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The Scalability of Credit-Enhanced EM Climate Debt

What Role Can Guarantees, Collateralization, Securitizations, and Investment Funds Play?

Prepared by Peter Lindner, Ananthakrishnan Prasad, and Jean-Marie Masse

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Prepared by Peter Lindner, Ananthakrishnan Prasad, and Jean-Marie Masse*

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ABSTRACT: This paper reviews the main types of credit enhancement approaches used to support climate debt issuances by EMDE borrowers. Fragmentation on the part of the providers of credit enhancements was identified as a major factor impeding scalability of credit-enhanced debt. The acceptance of credit-enhanced debt is also hampered by the structural characteristics of the capital markets, especially the fragmentation of the investor base. To place significant amounts of credit-enhanced climate debt with private sector investors, MDBs, DFIs, and other stakeholders should focus on simple and replicable debt structures. Securitizations and investment funds could help fund private sector climate investments in EMDEs.

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AAF	African Agriculture Fund
ABS	Asset-backed Security (/ies)
ADB	Asian Development Bank
AfDB	African Development Bank
AE	Advanced Economy Country
AIIB	Asian Infrastructure Investment Bank
AllianzGI	Allianz Global Investors
AUM	Assets under Management
BBIC	Belize Blue Investment Corporation
bp	basis point (one-hundredth of a percentage point, 1/10000)
BRD	Development Bank of Rwanda
CBO	Collateralized Bond Obligation
CLO	Collateralized Loan Obligation
CRA	Credit Rating Agency
DCS	Debt-for-Climate Swap
CRS	Congressional Research Service
DFC	United States International Development Finance Corporation
DFI	Development Financial Institution
DMO	Debt Management Office
DNS	Debt-for-Nature Swap
EIB	European Investment Bank
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EMBI	J.P. Morgan Emerging Market Bond Index
EMDEs	Emerging Market and Developing Economies
ESG	Environmental, Social and Governance
EUR	Euro currency
FCDO	UK's Foreign Commonwealth and Development Office
FDI	Foreign Direct Investment
FI	Financial Institution
FMO	Nederlandse Financierings-Maastschappij voor Ontwikkelingslanden N.V. (Dutch Entrepreneurial Development Bank)
FX	Foreign Exchange
GBP	Green Bond Principles

GFC	Global Financial Crisis
GIF	Global Infrastructure Facility
GoB	Government of Belize
HY	High Yield
IABS	Infrastructure Asset-Backed Security
ICIEC	Islamic Corporation for the Insurance of Investment and Export Credit
ICMA	International Capital Markets Association
ICSD	International Central Securities Depository
IDA	International Development Association
IDB	Inter-American Development Bank
IFC	International Finance Corporation
IG	Investment Grade
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
LCBM	Local Currency Bond Market
LGD	Loss given default
LIC	Low Income Country
MDB	Multilateral Development Bank
MIGA	Multilateral Investment Guarantee Agency
NAIC	National Association of Insurance Commissioners
NGFS	Central Banks and Supervisors Network for Greening the Financial System
NGO	Non-governmental Organization
NH	Non-honoring of Sovereign, Sub-sovereign, and State-owned Enterprises Financial Obligation Guarantees
OECD	Organization of Economic Co-operation and Development
PBG	Policy-based Guarantee
PCD	Preferred Creditor Debt
PCS	Preferred Creditor Status
PM	Portfolio Manager
PPF	Project Preparation Facility
PRI	Political Risk Insurance
RSF	Resilience and Sustainability Facility
RST	Resilience and Sustainability Trust
SSA	Sub-Saharan Africa
SDG	Sustainable Development Goal

SIDA	Swedish International Development Agency
SLB	Sustainability-linked Bond
SMEs	Small and medium-sized enterprises
SOE	State-owned Enterprise
SOFR	Secured Overnight Financing Rate
SPV	Special Purpose Vehicle
SSA	Sub-Saharan Africa
TA	Technical Assistance
TNC	The Nature Conservancy
UoP	Use of Proceeds
U.S.	United States of America
USAID	U.S. Agency for International Development
WB	World Bank
WBG	World Bank Group

Executive Summary

With Emerging Markets and Developing Economies (EMDEs) in need of large amounts of capital to finance their climate transition, credit enhancements can be central tools that can help facilitate these capital flows from the private sector. Despite decades of experience with credit enhancements for projects in EMDEs, and significant analytical work performed, viable approaches to credit enhancements that can support the climate funding needs of EMDEs in a scalable way have not yet been developed.

The key obstacles in the way of scalable credit-enhanced issuances by EMDE issuers are: (i) fragmentation of the investor space; (ii) fragmentation amongst guarantors; (iii) complexities and uncertainties associated with guarantees; (iv) focus on a project-driven rather than programmatic and portfolio approaches; (v) debt sustainability concerns; and (vi) the illiquidity often associated with idiosyncratic, one-off issuances.

The current system of guarantees has indeed benefited EMDEs but needs to evolve to effectively support large-scale climate investments. The existing system of guarantee provision for EMDEs has added notable value to investments in EMDEs and helped support EMDE sovereigns that find it difficult to access financial markets. However, it falls short of mobilizing large-scale private sector funding required for a successful climate transition of EMDEs.

The way forward for the community of guarantee providers—including Multilateral Development Banks (MDBs), Development Financial Institutions (DFIs), governments, private providers, and other stakeholders—involves changes to the provision of guarantees, their coverage parameters, associated conditionality, and the targeted recipients. There is an urgent need to address fragmentation, which requires streamlining and standardization of different types of guarantees—such as partial versus full guarantees, minimum credit strength requirements for sovereigns, and the use of arbitration, among others.

