decisions are better understood by focusing on their consolidated balance sheets (McGuire and von Peter (2012)).

Taking a consolidated perspective reveals a remarkable degree of concentration in decision-making in international banking. Banks headquartered in a mere four countries (Japan, the United Kingdom, the United States and France) accounted for

Concentration in foreign claims at end-Q1 2024[1] Graph 1



[1] The bars show worldwide consolidated foreign claims. Foreign claims of Chinese banks are estimated from data reported in the LBS. See technical annex for details. [2] "Other" reporting countries are not shown separately due to confidentiality. [3] "Other" is an aggregate of more than 180 other countries and jurisdictions available individually.

Sources: BIS consolidated banking statistics; BIS locational banking statistics by nationality.

[5] Banks derivatives activity expanded in the 1990s (McCauley et al (2002), Domanski et al (2003)). In the LBS, derivatives are included in claims, along with loans, holdings of debt securities and other instruments. In the CBS, derivatives are reported separately from other claims (see Box A).

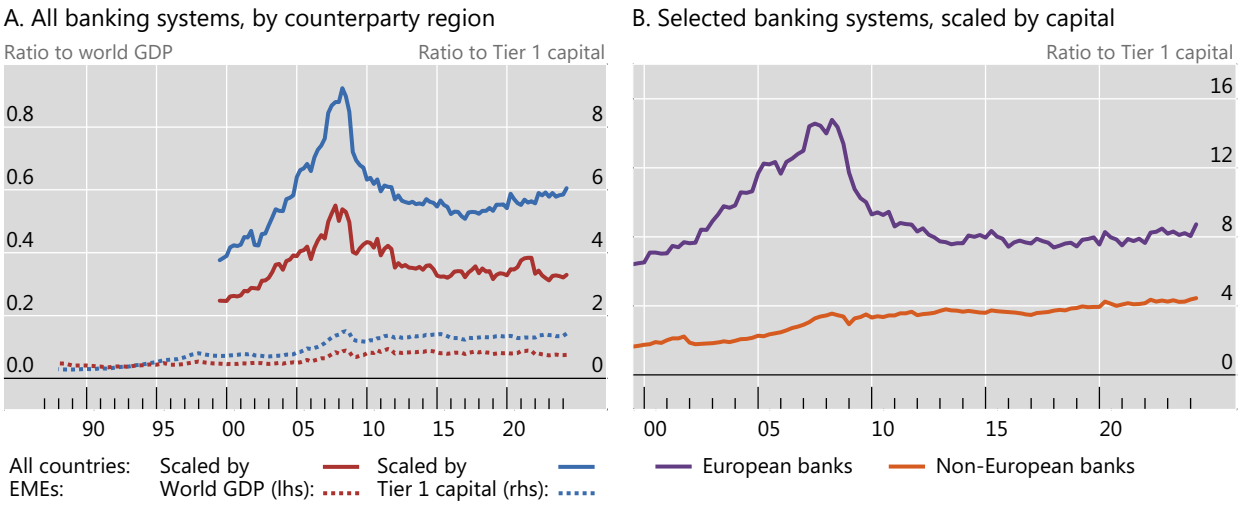
half of global foreign claims at end-Q1 2024 (Graph 1A).[6] These four countries are home to 17 of the 29 global systemically important banks (G-SIBs) that have operations in more than 160 jurisdictions. With consolidation, financial positions booked by affiliates in financial centres (eg the Cayman Islands) "disappear" as assets (and liabilities) are reallocated to the countries where the parent companies that own (owe) them are headquartered (McGuire et al (2024a)).

Foreign claims are not quite as concentrated on the counterparty side, although the United States stands out as an obligor to roughly a quarter of the global total (Graph 1.B). Claims on the United States are prominent due to the dominance of the US dollar in international finance and the size of the US economy; many non-US banks hold US Treasuries and have local operations in the United States that extend credit to corporates and other borrowers there (McGuire et al (2024b)). Claims on three financial centres, the Cayman Islands, Hong Kong SAR and the United Kingdom, are also substantial, jointly accounting for 16% of global foreign claims.[7] The remaining 59% of foreign claims are distributed across more than 200 jurisdictions.

Banks' foreign claims have evolved significantly over time, outpacing global economic activity and bank capital in some periods. In the run-up to the GFC, total foreign claims soared to more than 50% of global GDP (Graph 2.A, solid red line), which significantly stretched banks' regulatory capital bases (solid blue line). The retrenchment in the wake of the GFC reflected a massive deleveraging, mainly by European banks, and stricter regulation that required banks to hold more regulatory capital (Graph 2.B). Other banking systems, eg US, Japanese and Canadian banks, saw smaller disruptions in the trajectory of their foreign claims relative to capital.

The rise and fall of banks' foreign claims[1]

Graph 2



[1] Eleven countries did not report foreign claims (CBSI) before Q4 2000. See technical annex for details.

Sources: FitchConnect; IMF, *World Economic Outlook*; BIS banking list; BIS consolidated banking statistics; authors' calculations.

[6] Thirty-one countries report the CBS as of 2024, capturing the bulk of global consolidated banking positions. One major non-reporting country is China; a lower-bound estimate of Chinese banks' consolidated claims can be derived from the BIS locational banking statistics by nationality.

[7] Banks' exposures are fully consolidated by nationality; however, on the counterparty side, the definition of a country remains residence-based (box in McGuire et al (2024a)).

Box A

The structure of the BIS consolidated banking statistics (CBS)

*Bryan Hardy, Patrick McGuire and Goetz von Peter*①

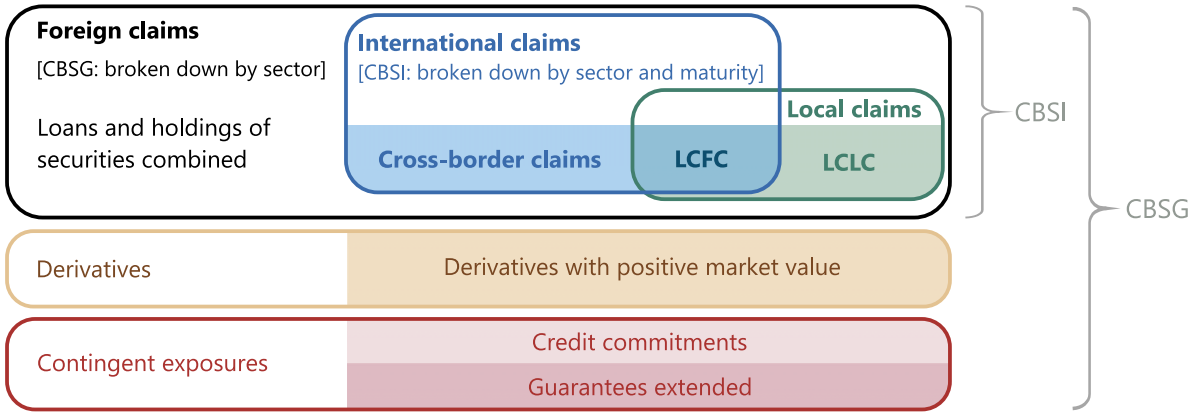
The CBS is one of the few statistical collections that provides a *geography* of banks' consolidated exposures. The statistics are compiled following supervisory principles to capture current and potential exposures to counterparties in particular countries and sectors. This box provides an overview of the structure of the CBS.

Reporting banks' positions are consolidated and then grouped by nationality, defined by the country of the supervisor of the global consolidated banking group (typically the country of headquarters). Banks report their on-balance sheet claims (assets) (Graph A1); only limited data on liabilities are collected. *Claims* comprise loans and holdings of securities (debt and equity). *Derivatives* claims are reported separately: only derivatives that give rise to a counterparty risk are reported; thus, derivative exposures are calculated as the positive market value of outstanding contracts.② Banks also report contingent exposures: *credit commitments* (eg credit lines) are irrevocable contractual obligations which, if utilised, result in the extension of a loan or purchase of a security; *guarantees extended* are contractual obligations to a third party if the bank's client fails to fulfil them.

The focus of the CBS is on *foreign claims* (FC), ie claims on counterparties outside the bank's home country. The counterparty country breakdown has been expanded over time, from emerging market economies (EMEs) since 1983 to all counterparties (more than 200 countries and jurisdictions) in 1999. In 2013, domestic claims on the home country were added, completing the worldwide consolidated view of banks' exposures.

Structure of the consolidated banking statistics

Graph A1



LCFC = local claims in foreign currency; LCLC = local claims in local currency.

Source: Authors' elaboration.

The CBS also shed light on the geography of banks' operations (Graph A1). Banks report foreign claims (FC) separately as cross-border or local, where FC = XBC + LC. Cross-border claims (XBC) are claims on non-residents booked by a bank's head office or a foreign affiliate. Local claims (LC) are those booked by a bank's affiliate on residents in the country in which the affiliate operates. Most local claims are in local currency and funded by local currency liabilities, while local claims in foreign currency are often funded from abroad in major currencies.③ Hence, foreign claims can also be split into international claims (INTC) and local claims in local currencies (LCLC), where FC = INTC + LCLC. International claims comprise cross-border claims and local claims denominated in a currency foreign to the counterparty country. For derivatives and contingent facilities in the CBSG, banks report only total exposures on a given country regardless of where these are booked.

The CBS distinguish between the residence of the immediate counterparty and that of the ultimate guarantor. The latter refers to the counterparty ultimately responsible for servicing any outstanding obligations in the event of a default by the immediate counterparty, eg a loan to a German corporate entity in Brazil is recorded as a claim on Brazil on an immediate counterparty basis (CBSI). If the German parent guarantees the

loan to the entity, the bank records a claim on Germany in the CBSG, along with an outward risk transfer from Brazil and an inward risk transfer to Germany in the CBSI.④ For any given counterparty country, CBSG foreign claims thus equal CBSI foreign claims plus net risk transfers:

Foreign claims(G) = Foreign claims(I) + inward risk transfers – outward risk transfers

Some types of claims are also broken down by maturity and by the sector of the counterparty. Counterparties are classified into the official sector (general government and central bank combined), unrelated banks or the non-bank private sector; the latter comprises non-bank financial institutions, households and non-financial corporations. Maturity information is available only for international claims (CBSI), in buckets of up to one, up to two and over two years of remaining maturity. The sector breakdown applies to international claims in the CBSI and to foreign claims in the CBSG. The technical annex elaborates on the reporting basis and valuation methods, and shows a table with the latest aggregate data covering the dimensions in Graph A1. Data availability depends on the confidentiality settings and reporting practices of individual reporting countries.

① The views expressed are those of the authors and do not necessarily reflect the views of the BIS. ② This takes into account legally enforceable bilateral netting arrangements but not collateral. Contracts with negative market value are classified as liabilities. ③ Banks also report their affiliates' local liabilities to local residents denominated in local currencies. ④ The purchase of credit default protection, and legally enforceable guarantees and collateral, if recognised as a risk mitigant under the Basel Framework, all lead to risk transfers. For every outward risk transfer there is an equivalent inward risk transfer elsewhere, so in aggregate net risk transfers should equal zero.

Measuring exposure to country risk

For monitoring exposure to transfer risk, the most appropriate data are *international claims* on an immediate borrower basis (CBSI). Transfer risk arises from both components of international claims: cross-border claims as well as local claims denominated in *foreign* currencies, which are often funded from abroad. By contrast, local claims in local currencies are usually funded by local deposits in local currency – a typically stable form of funding – and so are not affected by restrictions on external payments. This is why they are not part of *international* claims (but are part of *foreign* claims; see box).[8]

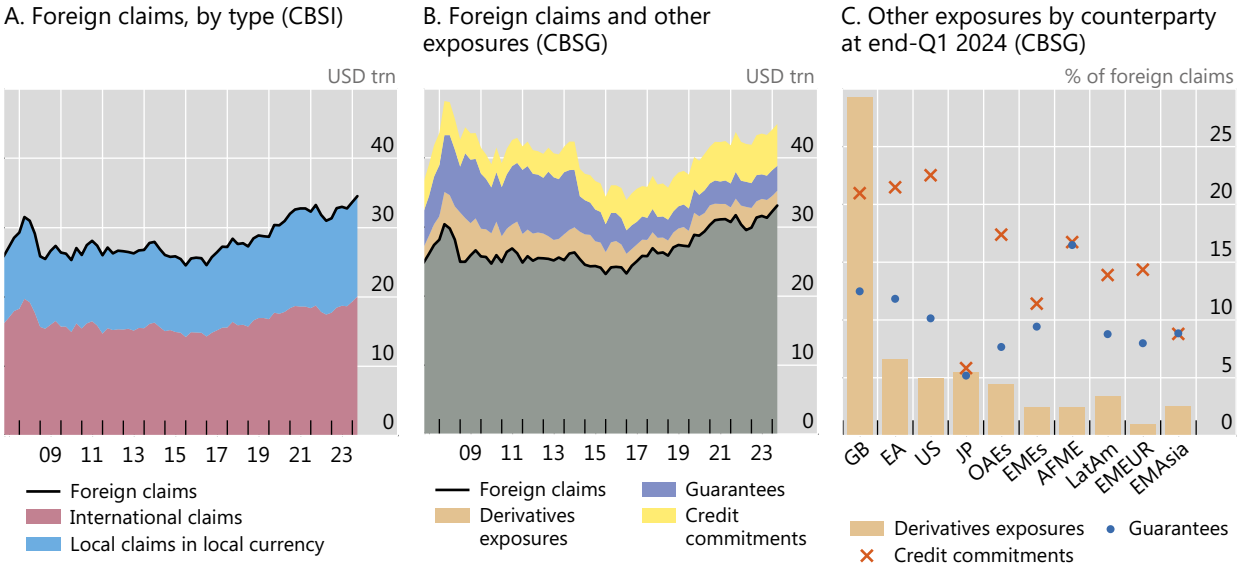
By contrast, measures of exposure to overall *country risk* should be broadened to capture all exposures, as tracked in the CBSG. Local currency claims extended locally in host countries, as well as international claims, are subject to country risk. Thus, total *foreign claims*, which include both of these components, is the more appropriate measure for country risk exposure. Foreign claims are typically 60–80% greater than international claims in aggregate, as local positions in local currency can be significant (Graph 3.A). Large international banking groups often acquire local claims by taking over domestic banks operating in a particular country.

The CBS on a guarantor basis (CBSG) captures additional exposures to country risk beyond just loans and securities holdings (ie claims). These data also include derivatives – which are reported separately from claims in the CBS – and contingent exposures. Derivatives facilitate leveraged trading; hence, small movements in the price of the underlying instrument can result in large changes in exposures. Further, borrowers may draw down lines of credit and call on guarantees provided by banks, especially in times of stress. Such contingent exposures raise banks' actual country

[8] Local claims in local currencies can be funded in foreign currency from abroad. This increases transfer risk exposures by the amount by which local claims exceed local liabilities in local currencies.

Foreign claims and other potential exposures in the CBS

Graph 3



AFME= Africa and Middle East; EA = euro area; EMAsia = emerging Asia; EMEUR = emerging Europe; LatAm = Latin America and Caribbean; OAEs = other advanced economies. CBS = consolidated banking statistics; CBSG = CBS on a guarantor basis; CBSI = CBS on immediate counterparty basis.

Source: BIS consolidated banking statistics.

risk exposure when drawn.[9] These off-balance sheet exposures add another 30% on average to aggregate foreign claims, while derivatives add 6% (Graph 3.B). For some counterparty countries, derivatives and contingent exposures can boost foreign exposures significantly, up to 63% in the case of borrowers in the United Kingdom (Graph 3.C). The outsize derivatives exposures on the United Kingdom mainly reflect the role of London as a centre for derivatives clearing.

Shifting to a guarantor basis also takes into account credit risk mitigants, eg guarantees and collateral received, and credit protection bought via derivatives. These have the effect of transferring risk from the country where the immediate counterparty resides to that where the ultimate guarantor resides. For example, if a country were to declare an external debt moratorium, then guarantees provided by the foreign parent of a borrower resident in the country (ie an outward risk transfer) can reduce a reporting bank's exposure to transfer risk. At the same time, claims on overseas affiliates of banks headquartered in the crisis-stricken country would increase a reporting bank's exposure (ie an inward risk transfer). In addition to guarantees, the purchase of credit protection (eg a credit default swap) and collateral provided by the borrower can also lead to outward risk transfers. In any case, the overall level of exposures stays the same, but the counterparty country for those exposures (and hence the transfer or country risk faced by the bank) changes.

Risk transfers in fact significantly alter the geography of banks' exposures. In March 2024, banks' claims on major financial centres (eg the Cayman Islands, Luxembourg and the United Kingdom) were some 6–15% lower once risk transfers are taken into account (Graph 4.A). This reflects the fact that many of the immediate

[9] This was the case at the onset of the Covid-19 pandemic, as firms drew down existing credit lines, which substantially increased banks' on-balance sheet claims (Casanova et al (2021)).

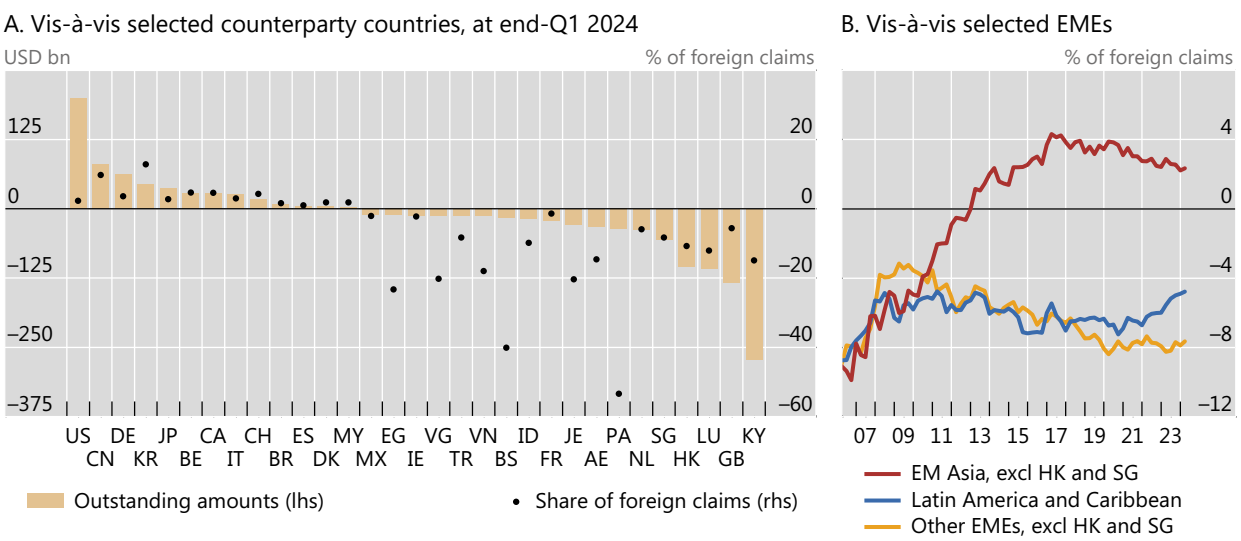
counterparties in these locations have parents elsewhere that provide guarantees to the creditor banks. These parents tend to be located in large economies (eg the United States, China and Germany) that are home to multinational firms. Accordingly, banks' positions vis-à-vis these economies on a guarantor basis (CBSG) are larger than on an immediate counterparty basis (CBSI).

