

Chapter 2 at a Glance

- Holdings by banks of domestic sovereign debt have surged in emerging markets during the COVID-19 pandemic, on average accounting for about one-fifth of banking sector assets and 200 percent of their regulatory capital.
- The larger holdings of domestic sovereign debt by emerging market banks have deepened the ties between the sovereign and banking sectors—the so-called sovereign-bank nexus. With public debt at historically high levels and the sovereign credit outlook deteriorating in many emerging markets, a deeper nexus poses risks of an adverse feedback loop that could threaten macro-financial stability.
- This chapter examines the sovereign-bank nexus in emerging markets, focusing especially on the COVID-19 pandemic, and puts forward policy options to minimize its potential risks and enhance resilience.
- The transmission of risks between the sovereign and banking sectors is significant—both directly and indirectly through the nonfinancial corporate sector.
- An increase in sovereign risk can adversely affect banks' balance sheets and lending appetite, especially in countries with less-well-capitalized banking systems and higher fiscal vulnerabilities. It can also constrain funding for the nonfinancial corporate sector and reduce its capital expenditure.
- Amid tightening global financial conditions, heightened geopolitical tensions, and large public financing needs, emerging markets face complex policy trade-offs. Given the multifaceted nature of the sovereign-bank nexus, the policy response to mitigate risks must be tailored to country-specific circumstances and should include:
 - Better targeting of spending and strengthening of medium-term fiscal frameworks in countries with limited fiscal space and tight borrowing constraints to build resilience and mitigate the impact of an adverse shock
 - Preserving bank resources to absorb losses by restricting capital distribution where needed
 - Conducting bank stress tests by taking into account the multiple channels of the nexus
 - Examining options to weaken the nexus—such as capital surcharges on banks' holdings of sovereign bonds above certain thresholds—once the economic recovery has taken hold and pandemic-related financial sector support measures have been withdrawn
 - Continuing efforts to foster a deep and diversified investor base to strengthen market resilience in countries with underdeveloped local currency bond markets
- Given that risks from the sovereign-bank nexus are not limited to emerging markets but have also manifested in advanced economies in the past, the Basel Committee on Banking Supervision could consider resuming its efforts to develop international standards that reflect a more risk-sensitive regulatory and supervisory treatment. To begin with, and in order to foster market discipline, banks should be mandated to disclose data on all material sovereign exposures.

Introduction

The increase in public debt in the wake of the COVID-19 pandemic has reinforced the relationship between sovereigns and banks in emerging market economies. The average public-debt-to-GDP

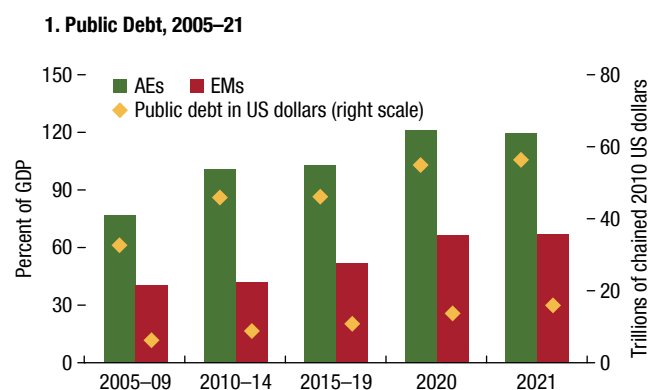
ratio in emerging markets surged to a record 67 percent in 2021 from about 52 percent before the pandemic, as economic activity declined and governments greatly increased fiscal support to nonfinancial firms and households to cushion the impact of the crisis (Figure 2.1, panel 1).¹ Although public

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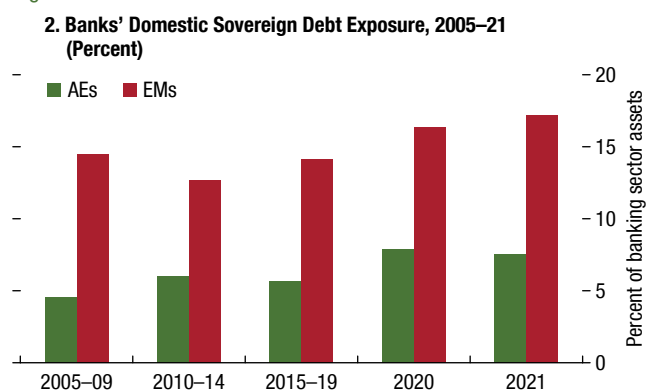
¹Henceforth, the chapter uses the shorthand “firms” for nonfinancial firms; that is, small, medium, and large enterprises other than banks and other financial institutions.

Figure 2.1. Developments in Emerging Market Public Debt and Banks' Sovereign Exposures

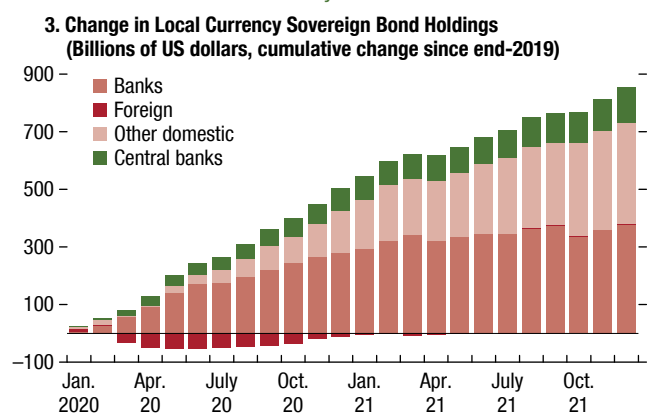
Public debt has surged in emerging markets ...



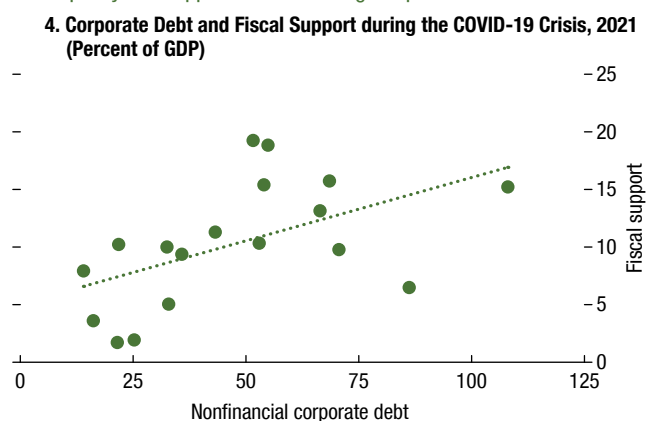
... and banks' domestic sovereign debt exposure has reached historic highs ...



... as banks have been the main buyers of domestic debt.



Fiscal policy has supported firms during the pandemic.



Sources: Fitch Connect; IMF, Monetary and Financial Statistics, World Economic Outlook, and Fiscal Monitor databases; and IMF staff calculations. Note: In panels 1 and 2, indicators are country averages weighted by purchasing-power-parity GDP. Public debt is in real terms; that is, in trillions of chained 2010 US dollars. In panel 2, banks' sovereign exposure corresponds to claims on central government debt divided by total banking sector assets. Advanced economies comprise economies classified as advanced in the IMF World Economic Outlook database. In panel 4, fiscal support corresponds to the discretionary fiscal support announced or taken during the COVID-19 crisis expressed as a percent of GDP. For 2021, fiscal support and the corporate-debt-to-GDP ratio shown in the panel correspond to September data. See Online Annex 2.1 for countries in the emerging market sample. AEs = advanced economies; EMs = emerging markets.

debt levels have also risen in advanced economies, the domestic sovereign debt exposure of banks has increased relatively more in emerging markets (Figure 2.1, panel 2)—reaching 17 percent of total banking sector assets in 2021—as the additional government financing needs have been met mostly by domestic banks amid declining foreign participation in local currency bond markets and a generally limited domestic investor base (Figure 2.1, panel 3). Consequently, the linkages between the financial health of the sovereign and banking sectors—the so-called sovereign-bank nexus—have intensified in these economies.

The relationship between sovereigns and banks has also become more complex during the pandemic

as interdependencies with the real sector have deepened. Countries across the world have supported the liquidity and solvency of firms through unprecedented policy measures, including accommodative monetary policy and fiscal measures such as cash transfers, equity injections, loans, and guarantee programs. In emerging markets, the discretionary fiscal response to the pandemic averaged about 10 percent of GDP during 2020–21—of which 6 percent consisted of additional spending and forgone revenues and 4 percent consisted of equity, loans, and guarantees. In turn, the corporate sector has become highly dependent on the continuation of policy support in cases where the economic recovery has yet to firmly take hold and corporate vulnerabilities are high (Figure 2.1, panel 4). This has

significantly deepened the interconnectedness of sovereigns and banks through firms, so that stress in the sovereign sector could spill over quickly to firms and hurt banks' balance sheets.²

Emerging markets are particularly vulnerable to the macro-financial stability risks associated with a strong sovereign-bank nexus in the face of an adverse shock as global financial conditions tighten. Growth prospects are generally weaker relative to the pre-pandemic trend in emerging markets compared with advanced economies (see the April 2022 *World Economic Outlook*), while governments' ability to support the economic recovery through increased spending or reduced revenues (fiscal space) is more limited, with a higher debt-servicing burden (Figure 2.2, panel 1). The public-debt-to-GDP ratio is thus projected to continue to grow in several emerging markets over the medium term, while it is expected to decline in advanced economies (Figure 2.2, panel 2). At the same time, refinancing risks are higher in emerging markets given the shorter average maturity profile of public debt compared with advanced economies (see the October 2021 *Fiscal Monitor*), a higher share of public debt denominated in foreign currency (especially in US dollars), and rising sovereign spreads amid a worsening sovereign credit outlook (Figure 2.2, panels 3–5). Local currency government bond yields have also increased for most emerging markets in recent months as foreign participation in local currency bond markets has declined, while central banks have tightened monetary policy on the heels of rising inflationary pressures (Figure 2.2, panel 6; see also Chapter 1).

Amid higher fiscal vulnerabilities, a sharp tightening in global financial conditions on the back of monetary policy normalization in advanced economies and intensifying geopolitical tensions caused by the conflict between Russia and Ukraine could push emerging market borrowing costs higher and potentially trigger an adverse feedback loop between the sovereign and banking sectors through multiple channels.³ For example,

²The sovereign-bank nexus has strengthened in some advanced economies as well, particularly in Europe. ECB (2020) documents considerable heterogeneity in banks' sovereign debt exposure across European countries and notes that banks' vulnerability to higher holdings of sovereign debt securities has been contained during the pandemic, since valuation changes have been modest.

³Commodity-importing emerging markets may be particularly at risk as they face the prospect of tighter global financial conditions and high commodity prices putting pressure on their external accounts.

with public debt already elevated, higher sovereign borrowing rates could fuel debt sustainability concerns and adversely affect banks' funding conditions and balance sheets through their *exposure* to sovereign debt.⁴ In this regard, it is worth noting that countries whose banks are more exposed to sovereign debt are also those with a higher public-debt-to-GDP ratio and lower bank capital ratios (Figure 2.3, panels 1 and 2; see also Chapter 1). Sovereign stress could thus potentially quickly transmit to the banking sector in these economies.⁵ Tighter borrowing constraints could also reduce governments' ability to support banks through implicit or explicit guarantees (the *safety net*), increasing stress in the banking sector and, in turn, raising the need for actual fiscal support and further weakening the sovereign balance sheet. In addition, a widening of sovereign spreads amid constrained fiscal space could lead to a rapid withdrawal of policy support to the *real economy*, hurting economic growth and intensifying bank losses that could further magnify the sovereign stress.

Domestic shocks such as a weaker-than-anticipated economic recovery in emerging markets amid the spread of new COVID-19 variants could also unleash the pernicious dynamics of the sovereign-bank nexus. For example, a decline in economic activity could put public finances under pressure and worsen the sovereign credit outlook, leading to an increase in sovereign funding costs. A substantial rise in corporate bankruptcies could also undermine banks' capital adequacy and diminish their willingness to lend, further undermining economic activity and straining sovereign balance sheets.⁶

Against this backdrop, this chapter examines the relevance of the sovereign-bank nexus in emerging markets for macro-financial stability and puts forward policy options to minimize potential risks and enhance resilience. Building on earlier research on the topic, which has focused mostly on advanced

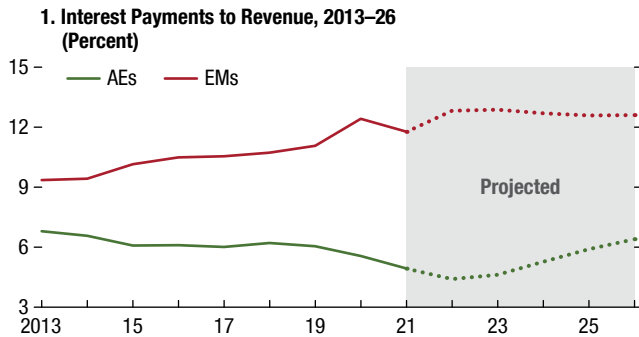
⁴These effects could be aggravated if tighter global financial conditions were accompanied by a large reversal in capital flows from emerging markets, inducing sharp currency depreciation and raising the domestic currency burden of liabilities denominated in foreign currency (Chapter 1 of the April 2022 *Fiscal Monitor*).

⁵In some major emerging markets, banks hold floating-rate bonds, inflation-indexed bonds, and "non-defaultable" bills issued by central banks, which may be less sensitive to interest rates and sovereign risk and could provide some insulation from a rise in sovereign risk.

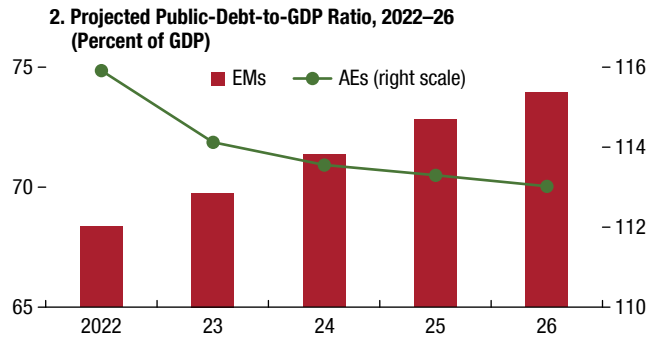
⁶Although banks remain generally well capitalized in emerging markets, pandemic-related regulatory flexibility and other supportive financial sector policy measures make it difficult to precisely ascertain the true health of the banking system at this time.