Furthermore, guarantee providers must address the complexities and uncertainties associated with the current system of guarantees. The current system of bespoke, one-off issuances needs to be transformed into a standardized system of sizable issuances that focus on transparent, publicly traded bonds, rather than relying on loans and private placements. This proposed approach can enhance the liquidity of EMDE climate debt, paving the road for issuances of large volumes at low spreads, and narrow bid-offer spreads. Additionally, the review processes for guarantees need to be expedited, to help address climate funding needs quickly and to assure better alignment with the time frames of private sector investors.

Close coordination among guarantee providers is essential to reduce the observed fragmentation. This cooperation can allow for the pooling of resources towards scalable EMDE bond finance and the design of securities and funds that benefit from co-guarantees. The costs and benefits of guarantees should be assessed within a consistent framework by MDBs and DFIs. Such a framework should distinguish between adaptation and mitigation finance, and include climate, other environmental, and social indicators.

Market participants prefer simple, standardized instruments, which can be easily analyzed. Simplicity reduces time spent on analysis and makes it more likely that others will bid for that security in the secondary market. Such securities can be more easily replicated, which is important since market participants want to see follow-on offerings. Simplicity plus standardization and replication will result in greater market acceptance and liquidity, leading to reduced spreads on new issuances. Policymakers and guarantors must be aware that the

process to build a new sub-asset class in fixed income can take a few years, during which time subsidies to guarantee fees or interest rates may have to be extended to EMDE-based issuers of credit-enhanced debt.

Standardized product templates for credit-enhanced securities should be developed and promoted so that they can become the basis for repeat issuances. MDBs and DFIs should coordinate the design of fixed-income products, utilizing insights from issuance experiences, and investor and issuer feedback to improve those designs. It will be paramount for MDBs and DFIs to replicate at scale approaches that have received positive feedback from investors and build on them. Once standardized guarantee products have been identified that find widespread investor acceptance and are acceptable to guarantee providers, they should be replicated and actively marketed. Additionally, thematic debt pools could provide another avenue that could increase investor appeal. For instance, debt extended to renewables projects could be assembled in thematic securitizations.

Securitization can address thematic or other concerns of investors, while allowing for the conversion of illiquid EMDE climate loans into more liquid bonds. Topical concerns of specific providers of credit support and catalytic funding can also be addressed. Securitizations can serve as a means to provide climate funding for EMDEs to reallocate credit risk from particular DFIs and banks to capital market investors. By design, securitizations allow for the incorporation of credit enhancements.

The fragmentation of the fixed income investor base is not welcoming to credit-enhanced debt and will remain a constraint for the adoption of such debt in the medium term. Investors are separated into investment grade (IG) and high yield (HY), Emerging Market (EM) and non-EM, structured product, and other categories. The reason behind this market segmentation lies in the fact that riskier and more complex debt instruments require different skills and experience, and this fundamental separation can be expected to prevail in the intermediate term. Providers of credit-enhancement will have to adopt to this market reality.

Credit enhancements do come at a cost. Theoretical and empirical considerations suggest that total return investors will demand a yield or spread premium for investing in credit-enhanced bonds above what is implied by instruments already available in the market. While most credit enhancements still provide benefits for the issuers, both issuers and guarantors should be mindful of the all-in costs associated with credit enhancement and structure the enhanced debt instruments accordingly.

I. Introduction

This paper discusses ways of attracting domestic and foreign private capital to EMDEs through credit-enhanced debt to finance the transition to a low carbon, climate-resilient economy. It explores the potential for risk-mitigated products to help EMDEs, particularly those in low-rated countries, raise capital from both the public and the private sectors, and diversify their investors bases. The paper considers solutions involving guarantees by multilateral development banks (MDBs), regional and national development finance institutions (DFIs), catalytic capital, and private sector support. Debt-for-Climate swaps (DCSs) are also covered due to their potential for advancing climate investments by countries that face high debt costs or market access challenges.

The paper covers the supply of credit enhancements through a description of the institutions and the instruments that make up the ecosystem of credit enhancement provision. This is joined by an analysis of the demand for these instruments and the constraints around this demand, using a market-centered approach, covering both the sovereign and non-sovereign space. It fills a void in the existing literature by focusing on the market-acceptance of credit-enhanced instruments and the conditions under which credit enhancements can successfully attract private capital to climate debt investments in EMDEs. We find that different types of instruments can work, although generally a subsidy element and the halo effects of MDB and DFI participation bolster these approaches. New approaches to the provision of credit enhancements outside the current system of project-focused finance are proposed. The analysis employed in this paper is centered around the incentives of the different stakeholders that participate in EMDE climate finance.

The remainder of the paper is organized as follows: Section II describes EMDEs' climate funding needs and challenges and highlights the importance of mobilizing private capital for financing of the climate transition in EMDEs. It motivates Section III, which reviews different approaches to credit enhancements from a financial perspective. It also surveys applications of credit enhancements to EMDE climate finance, summarizing the pros and cons of different approaches: Insurance and guarantees, collateralization, securitizations, and layered funds. Section IV describes the capital markets ecosystem that provides the foundation for the investments in EMDEs. Section V summarizes the costs and benefits of the different credit-enhancement approaches.

II. EMDE Climate Funding Needs and Challenges

Despite the rapid increase in climate investments in recent years, climate finance needs remain large, especially for EMDEs. Some estimates predict a need for about USD2 trillion per year of climate mitigation investments in EMDEs ex China by 2030, with the private sector having to account for roughly 90 percent of this (International Monetary Fund (IMF) (2023)). As domestic capital markets in many EMDEs often lack the requisite scope and depth, a significant share of the needed funding will have to come from private sector investors in advanced economies (AEs), mostly in the form of debt (Independent Expert Group (2023)).