Risk transfers evolve with the riskiness of borrower countries and the mix of creditor banks (Graph 4.B). They reflect the creditworthiness of counterparty countries: net inward risk transfers (and so exposures) to major EMEs tend to increase as their sovereign credit ratings improve (Aldasoro and Ehlers (2017)). The closeness of creditor banks to a region also matters. For example, reporting banks transferred around 8% of their exposures out of emerging Asia in early 2007; by 2013, they reported net transfers *into* the region (red line). Underlying this shift was a change in the composition of creditor banking systems: as European banks retreated in the wake of the GFC, banks from Chinese Taipei, Hong Kong SAR, Japan and Singapore increased their exposures to emerging Asia (Aldasoro and Ehlers (2017)).

Understanding banks' ultimate vulnerabilities to credit events in particular countries requires a deeper analysis that takes into account banks' business models (Avdjiev and Wooldridge (2018)). While a bank may have large exposures to a given country, it may have little capital at stake. For example, a multinational bank with a subsidiary in a crisis-stricken country could choose to sell the subsidiary, or even let it fail and simply write down the capital that the bank had invested in the subsidiary. In this case, the bank's exposure would be limited to its equity participation plus any intragroup funding and guarantees it provided. The decision of whether to exercise this option depends on a myriad of factors including the size of the equity stake and intragroup funding, the ownership structure (eg wholly owned or joint venture), the financial health of the overall banking group, the regulatory framework and the reputational risks associated with letting a subsidiary fail. The CBS do not provide the information needed to examine such scenarios.

Net risk transfers in international banking[1]

Graph 4



[1] Danish, Luxembourger, Mexican and Panamanian banks are excluded as they do not report net risk transfers.

Sources: BIS consolidated banking statistics; authors' calculations.

Banks' exposures and financial stability

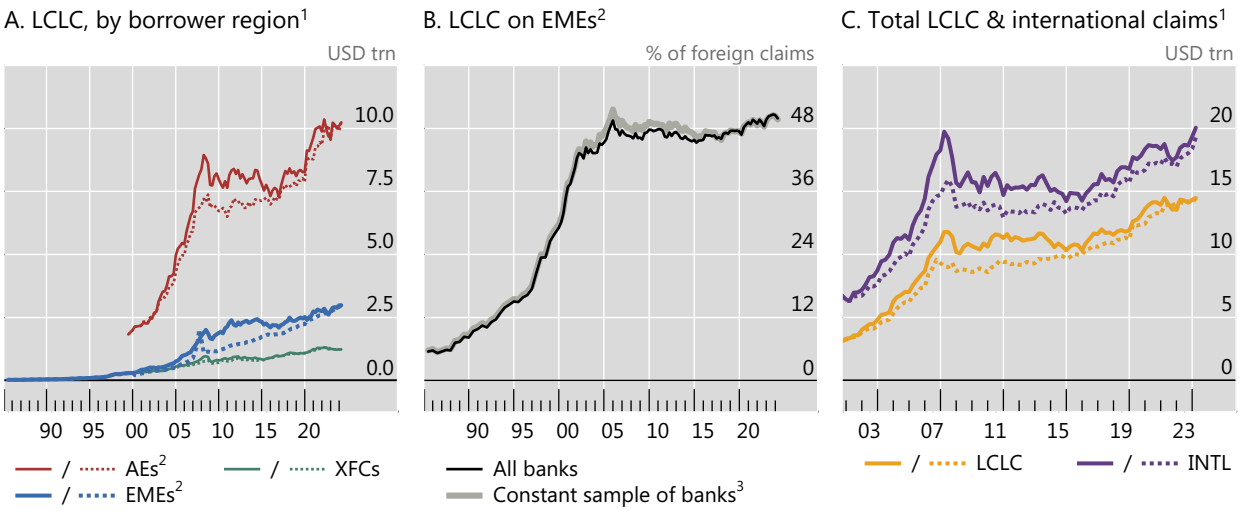
Banks' exposure to country risk comes in many forms, and banks have several options to manage it. Problems in one part of a global bank's balance sheet (eg exposure to country A) often have implications for other parts (eg lending to country B), as banks adjust their global balance sheet.[10] This section highlights cases where a consolidated view of banks' operations and exposures is essential for understanding issues of financial structure and stability.

The rise of local banking

The global operations of large banks create country exposures for the consolidated group through the local positions of their affiliates. In the 1980s, banks' exposures to EMEs were largely international claims (cross-border claims and local claims in foreign currencies), in part led by a boom in Japan and the expansion of banks headquartered there. In the 1990s and up to the GFC, major banks expanded their global operations by setting up local affiliates for local currency business in many countries. The largest offices were in advanced economies, where local currency claims grew to over $10 trillion, but operations in EMEs also steadily expanded (Graph 5.A). Such local currency positions are typically funded by local currency liabilities, so a higher share of such positions lowered banks' exposure to both transfer risk and currency risk.

The trend of global banks towards local banking in EMEs levelled off after the GFC but may again be on the rise. The share of foreign claims on EMEs that came from local offices rose rapidly from 6% at end-1985 to 50% at end-2005 (Graph 5.B). Since 2015, local and international claims have again been growing steadily to reach $15 trillion and $20 trillion at end-Q1 2024, respectively (Graph 5.C).

Local claims in local currency (LCLC) and international claims (INTL) — Graph 5



[1] Solid (dotted) lines show claims at current (constant end-Q1 2024) exchange rates. XFCs are cross-border financial centres defined in the technical annex. [2] Excludes claims on XFCs. [3] Banking systems that have reported data since 1985. See technical annex for details.

Sources: BIS consolidated banking statistics (immediate counterparty basis); authors' calculations.

[10] A wide geographic exposure also diversifies bank risk, making them more resilient to local economic shocks in host countries where they have exposure (Doerr and Schaz (2021), Aldasoro et al (2022)).

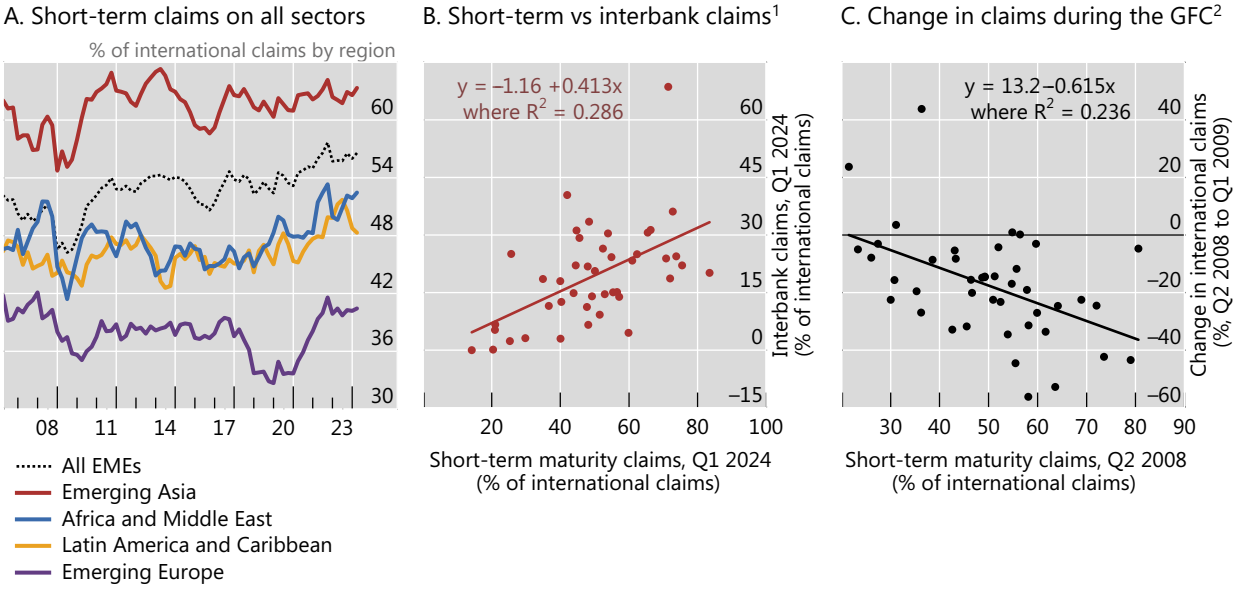
Maturity of international claims

When analysing countries' external vulnerabilities, it is important to monitor banks because of the typically short maturity of their claims. The CBS provide a maturity breakdown for international claims on individual countries, and a separate breakdown by sector.[11] This information is also useful for borrower countries, complementing International Investment Position (IIP) data to monitor risks in external positions.

The maturity of banks' exposures differs systematically across borrower countries. Claims on EMEs in Asia, for instance, tend to have a larger short-term component than those on other regions, especially emerging Europe (Graph 6.A). The differences in the short-term share have remained fairly constant over time. To some extent, the short-term share reflects the sectoral distribution of banks' claims, since interbank positions tend to be short-term (Graph 6.B).[12]

Details on the sector and maturity of bank claims provide crucial insights into banks' ability to adjust their exposure to country risk and the implications for the borrowing countries. Banks can quickly unwind their interbank positions due to their short-term nature. They can also reduce sovereign exposures by selling holdings of government bonds (possibly taking a loss on the market value), which shifts the risk to other creditors without reducing the funding obtained by the issuer.

International claims on EMEs by maturity, region and sector — Graph 6



[1] Claims of all banking systems on the 43 largest EMEs (by international claims), representing more than 90% of total international claims on all EMEs. [2] Claims of advanced European banking systems on the same 43 EMEs as in panel B.

Sources: BIS consolidated banking statistics (immediate counterparty basis); authors' calculations.

[11] Short-term international claims have a residual maturity of one year or less. Other maturity buckets are up to two years, more than two years and unclassified (eg equities and participations).

[12] The same holds for certain positions with non-bank financial institutions (NBFIs). Since the GFC, unsecured interbank lending has given way to secured lending (ie repurchase agreements), much of which are cleared with central counterparties (generally treated as an NBFI counterparty in the CBS).

The maturity of bank credit matters greatly during a crisis. The experience of EME borrower countries during the GFC illustrates this point. For many, credit from banks accounted for the bulk of their total external debt. As the GFC unfolded, European banks – saddled with losses on their real estate exposures and faced with a need to deleverage – retrenched their global positions in part by letting their short-maturity claims run off. In a sample of the top 43 EME borrower countries, a 10 percentage point higher share of short-term borrowing from European banks on the eve of the GFC (end-Q2 2008) translated into a contraction in international claims some 6 percentage points larger than otherwise (Graph 6.C). The maturity breakdown in the CBS is thus a useful barometer for how quickly bank credit can evaporate (Avdjiev et al (2018)).

Grappling with country risk

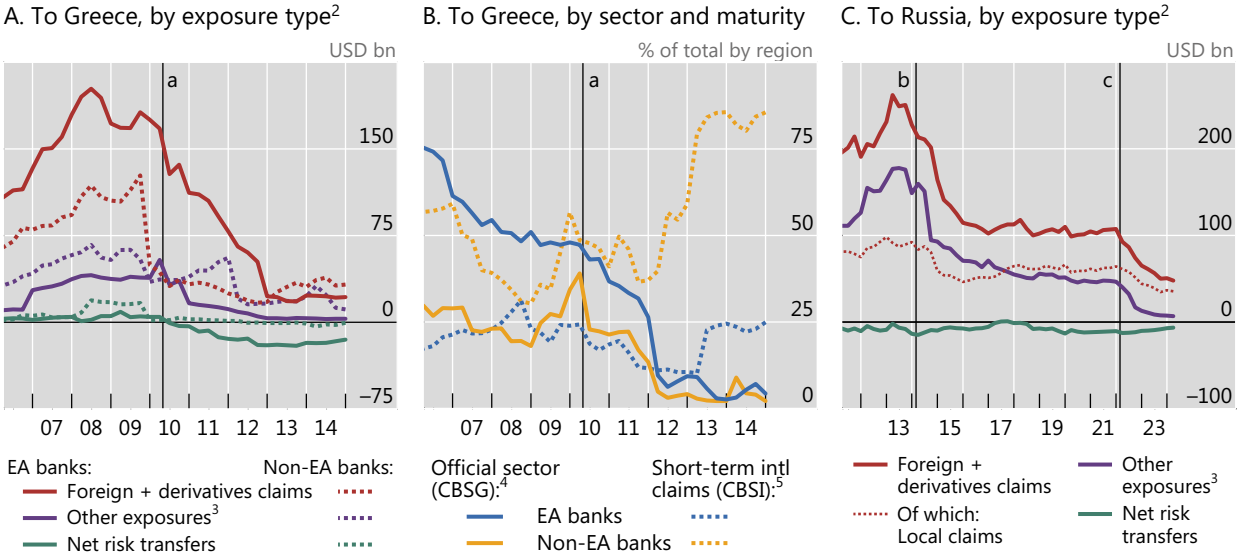
Banks have a number of different strategies to reduce exposures to risky countries. As concerns about country risk mount, banks may cut lending, seek third-party guarantees before rolling over maturing credits or hedge their exposures using derivatives. In some cases, banks may find it more cost-effective to buy protection against credit risks rather than sell their exposures outright or wait for them to mature. The CBS provide an aggregate view of these risk management strategies.

Consider banks' exposures to Greece during the euro area crisis. As Greek sovereign bonds grew risky, ultimately being downgraded to junk status in 2010, banks reacted by curtailing foreign claims on Greek borrowers, transferring risk out and decreasing other exposures like credit commitments (Graph 7.A). For banks from outside the euro area, this included selling a Greek subsidiary in 2009, as well as shedding exposures generally. By end-2011, non-euro area banks ended up with smaller exposures to Greece on their balance sheets than their off-balance sheet credit commitments and guarantees. By contrast, euro area banks had, by end-2012, shifted most of the risk from their remaining Greek exposures to other counterparties.

The sector and maturity composition of exposures to Greece shifted during this retreat. Half of euro area banks' claims were on the official sector in Q1 2010, but this share fell to nearly zero by 2012 (Graph 7.B). Non-euro area banks similarly reduced their claims on the official sector to near zero. As they cut long-term exposures, however, they increased their short-term claims. This may have reflected a high spread on such lending as well as these banks' trepidation about lingering exposure to Greek counterparties.

The Russian invasion of Ukraine and associated sanctions provide another example of banks adjusting their exposures to rising country risk. Foreign claims on Russia fell following the annexation of Crimea in 2014, and fell further after the 2022 invasion as many countries imposed wide-ranging sanctions (Graph 7.C). Risk transfers out of Russia remained relatively small during this period. While banks maintained some foreign claims, other exposures were all but eliminated. Before 2014, other exposures (notably guarantees) were as large as three quarters the size of foreign claims. However, guarantees sharply declined from Q1 2014 to end-2021, by 71% to reach $47 billion. In 2022, strict financial sanctions probably made credit commitments and guarantees incalculable, causing those on Russia to fall sharply to just 4% of their peak values. The few exposures left were mainly from banks that kept their local affiliates in Russia.

Banks' exposures to Greece and Russia[1] Graph 7



[a] Rating downgrade of the Greek sovereign debt to junk status (2010). [b] Annexation of Crimea (2014). [c] Invasion of Ukraine (2022).

[1] China does not report to the CBS. [2] On a guarantor basis. [3] Comprises credit commitments and guarantees extended. [4] As a percentage of total foreign claims. [5] As a percentage of total international claims.

Source: BIS consolidated banking statistics.

Conclusion

The history of recurrent financial crises shows that economic events in one country or region can have ramifications elsewhere. Often, stresses propagate across the balance sheets of creditor banks. This reflects the high degree of concentration in international banking and the wide geographic reach of global banks. The largest of these banks have local operations in scores of countries, but decision-making is concentrated in a select few.

Monitoring such a globalised financial system requires statistics that both reflect this concentration and capture these geographic exposures. The BIS CBS were designed with this need in mind. They allow users to evaluate how losses vis-à-vis particular countries and sectors might diminish bank capital. And supplementary information in the CBS sheds light on banks' use of guarantees, credit derivatives and collateral to shift risk away from riskier borrowers rather than winding down outstanding positions.

The CBS have been a key tool in global monitoring since the 1980s. They have been used for forensic analysis of system-level losses during the Asian financial crisis in the 1990s, the GFC in 2007–09, the European sovereign debt crisis in 2010–12 and, more recently, the Russian annexation of Crimea in 2014 and the full-scale invasion of Ukraine in 2022.

The recent rise in geopolitical tensions has sparked debate about geo-financial fragmentation, and whether the world is moving towards a multi-polar economic order (Qiu et al (2024)). Residence-based financial statistics, such as the BIS LBS and the IMF's Coordinated Portfolio Investment Survey and Coordinated Direct Investment Survey go a long way in mapping out the geography of global financial

positions, and are thus essential in monitoring financial fragmentation moving forward. The CBS complement these statistics with crucial information about which national banking systems drive this process.

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Technical annex

All graphs are based on data from the CBS reporting countries (see below for details). China does not report to the CBS.

Graph 1: The bars show worldwide consolidated foreign claims on a guarantor basis (CBSG) for 26 banking systems, and on an immediate counterparty basis (CBSI) for five banking systems that do not report the CBSG.

Graph 2: The 11 countries that started reporting foreign claims (CBSI) after Q3 2000 are AU (Q4 2000), BR (Q4 2002), CL (Q4 2002), GR (Q4 2003), IN (Q4 2001), KR (Q4 2011), MX (Q4 2003), PA (Q4 2002), SG (Q4 2000), TR (Q4 2000), and TW (Q4 2000). They accounted for 3% of total foreign claims in Q4 2000. Annual world GDP figures converted to quarterly frequency by using the end-year figure over the quarters of the same year are used.