Figure 2.2. Fiscal Vulnerabilities in Emerging Markets

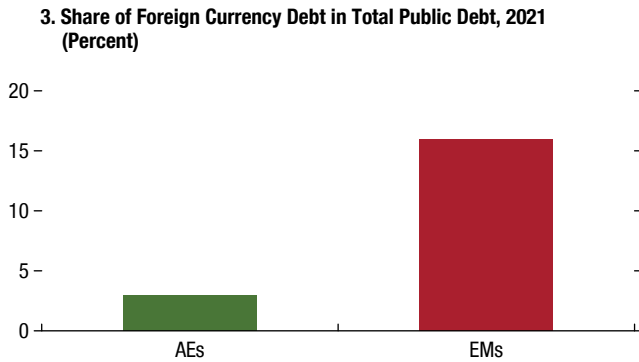
Emerging markets have much higher debt-service burdens relative to advanced economies ...



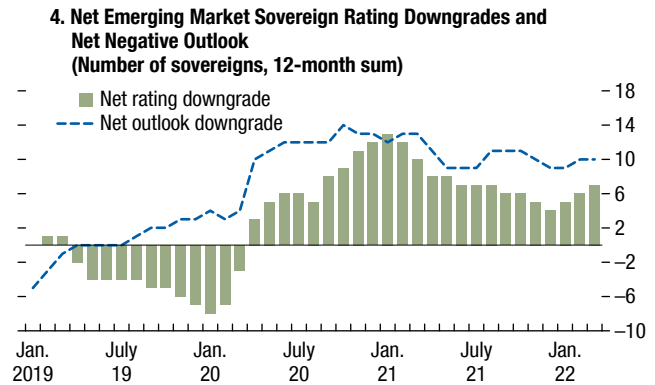
... and rising debt levels in the medium term.



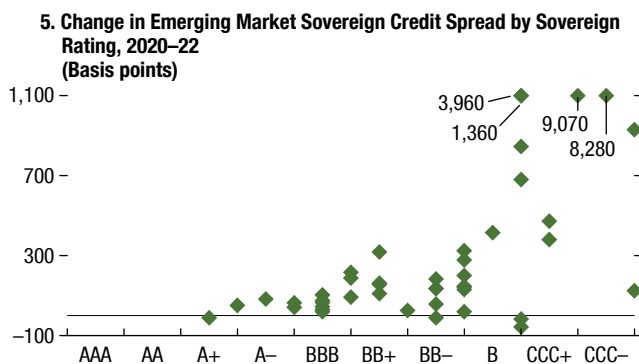
A large share of sovereign debt is denominated in foreign currency.



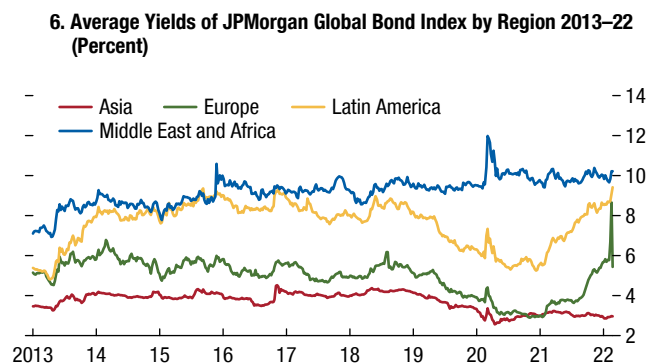
The sovereign credit outlook has worsened in emerging markets ...



... and spreads are above pre-pandemic levels.



Local currency government bond yields have also risen for most emerging markets in recent months.

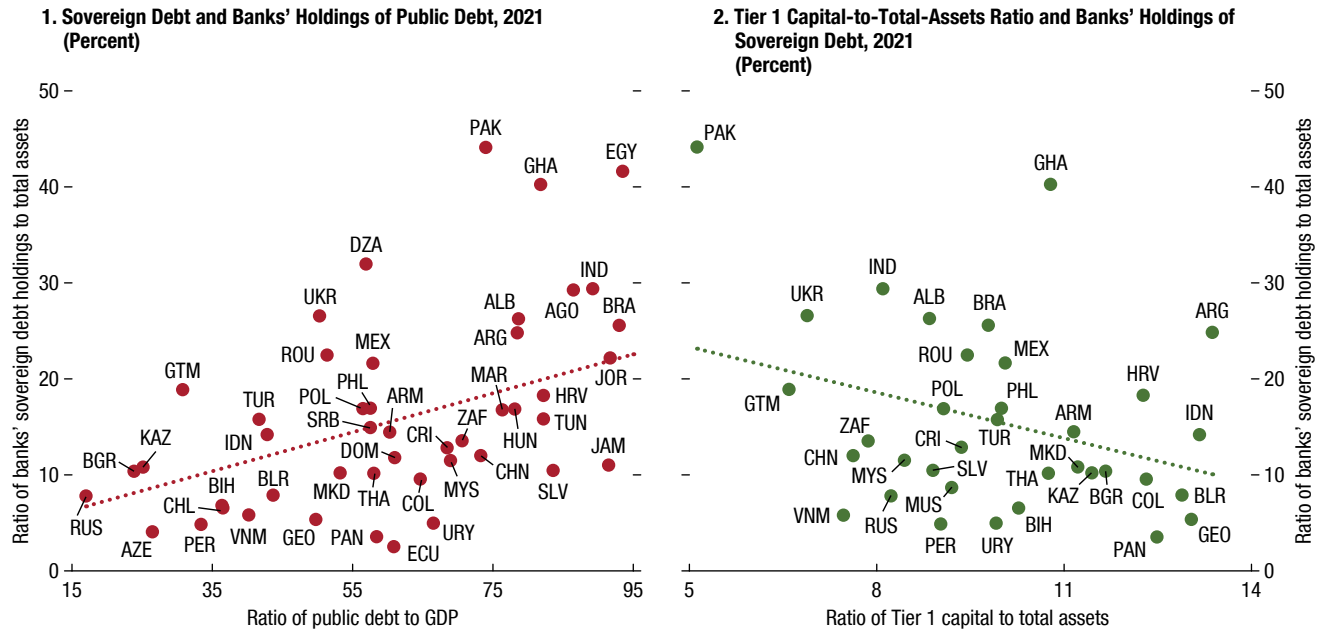


Sources: Bloomberg Finance L.P.; Fitch Connect; JPMorgan EMBI Global; Standard & Poor's Capital IQ; and IMF staff calculations.

Note: In panels 1–3, indicators are country averages weighted by purchasing-power-parity GDP. In panel 4, changes in sovereign rating and rating outlook are computed using a 12-month rolling sum based on changes reported by Standard & Poor's. Panel 5 shows the difference in credit spreads between December 31, 2020, and March 11, 2022. Spreads are calculated as the difference between a bond's yield and the linearly interpolated yield of the two base curve bonds that bracket the maturity of this bond. In panel 6, the drop in average yields for Europe in the second week of March 2022 reflects the exclusion of Russia from the JPMorgan index. AEs = advanced economies; EMs = emerging markets.

Figure 2.3. Banks' Exposure to Sovereign Debt in Emerging Markets

Banks' exposure to sovereign debt is greater in economies with higher public debt ... and lower bank capital.



Sources: Fitch Connect; IMF, Financial Soundness Indicators, Monetary and Financial Statistics, and World Economic Outlook databases; and IMF staff calculations. Note: In panel 1, red dots reflect provisional public-debt-to-GDP ratios in 2021 vis-à-vis banks' central government debt holdings in 2021 (third quarter). In panel 2, total assets are used in the denominator of the Tier 1 capital ratio (instead of risk-weighted assets) to provide greater comparability across countries. Given limited country-level data availability, banks' sovereign debt exposures for India and Argentina are computed using bank-level Fitch Connect data. Data labels use International Organization for Standardization (ISO) country codes.

economies,⁷ the chapter explores the strength of the nexus in emerging markets, especially during periods of sovereign stress, and the key channels of transmission.⁸ Specifically, relying on a comprehensive conceptual framework and drawing on data from the past two decades for a broad sample of emerging

⁷The linkage between sovereign and banking sector risk has been well explored for advanced economies, especially in the context of the euro area sovereign debt crisis (for example, Acharya and others 2018; Dell'Ariccia and others 2018). The findings of these studies, however, may not be generalizable to emerging markets, which have different structural characteristics—notably in terms of lower financial sector development, a greater share of foreign-currency-denominated public debt, and higher sensitivity to external shocks. Gennaioli, Martin, and Rossi (2018) and Feyen and Zuccardi Huertas (2019) document the existence of a sovereign-bank nexus in emerging markets using pre-COVID-19 pandemic data. IMF (2022) discusses the deepening of the sovereign-bank nexus in recent years in the context of South Africa.

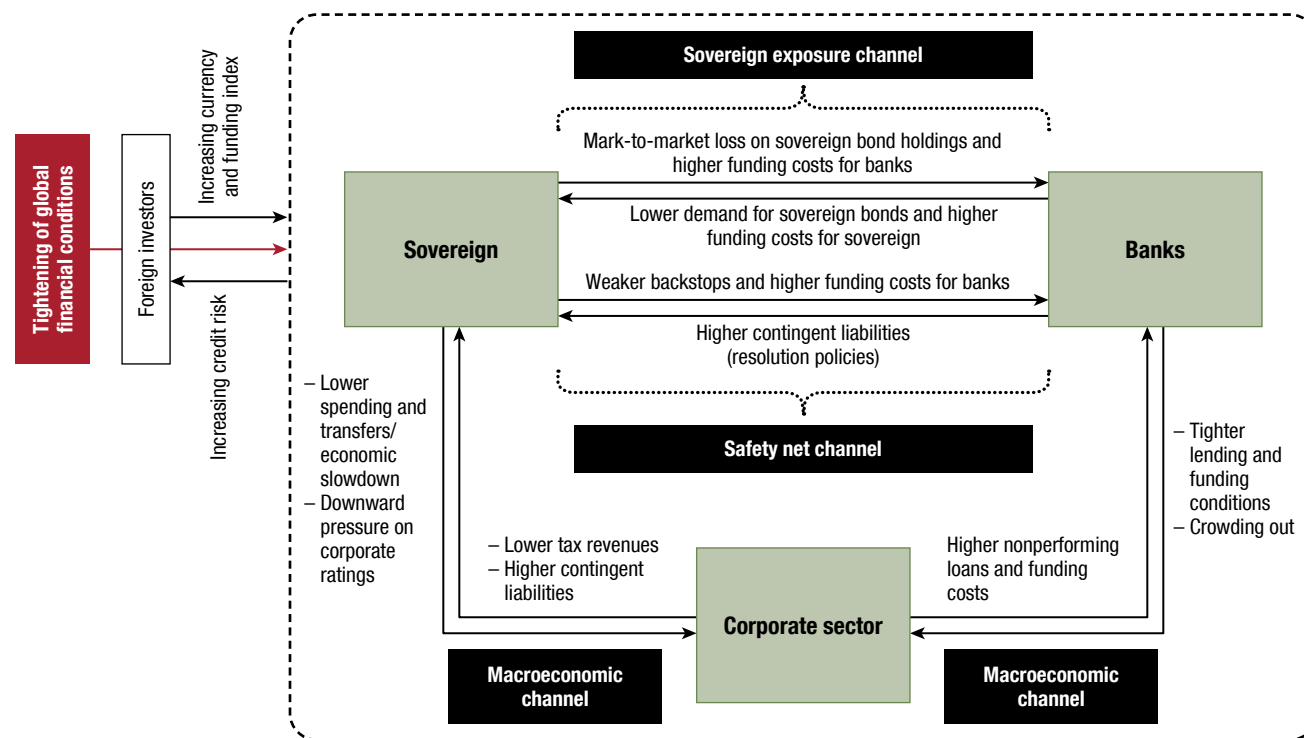
⁸Although shocks to the banking sector could also trigger the feedback loop, the elevated fiscal vulnerabilities in emerging markets, combined with the risk of a sharp tightening in global financial conditions as monetary policy normalizes in advanced economies, makes an increase in sovereign stress more relevant at the current juncture.

markets,⁹ the chapter investigates the following key questions:

- How has the link between the sovereign and banking sector evolved, and how has the COVID-19 pandemic affected that link? What factors motivate the banking sector to hold sovereign debt?
- How strong is the sovereign-bank nexus? How is it affected by adverse shocks such as a tightening in global financial conditions?
- How relevant are the various channels of transmission? To what extent does sovereign stress transmit directly to banks through their exposure to government bonds? How much do banks benefit from government guarantees, especially during episodes of sovereign stress? And to what degree does sovereign stress affect the real economy—in particular the corporate sector, which may in turn affect banks?

⁹The core sample of emerging markets comprises 53 economies. The specific sample of economies across empirical exercises and the time period covered depend on data availability. See Online Annex 2.1 for details. All online annexes are available at www.imf.org/en/Publications/GFSR.

Figure 2.4. Key Channels of the Sovereign-Bank Adverse Feedback Loop



Source: IMF staff.

Note: A sudden tightening of global financial conditions is one type of shock that may trigger an adverse sovereign-bank feedback loop. Other possible shocks include a terms-of-trade shock that may affect the sovereign, banking, and corporate sectors; a domestic banking crisis triggered by a deposit run that could disrupt credit supply to the corporate and household sectors, reducing economic activity and leading to fiscal sustainability pressures; and a shock to economic activity, for example, because of a health crisis or natural disaster, which could strain sovereign and banking sector balance sheets.