However, many EMDEs face significant challenges in funding their climate adaptation and mitigation expenditures due to several factors: high levels of indebtedness, with many sovereigns near debt distress, underdeveloped domestic capital markets, limited understanding of green finance by local investors, and

concerns among external investors' regarding country and political risks. Some investors will not consider EMDE investments at all, while others may require such large risk premiums that the projects to be financed become uneconomical. Many investors require an IG credit rating before considering a debt instrument for investment. The pool of capital available for investments in sub-investment grade HY debt is far smaller than the capital base targeting IG debt, making it hard for HY-rated EMDEs to receive the funds needed for their green transition. While private investors are generally comfortable with project-related risks, they consider governance risks as being largely outside their expertise and mitigate them via increases in required returns or insurance and guarantees. Another risk factor is foreign exchange (FX) risk: Hedging the currency of an EMDE country with high interest rates means high hedging costs, negating much of the advantage from hard currency financing (Global Infrastructure Facility (GIF)-IMF (2024)). The high share of adaptation projects in EMDEs adds to EMDEs' climate finance challenges since adaptation projects are considered less bankable than mitigation projects.[1]

With most fixed-income assets in search of low-risk investments,[2] significant de-risking is required, with the public sector the most obvious source of credit enhancements (BlackRock (2021)).[3] On the positive side, many of the projects that are core to the climate transition are long-term infrastructure projects with the potential to produce reliable returns and therefore can be attractive to investors that have to fund long-term liabilities, like pension funds or insurance companies.

III. Mobilizing Private Capital through Credit Enhancements

A. Overview

Many stakeholders have been focusing on blended finance as a central component to attracting additional large-scale portfolio flows to EMDEs from AE-based fixed income investors. Credit enhancements using collateral and guarantees are sought by creditors to help mitigate perceived risks posed by the borrower or by the nature of the transaction. While one single, commonly accepted definition of blended finance does not exist, it is understood to involve the investment of public resources from MDBs, DFIs, specialized climate finance funds, and philanthropies, which invest alongside profit-focused investors. This can involve a subsidy element, with public participants potentially taking on higher risks and low expected returns. But even if public investor target market-based returns, the financing can benefit from the halo effect of public sector participation and

[1] Most stakeholders and analysts view adaptation projects as less bankable than mitigation projects. This is due to the public good nature of many mitigation projects, like dams and levees, storm-resilient roads and public buildings, or storm warning systems. Some adaptation projects, for instance climate resilient agriculture techniques, are in principle bankable. However, that does not mean they can be readily adopted by smallholders and small and medium-sized enterprises (SMEs) in EMDEs with limited funding and implementation capacity. The latter could imply a need for governments or international development partners to subsidize these types of adaptation projects. While the alignment between bankability and mitigation is not perfect, in what follows this paper follows the general approach that equates mitigation with bankability.

[2] For the purposes of this paper *fixed income* comprises both bonds and loans.

[3] The public sector—which includes MDBs and DFIs in this paper—stands out as the primary provider of credit enhancements because (i) the sizeable amount of capital required; (ii) the social goods nature of climate investments; (iii) the commitment by AE governments to provide USD300+ billion per year in climate finance to EMDEs by 2035.

technical assistance (TA) provided. Many of the credit-enhancement mechanisms covered in this paper would fall under the most used definitions of blended finance, while others, like collateral provided by the issuer itself, is generally not considered part of blended finance.

Credit-enhanced debt has been around since the beginnings of lending: mortgages are collateralized by the borrower's property, or land or other assets used by the borrower serve as security for a bond or loan.[4,5] Credit enhancement will allow the borrower to receive credit at a lower rate than otherwise, or to qualify for the loan at all. Given the credit risks that many investors associate with investments in EMDEs, and climate investments in need of long-term debt at low rates, credit enhancements can play an important role.[6]

Credit enhancement approaches for climate finance can be separated into (i) guarantees and insurance; (ii) collateralization; (iii) climate securitizations and (iv) layered climate funds. Guarantees and insurance can be provided at the project level, covering equity, debt, or both. They can also apply at the portfolio level, providing support to investment funds or securitizations. Similarly, collateralization can support debt instruments directly, as well as debt portfolios. Securitizations and layered funds are portfolio instruments. Layered funds and securitizations are structured in a parallel fashion and can provide debt instruments with similar risk-return characteristics to their investors.[7,8] The riskier liabilities of a securitization or a layered fund are usually held by the sponsor or originator of the structure, and can contain a subsidy element when a sponsor or another investor is willing to provide high-risk capital or protection under conditions that most other total return investors would not accept. This would help attract total return investors with lower tolerance for risk to the low-risk "senior" tranches.[9]

The type and structure of a credit enhancement, its legal foundation, and complexity are important factors in its market acceptance and the pricing of credit-enhanced debt. To alleviate the risks associated with an investment, the credit enhancement must be viewed as credible. Therefore, it should be not under the influence of the borrower, and any claims process should allow for fast resolution. Complex conditions associated with the potential payout of an insurance or guarantee are disliked by investors and Credit Rating Agencies (CRAs) alike.

[4] In the U.S., investment grade bonds are usually unsecured. Exceptions are the so-called "first mortgage bonds" issued by utilities and high yield bonds, where the secured share of debt reached almost 30 percent in 2023. Empirical studies found that most bank loans are secured (Pozzolo (2002)).