Tier 1 capital is reported by 16 European countries (AT, BE, CH, DE, ES, FI, FR, GB, GR, IE, IT, LU, NL, NO, PT and SE) and nine non-European countries (AU, BR, CA, HK, IN, JP, KR, TW and US) in the CBS, with different reporting dates. Missing and/or confidential data are supplemented by bank-level data aggregated at the country level from FitchConnect; growth rates of FitchConnect country-level data where available are used to backdate CBS data. Tier 1 data only for countries for which foreign claims are available (and vice versa) are included.

Graph 5: XFCs are cross-border financial centres as defined in P Pogliani, G von Peter and P Wooldridge, "The outsize role of cross-border financial centres", *BIS Quarterly Review*, June 2022, pp 1–15. The XFC aggregate in Graph 5 comprises BH, BM, BS, CW, CY, GG, GI, HK, IE, IM, JE, KY, LR, LU, MH, MT, MU, NL, PA, SG, SM, VG and VU. The names of jurisdictions corresponding to ISO codes are provided under the abbreviations on pages iv–vii. Banking systems with long historical data for local claims in local currency are: BE, CA, CH, DE, ES, FR, GB, IT, JP, NL, US. For the denominator (foreign claims), all reporters are included irrespective of whether a country reported local claims in local currency.

The structure of the CBS – detail complementing Box A

This Annex complements Box A with detail on valuation and reporting practices and illustrates the structure of the CBS (Table A). See the glossary for a list of terms related to the BIS international banking statistics.

Valuation. Claims and derivatives are reported on a gross basis at fair value, or at nominal value for non-negotiable assets such as loans and deposits. Quarterly movements in outstanding stocks include changes in asset valuations or writedowns in the original currency. By contrast, credit commitments and guarantees extended are reported at face value so as to measure reporting banks' maximum possible exposure. Recording positions at face or nominal value does not take account of the likelihood of adverse circumstances (nor of the recovery value in the event of a loss). Derivative claims are calculated as the positive market value; contracts which have negative market value are classified as liabilities of the bank. Derivatives include contracts covering foreign exchange, interest rate, equity, commodity and credit risks. However, credit protection bought to hedge an outstanding claim is classified as a risk transfer, whereas credit protection sold is recorded as a guarantee.

Table A lays out the breakdowns available for two reporting bases (CBSI and CBSG) for the latest available data. Overall totals differ because the CBSI are reported by 31 countries, the CBSG by 26 countries (see "reporting countries" below).

Consolidated foreign exposures of BIS reporting banks[1] — Table A

Positions outstanding at end-Q1 2024, in billions of US dollars

	Basis for risk allocation		
	Immediate counterparty	Net risk transfers	Guarantor
By type of exposure			
Claims (loans and securities)[2]			
Foreign claims	34,539.7	–632.0	33,125.0
Cross-border claims	20,057.8 (International claims[3])		17,876.6
Local claims – in foreign currency			15,248.3 (Local claims)
– in local currency	14,476.7		
Derivatives with positive market value			2,132.9
Contingent facilities			
Guarantees extended			3,600.0
Credit commitments			6,060.2
Other breakdowns[4]			
Claims by sector	20,057.8		33,125.0
Official sector	4,267.8		10,034.6
Banks	3,956.4		4,192.9
Non-bank private sector	11,687.7		18,537.6
Non-bank financial institutions	5,411.2		6,571.6
Non-financial corporates	5,038.2		5,924.3
Households and NPISHs[5]	408.9		3,149.2
Unallocated by sector	146.0		359.8
Claims by maturity	20,057.8		
Up to and including 1 year	9,088.6		
Over 1 year up to and including 2 years	1,021.2		
Over 2 years	6,209.6		
Unallocated	3,728.9		
Memorandum: Starting date of time series	December 1983	June 1999	March 2005

[1] Sum of positions reported by banks headquartered in all CBS-reporting countries. [2] Outstanding loans and deposits, plus holdings of debt and equity securities; historically referred to as on-balance sheet claims. [3] Cross-border claims denominated in all currencies plus local claims of foreign offices denominated in foreign currencies. [4] For claims on an immediate borrower basis, the breakdowns refer to international claims; for claims on an ultimate risk basis, the breakdowns refer to foreign claims. [5] NPISHs = Non-profit institutions serving households.

Exchange rates. All outstanding stocks are reported in current US dollars. Unlike the locational banking statistics (LBS), no currency breakdown is available for the CBS; positions in other currencies are converted by reporting banks into US dollars at end-of-quarter exchange rates. Therefore, dollar appreciation leads to a reduction in reported claims in other currencies when expressed in dollars, even when actual positions remain unchanged.

Reporting countries. The CBSI data reporting began in Q4 1983 and included 15 reporting countries: Austria, Belgium, Canada, Denmark, France, Germany, Ireland, Italy, Japan, Luxembourg, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States. Since then, another 16 countries have joined. CBSG reporting began in 2005. See the international banking statistics' reporting country list for detail. Seventeen countries reporting the LBS do not report the CBS, notably China, Russia, and a number of cross-border financial centres.

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International finance through the lens of BIS statistics: the geography of banks' operations[1]

Global banks differ substantially in how they structure their operations across host countries. This feature draws on the BIS international banking statistics to distinguish between "international" bank structures, where positions with counterparties abroad are mainly booked from banks' home offices, and "multinational" structures, where they are booked in affiliates in host countries. It then assesses how differences in these structures shape banks' funding patterns, and what they imply for regulatory oversight and, ultimately, financial stability.

JEL classification: F34, F36, G21, F23, F31, F36, G15.

Banks' global operations are shaped by their history and the economic and regulatory environments in which they operate. Japanese banks rode the post-war industrial boom in Japan to become dominant lenders in cross-border banking by the late 1980s. In the 1990s, Spanish banks expanded their global footprint, mainly in Latin America, with a model that prioritised stand-alone affiliates. For their part, other European banks and US banks embarked on a merger spree throughout the 1990s that transformed them into universal banks with offices in major financial centres that serve all types of clients in every corner of the world. The imprints of these histories are still discernible in banks' global operations today.

Operating abroad exposes banks to complexities and risks that do not arise in purely domestic banking. Banks that lend exclusively at home tend to deal mainly in the domestic currency, face a single regulatory authority, enjoy access to liquidity from the home central bank and compete with other banks in a familiar financial landscape. By contrast, internationally active banks compete on a global stage, face multiple regulatory authorities and deal in various currencies where access to liquidity is not always guaranteed. Banks' *geography* – ie their organisational structure across countries – has bearing on how resilient they are to economic shocks and is thus of first-order importance for financial stability.

This feature is a primer on how the BIS international banking statistics (IBS) can be used to gain insights into the geography of banks' global operations. These statistics track the outstanding assets and liabilities of banks of a given nationality in

[1] The views expressed are those of the authors and do not necessarily reflect those of the Bank for International Settlements. This is the fourth feature in a series showcasing the BIS international banking and financial statistics, following McGuire et al (2024a, 2024b) and Hardy et al (2024). We thank Iñaki Aldasoro, Claudio Borio, Torsten Ehlers, Gaston Gelos, Robert McCauley, Benoît Mojon, Andreas Schrimpf, Hyun Song Shin and Sonya Zhu for their helpful comments, and Swapan-Kumar Pradhan for excellent research assistance.

Key takeaways

- *The BIS international banking statistics reveal banks' structures across home and host country locations, thus providing a view of banks' consolidated operations with geographic detail.*
- *Banks with an international structure mainly lend cross-border from their home country. Multinational banks use affiliates in host countries and allocate funds across the group via intragroup positions.*
- *Bank structure shapes the profile of risks that banks face as well as their ability to withstand funding shocks, access foreign currency liquidity and comply with home and host country regulation.*

various locations where they have offices, eg the balance sheet of the offices in Japan of banks headquartered in the United Kingdom ("UK banks"). This helps to shed light, for example, on how intragroup positions (ie "internal markets") enable funds raised in an office in one location to be used by offices elsewhere.

Banks headquartered in 15 countries, which account for the bulk of cross-border banking activity, operate with somewhat distinct organisational structures. Banks with an *international* structure borrow and lend abroad mainly from their home office (eg Japanese banks), drawing on their domestic deposit base. Others adopt a *multinational* structure, operating branches and subsidiaries in multiple jurisdictions. The multinational structure, in turn, can take different forms: *centralised* banks pool funds at major offices (eg in financial centres) and deploy them across the banking group (eg Swiss banks), whereas *decentralised* banks have autonomous subsidiaries that raise deposit funding to finance local assets (eg Spanish banks) (CGFS (2010)).

Each structure is associated with trade-offs and risks. The pooling of resources in a global treasury in international or centralised multinational structures tends to be cost-efficient and robust to local shocks in host countries but can make banks more vulnerable to disruptions in wholesale funding markets. By contrast, a decentralised multinational bank that raises deposits autonomously in each host location where it lends forgoes the benefits of centralised pooling but may be insulated from disruptions in global funding markets.

Episodes of financial volatility and elevated country risk have exposed the importance of bank structure for financial stability. For example, during the Great Financial Crisis (GFC) of 2008–09, centralised multinational banks that had relied extensively on wholesale funding markets were particularly vulnerable when those markets seized up. Banks with autonomous subsidiaries were more insulated from those disruptions. With post-crisis deleveraging and regulatory reforms, banks gravitated towards international or multinational decentralised structures.

Banks' intragroup cross-border funding has played a supportive role during such stress events, but it can also be a vulnerability. For example, when non-US banks faced difficulty in rolling over dollar funding during the GFC and in March 2020, extraordinary policy measures in the form of central bank swap lines were required to restore market functioning. Those banks with affiliates in countries that had access to dollar liquidity were able to deploy funds to affiliates elsewhere, leading to a surge in intragroup cross-border dollar flows. At the same time, multinational banks that rely extensively on cross-border intragroup funding are vulnerable to changes in regulation or macroeconomic downturns in funding locations that may impede the release of funds for use elsewhere.

This feature uses the IBS to first characterise banks' global operations, distinguishing between those with international and multinational (de)centralised structures. It then examines the importance of intragroup funding and how banks' structures affect their resilience to global funding shocks. The final section concludes.

The architecture of global banking

Historically, many banks that engaged in transactions with counterparties abroad often did not establish a foreign presence. In the 19th century, merchant or investment banks, eg those started by the Morgans, Rothschilds and Barings, were engaged in trade finance and foreign bond issuance; they undertook this activity without establishing affiliates abroad (Jones (1992)).[2] At the same time, British overseas banks established branches in the colonies. A second wave of multinational banking was led by US banks in the 1960–70s, to serve corporates, exploit regulatory differences and run wholesale market operations in financial centres.

The organisational structures seen today have been shaped by domestic economic booms, recurrent financial crises and subsequent regulatory changes, and waves of bank mergers and acquisitions. Riding the post-war economic boom in Japan, low capital costs enabled Japanese banks to lever up and expand internationally. They facilitated the export of capital from Japan to borrowers elsewhere, driving a surge in interbank lending in the second half of the 1980s. Concerns that Japanese banks were undercapitalised during this period were an impetus for the first Basel capital accord in 1988 (Ito and Hoshi (2020)). For their part, several European and US banks that operate today emerged as global giants from the merger and acquisition wave that began in the late 1980s and culminated in the GFC.[3] These banks established extensive international networks with major operations in key financial centres such as London and New York.

The structure of banks' consolidated global operations

The IBS are a unique source of information for understanding banks' organisational structures across countries. The IBS are aggregate data that group banks by residence (where they operate) and by nationality (where they are headquartered). For each of these perspectives, banks' assets and liabilities are broken down by the sector and country of residence of its counterparties (see Box A). The IBS can thus be used to deconstruct, at the level of national banking systems, banks' consolidated balance sheets according to the geography of their operations across countries. This helps to characterise the structure of banks' operations, as discussed below.

[2] Banks can also rely on correspondent banks to transact with counterparties abroad.

[3] To name but a few, Deutsche Bank acquired Morgan Grenfell Group in the United Kingdom in 1989; Bankers Trust in the United States in 1999; and Scudder Investments, a US asset management firm, in 2002. UBS/SBC acquired SG Warburg plc in London in 1995. In 1997, it acquired Dillon, Read & Co, an investment bank in New York, and later merged with PaineWebber (in 2001). Credit Suisse increased its holdings in First Boston in 1990 and then reorganised into CSFB in 1996–97. Barclays created an investment banking operation in 1986, which subsequently developed into Barclays Capital. In 1995 Barclays purchased the fund manager Wells Fargo Nikko Investment Advisors, which was integrated with BZW Investment Management to form Barclays Global Investors.

Box A

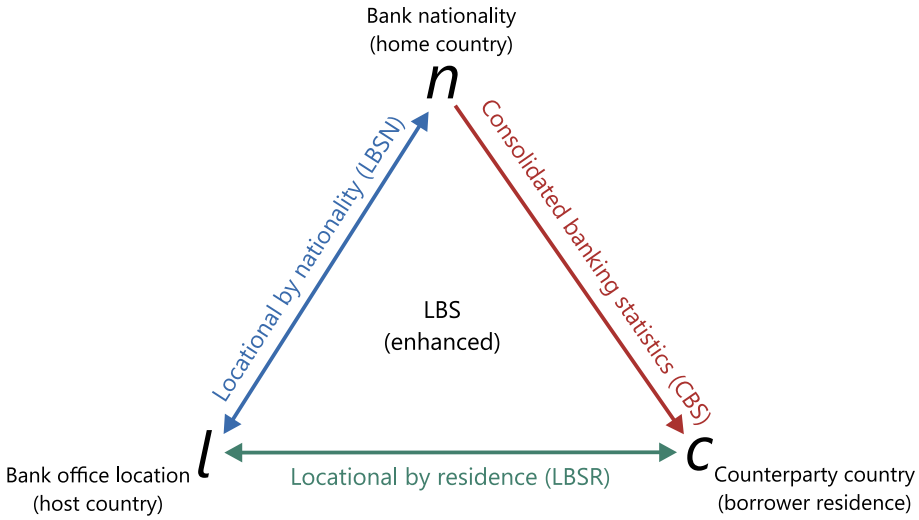
Geographic dimensions in BIS international banking statistics

The BIS international banking statistics (IBS) provide several complementary perspectives on international banking activity. This box puts the locational (LBS) and consolidated (CBS) versions of the IBS in their geographical context, using the country dimensions introduced in McGuire et al (2024a).

Consider a bank (eg lender *l*) that transacts with a borrower in country *c* (Graph A1). The arrow ($l \rightarrow c$) represents positions between them based on the *residence* view, ie the countries in which the lender and borrower reside. By contrast, viewing banks from a nationality perspective ($n \rightarrow c$) yields a consolidated view of the lenders' exposures to a particular country (Hardy et al (2024)). The nationality view groups the balance sheets of resident units with those of the non-resident affiliates they control (with intragroup positions netted out).

Country dimensions in locational and consolidated statistics[1]

Graph A1



[1] The nodes (*n, l, c*) represent the three geographical dimensions of bank and counterparty available in the BIS international banking statistics (IBS). The arrows in colour depict how the country dimensions relate and which IBS data set covers this perspective; eg the Locational banking statistics by nationality (LBSN) record banks' international claims and liabilities booked in location *l*, broken down by bank nationality *n*.

Source: Authors' elaboration.

The IBS capture all three dimensions at the country level. To illustrate, suppose a German bank books cross-border claims in its London office on counterparties in Brazil. How are these claims reflected in IBS data sets?

- The CBS track banks' worldwide consolidated claims on counterparties in a particular country. The CBS thus capture the *bank nationality* and *counterparty country* dimensions (**red** in Graph A1). The claims of the German bank in London on borrowers in Brazil are aggregated with German banks' total consolidated claims on Brazil, regardless of where the claims are booked (no bank location dimension).
- The LBS by residence (LBSR) track the claims of all bank affiliates located in one jurisdiction on counterparties in each country; the LBS capture the *bank location* and *counterparty country* dimensions (**green**). The German bank's claims on Brazil booked in London appear together with those of all banks in the United Kingdom, regardless of where they are headquartered (no bank nationality dimension).
- The LBS by nationality (LBSN) in every country record bank balance sheets grouped by their home country; they capture the *bank location* and *nationality* dimensions (**blue**). The German bank's claims booked in London on borrowers in Brazil are aggregated with all cross-border claims that German affiliates book in the United Kingdom, regardless of where the borrower abroad resides (no counterparty country dimension).
- The enhanced LBS available since 2013 combine LBSR and LBSN to capture all three dimensions simultaneously: *bank nationality*, *bank location* and *counterparty country*.

A banking group may have offices in multiple host countries that serve different functions. Some offices are sources of funding for the consolidated bank group, to be on-lent elsewhere. By contrast, other offices are *local intermediaries* that fund and lend *within* a host country, or *international intermediaries* that engage mainly in cross-border funding and lending (Box B). In some host jurisdictions, the regulatory and/or economic environment favours one office type over others. A banks' overall consolidated structure will reflect the mix of office types that make up the whole.

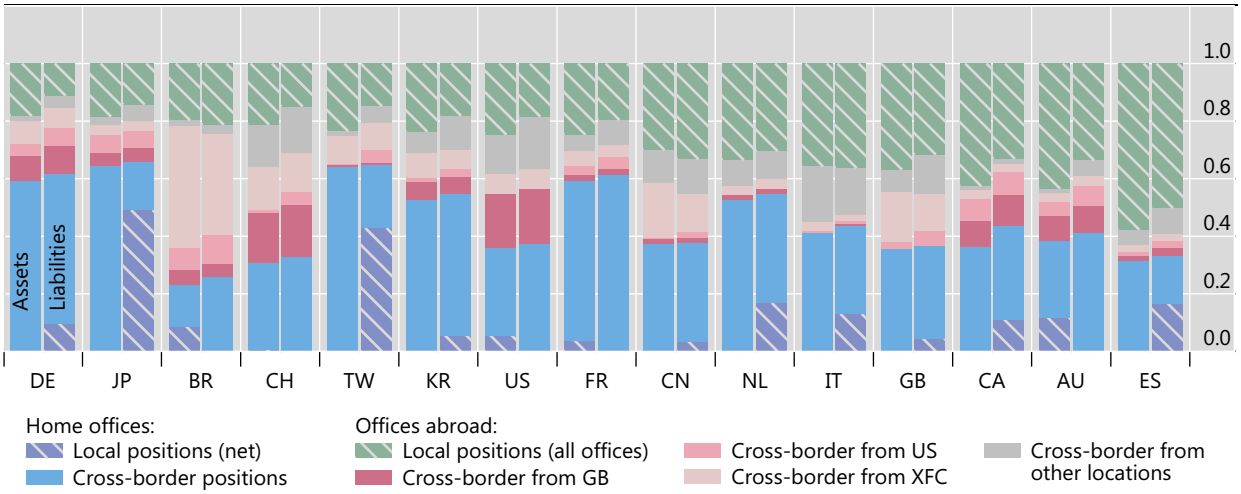
A useful starting point for characterising banks' operations is to examine this mix, focusing on *where* banks book their foreign claims and liabilities (Graph 1).[4] At one end of the spectrum are Japanese and German banks, which have large home offices that lend to the rest of the world. Most of their foreign claims are booked as cross-border positions by their home offices in Tokyo and Frankfurt (left bars, blue area). Japanese banks fund around half of their foreign claims via net borrowing from domestic depositors (right bars, purple area).