Sovereign-Bank Interlinkages: Conceptual Framework

The sovereign and banking sectors are connected through three key channels that facilitate the transmission of shocks from one sector to the other, interacting with and magnifying vulnerabilities in each sector and generating adverse feedback loops (Figure 2.4). The first channel stems from the *direct exposure* of banks to sovereign risk through their holdings of government debt. A rise in sovereign spreads could reduce the market value of government debt that banks hold and use as collateral to secure financing. As a result, banks could face higher funding costs and liquidity strains, potentially restricting their capacity to lend to the real economy.¹⁰

¹⁰A haircut applied to government debt exposures will lead to capital losses for banks unless the losses have already been absorbed by provisioning and mark-to-market accounting. As noted in IMF (2021), a timely and carefully designed domestic debt restructuring can limit the losses for banks and the impact on the broader economy.

The second channel relates to the *safety net*, or government support provided to banks in the form of implicit and explicit guarantees.¹¹ Sovereign stress could reduce these funding benefits, threatening the stability of banks. A weaker banking sector may in turn increase the need to activate the guarantees, straining fiscal accounts and further aggravating pressures on the sovereign. In some emerging markets, governments hold substantial bank equity, which could lead to additional fiscal losses (on top of potential recapitalization needs) if banks face financial pressure.

¹¹Such guarantees are provided to support banks and reduce the likelihood of a financial disruption if the banking sector comes under severe financial stress. As discussed later in the chapter, this channel is likely to be stronger for domestic state-owned banks—which are also more likely to be financing the fiscal deficit, relaxing the government’s borrowing constraint and potentially leading to greater public debt accumulation. Because these banks also tend to be subject to limited market discipline and weak governance and supervision, they could pose additional financial stability risks (Feyen and Zuccardi Huertas 2019).

The third channel refers to the indirect feedback loop effect between sovereigns and banks through the broader *macroeconomy*, in particular the corporate sector. A weakening of the sovereign balance sheet could hurt the corporate sector by raising borrowing costs, or through fiscal consolidation (for example, by raising taxes or reducing expenditure) and policy uncertainty. It may also increase the burden on domestic banks to finance government debt, crowding out bank lending to the corporate sector and affecting economic activity.¹² A weaker corporate sector could in turn have a negative impact on banks' balance sheets because of possible deterioration of its loan portfolio quality and higher credit provisioning. Subsequently, stress in the banking sector could disrupt economic activity even further, impairing government finances and transmitting stress back to the sovereign.

These three channels could also work in reverse—that is, stress in the banking sector could lead to sovereign stress—for example, by disrupting the government bond market, activating fiscal backstops, or dampening economic activity. Moreover, these three channels tend to feed into one another as financial conditions tighten, thus transmitting and amplifying shocks from one sector to the other, weakening balance sheets and creating a mutually reinforcing vicious “doom loop.”¹³

That said, well-capitalized banks could also serve as a shock absorber in times of distress by acting as a stable buyer of sovereign debt, especially in countries with a limited domestic investor base. Nevertheless, the overreliance of governments on the domestic banking sector for their financing needs is a source of significant risk—for example, by leading to a more

concentrated investor base and greater potential to amplify shocks.¹⁴

Another possible source of interconnection between sovereigns, banks, and firms is the role played by domestic nonbank financial institutions in many emerging markets. A rise in sovereign (or banking) sector risk may transmit to these institutions, which could further amplify vulnerabilities in each sector through direct and indirect exposures (both to banks and firms) and magnify the impact of the shock. Nonbank financial institutions hold a nontrivial share of public debt in some emerging markets (see Box 2.2.1 in Online Annex 2.2), but potential distress caused by these institutions may be more limited, as financial systems remain largely bank-based in emerging markets.¹⁵

Relevance of the Sovereign-Bank Nexus in Emerging Markets: Some Stylized Facts

Domestic banks have traditionally been important players in sovereign bond markets in emerging markets both as investors and market makers. Their share in sovereign debt holdings increased gradually from an average of about 20 percent two decades ago to more than 30 percent in 2020 (Figure 2.5, panel 1), but it varies considerably across countries. In some economies (such as Uruguay), banks hold less than 10 percent of total sovereign debt, while in others (such as China) this share exceeds 80 percent.¹⁶ In addition to banking sector solvency and liquidity regulations, which incentivize the holding of domestic sovereign debt relative to other claims (BCBS 2017, 2021), several other factors explain banks' exposure to sovereign debt, including

¹²“Crowding out” refers to less bank credit to the private sector because of increased lending to the government. Sovereign distress may crowd out bank lending as banks may be forced to hold more sovereign debt (moral suasion) when sovereign refinancing needs are typically higher. Banks may also engage in risk shifting and may choose to hold more government debt to profit from higher yields. For emerging markets, there is evidence of lower private sector credit growth during times of sovereign stress.

¹³The extent of the feedback loop may be affected by monetary policy. In an adverse scenario, a loosening of monetary policy (including large asset purchases) could reduce the severity of the loop by supporting economic growth and lowering domestic borrowing costs for sovereigns, banks, and firms. Furthermore, in emerging markets, the strength of the sovereign-bank nexus may also be affected by a “currency channel,” by which an external shock that triggers a currency depreciation could deepen sovereign and banking stress through balance sheet effects.

¹⁴Financial stability risks are also associated with the holding of government debt by nonbank financial institutions and foreign investors. For example, mutual funds could be prone to selling government securities in times of stress to meet liquidity needs, contributing to pressures in government bond markets. Foreign investors also tend to be skittish, and their quick withdrawal from government bond markets can create liquidity problems. Thus, the investor base needs to be well diversified to avoid overreliance on any one type of investor.

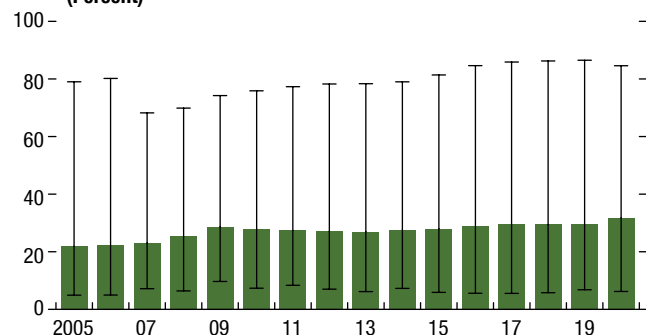
¹⁵Lack of detailed data on sovereign debt holdings of different types of nonbanking financial institutions in emerging markets (investment funds, insurance companies, pension funds, and so on), as well as on their interconnectedness with other sectors, precludes an in-depth analysis of their role in the sovereign-bank nexus in this chapter.

¹⁶In some emerging markets, banks' sovereign debt exposure declined over the past decade, as nonresident investor participation in local currency bond markets rose. This trend, however, reversed during the pandemic (Online Annex Figure 2.3.1).

Figure 2.5. Association between Emerging Market Sovereign and Banking Sector Default Risk

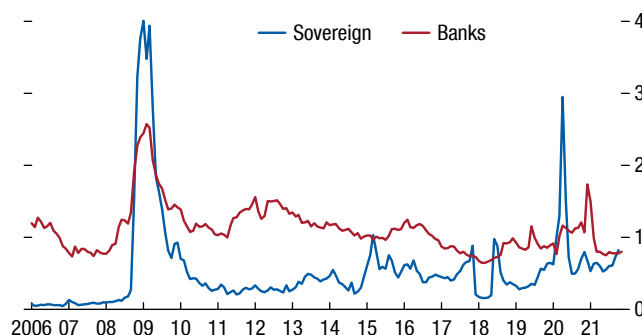
Domestic banks are major players in the sovereign debt market.

1. Share of Domestic Banks' Holding in Total Government Debt, 2005–20 (Percent)



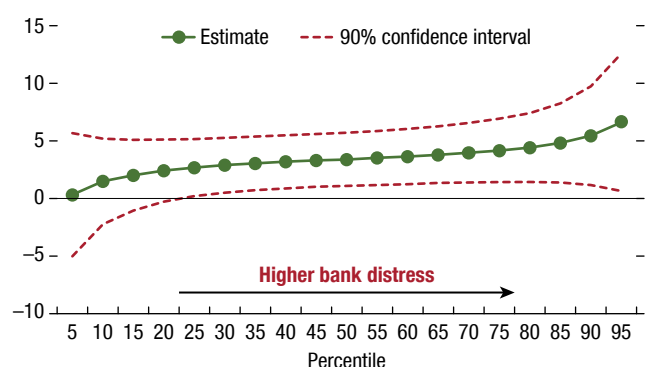
Sovereign and bank default risk move together ...

2. Sovereign and Bank Expected Default Frequencies, 2006–21 (Percent, average across countries)



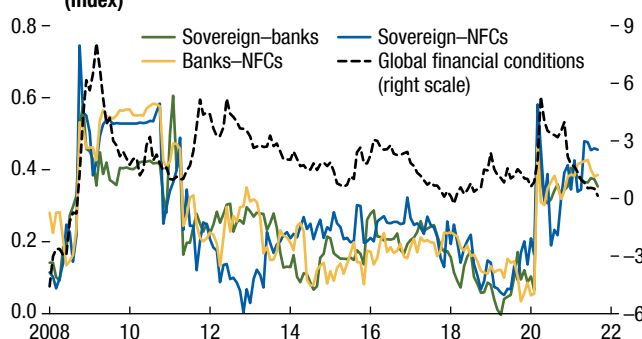
... and the correlation increases at higher levels of bank stress ...

3. Relationship between Changes in Sovereign and Bank Expected Default Frequencies, 2006–21 (Basis point)



... as well as when global financial conditions are strained.

4. Median Correlation among Sovereign, Bank, and Nonfinancial Corporate Sector Stress and Global Financial Conditions, 2008:M1–2021:M9 (Index)



Sources: Arslanalp and Tsuda (2014); Moody's; Refinitiv Datastream; and IMF staff calculations.

Note: Panel 1 shows the unweighted average of the domestic banks' share in general government debt. Bands refer to the minimum and maximum value of this share in the sample. In panel 2, banking sector expected default frequency (EDF) is equal to the average EDF of individual banks. Panel 3 shows the strength of the correlation between changes in banks and sovereign default risk at different values of bank stress calculated using a panel quantile regression with country fixed effects. Default risk is measured by the EDF. Higher bank distress refers to periods with larger changes in the banking sector EDF. Dots correspond to the effect of a change in sovereign EDF by 1 percentage point on the change in banks' EDF as computed by panel quantile regressions with country fixed effects. Panel 4 shows the median time-varying correlation between changes in sovereign, bank, and nonfinancial corporation EDFs across countries using a 24-month rolling window. The median correlation is a number between -1 and 1 . The global financial conditions indicator refers to the common component of monthly equity price returns estimated across advanced economies and emerging markets using a factor-augmented vector autoregressive model. NFCs = nonfinancial corporations.

liquidity management, higher interest rates, lower financial sector development, and government moral suasion (Box 2.1).¹⁷

The overreliance of governments on domestic banks for their financing needs, and the associated high

exposure of banks to sovereign debt, increases the likelihood of shock transmission between the two sectors. The default risks of sovereigns and banks—proxied by the expected default frequency—tend to move in lockstep in emerging markets (Figure 2.5, panel 2). Importantly, the strength of this relationship varies with the level of distress in the banking sector: at low levels of bank distress, a 1 percentage point increase in sovereign default risk is associated with a 0.4 basis point increase in banks' expected default frequency (Figure 2.5, panel 3). However, at higher levels of

¹⁷The use of domestic government bonds for liquidity management (such as to access central bank liquidity) can be a key driver of banks' preference to hold domestic rather than foreign bonds, resulting in a significant home bias. Asonuma, Bakhache, and Hesse (2015) show that when banks exhibit higher home bias, fiscal consolidation by the sovereign tends to be slower, all else equal.

Figure 2.6. Sovereign Debt and Banking Crises in a Historical Context: Emerging Markets versus Advanced Economies

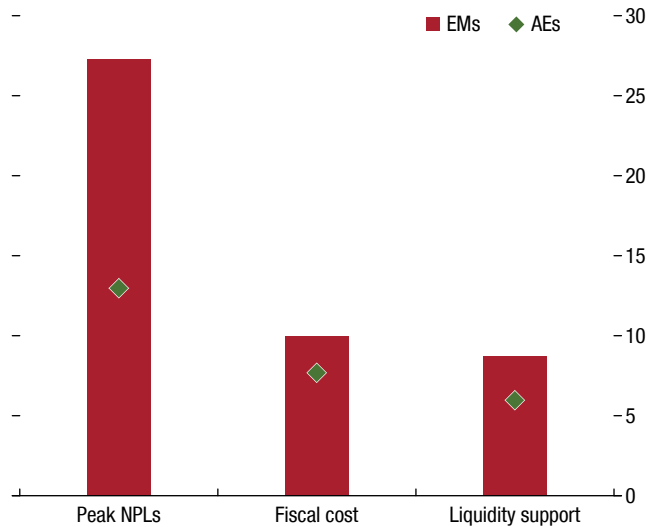
Banking and sovereign debt crises have often occurred together in emerging markets.

1. Frequency of Sovereign Default, Banking, and Currency Crises in Emerging Markets and Advanced Economies, 1971–2016 (Percent)

Type of crisis	EMs	AEs
Sovereign (domestic)	6.3	0.1
Sovereign (external)	18.5	0.5
Banking	15.0	16.1
Currency	25.8	10.9
Banking and sovereign	6.6	0.5
Banking, sovereign, and currency	5.1	0.0

Fiscal costs of banking crises have been significant in emerging markets.

2. Financial and Fiscal Costs of Banking Crises, 1971–2016 (Percent)



Sources: Emerging Portfolio Fund Research; Harvard Business School, Global Crises Data by Country; Laeven and Valencia (2018); IMF, Monetary and Financial Statistics database; and IMF staff calculations.