[5] The positive effects of guarantees for loan provision to households and small firms is discussed in Serebrisky, T., Suarez-Alemán, A. and Pastor, C. (2018).

[6] Many climate investments consist of large, capital-intensive projects, like solar plants, wind farms, or dams. Generally, the sponsors of long-term projects will prefer long-term funding at low rates (Damodaran). With the bond markets generally much better equipped to provide long-term funding compared to bank loans, this paper will focus on credit enhancements for bonds, if not stated otherwise. However, much of our analysis carries over to loans.

[7] While sometimes the term "tranched fund" is used in lieu of "layered fund," "layered fund" is more often used when referring to a fund whose capital structure consist of different layers of debt. This paper follows this market practice.

[8] A principal difference between a securitization and a tranched fund is the ability to trade the underlying assets, with the fund structure generally providing greater flexibility for the manager to trade these assets. On the other hand, the debt issued by a securitization vehicle—a securitization's liabilities—might be more easily tradable than fund liabilities, leading to greater liquidity of securitization liabilities. This lack of liquidity of funds' liabilities and the management fees that a managed fund comes with can hamper the take-up of a fund compared to a securitization. In addition, management of a fund by an asset management company will likely discourage other asset managers from investing in it.

[9] The basic securitization approach follows the senior/subordinated structure, where the senior tranches receive cash flows first before any other tranches and usually get paid off first. Next in line are the so-called mezzanine tranches. For details, see Standard and Poor's (2008).

Another important factor impacting market acceptance and the pricing of partially guaranteed, insured, or collateralized sovereign debt is how investors and CRAs view its treatment in case of default. Sovereign defaults are resolved through negotiations between the borrower and its creditors. However, negotiations allow the sovereign to propose haircuts for credit-enhanced debt that can dilute the value of the enhancement. For instance, in the case of some Brady bonds that underwent a restructuring together with other conventional bonds issued by the same sovereign, collateral was distributed to bondholders in accordance with the bonds' indentures, although Brady bondholders often received no higher recovery than other bondholders (Standard and Poor's (2013)).[10] But other debt restructurings left the holders of partially guaranteed sovereign bonds in positions in line with the guarantees or even better: Ecuador's 2035 social bond, which had benefitted from a 75 percent guarantee from the Inter-American Development Bank (IDB), was left out of Ecuador's 2020 debt restructuring. The World Bank (WB)-guaranteed Ghana 2030 bond issued in 2015 has received the full payout under its partial WB guarantee, with the unsecured part of the bond treated in the same manner as Ghana's other senior unsecured debt.

B. Credit Enhancement Approaches

i. Bond Guarantees and Insurance

Most debt guarantees and insurance contracts can provide full or partial coverage of a debt issuance and can cover both local currency and FX debt. Partial coverage is preferred by many providers of credit enhancements so that the beneficiary of the enhancement is incentivized to conduct proper due diligence during the debt issuance process, mitigating informational asymmetries and moral hazard in the process.[11,12] However, in some cases sovereign debt issuances were fully guaranteed or insured: The U.S. has fully guaranteed some bond issuances by other countries since 1991 (Congressional Research Service (2017)), and the United States International Development Finance Corporation (DFC) has insured 100 percent of the debt issued as part of some debt-for-nature swaps (DNSs) starting in 2021. Most credit enhancements by MDBs and DFIs extend to hard currency obligations, with credit enhancements for local currency debt usually provided by an EMDEs' own government.

This "skin in the game" principle provision of partial guarantees versus full guarantees is appropriate when considering guarantees that cover investments in individual projects or in risky corporate debt, especially loans or privately placed bonds. However, the liquidity of such partially guaranteed claims will not necessarily be improved. If a partially guaranteed claim is to be traded, the buyer has to conduct her own credit analysis, plus analyze the guarantee, which can be expensive and time intensive. So, while the buyer of a guaranteed claim faces a reduced loss in the case of a default, the tradability of the original claim has in most cases not been improved, for instance, when compared to the trading of loans between banks. A partial guarantee will make a claim safer for the creditors, but will not necessarily bolster its liquidity, something that has to be kept in mind when applying techniques from one market (loans or private placements) to another (the bond market).

[10] See footnote 41 for a definition of Brady bonds.

[11] For instance, the U.S.'s Small Business Administration or U.S. Agency for International Development (USAID) has only provided partial guarantees for bank loans. IBRD credit guarantees are only partial, with coverage provided by the World Bank group's Multilateral Investment Guarantee Agency (MIGA) limited to a maximum of 95 percent of covered obligations.

[12] The guarantee of bank loans is often mentioned in this context. A bank extending a loan will conduct due diligence prior to the credit extension. If 100 percent of the loan amount was guaranteed, it might not conduct any or little due diligence (G20 (2018)).

Although both guarantees and insurance contracts can protect fixed-income investors against non-payment by the borrower, they generally differ in terms of their conditionality and contract execution. On the execution side, a key difference between the two types of contracts concerns the purchaser of the contract. Insurance is usually purchased by the beneficiary of an insurance policy, that is the investor in the case of a financial product. The beneficiary of the contract can cancel the policy or let it lapse when possible. On the other hand, the insurance provider can also cancel the policy within its contractual limits.