At the other end of the spectrum are banks that engage mainly in local intermediation in multiple host countries. Spanish banks stand out as having the largest share of their foreign positions booked as local positions in the country of the borrower (Graph 1, green bars). This reflects a preference of banks and supervisors at home and in host countries (eg Latin America) to fund offices in those countries through local deposits (CGFS (2010); Argimón (2019)). Australian banks, with their large presence in New Zealand, have a similar structure.

The geographic patterns suggest that banking systems can be broadly characterised along two dimensions. The first captures banks' local presence across countries (Graph 2.A). Banks with an ***international structure*** run business mainly out

Geography of banks' gross foreign claims and liabilities[1]

End-June 2024 Graph 1



[1] By bank nationality (x-axis), booking location and type. The panel divides total foreign positions into local (hatched bars) and cross-border (solid bars) positions for banks headquartered in the countries listed on the x-axis. For each bank nationality, left (right) bars show assets (liabilities). Cross-border positions are further broken down by office location. The size of each bar indicates the share in total foreign positions. "Local positions" = positions (in all currencies) vis-à-vis residents of the host country; for home offices, only the net position (assets minus liabilities). XFC = cross-border financial centres. See technical annex for details.

Sources: US call reports; BIS consolidated banking statistics; BIS locational banking statistics by nationality; authors' calculations.

[4] The analysis defines home/domestic and foreign with respect to a bank's country of headquarters; the euro area is treated as 20 distinct countries. See also the glossary of terms in Annex A.

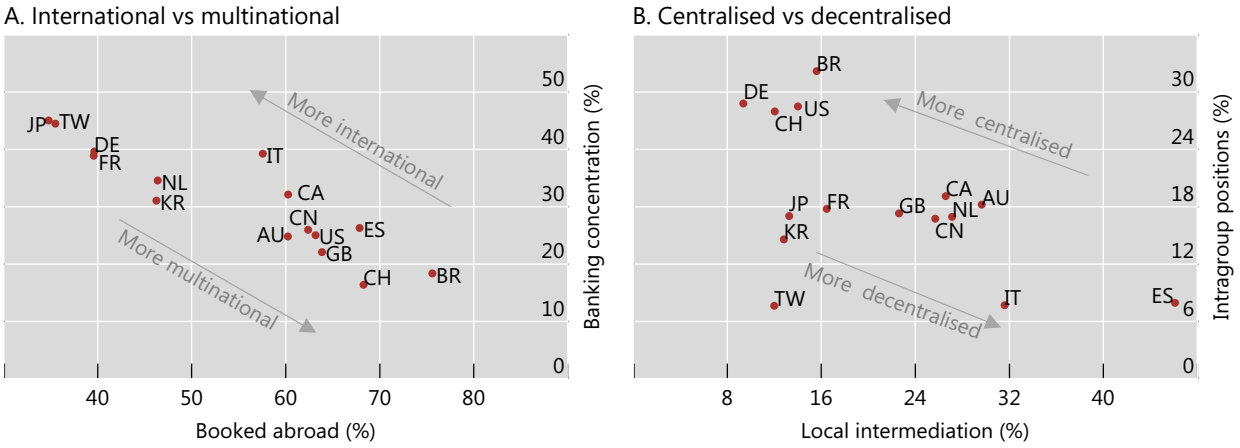
of their home country (eg Japanese, German and French banks). Accordingly, they book a low share of positions abroad (dots to the left) and concentrate their positions on a few booking locations (dots towards the top). Other banks have a ***multinational structure***, with sizeable foreign branches and subsidiaries in multiple jurisdictions. Spanish, Swiss, UK and US banks thus appear in the opposite quadrant (dots to the bottom right), since they raise most funds abroad in multiple host countries.

While the international structure is necessarily centralised, the multinational structure can also be decentralised. This second dimension is about the internal organisation of a banking group (Graph 2.B). ***Centralised*** banks pool funds at headquarters or at offices in financial centres and deploy them elsewhere via intragroup positions. Swiss, German, US and Brazilian banks stand out in this regard. ***Decentralised*** banks let their affiliates raise funds autonomously to finance assets in each country (CGFS (2010)). This often involves a high share of local intermediation through retail subsidiaries.[5] Accordingly, Spanish, Italian and Australian banks rely more on local intermediation than on intragroup funding (bottom right).

A bank's structure is rooted in its broader business model – subject to regulatory constraints. Banks with an international structure often rely on a large domestic deposit base to shift capital out of their home countries (eg Japan or Germany), where they centralise control at headquarters. Those with a centralised multinational structure may operate in financial centres outside their home country (eg Swiss banks in wealth management and US banks in investment banking and capital markets). They do so with a central treasury that pools and deploys resources across the group (CGFS (2010); Pokutta and Schmalz (2011); Cetorelli and Goldberg (2012)). More retail-focused decentralised banks with global footprints (eg Spanish banks) often take over local banks and let them operate autonomously (CGFS (2010)).[6]

The structure of banks' global operations, by type[1]

End-June 2024 Graph 2



[1] By banking system as shown with ISO country codes. See technical annex for details and Annex A for definitions.

Sources: BIS consolidated banking statistics; BIS locational banking statistics by nationality; authors' calculations.

[5] Local intermediation gauges the extent to which local claims are funded through local liabilities, rather than through cross-border (eg intragroup) borrowing (see Annex A).

[6] On the pros and cons of a more decentralised structure in which a greater portion of lending to residents of a particular country is funded, managed and supervised by offices in the country, see CGFS (2010). Kamil and Rai (2010) present empirical evidence on the relative stability of banks' local activities in Latin America during the GFC.

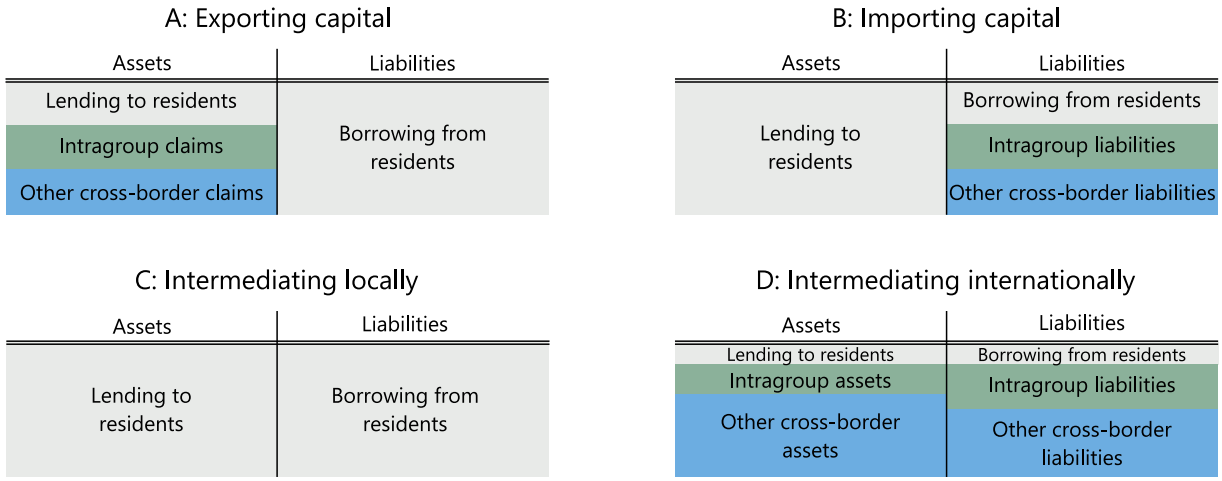
Box B

Office types and the role of banks in facilitating capital flows

Banks' operations across countries can serve a variety of functions, with implications for capital flows. Graph B1 portrays four stylised balance sheet types that depict characteristics captured in the IBS for banks of a particular nationality in a particular host location (eg US banks in Japan). The T-accounts delineate banks' assets and liabilities and the location of the counterparties. Positions with residents of the host country are in grey and cross-border positions are in green for intragroup positions and blue for other counterparties.

Bank offices can be involved in exporting or importing capital, depending on the net position. The home offices of Japanese, German and Swiss banks all **export capital** from the home country and thus have balance sheet structures as in panel A. These offices engage in direct cross-border net lending to counterparties elsewhere and serve as sources of intragroup funding to their offices abroad. Foreign currency assets may be financed with local currency deposits from home country residents, and banks manage the exchange rate risk using foreign exchange swaps. The opposite case is that of a bank office that **imports capital** to the home country (panel B), eg the home offices of Brazilian, US and Australian banks. They can source intragroup funding from their foreign offices or by borrowing from other counterparties (eg from wholesale markets).

Balance sheets by office type[1] Graph B1



[1] The four stylised balance sheet types shown here can be recreated from IBS data by aggregating bank offices with similar characteristics.

Source: Authors' elaboration.

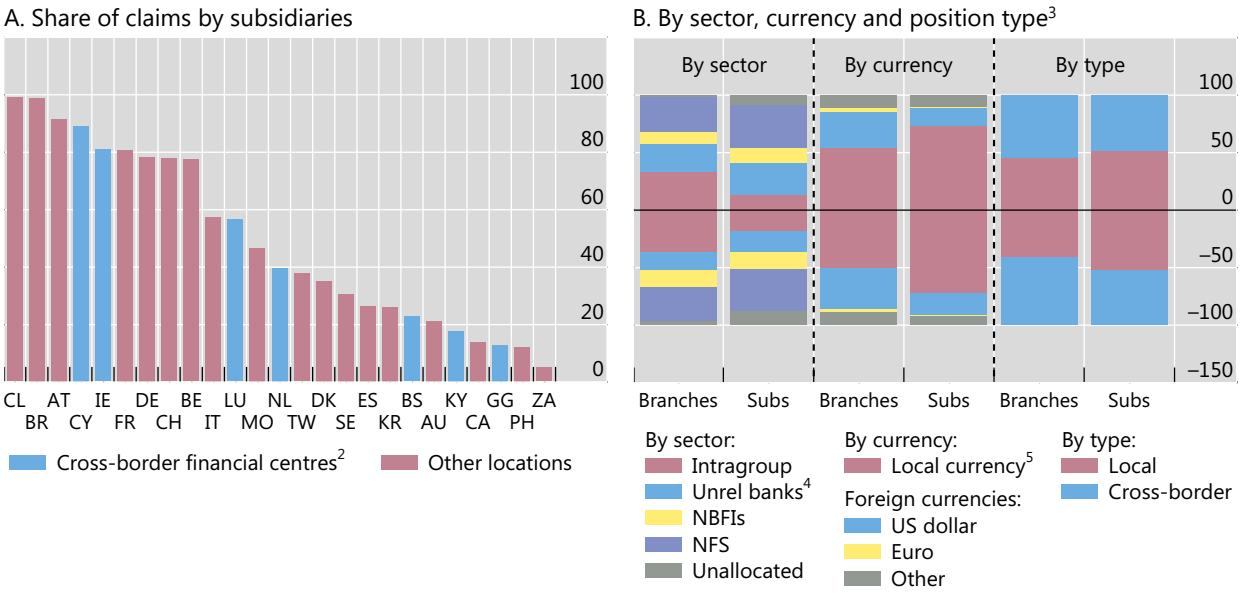
Offices operating as **local intermediaries** (panel C) typically have local assets denominated in the currency of the host country that are financed with local currency deposits. If under foreign ownership, they are often incorporated as subsidiaries and operate much like domestic banks. They tend to have limited currency mismatches and small cross-border positions and thus contribute little to overall net capital flows to the country.

Finally, there is the **international intermediary** office (panel D), where cross-border positions dominate on both sides of the balance sheet. Such offices serve as routing hubs to shift cross-border funding (eg wholesale funding) to intragroup lending and other cross-border credit to borrowers elsewhere. Examples include banks' offices in major financial hubs (eg London) or in cross-border financial centres (eg the Cayman Islands). Such offices do most business with non-residents and contribute little to domestic credit in the host country, but they do affect the host country's cross-border capital flows and international investment position.

Each structure tends to go with a particular choice between branches and subsidiaries. Unlike subsidiaries, branches do not have their own capital; they operate as an extension of the parent bank's balance sheet. While this makes them easy to manage and integrate in centralised operations, branches may not meet host country regulatory requirements for certain operations, eg taking insured deposits. Decentralised multinational banks therefore rely more on subsidiaries, incorporated as separate legal entities adapted to local regulations and market conditions. Some host countries (eg Brazil, Chile) favour subsidiarisation of foreign banks (Graph 3.A). Banking groups with major operations in such countries (eg Spanish banks) are shown to be decentralised in IBS data. On the other hand, branch activity is more prevalent in some cross-border financial centres (eg the Cayman Islands (KY), Guernsey (GG) and the Bahamas (BS)).

Foreign branches and subsidiaries in BIS reporting countries[1]

In per cent; end-June 2024 — Graph 3



[1] See technical annex for details. [2] Cross-border financial centres as of 2020, defined in Pogliani et al (2022). [3] As a share of total claims (positive bars) and liabilities (negative bars) of foreign branches and subsidiaries in host locations. NBFIs = non-bank financial institutions; NFS = non-financial sectors. [4] Positions with unrelated banks (ie excluding intragroup). [5] Cross-border and local claims positions in the currency of the host country.

Sources: Pogliani et al (2022); BIS locational banking statistics by residence; authors' calculations.

Foreign branches and subsidiaries operate with distinct balance sheet structures. Branches typically have larger interbank positions, particularly intragroup positions, reflecting their integration with the group's balance sheet (Graph 3.B). Subsidiaries, on the other hand, typically have larger positions vis-à-vis the non-financial sector, as being incorporated as subsidiaries facilitates deposit-taking and compliance with local regulatory requirements (Fiechter et al (2011); OECD (2017)). Branches often deal more in foreign currency and more with cross-border counterparties, since they are less often subject to host country limits on foreign exchange and interbank exposures. With this flexibility comes potential instability: compared with foreign subsidiaries, lending by foreign branches tends to be more volatile and more reactive to economic conditions in both their home and host countries (Aldasoro et al (2022)).

Banks' structures have evolved in response to changes in the economic and regulatory environment. Multinational banking was ascendent in the two decades

before the GFC, reflected in the rise of local banking. After the emerging market crises of the 1980s and 1990s, banks shifted towards the multinational decentralised structure.[7] As a result, the share of local currency claims in foreign claims on emerging market economies rose from 7% in 1983 to near 40% in the early 2000s (Hardy et al (2024)).[8]

This trend slowed in the 2000s. The introduction of the euro spurred an area-wide interbank market, and European banks ramped up their cross-border investment in asset-backed securities when US markets boomed. This boosted London's position as Europe's financial hub. In emerging markets, cross-border bank flows resumed in the mid-2000s in response to higher yields and US dollar depreciation (Galati et al (2007); CGFS (2009)).

The expansion of cross-border activity from offices in major financial centres proved to be transitory. The GFC exposed weaknesses in banks' overextended balance sheets and forced a broad deleveraging. Disruptions in funding markets disproportionately affected multinational banks that had relied on centralised operations (see the next section). Following the GFC, the international regulatory framework was strengthened (Basel III), and many countries tightened regulation of banks operating in their jurisdiction (Borio et al (2020)). Common measures included requirements to operate as subsidiaries, resolution frameworks and restrictions on business models, including on cross-border positions.[9]

These changes, especially when imposed by host country regulators, discouraged dependence on centralised wholesale funding. Some centralised multinational banks – in particular European banks – reacted by scaling down foreign operations in financial centres, shifting away from a multinational and towards an international structure (McCauley et al (2019)). Other banks gravitated towards the decentralised multinational model (Caparusso et al (2019).[10]

Implications of bank structure for policy

Bank structure shapes the profile of risks that banks face. For one, it has implications for the resilience of banks' funding models, which depend on their ability to shift funding internally between office locations. For another, the location of banks' affiliates matters in terms of access to central bank liquidity, particularly in foreign currencies. These have bearing on banks' ability to provide credit to the economy and thus are of concern to policymakers.

[7] Establishing or acquiring a local bank to borrow and lend locally avoided transfer risk, if not country risk (Hardy et al (2024)).

[8] This feature uses "emerging market economies" as a short form for *emerging market and developing economies*, the set of economies not classified as advanced economies in the BIS country grouping convention.

[9] See IMF (2015), informed by a survey of bank supervisors in 40 major banking markets, further examined by Ichiue and Lambert (2016).

[10] Since 2009, Swiss, German and Dutch banks have downsized their operations abroad, giving their home offices a larger relative role. This shifted them towards the international structure (top left area in Graph 2). By contrast, Korean and Taiwanese banks have shifted in the direction of the decentralised multinational structure (bottom right area).

Bank resilience during the GFC

International bank credit contracted sharply in the wake of the GFC and again during the European sovereign debt crisis of 2010–12. Many interrelated factors affected the extent of contraction, including banks' business models, their asset quality and funding structures, recessions in countries they operated in, and home and host country regulations.