Note: In panel 1, banking, sovereign, and currency crises are those identified by Global Crises Data by Country, updated by the Harvard Business School based on Reinhart and Rogoff (2009). Currency crises are defined as an annual depreciation in the nominal exchange rate of at least 15 percent. The frequency of occurrence of each type of crisis is computed as the total number of country-year observations identified as the corresponding crisis as a percent of the total number of country-year observations in the sample. In panel 2, information is sourced from Laeven and Valencia (2018). Fiscal costs refer to outlays directly related to financial sector restructuring as percent of GDP. Nonperforming loans are expressed in percent of total loans. Liquidity support is measured as the ratio of central bank claims on deposit money banks and liquidity support from the Treasury to total deposits and liabilities to nonresidents. AEs = advanced economies; EMs = emerging markets; NPLs = nonperforming loans.

distress, the association is 10 times stronger. The relationship is also much tighter when global financial conditions are under strain, as is evident from the jump in the correlation between sovereign and bank default risk during the global financial crisis and at the onset of the COVID-19–related financial market turmoil in March 2020 (Figure 2.5, panel 4).¹⁸

The strong association between sovereign and banking sector risks has amplified past financial crises. Banking and sovereign debt crises have been particularly prevalent in emerging markets, frequently occurring at the same time or in succession (Figure 2.6, panel 1). Their incidence typically increases in conjunction with a tightening in global financial conditions. This tends to induce a reversal in cross-border

capital flows, making it more difficult for both sovereigns and banks to obtain funding, while also leading to sharp currency depreciations (or a currency crisis) that further strain sovereign and bank balance sheets (Reinhart and Rogoff 2009).

These mechanisms were at work in several prominent emerging market sovereign debt and financial crises of the late 1990s and early 2000s (for example, Argentina, Ecuador, Russia). In some cases, governments increasingly relied on domestic banks to fund deteriorating fiscal positions, making a banking crisis unavoidable after the eventual sovereign default.¹⁹ The fiscal cost of restructuring and supporting the financial sector associated with banking crises, however, has also been significant in emerging markets (and on par with

¹⁸Similar dynamics are observed for the correlation of sovereign and banking sector stress with nonfinancial corporate sector stress, which provides further evidence of the strengthening of relationships among the three sectors when global financial conditions tighten.

¹⁹On average, government bond holdings of banks in emerging markets increase by about 7 percentage points after a sovereign debt crisis, while they tend to decline in advanced economies (see Online Annex Figure 2.3.2).

advanced economies), suggesting a possible transmission of banking stress back to the sovereign. Furthermore, the deterioration in credit quality (proxied by a high share of nonperforming loans in total loans) during banking crises has been twice as large in emerging markets as in advanced economies, indicating the existence of a strong macroeconomic channel in the former group (Figure 2.6, panel 2).

Deepening of the Sovereign-Bank Nexus during the COVID-19 Pandemic

The relationship between sovereigns and banks in emerging markets has been reinforced during the COVID-19 pandemic, as banks' holdings of local currency government debt have increased significantly as a share of their assets (Figure 2.1, panel 2; Box 2.1). While this increase has been driven by state-owned banks in several countries, private domestic banks have also played a role (Figure 2.7, panel 1). Banks' excess liquidity, driven by weaker credit demand and a surge in deposits, appears to have been one factor behind banks' decisions to purchase more sovereign debt (Figure 2.7, panel 2).

Banks in emerging markets are generally well capitalized because of reforms enacted following the global financial crisis and policy support provided during the pandemic.²⁰ However, sovereign debt exposure constitutes a significant share of regulatory capital in some countries (Figure 2.7, panel 3). Importantly, a sizable share of banks' outstanding sovereign debt holdings follows mark-to-market accounting in several emerging markets (Figure 2.7, panel 4), which could potentially undermine banks' capital adequacy if the market value of these assets were to decline.

This risk is particularly relevant in the current environment of monetary policy normalization in advanced economies and rising global yields.²¹ To assess its implications, a simple bank-level scenario analysis is undertaken for individual emerging markets. The minimum haircuts on banks' holdings of domestic sovereign debt that would lead to a breach of the 4.5 percent

²⁰The median capital adequacy ratio across emerging markets stood at 14 percent in 2020 (see Online Annex Figure 2.3.3), but recent global bank stress tests point to relatively lower resilience in emerging markets than in advanced economies.

²¹Higher policy rates and higher term premia will raise yields across the term structure of interest rates, reducing the market value of bond holdings (and capital) in bank balance sheets, even if fiscal conditions are sound.

minimum regulatory common equity Tier 1 (CET1) capital ratio are computed (Figure 2.7, panel 5). When taking the median value of these haircuts across banks in a region, the results show that banking systems in sub-Saharan Africa are relatively more vulnerable to sovereign distress. Haircuts as small as 30 percent, which are probable and have already been observed in the past, would breach the minimum CET1 capital ratio in domestic banks in the region.²²

Furthermore, banking sector health depends on the viability of banks' corporate borrowers, which have faced strains during the pandemic. In most emerging markets, the sustainability of corporate debt—as measured by earning capacity relative to debt—has declined as corporate revenues have fallen (Online Annex Figure 2.3.4). While it is difficult to fully ascertain the soundness of bank balance sheets at the current juncture because of regulatory flexibility and other financial sector support measures in place,²³ nonperforming loans are more than one-tenth of total loans in some countries (Online Annex Figure 2.3.4) and could edge up as loan-repayment moratoria and other support measures are unwound (Chapter 1). An adverse shock to firms due to a rise in sovereign risk could thus have a significant impact on banking stability through the macroeconomic channel.

In this economic landscape, sovereign and bank credit risk remain closely tied in emerging markets, as reflected by the positive correlation between sovereign and bank credit ratings (Figure 2.7, panel 6), indicating that the nexus is highly pertinent. The analysis that follows more formally evaluates the strength of the nexus in emerging markets and some of the key channels of transmission.

Measuring the Strength of the Sovereign-Bank Nexus

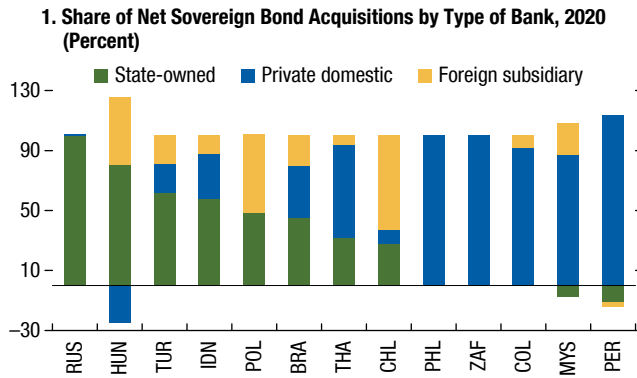
To assess the overall strength of the nexus in emerging markets, two-way relationships between the sovereign, banking, and corporate sector default

²²For further context, direct loss-given-default rates for sovereign debt holders have varied widely, but Cruces and Trebesch (2013) estimate a 37 percent average haircut for countries during 1978–2010 and a 50 percent average haircut during 1998–2010.

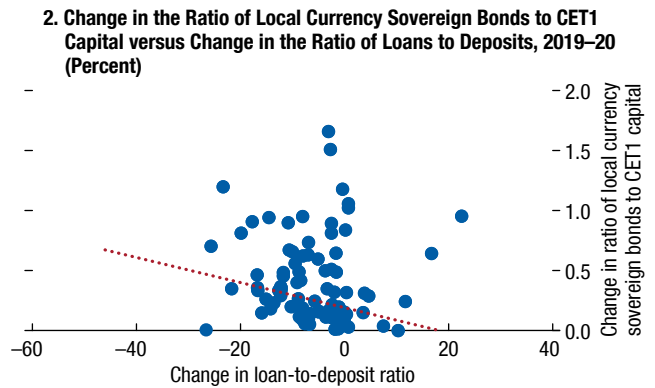
²³Regulatory flexibility refers to the temporary measures adopted by financial regulators and supervisors during the COVID-19 pandemic to ensure that banks continued to lend to the real economy—for example, the release of countercyclical capital buffers to free up lending capacity, restrictions on capital distributions, and debt payment moratoria.

Figure 2.7. Sovereign-Bank Nexus in Emerging Markets during the COVID-19 Pandemic

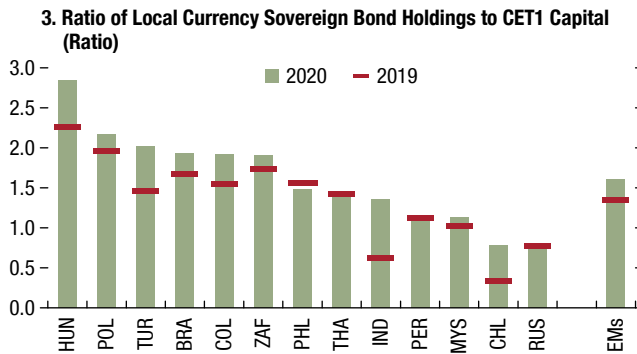
State-owned banks in several countries have been the major buyers of government debt.



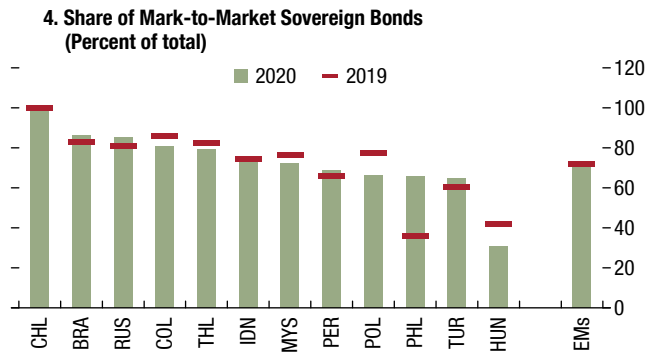
Excess liquidity is associated with banks' increased sovereign bond holdings.



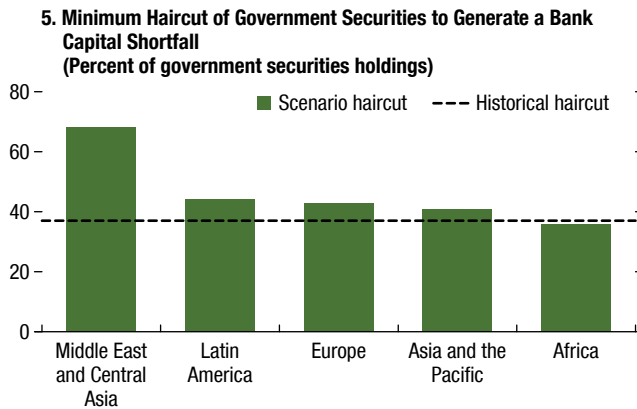
Banks' sovereign exposure relative to capital has increased during the pandemic.



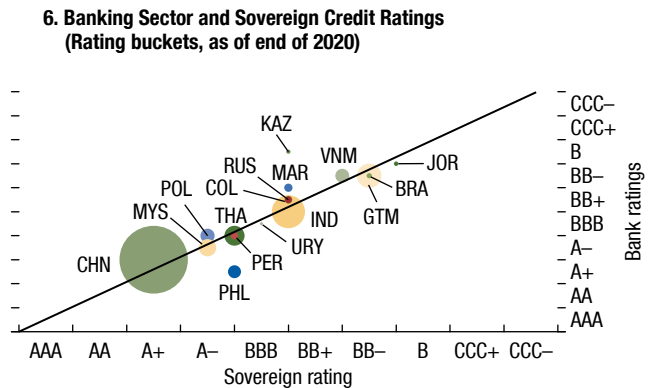
A sizable share of domestic government bond holdings is marked to market in major emerging markets, exposing banks to market risk.



A haircut of about 30–40 percent would breach the minimum CET1 capital ratio in some regions.



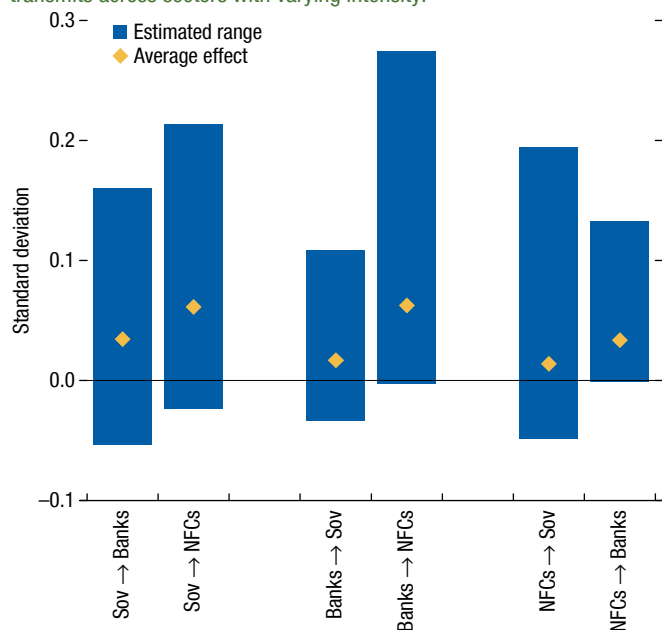
Bank and sovereign credit ratings are closely tied.



Sources: Bureau van Dijk's Orbis; Cruces and Trebesch (2013); data compiled from banks' accounting statements and Basel Pillar III disclosures; Fitch Connect; Haver Analytics; Standard & Poor's Capital IQ; IMF, Monetary and Financial Statistics database; and IMF staff calculations.
 Note: In panel 5, the historical haircut corresponds to the average direct loss given default rates for sovereign debt holders across 68 economies during 1970–2010 as reported in Cruces and Trebesch (2013). The scenario haircut refers to the level of haircut to government securities that would breach the 4.5 percent minimum CET1 capital ratio, assuming other sources of capital are unavailable. This is a strict approach since it is assumed that only the highest-quality capital is accessible. The value of the haircut for each geographic region is computed as a median for banks in individual economies and over regions. In panel 6, bank credit ratings correspond to the median rating across banks in each economy. The size of the dots is proportional to the size of the banking sector. Data labels use International Organization for Standardization (ISO) country codes. CET1 = common equity Tier 1.

Figure 2.8. Transmission of Risks through the Sovereign-Bank Nexus: Strength of the Main Channels across Emerging Markets
(Effect of a one standard deviation shock on other sectors' default risk)

An increase in sovereign, bank, and nonfinancial corporation default risk transmits across sectors with varying intensity.



Sources: Haver Analytics; Moody's; Refinitiv Datastream; and IMF staff calculations.