Guarantees are typically purchased by the issuer of a debt instrument, the sponsor of a project, or a third party that wants to improve the credit profile of a project or a specific debt instrument (Ng (2010), G20 (2018b)). Guarantees are usually not cancellable, with the premium often payable in advance for the duration of the coverage. Another important distinguishing feature of guarantee versus insurance is that insurance contracts are conditional on one or more prespecified events occurring. The events' occurrence may need to be validated by an adjuster who determines the validity and the amount of a claim. In the cross-country context claims often go to arbitration to establish the validity of a claim prior to a payout.[13] Guarantees, on the other hand, are unconditional. For instance, if a bond guarantee is activated, the guarantor will make the debt service payments as they come due, irrespective of the circumstances surrounding a payment default.[14] Another difference between insurance and guarantees is that the former are provided by insurance companies, while the latter is usually extended by banks, including government-owned development banks (Ng (2010), G20 (2018b)).[15] The use of arbitration represents a notable drawback for bond investors that value uninterrupted coupon payments highly.[16]

Insurance is an important part of international cross-border investments mainly on the project side, while bond investors usually prefer guarantees. Insurance contracts are frequently used to cover adverse events that can affect both equity or debt investments in projects. Many investors in cross-border project investments in EMDEs view such risks, including expropriation, failure to honor offtake agreements, or restrictions on the convertibility of local currencies, which are subsumed under the term Political Risk Insurance (PRI), as high. Investors often contract with an insurer in the broader public domain like the World Bank Group's Multilateral Investment Guarantee Agency (MIGA) or DFC or private insurers to cover damages related to political risks.[17] In the cross-border context the required arbitration commonly takes usually six to 24 months after an insurance event, but periods up to six years have been reported. This conditionality, uncertainty, and delays associated with insurance are disliked by financial investors and credit rating agencies (CRAs), who will generally prefer guarantees. The latter emphasize the timely and full payment of principal and interest. The fact that a guarantee covers a financial instrument while insurance covers events impacting a financial instrument may be

[13] For instance, arbitration services are provided by the International Chamber of Commerce, the London Court for International Arbitration, or the World Bank's International Centre for Settlement of Investment Disputes.

[14] Thus, the guarantor's obligation is co-extensive with the debtor's obligations. It can only be voided "if the underlying contract is void, illegal, or discharged …" (Ng (2010)).

[15] For instance, the European Investment Bank (EIB), the Netherland's FMO, or Germany's development bank Kreditanstalt für Wiederaufbau are organized as banks. Banks' business models differ from the business models of insurance companies and are subject to different regulatory treatment. These differences lead to distinct product offerings at different price points.

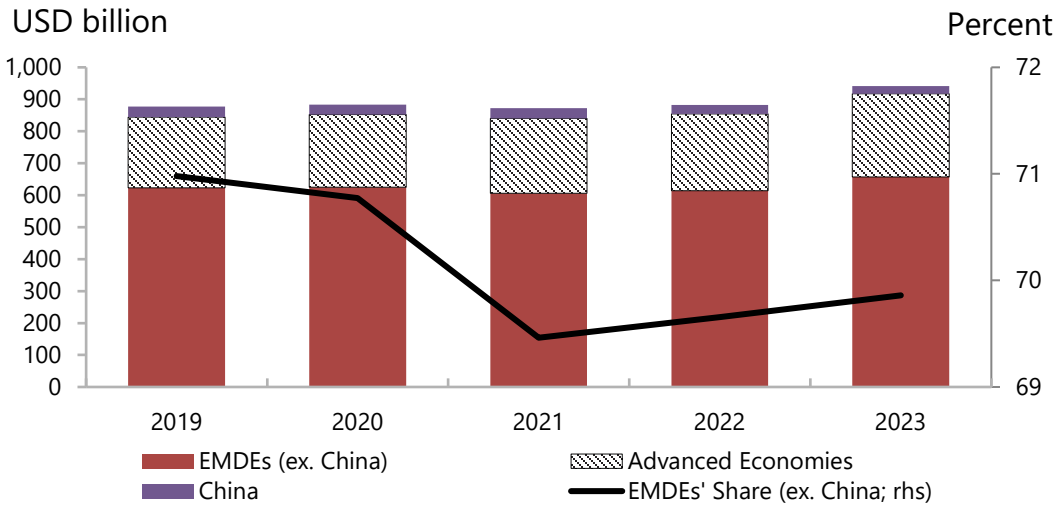
[16] For instance, the political risk insurance provided by DFC that insures the Belize 2040 blue bond covers "… non-payment of arbitral award or denial of justice (not a guarantee of payment)" (Bloomberg Terminal, bond description page, as of August 15, 2024). Investors have to be comfortable with this conditionality and associated payment delays in the case of a default.

[17] MIGA offers five specific types of coverage as part of its set of PRI products: Breach of Contract, Currency Inconvertibility and Transfer Restriction, Expropriation, Capital Optimization, and War and Civil Disturbance (MIGA (2024)). PRI can also cover other types of government action that can directly affect a company's operations and interfere with its ability to perform critical functions (National Association of Insurance Commissioners (NAIC) (2023)). For details on the changing nature of these risks and additional references, see Henisz and Zelner (2010).

of little importance when a non-traded loan is concerned, but a guarantee is preferrable for bonds, whose ownership changes with trades in the secondary market.

The market for worldwide cross-border guarantees is meaningful, exceeding USD900 billion in outstanding guarantees, with the majority of those going to EMDEs or projects located in EMDEs. However, the shares of both China and EMDEs ex. China in total outstanding guarantees at year-end has slightly decreased in recent years (Figure 1).[18] While many of these guarantees are likely in some way related to infrastructure projects, only a part thereof will likely be supporting climate investments.

Figure 1. Outstanding Global Cross-Border Guarantees



Notes: Data are from the Berne Union, an association of private and public sector guarantee providers. The data cover a substantial part of the market, with most large guarantee and insurance providers included. However, the coverage is only partial. The data include long-term (greater than one year) guarantees provided by export- credit agencies. There was a significant change in the compilation methodology of the Berne Union data in 2019, which makes pre-2019 data not comparable to the data from 2019 and later.