To disentangle the various factors at play, McGuire and von Peter (2016) examine how major banks' affiliates shed assets across host countries after the GFC. The IBS structure makes it possible to jointly examine the claims and liabilities of banks' foreign offices in different countries, separately from their parent. This in turn enables analysis of the peak-to-trough contraction in assets during the GFC that accounts for factors specific to bank nationality, host country and bank offices (notably their funding mix). Contractions were larger for: (i) offices operating in troubled economies and financial centres (host country effect); (ii) offices that were more exposed to the financial crisis (bank nationality effect); and (iii) offices with a fragile funding mix that relied more on interbank, foreign currency or cross-border funding than on local deposits (funding source effect).[11]

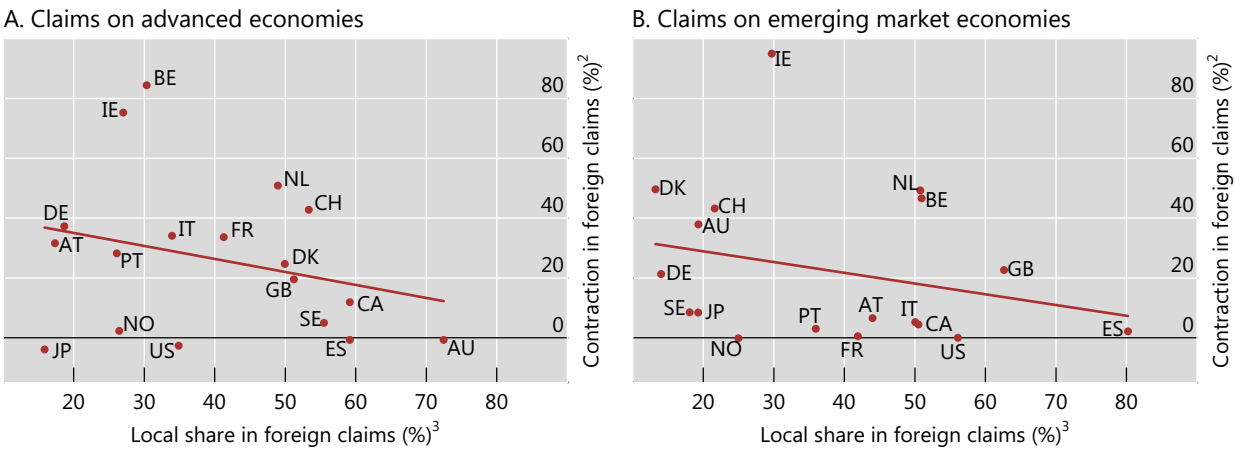
Banks with a decentralised multinational structure fared better in the wake of the GFC. Operating autonomous subsidiaries – ie with local claims funded by local liabilities – can shield banks from shocks to global wholesale funding markets.[12] Banks that had, on the eve of the GFC, booked a higher share of their overall foreign claims locally in local currencies (Graph 4, x-axis) experienced smaller subsequent contractions (y-axis). These affiliates' local operations, which are often retail banking activity, proved to be resilient when global wholesale funding markets seized up.[13] By contrast, affiliates that relied more on other liabilities (eg cross-border, interbank or foreign currency funding) saw larger balance sheet contractions.

[11] Hahm et al (2013) and de Haas and van Lelyveld (2014) find similar effects using country-level and bank-level data, respectively. Peek and Rosengren (1997) trace how Japanese banks transmitted financial distress at home to the supply of credit in the United States through their US affiliates. IMF (2015) finds cross-border lending is more volatile and has a stronger transmission of global shocks compared with local lending.

[12] At the same time, autonomous affiliates can expose banks to local shocks and limit their role in intermediating capital flows that can benefit host countries.

[13] For each country grouping, there is a weak but discernible downward slope in the regression line. That said, there are some clear outliers. For example, Dutch and Belgian banks experienced some of the largest overall contractions, reflecting the breakup of ABN AMRO and Fortis. By contrast, Japanese banks hardly contracted at all, yet they had the lowest ratio of local claims to foreign claims. Japanese banks were less exposed to toxic assets and suffered smaller losses during the crisis than did many European banking systems.

Local orientation mitigating the contraction in foreign claims around the GFC[1] Graph 4



[1] See technical annex for details. [2] Peak-to-trough contractions around the GFC of the foreign claims of the indicated bank nationalities on borrowers in the group of countries indicated in the panel heading. [3] Share of foreign claims booked locally in local currency (by the bank's affiliate there).

Sources: BIS consolidated banking statistics (immediate borrower basis); BIS locational banking statistics by nationality; authors' calculations.

Internal markets: banks' intragroup funding

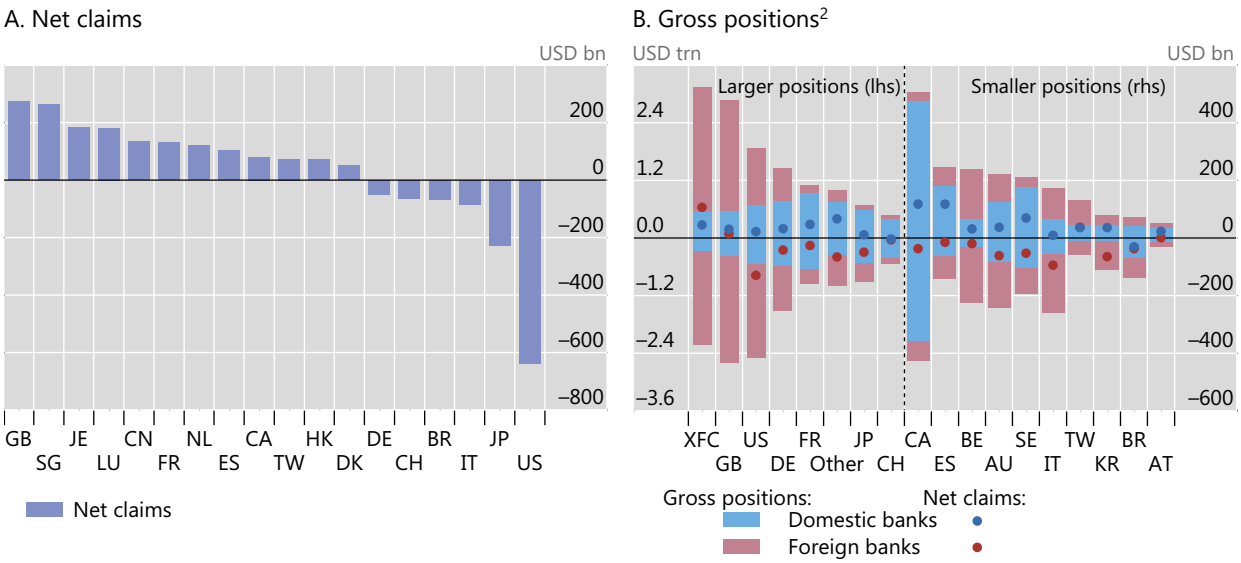
Banking groups routinely deploy funds raised in funding markets to investment markets (Cetorelli and Goldberg (2012)). A bank may set up funding operations in countries with a large deposit base or deep bond markets to fund credit by affiliates elsewhere that cannot rely on local deposits. For example, Swedish banks financed their operations in the Baltics in the 2000s through intragroup funding (CGFS (2010)). In the IBS for mid-2024, the United Kingdom and Singapore appear as funding centres – as evidenced by large net intragroup claims (Graph 5.A). By contrast, banks in the United States, Japan and Italy are net users of intragroup funds.

Domestic and foreign banks in a given country use intragroup positions in somewhat distinct ways (Graph 5.B). In France, Japan and Switzerland, for instance, most positions are reported by domestic banks (blue bars), while foreign banks (red bars) play a greater role in countries with financial centres (eg United States, United Kingdom) and in smaller cross-border financial centres (XFC). Domestic banks typically extend net intragroup funding to their affiliates abroad (blue dots), while foreign branches and subsidiaries are net receivers (red dots below zero).

Dollar funding is of particular importance, since the US dollar is the dominant currency across financial markets (McGuire et al (2024b)). Non-US banks hold large asset positions denominated in US dollars and use their network of affiliates around the world to source dollar funding. Less than a quarter (23% at end-2023) of their dollar liabilities are booked by their affiliates in the United States, where dollar funding markets are deep and banks have access to Federal Reserve facilities. The bulk is borrowed either by their home office or by offices elsewhere, in jurisdictions where the dollar is a foreign currency (Aldasoro and Ehlers (2018)).

Internal markets: banks' cross-border intragroup positions[1]

End-June 2024 Graph 5



[1] See technical annex for details. Net claims are cross-border intragroup claims minus intragroup liabilities of all reporting banks located in the country shown on the x-axis. [2] Intragroup gross claims (positive) and liabilities (negative) for domestic (blue) and foreign (red) banks. Other represents reporting jurisdictions other than XFC (cross-border financial centres) and those listed individually.

Sources: Pogliani et al (2022); Pradhan and Silva (2019); BIS locational banking statistics (by nationality); authors' calculations.

Intragroup positions are especially important following regulatory changes. Prior to the GFC, non-US banks raised dollar funding from their US operations to lend intragroup to affiliates elsewhere. With US quantitative easing after the GFC and subsequent changes in Federal Deposit Insurance Corporation (FDIC) regulation, intragroup flows reversed as these banks invested heavily in reserve holdings at the Federal Reserve (Kreicher et al (2013)).

Similarly, intragroup positions are essential for reallocating funds during periods of financial stress. During the GFC and again in March 2020, non-US banks tapped dollar facilities at major central banks and used intragroup positions to allocate dollars. Intragroup flows in all currencies explained almost $1 trillion of the outsize expansion in cross-border flows in the first quarter of 2020 (Graph 6.A). The surge in intragroup dollar flows, mostly vis-à-vis affiliates in the United States (Graph 6.B), largely reversed in the second quarter as financial conditions improved (Aldasoro et al (2020)).

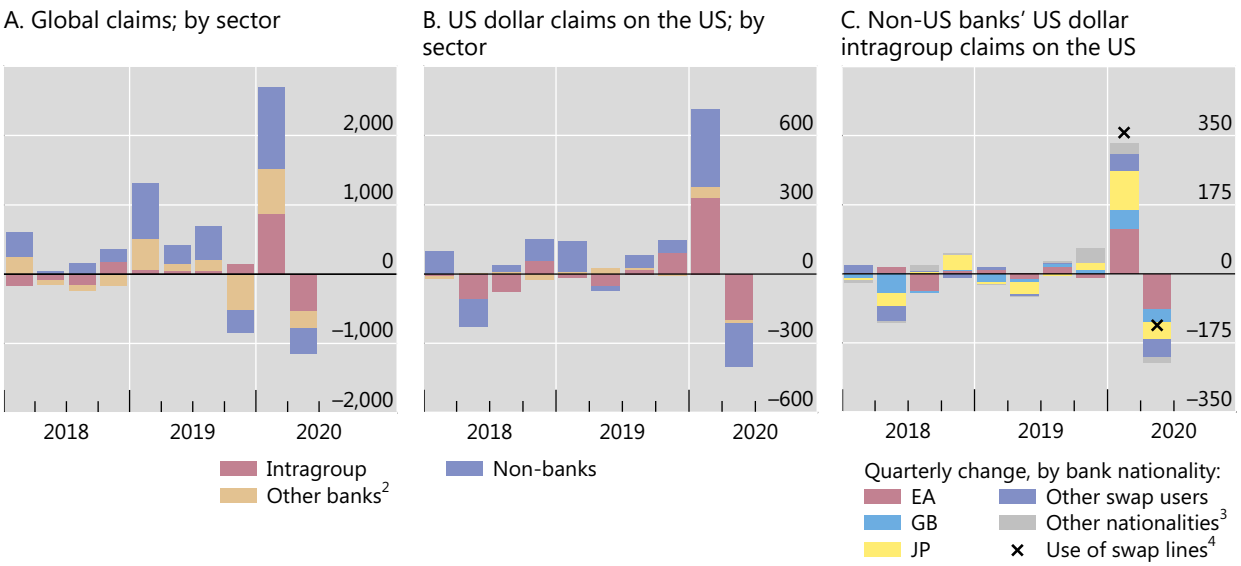
These extraordinary movements reflect how funds secured via the Federal Reserve's US dollar swap lines propagated through the global banking network via intragroup positions. By end-March 2020, a total of $358 billion had been drawn from dollar swap lines. In practice, banks draw on the swap line by booking a liability to their home central bank and an intragroup claim on their US affiliate that obtains dollar reserves at the Federal Reserve (Aldasoro et al (2020); McCauley (2024)). Not by coincidence, banks in Japan, the euro area and the United Kingdom, which tapped dollar swap lines the most, reported the largest increases in intragroup dollar claims on their affiliates in the United States (Graph 6.C).[14]

[14] 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 United States to handle drawdowns of credit lines by their customers.

Swings in cross-border positions reflect banks' internal markets[1]

In billions of US dollars

Graph 6



[1] Panel A shows quarterly changes adjusted for breaks in series and exchange rate fluctuations. US dollar claims in the remaining panels require no exchange rate adjustment. See technical annex for details. [2] Includes central banks and banks unallocated by subsector between intragroup and unrelated banks. [3] All other bank nationalities in BIS reporting countries. [4] Use of central bank liquidity swap lines; quarterly change in amount outstanding.

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

Conclusion

Banks' organisational structures reflect their unique histories and business models and have evolved with changes in the regulatory and economic environments in which banks operate. The BIS IBS are a unique source of data on banks' structures since they provide a view of banks' global consolidated operations at the level of the constituent parts. This reveals not only the location of banks' major affiliates but also the location of their funding sources and use of internal markets.

The geography of banks' global operations has important policy implications. It has a bearing on banks' resilience. Supervisory guidance by both home and host regulators can push banks to a decentralised multinational structure, which proved resilient during the GFC. At the same time, a purely local orientation in a host country limits a foreign bank's ability to intermediate capital flows that can benefit host countries. Further, managing access to foreign currency liquidity during stress events is a global challenge that requires cooperation between central banks: banks without affiliates in countries with access to dollar liquidity facilities may face constraints.

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Annex A: The structure of banks' operations

This annex defines key terms and concepts used throughout the feature, based on the BIS Glossary and the Box in the previous feature in this series (Hardy et al (2024)).

1. **Domestic positions:** claims[15] or liabilities of a domestic bank vis-à-vis residents of the bank's home country.
2. **Cross-border positions:** positions on a non-resident – for example, claim on or liability to a counterparty located in a country other than the country where the banking office that books the position is located.
3. **Local positions:** claims on or liabilities to a counterparty located in the same country as the office that books the positions (the opposite of cross-border positions). Local positions in the home country are domestic positions (see 1.).
4. **International positions:** positions on a non-resident or denominated in a foreign currency. International claims comprise banks' cross-border claims in all currencies plus their local claims denominated in foreign currencies.
5. **Foreign positions:** claims on, or liabilities to, counterparties outside the bank's home country (typically the country of headquarters). Foreign claims comprise positions 2 and 3 above, ie local claims of the bank's offices abroad as well as cross-border claims of the bank's offices worldwide.
6. **Gross foreign positions**: foreign positions plus intragroup positions and net local claims (or liabilities) on home country residents (Graph 1). This, together with gross domestic positions on home country residents, makes up the total of banks' global positions, ie all financial positions on banks' balance sheets.

The various indicators on the structure of banks' operations (Graph 2) can be constructed from foreign positions broken down by booking location. Let FC_n denote gross foreign claims (and FL_n gross foreign liabilities) of banks headquartered in country n (nationality), and FC_{nl} denote those booked in country l (office location), so $FC_n = \sum_l FC_{nl}$. When foreign claims and liabilities are combined, the share of foreign positions booked in country l equals $s_{nl} = (FC_{nl} + FL_{nl})/(FC_n + FL_n)$.

The share ***booked abroad*** is the share of positions booked by offices abroad, ie the share not booked at home, $1 - s_{nn}$. The share booked abroad equals 0 for banks booking all positions in their home country, as would be the case for purely domestic banks or international banks booking cross-border claims from their headquarters.

Booking concentration can be measured by the Herfindahl-Hirschman index, $\sum_l s_{nl}^2$. It equals one if all positions are booked in one location (eg at home) and falls when banks book positions in a greater number of countries in similar amounts.

Intragroup positions are the sum of gross intragroup claims and liabilities across all offices, as a share of gross foreign positions $(FC_n + FL_n)$.

Local intermediation is the minimum of local claims and local liabilities (in all currencies) across all office locations, scaled by overall foreign claims:

$$\sum_l \frac{\min\{LC_{nl}, LL_{nl}\}}{FC_n},$$

where LC_{nl} stands for *local claims* in country l booked by banks from n, and LL_{nl} likewise stands for local liabilities. This indicator is zero for banks that source liabilities

[15] In the BIS LBS, bank claims comprise (i) loans and deposits, (ii) holdings of debt securities, and (iii) derivatives with a positive market value and other residual instruments (combined). Credit is defined as the sum of (i) and (ii). In the BIS CBS, derivatives are broken out from claims. See Hardy et al (2024).

in one country to fund lending in another. It approaches unity for banks acting as local intermediaries without relying on any cross-border lending or funding.

Technical annex

All graphs are based on data from the LBS and CBS. While China does not report to the CBS, its data in Graph 1 and Graph 2 are estimated using (incomplete) data available in these two data sets. Banking systems with long historical data for local claims in local currency are BE, CA, CH, DE, ES, FR, GB, IT, JP, NL and US. For the denominator (foreign claims), all reporters are included irrespective of whether a country reported local claims in local currency. The cross-border financial centres (XFC) comprise 23 jurisdictions, of which 14 report locational banking statistics. They are BH, BM, BS, CY, GG, HK, IE, IM, JE, KY, LU, NL, PA and SG. The data for these jurisdictions are shown aggregated together in Graph 1, Graph 3.A and Graph 5.B.

"Emerging market economies" is a short form for *emerging markets and developing economies*, the set of economies not classified as advanced economies in the BIS country grouping convention. Cross-border financial centres are defined in Pogliani et al (2022). The names of jurisdictions corresponding to ISO codes are provided under the abbreviations on pages iv–vii.

Graph 1: All LBS reporting jurisdictions except BH, CN, IN, JE, JP, PA, SG, TR and US report local currency claims and local liabilities of banks' foreign affiliates in their jurisdictions (IN and JP report these local positions only for domestic banks). The consolidated banking statistics on an immediate borrower basis (CBSI) data fill this gap for bank nationalities shown on the x-axis. The CBSI are also sourced for these positions in all countries other than BIS LBS reporting countries. Intragroup claims (liabilities) vis-à-vis non-reporting countries are mirrored as liabilities (claims) of affiliates in these locations. XFC = cross-border positions booked by offices in cross-border financial centres (Pogliani et al (2022)), excluding NL, which is shown separately. Local positions of banks in the United States for Chinese banks are sourced from the US call reports.