Note: The figure shows the estimated range of coefficients for individual emerging markets obtained from a structural model using daily data of default risk for sovereign, banking, and corporate sectors. See Online Annex 2.5 for estimation details. NFCs = nonfinancial corporations; Sov = sovereign.

risks are examined for individual emerging markets, while taking into account other domestic and external factors that may impact these relationships.²⁴ Three key findings emerge from this analysis. First, the nexus is strong, on average, with significant feedback effects between sectors (Figure 2.8). Second, the strength of the transmission of risk between sectors varies. For example, spillovers from sovereign default risk to banks are, on average, larger than those in the opposite direction from banks to sovereign default risk. Overall, the largest spillovers are from sovereign and bank default risk to firms. Third, the relevance of the nexus differs

²⁴To examine the relationships, a structural value-at-risk model is estimated for 15 emerging markets using 2006–20 data; identification is achieved through Rigobon's (2003) methodology. The dependent variable is the expected default frequency (as a proxy for default risk) for the sovereign, banking, and corporate sectors. See Online Annex 2.5 for details on the empirical analysis.

across countries, with the transmission of shocks being three to five times higher than the average in some cases.

The heterogeneity in the size of the transmission of shocks suggests that some country-specific factors, such as the fiscal position and financial vulnerabilities, may be at play in amplifying the impact of an adverse shock. Further empirical analysis supports this observation. For example, after a sharp tightening in global financial conditions, emerging markets with a higher level of public debt and banks' holdings of sovereign debt experience an increase in sovereign and bank default risks that is twice as large as the average increase (Figure 2.9).²⁵ Furthermore, the impact of the shock is persistent and remains larger than the average effect for up to six quarters after the shock.

These findings confirm that the interlinkages underlying the sovereign-bank nexus are relevant in emerging markets. The next section further explores these linkages and examines some of the key channels and vulnerabilities that facilitate the transmission and amplification of shocks across sectors.

Evidence about the Transmission Channels

To investigate the importance of the various transmission channels underlying the nexus in emerging markets, this section focuses mainly on the direct shock transmission from the sovereign sector to the banking and corporate sectors. While shocks originating from banks and firms may also be relevant, and may interact with a sovereign shock, shock transmission from the sovereign sector to the banking and corporate sectors appears to be more pertinent at this juncture given the elevated fiscal vulnerabilities in emerging markets that make the sovereign particularly prone to an adverse shock.²⁶

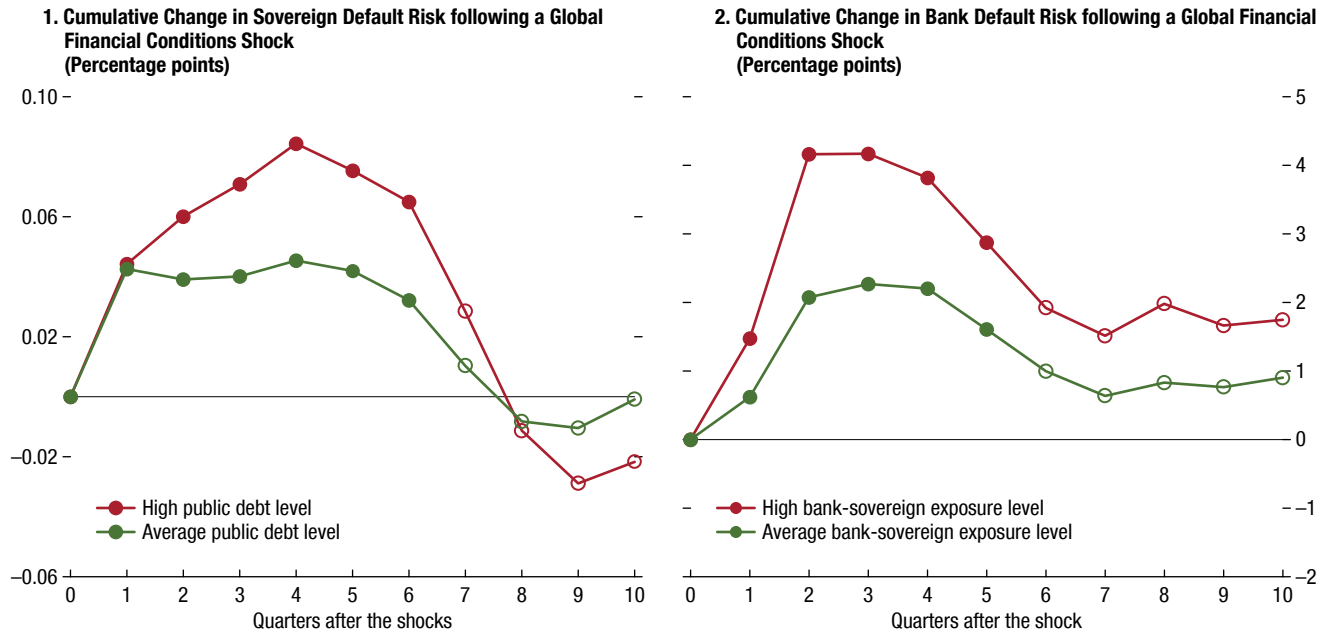
²⁵For this exercise, a local projection panel regression model is estimated to exploit the cross-country variation in vulnerabilities using the same sample of countries and model specification as in Figure 2.9. High levels of public debt and bank sovereign exposure are defined as one standard deviation above the sample average (equivalent to about 80 percent and 20 percent, respectively, while the mean value is about 50 percent and 9 percent, respectively). See Online Annex 2.5 for further details.

²⁶As multiple channels of the nexus could operate simultaneously, the analysis presented in the following sections is based on granular bank- and corporate-level data to better identify the effects of each individual channel. The results of these exercises, however, may not be strictly comparable and are subject to some degree of estimation uncertainty given that the sample composition varies across analyses, depending upon data availability.

Figure 2.9. Sovereign and Bank Default Risk and Tightening of Global Financial Conditions in Emerging Markets

Sovereign default risk rises after global financial conditions tighten, especially in emerging markets with higher public debt ...

... and where banks have a higher sovereign exposure.



Sources: Haver Analytics; Moody's; Refinitiv Datastream; and IMF staff calculations.

Note: Panels 1 and 2 show results from local projection models in which the sovereign and banking default risks at quarterly frequency are regressed on lagged values of each other, controlling for other domestic and external factors, including a global financial conditions index and its interaction with an indicator variable identifying countries with high public debt or high bank-sovereign exposure (with high vulnerability identified as values of public debt to GDP or a ratio of banks' holdings of government debt to total banking sector assets that is one standard deviation above the sample average). Solid dots indicate statistical significance at 10 percent or lower.

Exposure Channel

As discussed, banks hold a substantial amount of public debt, including as a share of capital, exposing them to the risk of losses on these holdings. Weaker capital buffers, in turn, can affect banks' default risk and lending behavior. Empirical analysis performed over a large sample of emerging market banks using data for the past two decades confirms this intuition.²⁷ A sovereign distress event—defined

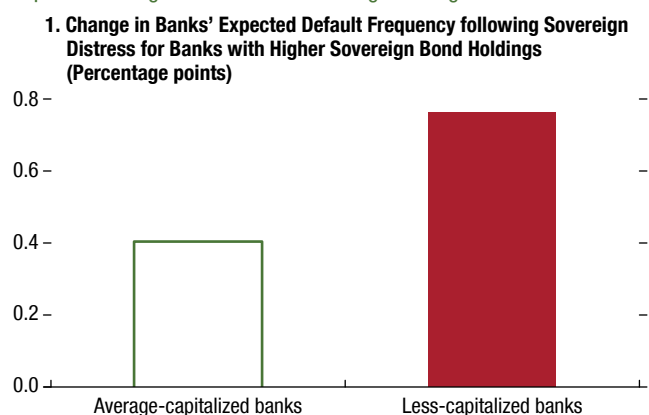
as an explicit default or a period with sovereign credit default swap spreads higher than 500 basis points—is followed within the same year by a significant increase in default risk for banks with a greater sovereign exposure. For instance, in the event of sovereign distress, banks with a 10 percentage point higher ratio of government debt holdings to total bank assets (relative to average bank holdings of government debt) face an expected default frequency that is, on average, 0.4 percentage point higher (Figure 2.10, panel 1, green bar). Notably, this effect is about twice as large for banks with relatively less capital (Figure 2.10, panel 1, red bar)²⁸ and is accompanied by a decline in their equity-to-assets ratio (Figure 2.10, panel 2), presumably because more exposed banks face higher funding costs that affect their profits and equity.

²⁷The sample here comprises 525 banks based in 18 emerging markets over 2000–20. The median credit default swap spread in the sample is about 250 basis points. Banks' indirect exposure to changes in sovereign stress (such as through economic growth, inflation, or exchange rate) is considered in the analysis by including country-year fixed effects. Furthermore, to address potential reverse causality concerns that sovereign distress in itself may be driven by banking sector stress, alternative definitions of sovereign distress—such as high government refinancing needs during tight global financial market conditions, or large changes in foreign-currency-denominated public debt due to currency depreciation—are also considered for robustness. See Online Annex 2.6 for details.

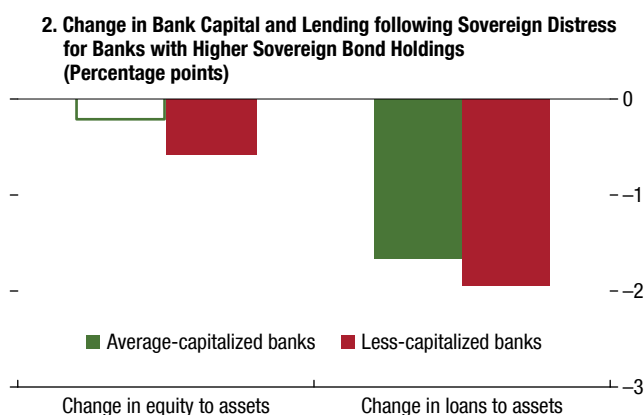
²⁸These effects appear meaningfully large, as the average expected default frequency in the sample is 1.2 percent.

Figure 2.10. Transmission of Sovereign Risk through the Exposure Channel

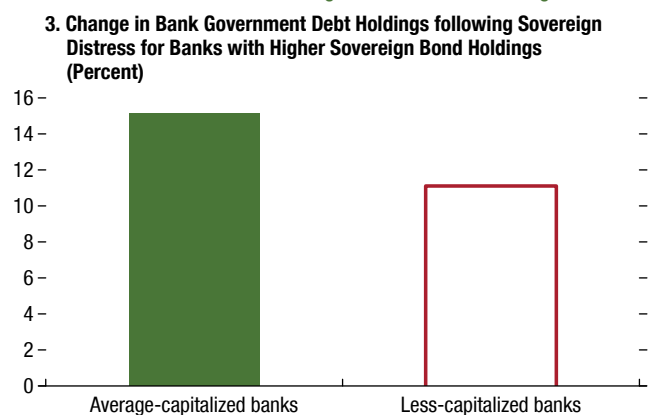
Banks with greater sovereign debt holdings and weaker balance sheets experience a higher default risk following sovereign distress ...



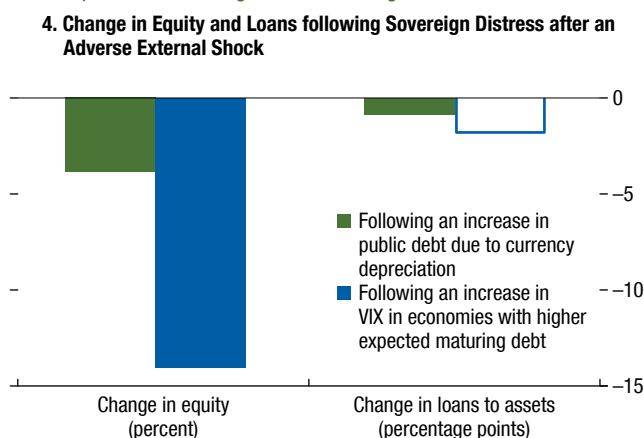
... as well as lower capital and lending to the private sector ...



... and a further increase in banks' government bond holdings.



Bank capital losses are significant following external shocks.



Sources: Bloomberg Finance L.P.; Fitch Connect; IMF, World Economic Outlook database; IHS Markit; Standard & Poor's Capital IQ; and IMF staff calculations. Note: Panels 1–4 report results from bank-level panel regressions. The dependent variable is the change in banks' expected default frequency (panel 1); change in equity to lagged total assets (panels 2 and 4, left side); change in total loans to total assets (panels 2 and 4, right side); and log change in total government debt holdings (panel 3). Balance sheet variables and expected default frequency are based on year-end data. The focus variable is the ratio of banks' holdings of government debt securities to total assets (sovereign exposure) interacted with sovereign distress (or an alternative measure of sovereign stress in panel 4) and the bank capital ratio (total-equities-to-total-assets ratio). The average effect refers to the impact of 10 percentage point higher bank sovereign exposure on the dependent variable for banks with an average capital ratio (which is close to a one standard deviation in the sample). The impact of "less-capitalized" banks corresponds to a bank capital ratio one standard deviation below the mean. Sovereign distress indicates periods when the monthly average of sovereign credit default swap spreads is higher than 500 basis points within a given year, or Standard & Poor's long-term rating for sovereign foreign exchange debt is CCC- or lower, or the government is in external or domestic default according to Harvard Business School Global Crises Data by Country. In panel 4, the valuation effect on public debt following a currency depreciation is computed by multiplying foreign-currency-denominated gross public debt in year $t-1$ by the change in the exchange rate from $t-1$ to t . The valuation effect is then normalized by total gross public debt in $t-1$. Solid bars indicate statistical significance at 10 percent or lower. See Online Annex 2.6 for further details. VIX = Chicago Board Options Exchange Volatility Index.

Banks with higher sovereign debt exposure also cut back on lending more than their peers following sovereign distress (Figure 2.10, panel 2). The reduction in lending is consistent with losses from sovereign debt exposures tightening banks' capital constraint and thus impairing their lending posture,

but it could also result from crowding-out effects, which occur when banks lend more to the government at the expense of firms and households. Empirical evidence supports this assertion: banks with an average capital ratio that are more exposed further increase their holdings of government debt

when the sovereign is in distress (Figure 2.10, panel 3).^{29,30}

The effects on default risk, bank lending, and capitalization tend to grow in magnitude as sovereign distress deepens, pointing to possible nonlinear effects. Thus, for example, the impact of sovereign distress on banks' equity is more than twice as large when sovereign spreads reach 1,000 basis points (Online Annex 2.6). The sovereign's holdings of international reserves act as a buffer, helping to dampen the severity of the shock. On average, domestic banks in countries with a higher stock of foreign exchange reserves relative to short-term external debt experience a significantly smaller decline in capital during episodes of intense sovereign stress than domestic banks in countries with less adequate reserves (Online Annex 2.6), possibly because of a smaller currency depreciation and more limited funding cost increases from unhedged foreign debt.