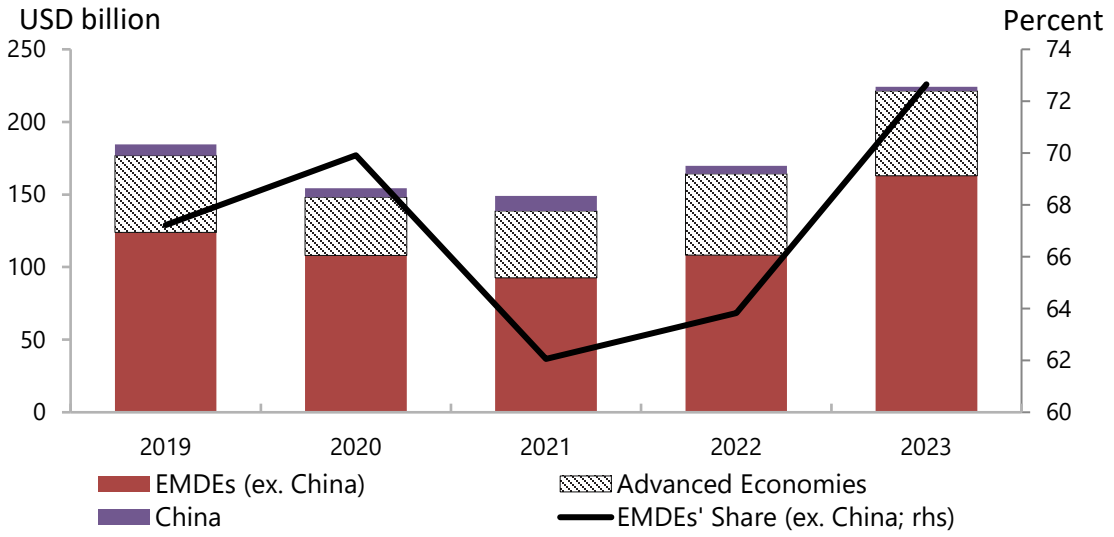
Sources: Berne Union; IMF staff calculations

On the new business volume side, we see China moving from 4 percent in 2020 to 7 percent in 2021, then declining to 1 percent of new business volume in 2023, possibly a reflection of geopolitical frictions (Figure 2). EMDEs ex. China's share increased from a low of 62 percent in 2021 to a high of 73 percent in 2023, although a clear trend is not discernible. The COVID-19 pandemic likely led to reductions in new guarantee volumes.

A variety of data providers covering the guarantee space, which cover different business lines and institutions, makes it hard to draw definite conclusions for EMDE climate finance. However, it seems possible that a determined effort by guarantee providers could help direct notably greater capital flows towards the financing of EMDEs' climate transition.

[18] It should be noted that our data only provide an indication of the market's size and direction. They cover only part of the market, while including public as well as private guarantee providers and long-term guarantees provided by export-import agencies. There was a significant change in the compilation methodology of the Berne Union data in 2019, which impairs the comparability of pre-2019 data with the later data.

Figure 2. Global Cross-Border Guarantee Volumes: New Originations



Notes: Data are from the Berne Union, an association of private and public sector guarantee providers. The data cover a substantial part of the market, with most large guarantee and insurance providers included. However, the coverage is only partial. The data include long-term (greater than one year) guarantees provided by export credit agencies. There was a significant change in the compilation methodology of the Berne Union data in 2019, which makes pre-2019 data not comparable to the data from 2019 and later.

Sources: Berne Union; IMF staff calculations

With the terms "insurance" and "guarantee" sometimes used interchangeably by stakeholders, since both cover the non-payment of financial claims, for the rest of this paper the term "guarantee" will be used to include any third-party, non-collateralized credit enhancement, except if the context makes it advisable to distinguish between the two.[19]

Up to the Global Financial Crisis (GFC) many bond guarantees had been provided by so-called "monoline" insurers (or "monolines"), which provided 100 percent coverage (Jayasuriya (2016)).[20,21,22] Most of those business lines ceased to exist after the GFC, when most monolines became financially impaired. Some core elements of the monolines' approach to bond insurance—for instance, their close involvement in the structuring of bonds and the provision of unconditional coverage—could be considered as part of future guarantee initiatives.

[19] PRI as provided by MIGA, DFC, or private providers includes largely what the term "Partial Risk Guarantee" encompasses as defined in G20 (2018b), whereas the term "guarantee" as used above captures the type of less conditional coverage that captured by the term "Partial Credit Guarantee" as used in G20 (2018b).

[20] Some important U.S. insurance regulators did not allow multiline insurers to provide financial guarantees (Jayasuriya (2016), Liberty Mutual (2022)). The main focus of monoline insurers was bond insurance, especially U.S. municipal bonds, but they also provided insurance for mortgage and structured credit exposures prior to the GFC (Jayasuriya (2016)). They also guaranteed emerging market project debt and securitizations covering more than USD200 billion with low default rates (G20 (2018), Bandura and Ramanujam (2019)).

[21] Those guarantees have also been called "financial guarantee insurance," a term that blurs the lines between these two ways of credit enhancements and could lead to confusion amongst stakeholders about their differences.

[22] Monoline coverage was provided on a non-accelerated basis. Investors in a bond guaranteed by a monoline were not paid back the principal immediately post-default. Instead, the monoline would step into the shoes of the original borrower and pay the original claim over time, as specified in the underlying debt contract. Guarantee premiums were due in advance on a present-value basis.