Graph 2: Banking concentration, intragroup positions and local intermediation are defined in Annex A. The Herfindahl-Hirschman index is calculated for gross foreign claims and liabilities (both cross-border and local, including intragroup) by individual office location and expressed as a percentage. Booked abroad relates to the percentage of gross foreign claims and liabilities booked by offices outside the home country.

Graph 3: Based on the bank type breakdown (branch vs subsidiary) reported by 35 of 46 reporting countries (does not include BH, CN, GB, JE, JP, MX, NO, PA, SG, TR and US).

Graph 4: For each banking system, peak values are the maximum values observed in the Q1 2006–Q1 2009 period, and trough values are the minimum values in the Q2 2009–Q2 2012 period. Locally booked claims in local currency relate to the average share during the Q1 2006–Q1 2009 period. Taken from McGuire and von Peter (2016).

Graph 5: Domestic banks and foreign banks by host locations. The LBSN is used for the split of domestic and foreign banks. Reporting gaps in bilateral intragroup positions are filled in using mirror data techniques (see Pradhan and Silva (2019)).

Panel A shows net positions of all banks (domestic and foreign banks) in the host locations.

Graph 6: Non-banks in panels A and B include non-banks and those unallocated by sector. Changes in intragroup claims (panel C) 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 United States with the intragroup liabilities of those same offices vis-à-vis reporting banks outside the United States. EA banks are those headquartered in any of the 13 BIS reporting euro area countries. Other swap users comprise AU, CH, DK, KR, NO, MX and SG (KR and MX started to use their swap lines in Q2 2020).

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International finance through the lens of BIS statistics: the international dimensions of credit[1]

International sources of credit can be a boon to borrower countries in need of capital. But they can also be destabilising by enabling domestic credit booms. Before the global financial crisis (GFC), internationally active banks drove credit growth by lending both across borders as well as locally in the host countries where they operated. Since the GFC, borrowers have increasingly turned to international bond markets. This article shows how BIS statistics can help disentangle the various international dimensions of credit to borrower economies and describes the role of foreign banks and international bond markets in the credit provision process.

JEL classification: F34, F36, G21, F23, F31, F36, G15.

In the last half century, borrower countries have been repeatedly rocked by swings in international capital flows. The ebb and flow of cross-border credit, often driven by changes in investor risk appetite, can expose vulnerabilities and thus be destabilising. Before the Great Financial Crisis (GFC) of 2007–09, for example, international *banks* fuelled domestic credit booms in advanced economies (AEs) and emerging market economies (EMEs) alike. In the post-GFC low rate environment, many corporate borrowers bulked up on foreign currency *bonds*, mainly denominated in the US dollar. Rising dollar borrowing costs since 2020 have curtailed this somewhat, but continued dollar appreciation and geopolitical uncertainty have brought questions of debt sustainability to the fore yet again.

This article is a primer on how BIS statistics shed light on various international dimensions of credit and their impact on financial stability in borrower economies. The first dimension is the funding source. Cross-border credit can be *direct*, such as a cross-border loan to a non-bank borrower, or *indirect*, such as a loan extended by a local (ie resident) bank but that is funded by cross-border borrowing. In both cases, the funding for this credit is sourced from abroad. A second dimension is the currency of denomination, which can be the borrower's domestic currency or a foreign currency. A third dimension is the mix of creditors and their structures: they can be banks or non-banks, foreign or domestic, and extend credit locally or across borders.

[1] This is the fifth article in a series showcasing the BIS international banking and financial statistics, following McGuire et al (2024a, 2024b) and Hardy et al (2024a, 2024b). We thank Stefan Avdjiev, Gaston Gelos, Benoît Mojon, Swapan-Kumar Pradhan, Andreas Schrimpf, Ilhyock Shim, Hyun Song Shin, Goetz von Peter and Sonya Zhu for their helpful comments, and Jhuvesh Sobrun for excellent research assistance. The views expressed are those of the authors and do not necessarily reflect those of the Bank for International Settlements.

Key takeaways

- *Rapid international credit growth can enable domestic credit booms, posing risks to financial stability. Both direct cross-border credit and indirect cross-border credit bear watching.*
- *Foreign banks operating in domestic markets may enhance credit provision in local credit markets, but their cross-border credit tends to dry up first when financial volatility arises.*
- *Foreign currency credit is increasingly intermediated through capital markets rather than through banks, which diversifies the sources of credit but also alters the risks.*

International credit bears watching, in particular when it grows faster than domestic credit. This can enable domestic credit booms, as happened in many countries in the run up to the GFC (CGFS (2011)). Direct cross-border credit fuelled by a search for yield inflated asset prices, and the resulting rise in collateral values further amplified credit growth. Indirect cross-border credit also played a key role in many economies by allowing local banks to extend credit in excess of what would be sustainable by the domestic deposit base alone.

Borrowing during such boom periods is often denominated in a foreign currency, mainly the US dollar. This enables borrowers to take advantage of lower funding costs or access larger pools of capital. However, it also creates risk when the borrower's local currency depreciates: higher debt burdens beget higher repayment costs and potential defaults. For example, mortgages denominated in low interest rate foreign currencies (eg the Swiss franc) were popular in some eastern European countries ahead of the GFC. But in its wake, the debt burden ballooned in local currency terms. After the GFC, borrowers increasingly took advantage of low long-term rates in bond markets. This helped diversify and deepen their access to capital, but also exposed them to changes in the risk appetite of international bond investors.

Dynamics in the growth of cross-border credit in part reflect conditions in global wholesale funding markets. This makes it important to also consider the composition of creditors, how they fund their credit and thus how flighty the credit is. For banks, BIS statistics provide useful measures of how much credit is provided by foreign banks versus home banks, and how much of the credit is funded and extended locally versus across borders. Short-term wholesale funding, which proved to be unstable in the GFC (Bruno and Shin (2015), Ivashina and Scharfstein (2010)), is often used to fund cross-border credit. Consequently, during periods of financial stress, foreign banks tend to withdraw cross-border credit more rapidly than do domestic banks or foreign banks operating locally in the country.

The international dimensions of credit growth pose policy challenges (Borio et al (2011)). In economies experiencing booms, international credit complicates the job of domestic authorities who seek to constrain credit. They have several tools to slow the growth of domestic credit but only limited tools to control credit extended by institutions abroad. In addition, borrowers may shift from local to foreign currency liabilities if local currency rates rise. This can reduce the efficacy of domestic monetary policy and ties the economy to interest rate conditions set elsewhere – including in international bond markets.

This article first describes the international dimensions of credit and how they are reflected in BIS statistics. It then discusses the implications of such credit for financial stability. The final section concludes.

International dimensions of credit

International credit can help economies grow, but a rapid expansion in such credit can be destabilising. The BIS international banking statistics (IBS) and global liquidity indicators (GLIs) are key resources that provide visibility on *three dimensions* of credit to non-bank borrowers in a particular economy (see Box A): the source of funding (ie cross-border or local), the currency of denomination and the identity of the creditor (eg a foreign bank, domestic bank or non-bank creditor).

Direct and indirect cross-border credit and foreign currency credit

One key aspect of financial stability analysis is the extent to which credit to non-banks in a particular economy is supported by funding from abroad. Zeroing in on non-bank borrowers – ie non-bank financial institutions, non-financial corporations, households and governments – puts the focus on the real economy. Cross-border credit can take various forms. The most common is direct borrowing by non-banks from non-resident creditors, either bank or non-bank creditors. Such *direct cross-border credit* is the standard metric used in assessing reliance on international credit.

However, international credit can also be indirect. Creditors located in a particular country may finance a large share of their own locally extended credit to non-banks (ie domestic credit[2]) with net borrowing from non-residents (from other banks or non-banks). Importantly, this *indirect cross-border credit* allows credit growth to outrun domestic deposit growth. This component is often ignored in empirical analysis of credit booms, but as discussed below, it has been the marginal source of credit in many economies (Ehlers and McGuire (2017), Avdjiev et al (2020)).

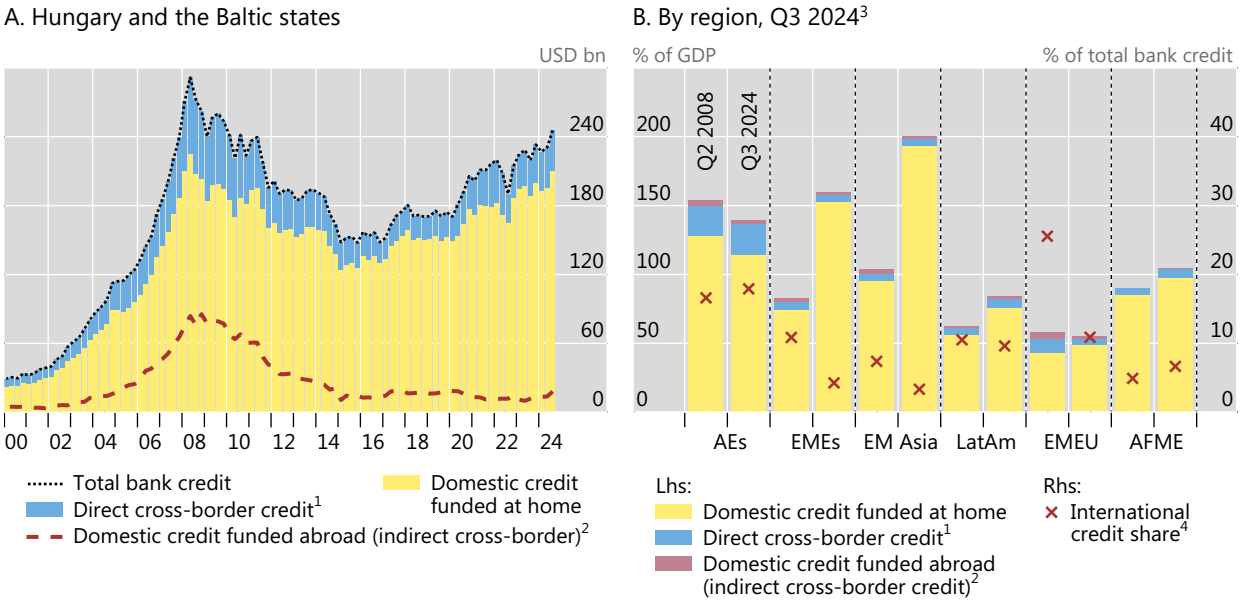
Several European cases highlight the roles of direct and indirect cross-border bank credit during the global credit boom ahead of the GFC. Direct cross-border credit to non-banks in Hungary and the Baltic states, for example, grew at roughly 34% year on year in the six years prior to Q1 2009 (Graph 1.A), about three percentage points above the rate for domestic bank credit. In addition, banks in these countries drew on indirect cross-border credit to support their domestic lending (dashed red line). Combined, these two cross-border components accounted for more than half of the stock of total bank credit to non-banks in these countries by 2008.

Since the GFC, direct and indirect bank credit have grown in importance in some regions but not in others (Graph 1.B). For AE borrowers, total bank credit has fallen somewhat relative to the scale of economic activity (stacked bars). But the combined share of direct and indirect bank credit rose modestly, to reach 18% of total bank credit (red x). For EME borrowers, by contrast, international bank credit has fallen as a share of total bank credit. This mainly reflected significant growth in domestic credit funded with local deposits (yellow bars) in the Asia-Pacific region and to a lesser extent Latin America. Emerging Europe, where international credit had surged leading up to the GFC, saw the largest declines in its share.

[2] Domestic credit, as usually measured, captures only loans or securities booked at banks in a given jurisdiction vis-à-vis residents of that jurisdiction. The addition of cross-border bank credit (from the IBS) yields a measure of the total credit provided by banks to non-banks in a particular country.

Direct and indirect bank credit to non-banks

Graph 1



AEs = advanced economies; AFME = Africa and Middle East; EM Asia = emerging Asia; EMEs = all emerging market economies; EMEU = emerging Europe; LatAm = Latin America.

[1] BIS reporting banks' cross-border claims on resident non-banks. [2] For BIS reporting countries, net cross-border borrowing (liabilities minus claims) by banks resident in the country; for non-BIS reporting countries (eg Hungary and Baltic states), BIS reporting banks' net cross-border claims on banks in the country. Net cross-border positions of countries with banks that export capital (ie with positions below zero) are excluded. [3] See endnotes for details. [4] Sum of direct and indirect cross-border credit.

Sources: IMF; LSEG Datastream; national data; BIS international banking statistics; authors' calculations.

International credit is often denominated in a currency that is foreign to the borrower. The *currency of denomination* of credit, regardless of whether this credit is extended by banks inside or outside the country, is of particular concern to policymakers since sudden moves in the exchange rate can significantly increase the debt burden expressed in local currency terms. As of end-Q3 2024, 90% of the total direct cross-border bank credit was denominated in five major currencies (USD, EUR, JPY, GBP, CHF). As discussed below, borrowing via bond issuance in international markets, mainly in US dollars, in part replaced bank borrowing in foreign currencies.

Policy measures such as capital controls and financial regulation can affect the channels through which international credit flows. Some of these measures focus on direct cross-border credit, while leaving a banks' intragroup funding alone. Ultimately, the mix of direct versus indirect international credit is shaped by policy and by the organisation of globally active banks (Hardy et al (2024b)). Thus, focusing on only one type of international credit (eg direct cross-border) risks missing important developments in other forms (eg indirect cross-border).

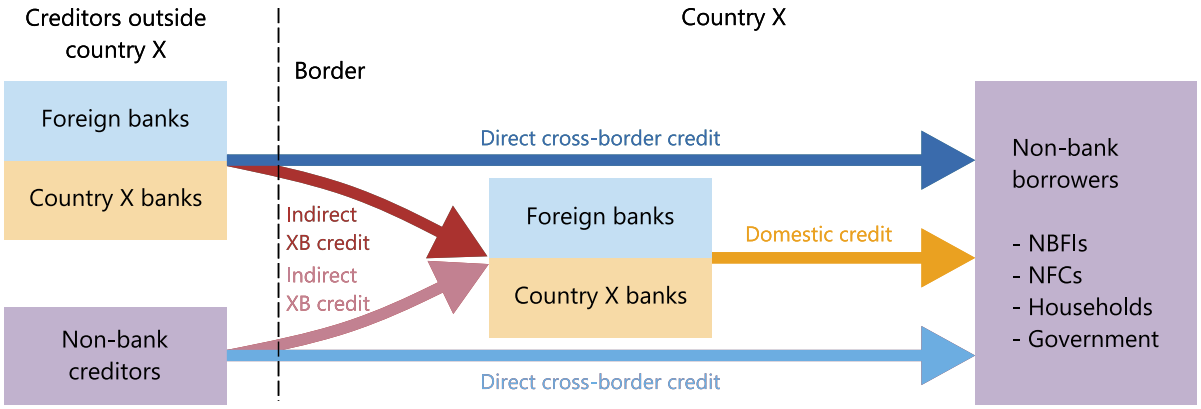
Box A

Tracking international credit with BIS statistics

BIS statistics provide several complementary perspectives on international credit. This box shows how the international banking statistics (IBS) shed light on bank credit to non-bank borrowers in a given country.

International credit reaches borrowers through several channels (Graph A1). It can be extended across borders directly from banks or non-banks abroad. It can also come indirectly through banks in the borrowing country that fund themselves from abroad, either through intragroup positions or with funding from unrelated parties (banks or non-banks). Both direct and indirect cross-border credit are often supported by wholesale funding (Bruno and Shin (2015)). For its part, domestic credit (locally extended) can come from foreign-owned banks or from domestic banks, regardless of the funding source. The IBS cover direct and indirect credit provided by banks quite well (dark arrows). However, BIS statistics only partially cover such credit provided by non-banks (light arrows). Specifically, indirect cross-border credit is well captured for countries that report to the IBS, but it must be estimated for those that do not (see endnotes). Borrowing via international bonds is tracked in the BIS international debt securities (IDS) statistics and the global liquidity indicators (GLIs), but the identity of the holders of these bonds is not known.

Credit to non-bank borrowers in country X — Graph A1



NBFIs = non-bank financial institutions; NFCs = non-financial corporations; XB = cross-border.

Source: Authors' elaboration.

The IBS contain various breakdowns that are not generally available in banks' public financial data sources. Banks' claim (ie asset) positions can be broken down by the location (country) and sector of the counterparty, as well as by booking location. For example, a French bank can extend a loan to a non-bank borrower in Brazil, either from an office outside of Brazil (a cross-border claim) or from an affiliate in Brazil (a local claim, part of domestic credit in Graph A1). This breakdown, combined with the breakdown by currency, yields several useful ratios:

Direct cross-border bank credit share: share of cross-border credit to non-banks in total bank credit to non-banks. The denominator is domestic credit (DC), as reported in the *IMF International Financial Statistics*, plus total cross-border (XB) credit to non-banks in the country from the IBS.

$$\text{Direct XB share} = XB / (DC + XB).$$

Direct plus indirect cross-border bank credit share: the direct XB share, adding to the numerator the net cross-border borrowing by banks in the country (net XB bank bor). This *additional* piece is the amount of domestic credit extended by banks in the country that is *financed by cross-border liabilities*. It enters the numerator only when net cross-border borrowing by local banks is positive.

Direct and indirect XB share = (XB + max(0, net XB bank bor)) / (DC + XB)

Foreign currency share: the share of total bank credit that is denominated in currencies other than the currency of the borrowing country. Estimates of cross-border bank credit in foreign currency are constructed from the IBS. The construction of domestic bank credit in foreign currency varies by country (see endnotes).

Foreign currency share = (DC in FX + XB FX credit) / (DC + XB)

Foreign bank participation rate (FBP rate): share of total bank credit to non-banks that is provided by foreign banks. The numerator includes foreign banks' international claims on non-banks (INTC) on an immediate counterparty basis, comprising cross-border claims (in all currencies) plus claims extended by bank affiliates inside the borrower country and denominated in non-local currencies, as well as these affiliates' locally extended claims on non-banks in the local currency (LCLC). For this latter piece, LCLC is not broken down by counterparty sector in the data. Rather, the parameter α denotes the estimated share of LCLC to the non-bank sector, computed as the share of overall foreign claims on the non-bank sector (guarantor basis).