The analysis also considers the impact of an increase in sovereign risk associated with a tightening in global financial conditions by focusing on two alternative definitions of sovereign distress. The first is defined as a situation in which sovereign debt rollover needs are high amid significant volatility in global financial markets. The second is an episode in which public debt increases sharply following a currency depreciation. In most of these cases the impact on banks' equity and loans is significantly larger than in cases of low fiscal vulnerabilities following the external shocks (Figure 2.10, panel 4). These findings confirm the relevance of the exposure channel in emerging markets and highlight the amplification of the nexus when fiscal, financial, and external vulnerabilities are high and external financial conditions deteriorate.

²⁹Intuitively, it could be that banks are forced to hold more sovereign debt, since sovereign refinancing needs are typically higher during sovereign distress. But banks may also extend less credit to the private sector during such episodes because of weak credit demand, which is captured by including country-year effects in the regression.

³⁰The effects documented in Figure 2.10 (panels 2 and 3) are robust to defining the dependent variables as percentage changes in bank equity and lending, and the results are similar to those reported in the literature on the euro area sovereign debt crisis (Acharya and others 2018; Bofondi, Carpinelli, and Sette 2018).

Safety Net Channel

Risks to the banking sector are also intertwined with sovereign risks through the explicit and implicit guarantees, or the safety net, provided by the sovereign to banks. To assess the transmission of shocks through this channel, the analysis relies on bank-level estimates of government support called support rating floors—developed by the Fitch rating agency—which isolate potential sovereign support for banks from other sources of external support.³¹ On average, government support proxied through the support rating floors is greater in emerging markets than in advanced economies, and it has generally increased since the global financial crisis (Figure 2.11, panel 1).³²

The extent to which banks benefit from the public safety net varies across emerging markets and is importantly associated with bank-specific characteristics (Online Annex 2.7).³³ In general, there is a strong positive relationship between bank size and government support ratings, implying large implicit subsidies for banks that are “too big to fail.” In addition, banks with higher support rating floors tend to have lower capital ratios (Online Annex Figure 2.7.4, panel 2)—pointing to potential moral hazard—and a majority government stake.

This safety net provides some protection to banks and their performance in times of financial stress. However, when the sovereign itself is under stress, the perception of a weaker ability to support banks could undermine investor confidence and banks' performance. This indeed appears to be the case: the

³¹The indicator reflects the Fitch rating agency's judgment of the propensity and ability of a government to provide support to a bank. Factors used to assess the support rating floor include the size and structure of the banking system, sovereign financial flexibility, resolution legislation, support stance, bank systemic importance, bank liability structure, bank ownership, policy role, guarantees, and legal status. The key advantage of this indicator is that it does not incorporate other forms of external support, such as the institutional support of the entity's shareholders. The rating also does not reflect the intrinsic credit quality of the bank.

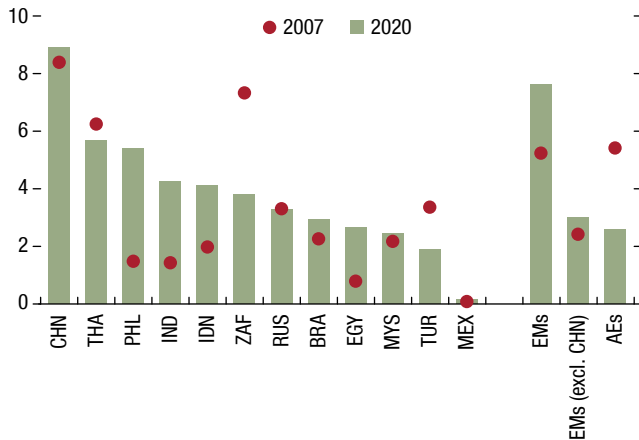
³²The contrasting patterns between advanced economies and emerging markets may reflect different implementation stages of their regulatory reforms (for example, capital surcharges for global systemically important banks). The correlation between bank size and the support rating floor in advanced economies has diverged from that in emerging markets and has substantially receded since the end of 2015, just before the capital surcharges for global systemically important banks were phased in.

³³The distribution of government support ratings spans a wide spectrum in emerging markets, ranging from high to no support, but has changed little since 2007 (see Online Annex 2.7).

Figure 2.11. The Banking Sector Safety Net in Emerging Market Economies

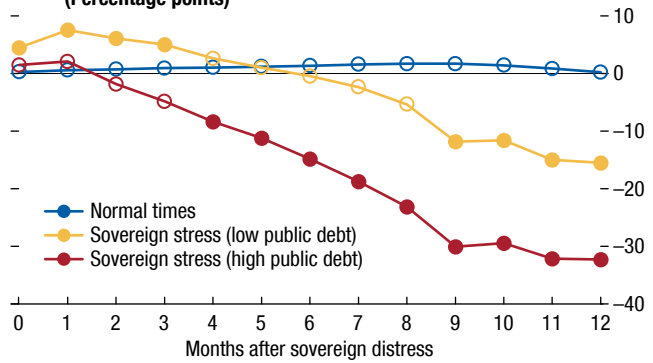
Government implicit guarantees to the banking sector have increased since the global financial crisis.

1. Average Bank Government Support Ratings across Emerging Markets (Support rating floor on a numerical scale from 0 to 17)



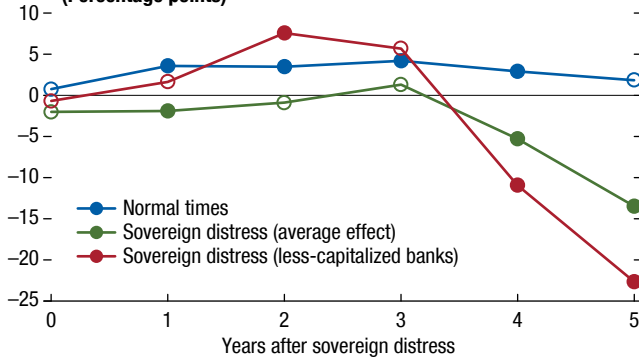
Government guarantees support banks after sovereign distress, but not so much in countries with high public debt.

2. Cumulative Abnormal Returns of Banks with a One-Notch-Higher Government Support Rating in Countries with Different Public Debt Levels (Percentage points)



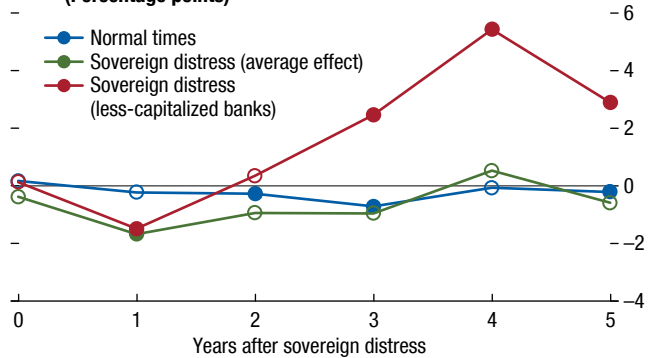
Undercapitalized banks with higher implicit guarantees increase credit growth following sovereign distress ...

3. Cumulative Bank Credit Growth with a One-Notch-Higher Government Support Rating across Banks with Different Capital Buffers (Percentage points)



... leading to higher levels of nonperforming loans, suggesting increased risk-taking.

4. Cumulative Change in Bank Nonperforming Loan Ratio with a One-Notch-Higher Government Support Rating across Banks with Different Capital Buffers (Percentage points)



Sources: Fitch Connect; IHS Markit; Refinitiv Datastream; Standard & Poor's Capital IQ; and IMF staff calculations. Note: Panel 1 shows the weighted average of Fitch support rating floors in major emerging markets, in which weights correspond to banks' total assets in US dollars. The support rating floor ranges from AAA to NF and is converted to a numerical scale of 1–17 (higher values correspond to a higher rating or higher likelihood of receiving government support during distress). Panel 2 shows the capital asset pricing model-based cumulative abnormal returns associated with a one-notch-higher support rating floor after sovereign distress using a local projection methodology. Sovereign distress indicates the months with average sovereign credit default swap spreads higher than 500 basis points, a Standard & Poor's long-term rating for sovereign foreign exchange debt that is CCC– or lower, or months with external or domestic debt defaults occurred. Estimated abnormal returns are shown for economies with a sovereign-debt-to-GDP ratio greater than 60 percent ("high public debt") or lower than 60 percent ("low public debt"). Panel 3 shows cumulative bank credit growth associated with a one-notch-higher support rating floor up to five years after the sovereign distress or during normal times. The green line shows the impact after the sovereign distress for banks with an average equity-to-capital ratio, while the red line shows the cumulative impact following the same sovereign distress but for banks with an equity-to-capital ratio that is one standard deviation below average. Panel 4 shows results for a similar analysis in which the dependent variable is the cumulative increase in the bank nonperforming-loans-to-assets ratio. In panels 1–4, the analysis is based on the sample of firms with available support rating floor information. Solid dots indicate statistical significance at 10 percent or lower. Data labels use International Organization for Standardization (ISO) country codes. AEs = advanced economies; EMs = emerging markets.

equity returns of emerging market banks in times of sovereign distress are higher for banks whose support rating floor is one notch higher than that of their peers (Figure 2.11, panel 2), whereas in normal times there is no significant difference between the two groups.³⁴ However, the positive effect of higher implicit guarantees before sovereign distress declines over time, turning negative six months after the shock—potentially suggesting that the weakened sovereign strength eventually hurts the credibility of these guarantees. Accordingly, the negative effect on banks with high government support ratings starts sooner and is larger if the economy enters the distress event with a higher public debt burden (Figure 2.11, panel 2, red line).

The strength of sovereign support also matters for the ability of banks to lend following a sovereign distress event. Banks with higher government support ratings experience lower credit growth, particularly after three years (Figure 2.11, panel 3, green line), which is in line with the negative impact on bank stock returns observed after the sovereign distress event. Furthermore, banks with a higher support rating floor but lower capital expand their loan portfolios more aggressively, with cumulative credit growth about 8 percentage points higher than that of other banks two years after the distress event (Figure 2.11, panel 3). This increase in lending goes hand in hand with a worsening of bank credit quality, which suggests greater risk-taking by these banks. For example, although nonperforming loans do not seem to depend much on the level of the government support rating on average, banks with both a lower capital ratio and a higher support rating experience a significant jump in nonperforming loans in the medium term (Figure 2.11, panel 4).

Macroeconomic Channel

Empirically analyzing the macroeconomic channel—that is, the interconnectedness of sovereigns and banks through the real economy—is particularly challenging because of difficulties in isolating shocks to different sectors (Dell’Ariccia and others 2018).³⁵ For simplicity, the following analysis focuses on one component of

³⁴The sample for this analysis is composed of 10 major emerging markets covering the period 2007–20. See Online Annex 2.7 for further details of the empirical analysis.

³⁵For example, sovereign and corporate riskiness may be influenced by common factors, such as a decline in economic activity.

this channel: the transmission of risk from the sovereign to the corporate sector.

A possible empirical strategy to identify the effect of a rise in sovereign risk on firms is to exploit the uneven effect of sovereign downgrades on firms with different credit ratings. While downgrades of firms and sovereigns may both be driven by a deterioration in economic fundamentals, sovereign downgrades are more likely to cause the downgrades of highly rated firms because of rating agencies’ ceiling policies. These policies often require that firms’ ratings remain at or below the sovereign rating of their country of domicile.³⁶ This approach allows the analysis in turn to isolate the direct effect of a sovereign downgrade on firms by comparing the performance of firms subject to ceiling policies (“bound firms”—that is, those with a rating equal to or above that of the sovereign) with that of firms not subject to these policies (“unbound firms”—that is, those with a lower rating than the sovereign) under the assumption that both groups of firms are equally affected by the change in fundamentals.³⁷

The data confirm that the ratings of bound firms are more affected by sovereign downgrades than the ratings of unbound firms (Figure 2.12, panel 1).³⁸ A formal analysis of the two groups of firms following a sovereign downgrade shows that a bound firm’s cumulative investment drops nearly 17 percentage points more than an unbound firm’s cumulative investment (controlling for firm characteristics) two years after a sovereign downgrade (Figure 2.12, panel 2). Furthermore, the effect on investment is significantly larger if the sovereign downgrade is accompanied by higher sovereign stress, proxied by sovereign credit default swap spreads greater than 500 basis points (Figure 2.12, panel 3). Overall, these results are consistent with the

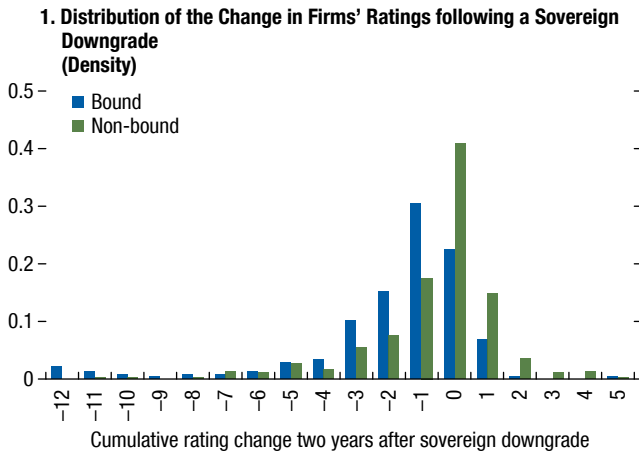
³⁶These policies are set after taking into account the risk of capital and foreign exchange controls, which could hamper a firm’s ability to service its debt. A similar empirical strategy is used in Almeida, Fos, and Kronlund (2016).

³⁷It is worth noting that unbound firms are by definition those with lower credit quality than bound firms. Thus, a key advantage of this empirical approach is that alternative explanations based on changes in fundamentals and credit risk are unlikely to explain the differential impact on firms’ performance around the sovereign ceiling.