Guarantee providers operate with different objectives, different constraints, and use different business models, resulting in fragmented product offerings. Some guarantee providers are supporting the private sector only, while others are also guaranteeing obligations by the government or by quasi-governmental entities. Guarantees have been credited as a highly effective capital mobilization tools (OECD (2021)).

Guarantees are mainly provided by Export Credit Agencies (ECAs), MDBs and DFIs, with philanthropies and sustainability-focused investment vehicles playing an increasingly important role. While ECAs are the largest providers of cross-country investment guarantees, the guarantees provided by ECAs are mostly short-term an generally associated with exports from the guarantor country to the foreign buyer of goods (Peterson and Downie (2023)). While there can be a development component associated with them, this paper focuses on guarantees that lack the export promotion aspect and follows the approach taken by most other analysts and does not consider ECA-specific instruments, given that they will likely not be part of climate finance in the near-to-medium term. The World Bank Group (WBG), the European Investment Bank (EIB), DFC, Sweden's International Development Agency (SIDA), Export-Credit Agencies and other institutions have been the most important guarantee providers of EMDE debt (Climate Policy Initiative (2024)). Most guarantees are provided by entities that are government agencies and whose guarantees are therefore based on the usually high credit rating of those governments, like the DFC, the U.S. Agency for International Development (USAID), or SIDA. MDBs' guarantee provision is constrained by credit risk considerations, restricting the types and volumes of the guarantees they provide.

The World Bank and other entities have guaranteed EMDE sovereign bonds in conjunction with policy reforms. The WBG's policy-based guarantees (PBGs) require a country to embark on a set of reforms in return for the guarantee (World Bank (WB) (2014)).[23] Similar approaches have been followed by the Asian Development Bank (ADB) and USAID, which had guaranteed some EMDEs' sovereign debt (ADB (2022), Congressional Research Service (CRS) (2017)).

Since guarantees often contain bespoke elements across different issuances, and insurance contracts are subject to conditionality and arbitration, most total return investors will require a spread premium above fair value when buying such bonds. While guarantees lack much of the conditionality of insurance contracts, residual uncertainty with the provisions associated with the exercise of a debt guarantee often remains. Although formal guarantees do not require arbitration, uncertainties associated with the exercise of a guarantee can lead investors to demand an "uncertainty premium" that is reflected in additional spread above risk free rates for the guaranteed debt (Box 1; Annex III). Even the time that investors expect to spend analyzing a guarantee or insurance contract can lead them to expect a positive spread above fair value for such securities prior to analyzing them.

Even if provided by an EMDEs' multilateral or bilateral partners, guarantees and insurance come with fees and restrictions. While these guarantee and insurance providers usually charge significantly less than commercial providers, premiums for sovereign risk coverage from 50 bps/year on are common, more for project-related coverage.[24] Guarantee premiums can be due upfront, payable on a present value basis.[25]

[23] The WB has used PGBs mainly to guarantee sovereign loans rather than bonds (World Bank (2016)).

[24] MIGA (undated) mentions that its loan guarantee "fees average approximately 1 percent per year but can be significantly lower or higher." World Bank guarantee fees are presented in World Bank (2018).

[25] This prevents the possibility of non-payment and the subsequent lapse of the guarantee.

Box 1. World Bank Bond Guarantees for Argentina (1999) and Ghana (2015)

The market perception of the WB Ghana bond guarantee was influenced by the WB's 1999 guarantee for Argentina.[1,2] In the case of Argentina, the guarantee covered six Argentinean zero-coupon bonds with successive maturity dates on a rolling basis, each with a par amount of UDS250 million. The guarantee was revolving, so once the first of the six bonds matured, the bond next in line to mature would be covered by it. Reportedly, general investor perception was that Argentina would not default on the guarantee. The reasons cited for this were: (i) Once an MDB guarantee has been exercised, it often becomes preferred creditor debt (PCD) of the country and will be outside the parameters of a debt restructuring; (ii) in case of a default on one of the six guaranteed issuances, the WB had the option to ask for repayment of Argentina new PCD within 60 days; (iii) after Argentina repaid the WB–the rational course of action, since it would otherwise be in arrears against a multilateral creditor, with adverse impact on future IMF programs–the WB, for instance, could reinstate the guarantee to cover the next bond in line. However, once Argentina defaulted on the zero-coupon bond that was fully covered, after paying out on the guarantee, the WB used another option, namely allowing Argentina to repay its new debt to the WB over five years, starting in 2005. Following the decision, the reinstatement of any guarantees was revoked. Rather than safeguarding all six zero-coupon bonds, only a single bond received protection. This outcome placed the two rating agencies that had rated the series of zero-coupon bonds in an awkward position, since initially, they had assigned the nearest bond an AAA rating and had elevated the ratings of all remaining bonds by three to five notches above Argentina's standalone country rating, attributing this boost to the guarantee's rolling nature.[3]

The complexity surrounding the decision-making process for both the issuer and the WB concerning a bond with this type of guarantee can be analyzed through the lens of game theory. Factors such as the severity of the defaulting sovereign's financial distress, the total amount of the guaranteed bond, and the scale of the guarantee are critical considerations. However, the result of any analysis depends on the information analysts have and how they interpret this information, which will include subjective elements. The size of the spread premium charged when a guaranteed bond is issued will therefore depend on the minimum spread at which the marginal investor wants to invest.