FBP rate = (INTC + α*LCLC)/(DC + XB)

Credit providers: nationality and location

Cross-border bank credit can, but need not, give foreign-owned banks an outsize role in domestic credit markets. Such non-domestic banks loom large in economies where direct cross-border bank credit is a large part of overall credit. But even in economies with relatively little cross-border credit, foreign banks can play a pivotal role via their local presence in the domestic banking system. While some operate like domestic banks, raising deposits in the country to lend locally, others fund their local lending with cross-border liabilities. These can take a variety of forms, including interoffice funding, wholesale funding or cross-border deposits (Hardy et al (2024b).

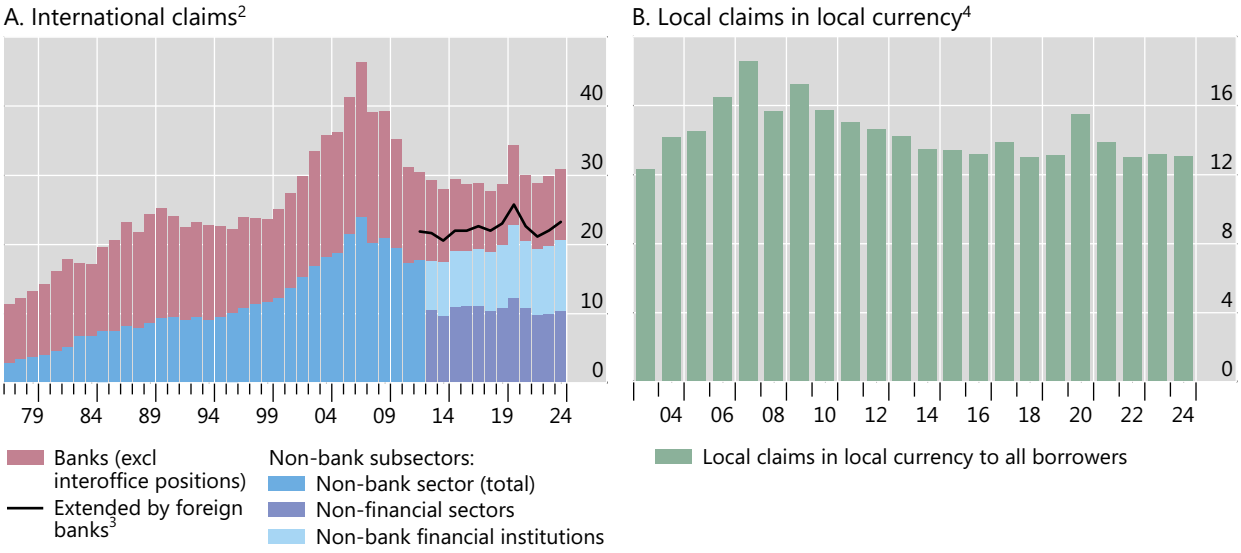
The role of foreign banks as credit providers has evolved over the decades. International claims (comprising all cross-border lending and local lending in foreign currency) expanded through the 1970s and 1980s (Graph 2.A), fuelled by regulatory arbitrage, financial innovation and financial liberalisation (McCauley et al (2021)). A second wave of expansion preceded the GFC, after which many banks – in particular European banks (IMF (2015), McCauley et al (2019)) – retrenched their overseas operations. Of the total international bank credit outstanding at end-Q3 2024, an estimated 75% was extended by a bank that is foreign to the borrower (black line).

But foreign banks also have local operations in the borrower countries, much of which are denominated in the borrower's local currency (Graph 2.B). Combining these claims with their international claims provides a measure of foreign banks' share in total bank credit to non-bank borrowers – ie the *foreign bank participation (FBP) rate* (Ehlers and McGuire (2017); see Box A).

Since the GFC, foreign banks have accounted for a decreasing share of total bank credit to EMEs as domestic financial systems have grown. For EMEs as a group, their FBP rate fell from over 20% in 2008 to 7% in 2024 (Graph 3.A, blue line). While foreign bank credit rose faster than economic activity for much of this period, it was overshadowed by the dramatic expansion in credit from domestic banks (Avdjiev et al (2024), Hardy (2019)). By contrast, the FBP rate for advanced economies (red line) has continued to rise after the GFC.

Bank claims by borrower and type[1]

Claims scaled by world GDP; in per cent — Graph 2



[1] See endnotes for details. [2] International claims comprise cross-border claims in all currencies plus local claims in foreign currencies from the BIS locational banking statistics; end-year, except for Q3 2024. [3] Lower bound estimate of international bank claims where the creditor bank is foreign to the borrower. [4] Local claims in local currency for a constant sample of reporting countries in the BIS consolidated banking statistics from 2003 onwards.

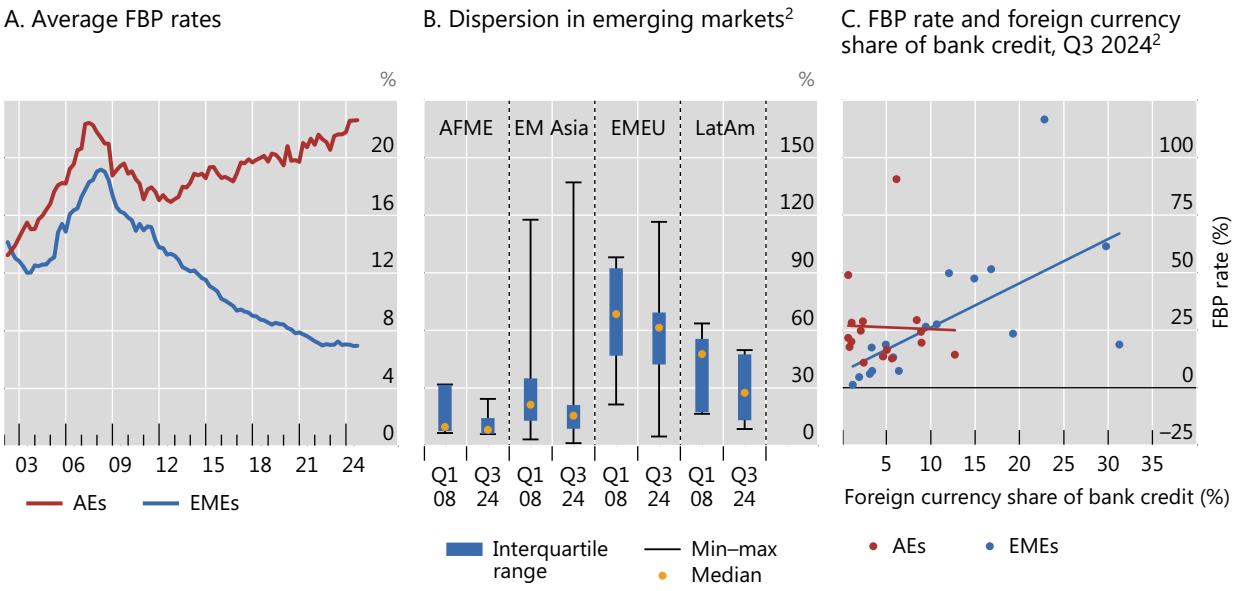
Sources: IMF; World Bank; BIS international banking statistics; authors' calculations.

Foreign bank participation rates varied markedly both across and within EME regions in mid-2024. Asia-Pacific EMEs stood out with relatively low FBP rates (Graph 3.B). For instance, the rate for China was close to 1% in Q2 2024, falling from an already low 3% a decade earlier. Similarly, both India and Korea have had FBP rates below 15% for the last two decades. FBPs in Latin America and other EMEs have been consistently higher than in Asia but have shifted down since the GFC.

Foreign banks often, but not always, bring foreign currency credit to borrower economies. Their access to foreign currency funding sources makes them a natural conduit. They tend to transact much more in foreign currencies than do domestic banks (Aldasoro et al (2022)), and their lending can be linked to borrowing costs in their home currency (Morais et al (2019)). EMEs with relatively higher FBP rates also tend to have a higher share of bank credit denominated in foreign currencies (Graph 3.C).[3] No such correlation is evident for AE borrowers, which tend to borrow primarily in domestic currency regardless of the banks' ownership. Moreover, many domestic banks in AEs are well integrated in the global financial system and thus can access foreign currency funds themselves directly or via affiliates abroad.

[3] The declining FBP rates are thus consistent with the declining reliance on foreign currency credit in general (Avdjiev et al (2024), Gelos et al (2024)).

Foreign bank participation (FBP) in domestic banking markets[1] Graph 3



AFME = Africa and Middle East; EM Asia = emerging Asia; EMEU = emerging Europe; LatAm = Latin America.

[1] FBP rate is the estimated claims by BIS reporting foreign banks on non-bank borrowers of the domestic economy, divided by the sum of cross-border claims on non-bank borrowers and domestic bank credit to non-banks. See endnotes for details. [2] The foreign currency share is calculated for total bank credit to non-banks.

Sources: IMF; LSEG Datastream; national data; BIS international banking statistics; authors' calculations.

Capital markets as a rising force in global finance

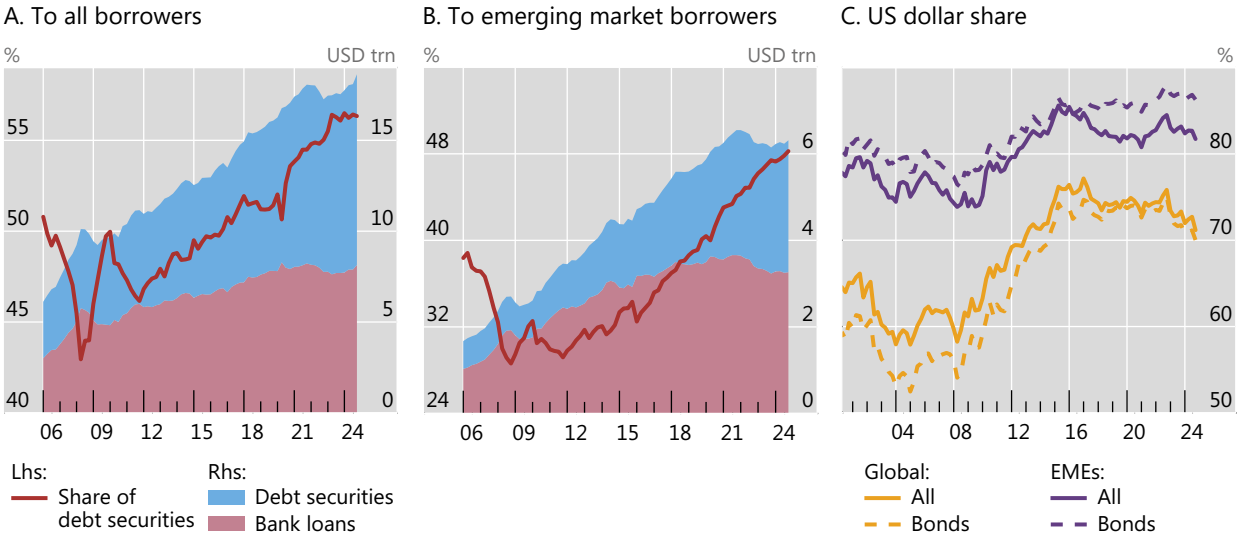
While banks remain key providers of foreign currency credit, international capital markets have become increasingly important since the GFC (Hardy and von Peter (2023)). This development is reflected in the BIS GLIs, which track credit denominated in US dollars, euros and yen to non-bank borrowers outside the respective currency-issuing jurisdictions (Graph 4.A). The major share of credit captured in the GLIs is to private sector firms.[4] The rise in credit through debt securities occurred as bank creditors stepped out after the GFC and non-bank investors stepped in (McCauley et al (2015), Shin (2012)). The shift has been particularly stark in EMEs, where the bond share rose from almost a third at end-2008 to almost a half in mid-2024 (Graph 4.B). The shift towards capital market financing is likely to be even starker if growth of domestic capital markets is factored in.[5]

Greater reliance on capital markets has both pros and cons for borrowers. Debt securities allow EME borrowers to tap larger investment pools, which in turn helps diversify risks away from banks and across a broader set of investors. Further, EME borrowers have been able to obtain credit at tenors that can exceed those generally offered by banks. On the other hand, capital markets can be more prone to swings in

[4] See BIS, "BIS global liquidity indicators: methodology", December 2022, at www.bis.org/statistics/gli/gli_methodology.pdf, for the GLI compilation methodology.

[5] International investors also hold local currency bonds issued in domestic markets, but these are not captured in the GLIs (Gelos et al (2024)).

The rising bond share in foreign currency credit and the dominant US dollar[1] Graph 4



[1] US dollar-, euro- and yen-denominated credit to non-bank borrowers outside the respective currency areas (non-residents).

Sources: BIS global liquidity indicators; authors' calculations.

global risk sentiment, which in turn can affect exchange rates and thereby the ability to repay foreign currency credit (Koepke (2019), Hofmann et al (2022)).

The dollar remains EMEs' foreign currency of choice in both bank and bond credit (Graph 4.C). Countries with exports denominated in dollars (eg commodities producers) have a natural hedge. But those without such a hedge face both balance sheet and rollover risk when the dollar appreciates or when borrowing costs rise. As discussed below, the recent dollar appreciation and rising dollar borrowing costs make EMEs more vulnerable to sudden changes in investor sentiment.

Implications of international credit for domestic policy

International credit bears watching by policymakers. For one, international credit is often the marginal source of credit and can be subject to destabilising reversals. For another, the modes of credit extension and funding (ie cross-border vs local) by foreign banks affect the stability of their lending (Hardy et al (2024b)). The following subsections discuss cases that illustrate these points.

International credit and domestic credit booms

Rapid expansion in international credit can be an enabler of domestic credit booms (Domanski et al (2011), Aldasoro et al (2023), Borio et al (2011)). In the run-up to the GFC, for example, international credit was the marginal source for borrowers in many countries, fuelling a rise in ratios of bank credit to GDP. As the crisis unfolded, countries that had relied heavily on such credit saw the largest credit contractions.

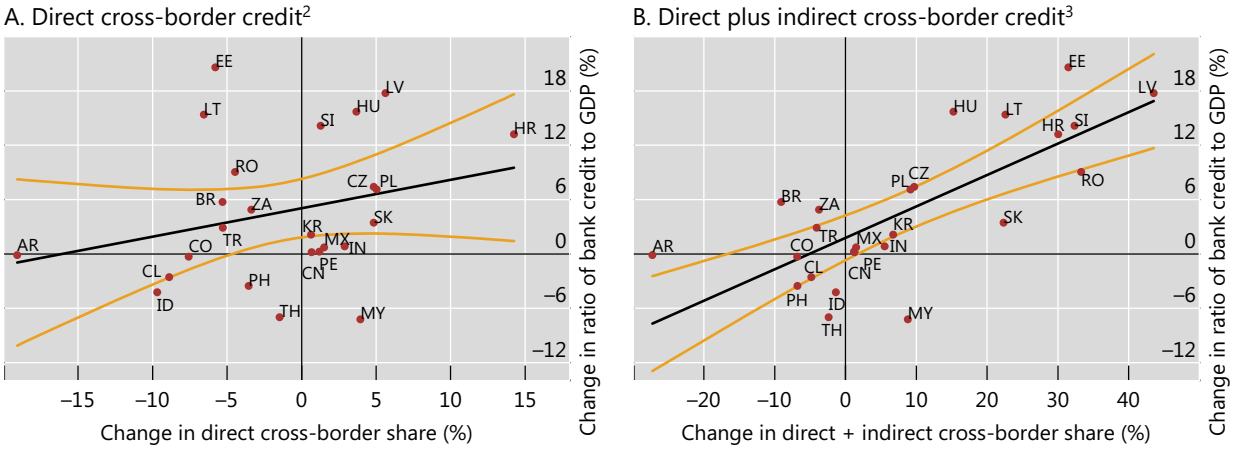
The *type* of international credit matters in these boom-bust episodes. In a sample of EME borrower countries, there is a statistically significant relationship between the change in the share of *direct* cross-border bank credit between 2002 and 2008 and

the change in the ratio of bank credit to GDP (Graph 5.A). Importantly, the relationship is more pronounced when the more comprehensive measure of international credit is used. That is, the rise in the ratio of bank credit to GDP is more tightly related to the change in the *combined* share of direct cross-border credit and *indirect* cross-border credit (Graph 5.B). This is seen in the steeper slope of the regression line and the much narrower confidence bands for the estimated regression line (yellow lines).

Such indirect cross-border credit can come in different forms. In several eastern European countries, foreign banks advanced euros or Swiss francs to their local affiliates, which in turn extended foreign currency mortgages to households. Indeed, these countries experienced big credit booms with a high share of foreign currency credit in mid-2008. By contrast, in Korea, foreign banks advanced dollars to banks in the country, but those were not used to fund dollar-denominated assets. Rather, banks in Korea bought won-denominated investments that were hedged back into dollars using FX forwards (McCauley and Zukunft (2008)). The forward counterparties, mostly Korean exporters such as shipbuilders, in effect borrowed dollars by contracting to sell future dollar revenues.

As in the boom period, so too in the bust period: international credit drove larger swings in activity (Graph 6). Note that here the focus is on the cumulative contraction in output (real GDP) during the GFC rather than the change in the ratio of bank credit to GDP. Those EMEs most dependent on international credit before the Lehman Brothers collapse tended to suffer sharper downturns.[6] The share of direct cross-border credit on the eve of the GFC is only loosely related to GDP growth in the following years (Graph 6.A). But once again, the combined (direct plus indirect) share of cross-border credit (Graph 6.B) and foreign currency credit (Graph 6.C) are more tightly associated with the severity of the downturn.