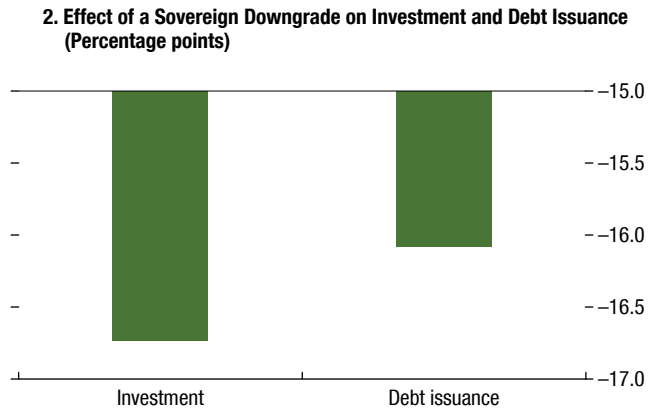
³⁸The sample is composed of 100 sovereign debt downgrades in 29 countries during 1998–2020. For each country, years with banking crises in which the country was downgraded are excluded in order to better isolate the direct real effect of sovereign downgrades (Almeida, Fos, and Kronlund 2016). See Online Annex 2.8 for further estimation details.

Figure 2.12. The Effects of Sovereign Downgrades on Firms

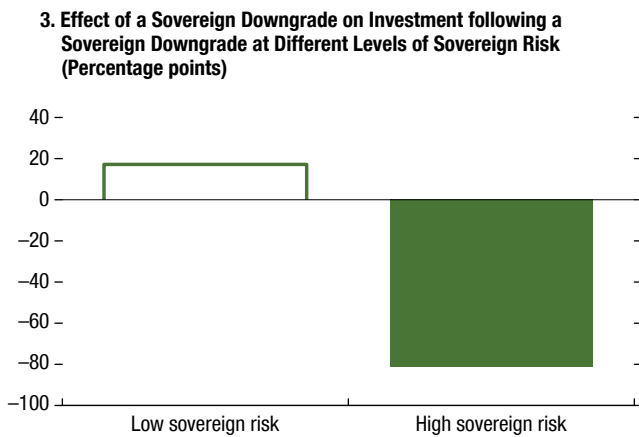
The ratings of bound firms have a higher probability of being downgraded after a sovereign downgrade ...



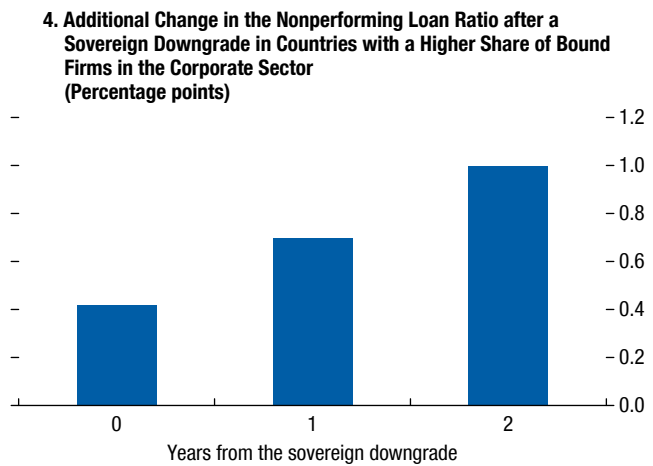
... and bound firms reduce their investment and debt issuance more than unbound firms.



The impact is larger when the downgrade is accompanied by sovereign distress ...



... and leads to spillover effects on banks' asset quality.



Sources: Haver Analytics; IHS Markit; Standard & Poor's Capital IQ; and IMF staff calculations.

Note: Panel 1 shows the distribution of the change in corporate ratings between the period before the sovereign downgrade and two years after the downgrade for "bound" and "unbound" firms. Bound firms are those with a rating equal to or above their sovereign before the downgrade. Panel 2 reports the estimates based on a difference-in-differences model comparing changes in the outcome variable between bound and unbound firms around the sovereign downgrade, in which the considered outcome variables are the changes in the firm's investment ratio and debt issuance between the period before the sovereign downgrade and two years later. The investment ratio is equal to the ratio of capital expenditure to lagged capital stock. Debt issuance is proxied by changes in the net-debt-issuance-to-asset ratio. Panel 3 shows the marginal effect of a sovereign downgrade on bound firms for different levels of sovereign risk. Low sovereign risk refers to periods with a sovereign credit default swap (CDS) spread between 250 and 500 basis points. High sovereign risk refers to periods with a sovereign CDS spread greater than 500 basis points. Panel 4 shows the cumulative effect of a one standard deviation larger share of assets of bound firms in economy-wide corporate assets on the change in banking sector nonperforming loans ratio two years after the sovereign downgrade. Estimates are based on a country-level difference-in-differences model. Solid bars indicate statistical significance at 10 percent or lower. See Online Annex 2.8 for further details of the empirical analysis.

hypothesis that firms face tighter funding constraints when directly affected by a sovereign downgrade.

The negative effects of sovereign stress on firms' borrowing costs and activity may weaken the soundness of their balance sheets. Consequently, banks' loan portfolio quality may be adversely affected, possibly leading them to curtail lending. This would further reduce consumption and investment in the domestic economy, with a consequent drop in aggregate demand and decline in the health of the corporate sector. Hence, disruptions in financial intermediation could act as an amplifier and exacerbate the damage to economic activity following a sovereign downgrade. Empirical evidence supports this intuition: following a sovereign downgrade, banks' nonperforming loans increase more in economies where bound firms play a larger role in the corporate sector, as determined by the share of their assets in total economy-wide corporate assets (Figure 2.12, panel 4).³⁹

Conclusion and Policy Recommendations

The sovereign-bank nexus has intensified in emerging markets as banks' exposure to domestic sovereign debt has increased to all-time highs. With public debt also historically high—and with the sovereign credit outlook deteriorating in many emerging markets—it is increasingly likely that a negative shock to the sovereign balance sheet may trigger an adverse feedback loop between sovereigns and banks that could threaten macro-financial stability. The analysis in this chapter shows that such a loop could occur through multiple channels, including by affecting corporate sector activity, and would be stronger in countries with higher fiscal vulnerabilities and less-well-capitalized banking systems.

Emerging markets thus face complex policy trade-offs amid tighter global financial conditions on the back of monetary policy normalization in advanced economies and heightened economic and

geopolitical uncertainty. Growth prospects are weak in several emerging markets; policy space to support the economy is limited, and borrowing constraints have tightened as foreign investor interest in local currency sovereign bond markets has dwindled and yields have risen. Policymakers must remain vigilant to emerging signs of vulnerability in the banking sector and ensure banking sector stability in the event of deteriorating credit quality.

Given the strength and multifaceted nature of the sovereign-bank nexus, policy action is required on multiple fronts. Given the heterogeneity of countries' fiscal and financial vulnerabilities, policy must be tailored to country-specific circumstances. In general, countries with stronger fiscal positions and a sound banking system will be better placed to manage tighter financial conditions. But they should seek to extend maturities of public debt where feasible and avoid a further buildup of currency mismatches to limit balance sheet vulnerabilities (see the January 2022 *World Economic Outlook Update*). In countries with limited fiscal space and tight borrowing constraints, it is imperative to (1) improve the efficiency and targeting of fiscal spending to support recovery and (2) embed fiscal policy in credible and sustainable medium-term fiscal plans to mitigate the impact of an adverse shock (see the April 2022 *Fiscal Monitor*). Some emerging markets—especially those with larger maturing debt or higher exposure to exchange rate volatility—may need to adjust faster to preserve market confidence and prevent a further intensification of the sovereign-bank nexus.

Policymakers should also seek to develop robust resolution frameworks for sovereign debt to facilitate orderly deleveraging and restructuring if needed (IMF 2020a). Domestic debt restructurings may become more frequent in the future following the increase in the share of domestic debt in total public debt in emerging markets, so a sovereign considering such restructuring should anticipate, minimize, and manage its impact on the financial system and broader economy (IMF 2021).

On the financial sector front, banks' resources should be preserved to absorb potential losses by limiting capital distribution in cases where bank profitability is difficult to assess because of regulatory flexibility. Fully assessing banking sector health remains difficult in many countries due to regulatory flexibility and forbearance. As a result, asset quality reviews may be necessary to quantify hidden losses and identify weak banks once forbearance

³⁹These findings are based on a country-level difference-in-differences regression, in which banking sector nonperforming loans across countries are regressed on the share of bound firms' assets relative to total assets of the nonfinancial corporate sector, and other control variables (see Online Annex 2.8). The results indicate that a one standard deviation higher value of this share is associated with a 1 percentage point greater change in nonperforming loans two years after the sovereign downgrade. However, these findings are only suggestive—a more direct analysis linking banks' lending behavior to their exposure to bound firms is difficult given a lack of available data.

has ceased. The results of these reviews may guide supervisory actions requiring more robust levels and quality of bank capital, which could be phased in over time in a preannounced manner to minimize procyclical effects. This is especially pertinent for countries with weak growth prospects and high corporate insolvency risks that could adversely affect financial stability should banks ultimately need to recognize loan losses. Moreover, in emerging markets with inadequate frameworks to deal with corporate bankruptcies, private debt resolution frameworks should be strengthened to prepare for the eventual withdrawal of policy support measures and minimize risks to macro-financial stability.⁴⁰

Risk to banks from sovereign exposure can materialize not just in emerging markets but also in more advanced economies, as was the case in Europe following the global financial crisis. Hence, improving transparency and data quality of banks' holdings of government debt to assess risks arising from possible sovereign distress should be a global priority. While current international standards stop short of "encouraging" banks to disclose data on all material sovereign exposures by currency denomination and account classification (BCBS 2021), market discipline will work meaningfully only if this becomes a necessary requirement for all banks. Furthermore, banks could be required to cover the risks of significant sovereign exposures in their stress tests by taking into account the multiple channels of the nexus.⁴¹

Once the economic recovery has taken hold and pandemic-related financial sector support measures have been normalized, both advanced and emerging market economies could consider introducing measures aimed at reducing incentives to hold excessive sovereign debt.^{42,43} In this regard, several reform options

⁴⁰Liu, Garrido, and DeLong (2020) discuss in detail the key measures needed for effective private sector debt resolution.

⁴¹See Jobst and Oura (2019) for recent approaches to stress testing sovereign exposures.

⁴²Sovereign debt exposures could become excessive if banks are not fully pricing the risks associated with them, expecting to be bailed out in the event of sovereign distress (Dell'Ariccia and others 2018; Farhi and Tirole 2015). Furthermore, the expectation of intervention might lead to correlated risk exposures across banks as banks expect public support to be more likely in a systemic banking crisis.

⁴³In the current regulatory framework, sovereign exposures are treated more favorably than other asset classes, encouraging banks to hold sovereign bonds. The Basel Committee's standardized approach to credit risk provides a regulatory exemption that allows banks to apply zero risk weights on local currency government bonds regardless of sovereign risk. Other aspects of the regulatory framework, such as the liquidity standards, also favor the holding of sovereign debt.

have been discussed internationally in the aftermath of the global financial crisis, including the establishment of nonzero, risk-sensitive capital requirements (BCBS 2017). So far, however, no consensus has been reached to make any changes to the regulatory capital treatment of risks from sovereign exposures, although the Basel Committee could consider resuming its efforts in this regard. An alternative approach could be strict concentration limits, but these are likely to generate negative effects because banks need to hold sovereign bonds for liquidity management. Capital surcharges on bank holdings of domestic sovereign bonds above certain thresholds are more flexible and can target concentration risk if appropriately calibrated. The setting of such a surcharge should consider the liquidity needs and availability of other liquid assets in domestic currency, along with the perceived risk from excessive concentration.⁴⁴

Strengthening banking crisis management frameworks could reduce the need for government guarantees and minimize the costs of resolution to the government, including through the recovery of public funds from the industry. Some emerging markets have made much progress in this regard (Botes and others 2021). Given the economic uncertainty and the eventual unwinding of financial sector measures that have supported bank balance sheets through the pandemic, it is important to act to strengthen the financial safety net, including through deposit guarantee programs, resolution regimes, and central bank liquidity facilities. Preparing contingency plans that detail how the authorities will respond to possible future pressures is critical to support effective policy responses should an adverse scenario materialize (IMF 2020b).

Effective governance, regulation, and supervision are necessary to ensure that public banks are safe and sound while achieving their public policy objectives (IMF, forthcoming). Mitigating the risks to financial stability posed by public banks requires closing existing prudential gaps. Deposit-taking public banks directly competing with private banks should be subject to the same expectations and requirements of governance,

⁴⁴The IMF's Financial Sector Assessment Program for Romania provides an example of systemic risk buffer calibration that aims to ensure the resilience of banks with concentrated exposures, while minimizing potential adverse impacts (IMF 2018). The framework applies a marginal scheme, with systemic risk buffer surcharges rising with the ratio of sovereign exposures to risk-weighted assets.

disclosure, regulation, and supervision as private banks. A key element of the reform agenda should be to promote mechanisms so that arm's length distance can be created between the government as the owner and the management of the bank, which can then run the bank on as much a commercial basis as possible. The government's role as an informed owner should also be separated from the supervisory authority's prudential supervision role.

Given that a lack of investor diversity can induce volatility in sovereign debt markets amid sudden changes in risk appetite, policymakers should aim to promote a deep and diversified investor base to strengthen market resilience in countries with underdeveloped local currency bond markets (IMF 2021). While domestic banks usually play a major role in emerging market and developing economies both as investors in government bonds and as intermediaries for government bond trading, a highly concentrated banking sector can undermine banks' incentives to

trade and can impede market liquidity.⁴⁵ A developed investor base should thus include a diverse range of bank and nonbank participants with different investment horizons and risk-return preferences, particularly institutional investors, to allow the government to spread risk in its debt portfolio and extend the yield curve.⁴⁶ This would also help mitigate banks' excessive exposure to the sovereign and weaken the sovereign-bank nexus.

⁴⁵Banks tend to trade securities for liquidity management purposes, which helps bolster secondary market activity. A highly concentrated banking sector can restrict market liquidity in countries with smaller financial systems.

⁴⁶Nonbank investors bring different risk-return preferences and investment horizons to the government bond market compared with banks. For example, pension funds and insurance companies generally prefer longer-dated assets to match their longer-term liabilities, largely determining the ability of the government to issue longer-dated securities and thereby facilitating the extension of the yield curve. See IMF (2021) for detailed guidance on diversifying the investor base and developing local currency bond markets in emerging market and developing economies.

Box 2.1. The Drivers of Banks' Sovereign Debt Exposure in Emerging Markets

Bank holdings of sovereign debt vary significantly across emerging markets, ranging from about 5 percent of banking sector assets (for example, in Chile and Peru) to more than 25 percent (for example, in Brazil and Pakistan) (Figure 2.1.1). In general, the exposure of emerging market banks to sovereign debt has risen since the global financial crisis, most notably in China, Hungary, and Pakistan.

Why do banks hold government debt? Several factors may be at play, including liquidity management, expected returns, and limited alternative investment opportunities (Dell'Ariccia and others 2018). Sovereign debt offers a relatively liquid and safe asset status that may be particularly attractive in countries with weaker institutions and enforcement of creditor rights that could lower incentives for banks to lend to the private sector (Holmström and Tirole 1998). Banks may serve as market makers in government bond markets, while their government bond holdings also serve as collateral for securing funding from the central bank. The regulatory treatment of sovereign exposures—which allows banks to apply zero risk weights on local currency domestic government bonds—also makes them attractive for banks to hold. Moral suasion and risk shifting are two other potential reasons. Moral suasion refers to government pressure on banks to purchase public debt; risk shifting can occur during times of sovereign distress when banks increase their sovereign debt exposure to take advantage of higher sovereign yields.¹

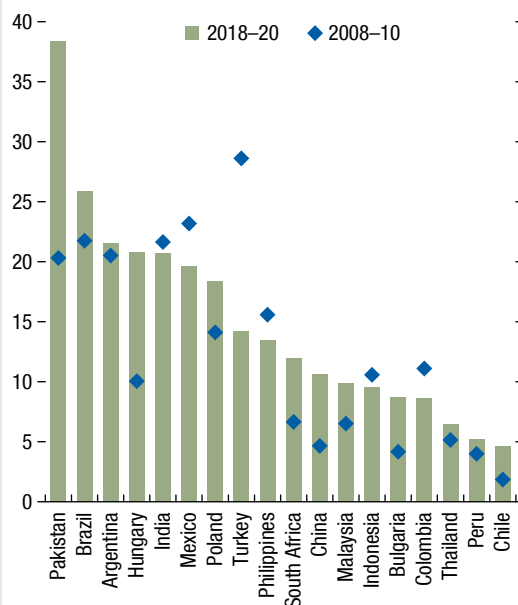
For emerging markets, empirical analysis using country-level data shows that several of the abovementioned factors are relevant (Figure 2.1.2, panel 1).² For example, banks tend to hold more government debt when interest rates are high and the sovereign is more indebted (pointing perhaps to moral suasion or risk-shifting motives) and when there are fewer opportunities to lend to the private sector, as indicated by a lower ratio of stock market capitalization to GDP, as well as a lower ratio of private sector credit to GDP.

The author of this box is Tara Iyer.

¹The flip side of this is that during sovereign distress, domestic banks could incur huge losses that wipe out their capital, leading to a banking crisis.

²See Online Annex 2.4 for a detailed description of the model, estimation method, and data used for this analysis.

Figure 2.1.1. Bank Holdings of Sovereign Debt
(Percent of total bank assets)



Sources: Fitch Connect; IMF, Monetary and Financial Statistics database; and IMF staff calculations.

Note: Given limited country-level data availability, banks' sovereign debt exposures for India and Argentina are computed using bank-level Fitch Connect data.

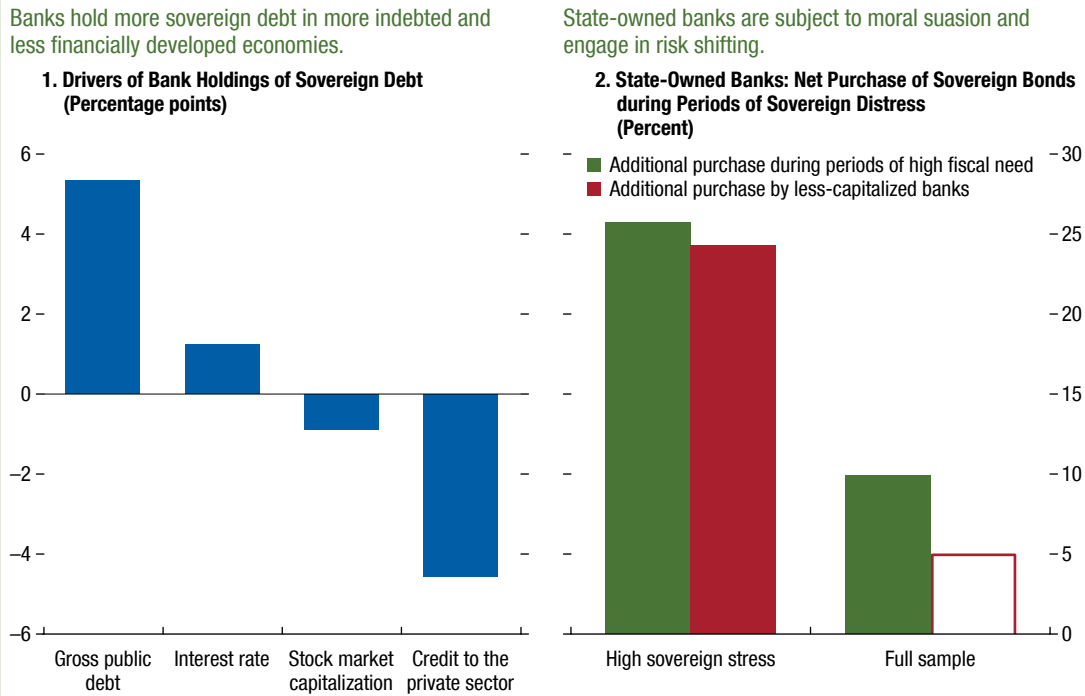
Further analysis using bank-level data shows that moral suasion and risk-shifting motives are indeed important in emerging markets. Domestic state-owned banks, generally dominant in emerging markets and potentially more likely to be induced to hold government debt (Ongena, Popov, and Van Horen 2019),³ purchase significantly more sovereign debt in times of high fiscal need or when the sovereign is in distress (Figure 2.1.2, panel 2).⁴ However,

³Domestic state-owned banks tend to be generally dominant in emerging markets. On average, such banks held about 30 percent of total banking sector assets in major emerging markets in 2020, but this ratio exceeded 40 percent in some countries.

⁴High fiscal need is defined as years when maturing sovereign debt (to lagged total debt) is in the top 75th percentile of the distribution, indicating that more new public debt is likely to be issued. Sovereign distress is defined as periods when the sovereign credit default spread exceeds 500 basis points, a Standard & Poor's long-term rating for sovereign foreign currency debt CCC– or lower, or the sovereign is in external or domestic default.

Box 2.1 (continued)

Figure 2.1.2. Drivers of Bank Holdings of Sovereign Debt in Emerging Markets



Sources: Bloomberg Finance L.P.; Fitch Connect; IHS Markit; IMF, Monetary and Financial Statistics and World Economic Outlook databases; Standard & Poor's Capital IQ; and IMF staff calculations.
 Note: Panel 1 presents results obtained from a cross-country regression for a sample of 21 emerging markets during 2000–20. Aggregate banks' government debt holdings are computed from Fitch Connect if data from Monetary and Financial Statistics are limited. The dependent variable is banks' holdings of sovereign debt to total banking sector assets. The bars show the effect of a one standard deviation increase in the value of the regressors on changes in banks' holdings (in percentage points). Panel 2 presents regression results from a bank-level cross-country regression during 2011–20. The dependent variable is banks' net purchases of sovereign debt. (See Online Annex 2.4 for the model and estimation details.) Moral suasion is defined as the additional purchase of sovereign debt by state-owned banks in times of "high fiscal need"; that is, the years when the total amount of new debt auctioned by the sovereign (proxied by maturing debt as a share of lagged gross debt) is above the 75th percentile in the sample. Risk shifting is defined as the additional purchases of sovereign debt by less-capitalized state-owned banks, where "less capitalized" refers to an equity-to-assets ratio that is one standard deviation below the mean, which is about 7 percentage points. Solid bars indicate statistical significance at 10 percent or lower.

there is no such evidence of government pressure on private banks (Online Annex 2.4). Moreover, less-capitalized state-owned banks are more likely to purchase sovereign debt during periods of sovereign distress (Figure 2.1.2, panel 2). This pattern suggests

the presence of a moral suasion motive, but there may also be a risk-shifting strategy by these banks, whereby they are more willing to take on additional risk and improve their capital positions by purchasing high-yield debt (Acharya and others 2018).

References

- Acharya, Viral V., Tim Eisert, Christian Eufinger, and Christian Hirsch. 2018. "Real Effects of the Sovereign Debt Crisis in Europe: Evidence from Syndicated Loans." *Review of Financial Studies* 31 (8): 2855–96.
- Almeida, Heitor, Vyacheslav Fos, and Mathias Kronlund. 2016. "The Real Effects of Share Repurchases." *Journal of Financial Economics* 119 (1): 168–85.
- Arslanalp, Serkan, and Takahiro Tsuda. 2014. "Tracking Global Demand for Advanced Economy Sovereign Debt." *IMF Economic Review* 62 (3): 430–64.
- Asonuma, Tamon, Said Bakhache, and Heiko Hesse. 2015. "Is Banks' Home Bias Good or Bad for Public Debt Sustainability?" IMF Working Paper 15/44, International Monetary Fund, Washington, DC.
- Basel Committee on Banking Supervision (BCBS). 2017. "The Regulatory Treatment of Sovereign Exposures." Discussion Paper, Basel.
- Basel Committee on Banking Supervision (BCBS). 2021. "Voluntary Disclosure of Sovereign Exposures." Basel.
- Bofondi, Marcello, Luisa Carpinelli, and Enrico Sette. 2018. "Credit Supply during a Sovereign Debt Crisis." *Journal of the European Economic Association* 16 (3): 696–729.
- Botes, Jacques, Aidan Lawson, Vasily Pozdyshev, and Rastko Vrbaski. 2021. "Managing Banking Crises in Emerging Market Economies." FSI Insights on Policy Implementation 38, Financial Stability Institute, Bank for International Settlements, Basel.
- Cruces, Juan J., and Christoph Trebesch. 2013. "Sovereign Defaults: The Price of Haircuts." *American Economic Journal: Macroeconomics* 5 (3): 85–117.
- Dell'Ariccia, Giovanni, Caio Ferreira, Nigel Jenkinson, Luc Laeven, Alberto Martin, Camelia Minoiu, and Alex Popov. 2018. "Managing the Sovereign-Bank Nexus." ECB Working Paper 2177, European Central Bank, Frankfurt.
- European Central Bank (ECB). 2020. *Financial Stability Review November 2020*. Frankfurt.
- Farhi, Emmanuel, and Jean Tirole. 2015. "Liquid Bundles." *Journal of Economic Theory* 158:634–55.
- Feyen, Erik, and Igor Esteban Zuccardi Huertas. 2019. "The Sovereign-Bank Nexus in EMDEs: What Is It, Is It Rising, and What Are the Policy Implications?" Policy Research Working Paper 8950, World Bank, Washington, DC.
- Gennaioli, Nicola, Alberto Martin, and Stefano Rossi. 2018. "Banks, Government Bonds, and Default: What Do the Data Say?" *Journal of Monetary Economics* 98:98–113.
- Holmström, Bengt, and Jean Tirole. 1998. "Private and Public Supply of Liquidity." *Journal of Political Economy* 106 (1): 1–40.
- International Monetary Fund (IMF). 2018. "Romania: Financial Sector Assessment Program." June 8. <https://www.imf.org/en/Publications/CR/Issues/2018/06/08/Romania-Financial-Sector-Assessment-Program-45961>.
- International Monetary Fund (IMF). 2020a. "The International Architecture for Resolving Sovereign Debt Involving Private-Sector Creditors—Recent Developments, Challenges, and Reform Options." IMF Policy Paper 2021/071, Washington, DC.
- International Monetary Fund (IMF). 2020b. "Managing Systemic Banking Crises: New Lessons and Lessons Relearned." Departmental Paper 20/05, Washington, DC.
- International Monetary Fund (IMF). 2021. "Issues in Restructuring of Sovereign Domestic Debt." IMF Policy Paper 2020/043, Washington, DC.
- International Monetary Fund (IMF). 2022. "South Africa: 2021 Article IV Consultation Staff Report." Washington, DC.
- International Monetary Fund (IMF). Forthcoming. "Regulating, Supervising, and Handling Distress in Public Banks." IMF Departmental Paper, Washington, DC.
- Jobst, Andreas A., and Hiroko Oura. 2019. "Sovereign Risk in Macroprudential Solvency Stress Testing." IMF Working Paper 19/266, International Monetary Fund, Washington, DC.
- Laeven, Luc, and Fabian Valencia. 2018. "Systemic Banking Crises Revisited." IMF Working Paper 18/2076, International Monetary Fund, Washington, DC.
- Liu, Yan, José Garrido, and Chanda DeLong. 2020. "Private Debt Resolution Measures in the Wake of the Pandemic." IMF Special Series on COVID-19, International Monetary Fund, Washington, DC.
- Ongena, Steven, Alexander Popov, and Neeltje Van Horen. 2019. "The Invisible Hand of the Government: Moral Suasion during the European Sovereign Debt Crisis." *American Economic Journal: Macroeconomics* 11 (4): 346–79.
- Reinhart, Carmen M., and Kenneth S. Rogoff. 2009. *This Time Is Different: Eight Centuries of Financial Folly*. Princeton, NJ: Princeton University Press.
- Rigobon, Roberto. 2003. "Identification through Heteroskedasticity." *Review of Economics and Statistics* 85 (4): 777–92.