International credit in EMEs during the pre-GFC boom (Q1 2002–Q2 2008)[1] Graph 5

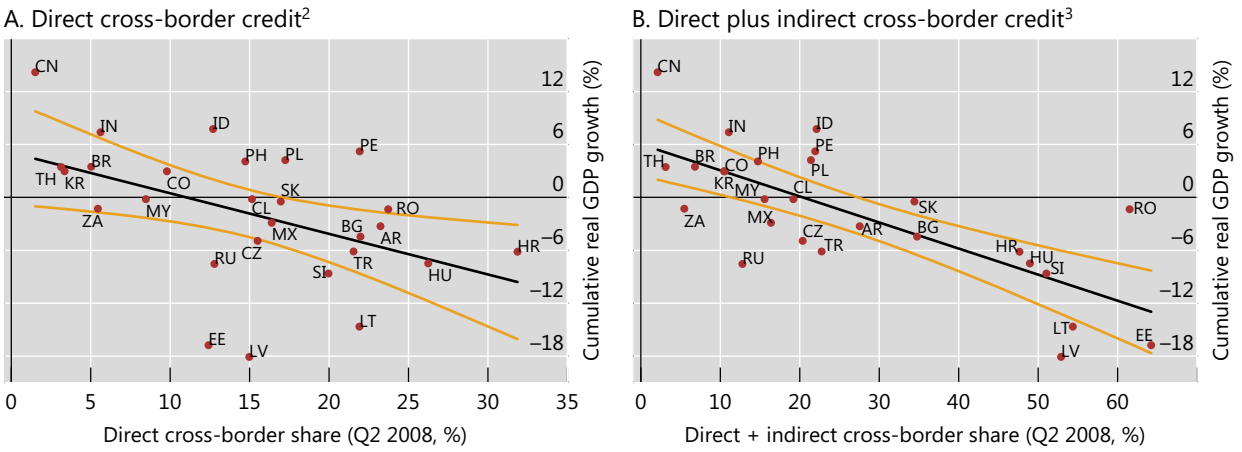


[1] The y-axes show the change in the ratio of total bank credit (including credit to governments) to GDP over the Q1 2002–Q2 2008 period. Total bank credit is the sum of domestic credit and cross-border bank credit to non-banks in the country. The black lines indicate OLS predicted values, and the yellow lines indicate the 95% confidence bands for these regression lines. [2] The x-axis shows the change in the ratio of direct cross-border credit over total bank credit to non-banks (including governments). [3] The x-axis shows the change in the ratio of direct cross-border credit plus net cross-border borrowing by banks in the country (if positive) to total bank credit to non-banks.

Sources: IMF; national data; BIS international banking statistics; authors' calculations.

[6] Berkmen et al (2012) show that financial factors were key in determining the size of the growth impact of the GFC. Leverage and the share of short-term debt in GDP are significant explanatory variables in various regression specifications. Lending from advanced economies also factors in significantly.

International credit and GDP in EMEs in the post-GFC bust (Q2 2008–Q4 2009)[1] Graph 6



[1] The y-axes show the cumulative growth in GDP in the six quarters between end-Q2 2008 and end-Q4 2009. The black lines indicate OLS predicted values, and the yellow lines indicate the 95% confidence bands for these regression lines. [2] The x-axis shows the ratio of direct cross-border credit to total bank credit to non-banks (excluding governments) at end-Q2 2008. [3] The x-axis shows the ratio of direct cross-border credit plus net cross-border borrowing by banks in the country (if positive) to total bank credit to non-banks, at end-Q2 2008.

Sources: IMF; national data; BIS international banking statistics; authors' calculations.

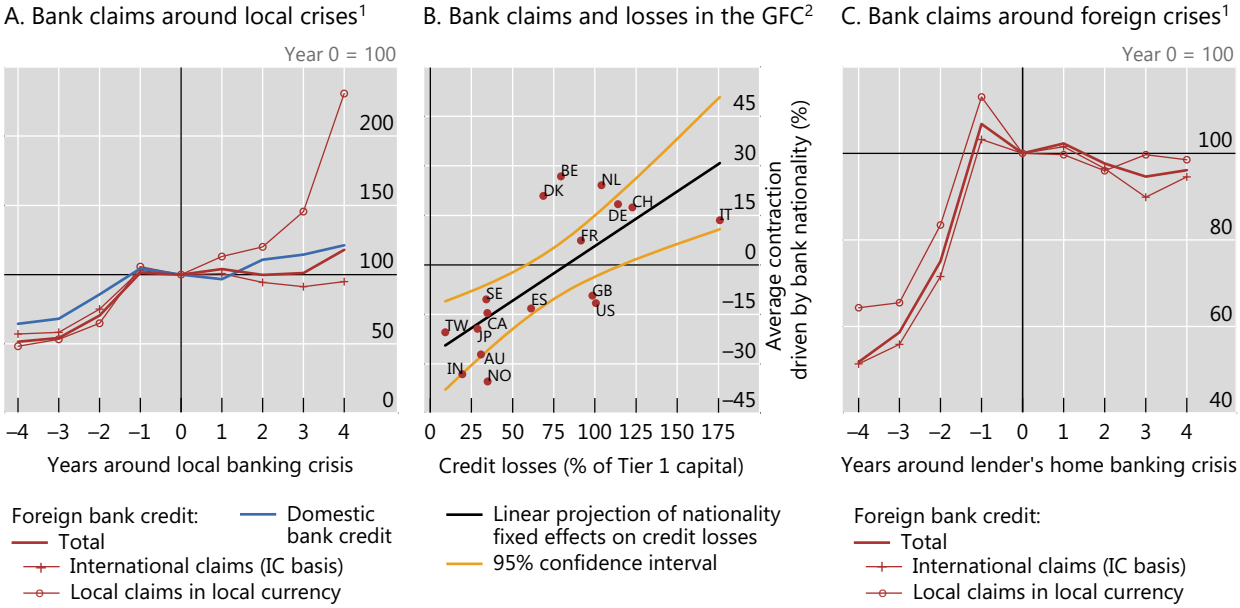
The trade-offs of greater foreign bank participation

The identity of the lender is another key dimension of international credit. A greater share of credit from foreign banks brings both benefits and risks for the borrower. Foreign banks, which typically enjoy a broader intragroup support network and funding mix, can both bring best practice to domestic markets and increase competition that drives cost reductions at domestic banks (Caparusso and Hardy (2022), Claessens and van Horen (2014)).

However, for the stability of credit in borrower countries, the source of funding matters more than the ownership of the bank (Ehlers and McGuire (2017), Ongena et al (2015)). For example, foreign banks operating locally can often rely on support from their parent bank (De Haas and van Lelyveld (2010)). In such cases, they can be better equipped than domestic banks to handle economic shocks originating in the borrower country (Cull et al (2017)). BIS statistics show that, following a local banking crisis, local credit extended by foreign banks expands strongly in subsequent years (Graph 7.A). Indeed, it is more resilient than local lending by domestic banks (blue line). By contrast, foreign banks' international claims are fickle and tend to disappear.

This ordering of resilience stems mainly from the funding source. International credit is more likely to be funded by wholesale funding, which is subject to periodic squeezes (Bruno and Shin (2015), Ivashina and Scharfstein (2010)). By contrast, local credit, particularly if denominated in the local currency, is often funded by local liabilities (eg stable domestic deposits) in the local currency. This matching of currencies across the assets and liabilities sides of the balance sheet helps insulate creditors from movements in exchange rates (IMF (2015), McGuire and von Peter (2016)) and thus tends to be a stabilising force.

Foreign banks and lending responses to shocks Graph 7



[1] Years before and after the start of a banking crisis, as defined by Laeven and Valencia (2020) for 27 borrower countries (panel A) and 18 lender countries (panel C). [2] The y-axis is a nationality fixed effect from a regression on peak-to-trough contractions in credit around the GFC. Taken from McCauley et al (2019). See endnotes for details.

Sources: Laeven and Valencia (2020); McCauley et al (2019); national data; BIS international banking statistics; authors' calculations.

However, in the case of global shocks or shocks in a bank's home country, foreign banks can be transmitters of risk to local economies. For instance, a bank that faces a shock in one location may adjust its globally consolidated balance sheet, leading to credit contractions in other locations (Adams-Kane et al (2017), Peek and Rosengren (1997)). During the GFC, banks that racked up larger credit losses saw larger peak-to-trough contractions in their foreign claims (Graph 7.B) after accounting for borrower- and location-specific factors (see endnotes). More generally, banking crises in the foreign bank's home country are followed by a decline in lending abroad, mainly due to lower international claims (Graph 7.C).

Dollar debt, dollar appreciation and rising dollar rates

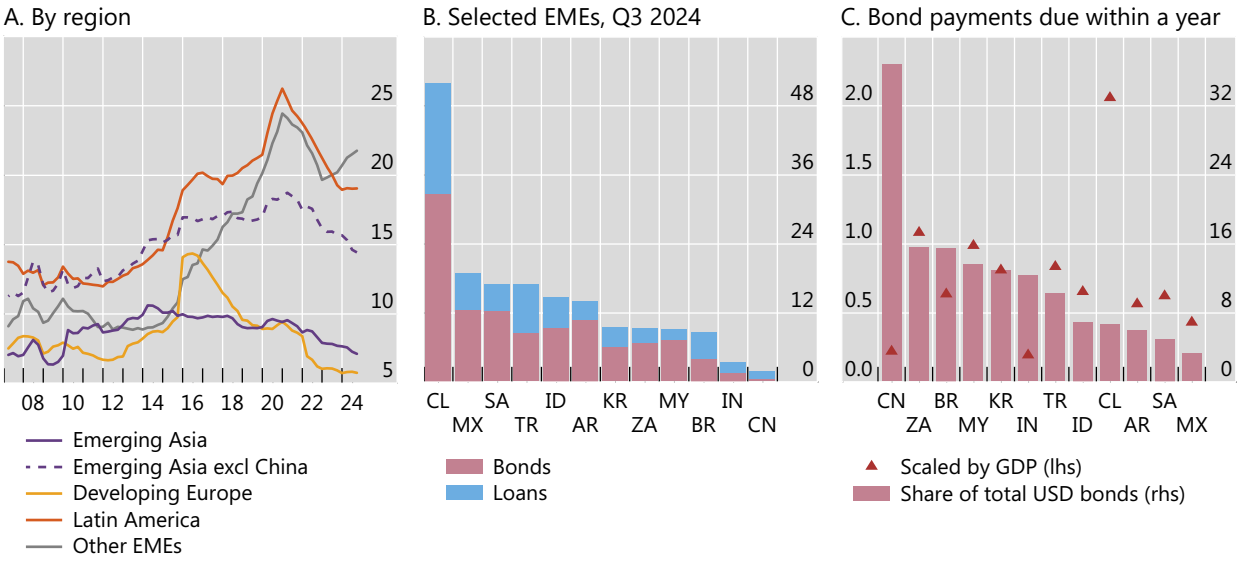
Low long-term borrowing costs in the major currencies after the GFC led to a nearly decade-long rise in foreign currency borrowing by EMEs (Graph 8.A). However, the rise in dollar policy rates and sustained dollar appreciation since 2020 have led to a steepening of the dollar yield curve, which, in turn, has curtailed this borrowing.

Despite this decline, dollar repayment obligations remain a concern in the current environment (Graph 8.C). Changes in policies that affect trade (eg tariffs) – and any further appreciation of the US dollar – could put additional pressure on EMEs' ability to repay. Many EMEs are exporters of commodities, goods and services priced and traded in dollars. The associated dollar revenue has served as a natural hedge against currency mismatches. However, falling sales and commodity prices can foreshadow difficulties in servicing their international debt. This debt bears watching as trade policies evolve and their impact on the global economy is felt.

Dollar credit to EME non-bank borrowers, scaled by GDP[1]

In per cent

Graph 8



[1] US dollar-denominated credit to non-bank borrowers outside the respective currency areas (non-residents).

Sources: IMF; BIS global liquidity indicators; BIS international debt securities statistics; authors' calculations.

Conclusions

The international dimensions of credit growth pose various policy challenges.[7]

First, in economies experiencing booms, international credit often complicates the job of domestic authorities who seek to monitor and constrain credit. For example, domestic authorities have several tools to slow the growth of credit extended by banks within their jurisdiction. But short of capital controls, the tools to measure, much less control, credit extended by institutions outside the country are limited. BIS work on the early warning properties of various "gap" variables, in particular the credit-to-GDP gap, has proven quite useful in this regard (Borio and Lowe (2002, 2004), Borio and Drehmann (2009), Aldasoro et al (2018)).[8]

Second, the post-GFC push in several jurisdictions for local capital requirements and "ring-fencing" of banks' operations presents its own trade-offs. The longer-term implications of such a move are widely debated. While such regulatory changes may make banks more stable in the near term, they do so by possibly hampering cross-border transfers of capital. Policymakers should continue to examine these trade-offs.

[7] See, inter alia, IMF (2018), Albertazzi and Bottero (2014), Kim and Mitra (2014), Popov and Udell (2012), Borio et al (2011), CGFS (2011), Espinosa-Vega et al (2010).

[8] In addition, some provisions in the Basel III framework may help policymakers dampen unwanted credit flows. "Jurisdictional reciprocity", as detailed in BCBS (2010), should help promote supervisory coordination across jurisdictions. Supervisors in a jurisdiction seeking to dampen cross-border bank credit in that jurisdiction can coordinate with supervisory authorities abroad in setting buffer requirements on the creditor banks' cross-border positions.

Finally, policymakers should not lose sight of other challenges that have emerged since the GFC. Cross-border bank credit has taken a back seat to bond issuance, much of which was absorbed by non-bank creditors (McCauley et al (2015)). Such "non-bank to non-bank credit" remains opaque because of a lack of data on the consolidated holders of the claims. Moreover, it has been less affected by many of the post-GFC regulatory initiatives that targeted the banking sector.

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Annex A: Sources of credit

This annex defines key terms and concepts used throughout the feature, based on the BIS Glossary and the Box in a previous feature in this series (Hardy et al (2024a)).

1. **Domestic positions:** claims[9] or liabilities of a domestic bank vis-à-vis residents of the bank's home country. They are not usually covered in the IBS.
2. **Cross-border positions:** positions on a non-resident – for example, a claim on or liability to a counterparty located in a country other than the country where the banking office that books the position is located.
3. **Local positions:** claims on or liabilities to a counterparty located in the same country as the office that books the positions (the opposite of "cross-border positions"). Local positions in the home country are domestic positions (→1).
4. **International positions:** positions on a non-resident or denominated in a foreign currency. International claims comprise cross-border claims in any currency plus local claims of foreign affiliates in non-local (foreign) currencies.
5. **Foreign position:** claims on, or liabilities to, residents of countries other than the country where the controlling parent is located. Foreign claims comprise positions 2 + 3 above, ie local claims of the bank's offices abroad as well as cross-border claims of the bank's offices worldwide.

Endnotes

AFME = Africa and Middle East; EM Asia = emerging Asia; EMEU = emerging Europe; LatAm = Latin America. All graphs are based on data from the locational banking statistics (LBS) and the consolidated banking statistics (CBS). China does not report to the CBS.

"Emerging market economies (EMEs)" is used as a short form for *emerging market and developing economies*, the set of economies not classified as advanced economies (AEs) in the BIS country grouping convention. The names of jurisdictions corresponding to ISO codes are provided under the abbreviations on pages iv–vii.

Graph 1.B: The number of countries in each region are: AEs (24), AFME (4), EM Asia (10), EMEs (32), EMEU (12) and LatAm (6).

Graph 2.A: International claims extended by foreign banks are derived as the sum of all parent bank nationalities in the BIS consolidated banking statistics on an immediate counterparty basis and estimated international claims of nine parent bank nationalities that do not report to the CBS (from the BIS locational banking statistics by nationality). Interoffice claims are included in "Banks" (red bars) prior to 1983.

Graph 2.B: The following reporting countries are excluded due to data unavailability or because they started reporting later than 2003: AT, CL, HK, KR, LU, MX and PA.

Graph 3: The numerator of the FBP rate is the sum of international claims (IC) and local claims in local currency (LCLC) on non-bank borrowers, on an immediate counterparty basis. IC consist of cross-border claims of foreign banks plus local claims

[9] In the BIS LBS, bank claims comprise: (i) loans and deposits; (ii) holdings of debt securities; and (iii) derivatives with a positive market value and other residual instruments (combined). Credit is defined as the sum of (i) and (ii). In the BIS LBS, derivatives are broken out from claims, see Hardy et al (2024a).

extended in foreign currency by hosted foreign banks (in domestic economy). LCLC are claims made by foreign banks resident in the domestic economy to domestic non-bank borrowers in the domestic currency; LCLC to non-bank borrowers are calculated by multiplying LCLC on all sectors (on an immediate counterparty basis) by the share of non-banks in total foreign claims (on a guarantor basis). Since most countries started reporting claims on an guarantor basis around end-2004, the Q1 2005 figures are used for the shares between 2000 and 2004.

Graph 3.A: The regional aggregates are made up of 23 AEs and 31 EMEs.

Graph 3.B: The number of countries in each region are: AFME (7), EM Asia (8), EMEU (9) and LatAm (7).

Graph 3.C: The regional aggregates are made up of 16 AEs and 18 EMEs. Foreign currency share of bank credit: the currency composition of banks' cross-border claims on non-banks in a country is captured in the BIS LBS, which break down cross-border claims into five major currencies (USD, EUR, JPY, GBP and CHF). The method for obtaining the currency breakdown of domestic credit to non-banks depends on the country. In the LBS, reporting countries provide the same breakdown for banks' local positions in foreign currencies, and thus the difference between this total and domestic credit is the amount in domestic currency. This yields the estimates for EMEs that themselves report to the LBS (ie BR, CL, MX, KR, TR and ZA). For other EMEs, the share of local claims in foreign currency of domestic credit is estimated as the difference between BIS reporting banks consolidated cross-border claims (guarantor basis) and their international claims (IC basis) (ie local claims in non-local currencies booked by foreign banks). Thus, the figures are incomplete for these countries because (a) there is no explicit currency breakdown for this piece, and thus assumptions are required to determine the USD, EUR, JPY, GBP and CHF shares; and (b) the positions of domestic banks' local foreign currency positions are not known. For (b), we assume for most countries that these banks' local positions are all in domestic currency.

Graph 7B: "Average contraction driven by bank nationality" is derived from a nationality fixed effect σ_n derived from the following regression equation in McCauley et al (2019):

$$-\frac{\Delta A_{in}}{A_{in}} = \alpha \log(A_{in}) + \delta \log(d_{in}) + \sum_r (\beta^r * R_{in}^r) + \lambda_i + \sigma_n + \epsilon_{in} ,$$

where ΔA_{in} is the peak-to-trough contraction in foreign claims A_{in} of bank nationality n on borrowers in country i. d_{in} is the geographic distance between home and borrower countries, R_{in}^r are the values of various balance sheet variables of the foreign affiliate measured at the peak of A_{in}. These include balance sheet size, peak-to-trough contraction (of the affiliate), local intermediation share, interbank funding ratio, foreign currency funding ratio, cross-border funding ratio, cross-border excluding intragroup ratio, net intragroup funding, intragroup funding received, pre-crisis expansion (log) and a post-crisis recovery dummy. λ_i is a borrower country fixed effect. Credit losses for each nationality are the maximum credit losses on securities (from Bloomberg-reported company statements) and non-performing loans (from S&P CapitalIQ) expressed as a share of Tier 1 capital in 2008.