The USD1 billion bond issued by Ghana in 2015 (Ghana 2015 bond) with support of a 40 percent first-loss guarantee from the WB was the third and last PBG for a sovereign bond issued prior to end-2024. This bond received a two notch upgrade from both Moody's and Fitch (World Bank and Rothschild (2016)). Market contacts noted that this bond was issued expensively compared to other outstanding Ghana bonds (Annex III), and after Ghana's sovereign default in late 2022 some observers commented on the uncertainty associated with the guarantee, and particularly how it would fare during the incipient debt restructuring (Financial Times (2022)).The bond was restructured with other sovereign bonds issued by Ghana under the terms of the collective action clauses that were governing its bonds in October 2024. Under the terms of the guarantee the investors will have benefitted from four coupon payments, with the WB having made a final payment of USD212 million to reach the maximum total payment of USD400 million possible under the guarantee (Fitch (2024b)). The remaining unprotected part of the guaranteed bond was treated in the restructuring like the other senior unsecured debt of Ghana, as had been envisioned when Fitch and Moody's rated the bond in 2015.[4] Fitch estimated the total payout to holders of this issuance could amount to up to 70 percent of nominal value, significantly more than the 55 percent recovery that the holders of the other unsecured Ghana bonds will likely have recovered based on market prices in early October 2024 (Bloomberg (2024)).[5]

Box 1. *(continued)*

[1] The WB guarantees commits the issuer to fulfill a set of policy measures.

[2] Another bond guarantee was provided by the World Bank for a sovereign issuance by Columbia in 2001. This issuance matured on schedule and therefore neither the WB nor the sovereign had to take any default-related actions.

[3] A "notch" signifies the division of an alphabetical rating into three sub-categories. For instance, Moody's separates Aa credit ratings into Aa1, Aa2, or Aa3 ratings notches. A Aa1 rating indicates a one-notch uplift versus a Aa2 rating. Notching can also more narrowly refer to the provision of different ratings to issuances of the same or closely related entities.

[3] This course of events is how a guarantee should ideally be treated as part of a sovereign debt restructuring. However, it was not clear that this is how the Ghana 2030 bond would be treated. As a matter of fact, the owners of a guaranteed bond might believe it to be to their advantage to impede a debt restructuring until the maximum guarantee amount has been paid out. Again, ex-ante certainty on this issue is highly desirable.

[5] This is the second time since 2019 that the holders of a partially guarantee sovereign bond notably outperformed the holders of the unsecured debt, contravening some previous experiences. The first time was when Ecuador's partially IDB-guaranteed 2035 social bond was exempt from Ecuador's 2020 debt restructuring.

Sources: IMF staff, conversations with market participants, and press reports

Private insurers are important market participants both on the primary insurance side as well as reinsurers for coverage provided by bilateral and multilateral institutions. While in the past multilateral and bilateral institutions have been the main providers of these types of insurance, private insurance companies have been expanding their PRI activities notably since the 1990s (NAIC (2023)). The expanded provider base allows investors in need of coverage to select an insurer according to the cost of the coverage, speed of approval, and other criteria. Some multilateral and bilateral insurance providers also use reinsurance for PRI coverage: As of June 30, 2023, MIGA had reinsured 65 percent of its total notional coverage amount, while Ecuador's 2023 debt-for-nature swap that was backed by a DFC guarantee was reinsured by 11 commercial reinsurance providers (MIGA (2023), and Columbia Threadneedle (2023), respectively).

MIGA also provides cover against the risk of non-honoring of the financial obligations of sovereigns, sub-sovereigns, or state-owned enterprises (NH). NH is designed to protect lenders against the risks of an unconditional payment obligation not being honored, with NH usually covering 95 percent of such an obligation. NH requires a 180-day waiting period but is not subject to arbitration (MIGA (2015) and World Bank (2022)). Its objective is the provision of long-term debt financing to EMDE sovereigns and SOEs. The country where the covered obligations originate needs to exceed a minimum score on MIGA's proprietary sovereign credit scale. NH appeals to banks since NH guarantees are often accorded zero-risk weights under the Basel III capital adequacy framework. 86 percent of NH volume has occurred in middle- and high-income countries, with 73 percent of volume having been reinsured (World Bank (2022)). Increased NH use could help MIGA to increase coverage to its strategic focus areas of climate and International Development Association (IDA) countries. However, currently NH coverage is provided for project-related debt only, not allowing for the coverage of sovereign debt. To allow for greater coverage of IDA countries, the credit rating requirement could be relaxed or mitigated by third-party guarantees or collateralization. However, while a third-party guarantee or collateral could reduce MIGA's losses in case of default or cover the 5 percent exposure currently left to the creditor, either approach could contravene one key reason behind MIGA's credit quality requirement, namely, not to provide financing close to market rates to countries with low debt-carrying capacity (World Bank (2022)).[28]

The "halo effect" surrounding the activities of MDBs and other public sector institutions explains part of their importance in the guarantee provision for investments in EMDEs, and the relatively low fees they charge. MDBs and DFIs have been providing support for infrastructure projects in EMDEs for decades, having become

[28] Guarantees to riskier borrowers might also be harder to re-insure and require higher fees.

trusted long-term partners of many EMDE governments. Three reasons can be identified for this "halo" effect (World Bank (2009),[29] G20 (2018b), Standard and Poor's (2018)): (i) Their participation in a project provides a "seal of quality;" (ii) MDBs intermediate the relationship between relevant stakeholders and local authorities; and (iii) MDBs can be a positive influence when projects run into problems. Empirical studies show evidence for this halo effect, in that MDB-supported projects are in the average of higher quality, better selected, and better prepared (Serebrisky et al. (2018)). Projects where an MDB is centrally involved and an MDB is willing to play the role of guarantor can therefore benefit from the presumption on the part of private investors that they are participating in a higher quality and likely financially more successful endeavor.

The nature and the closeness of the relationships between EMDE governments and MBDs or DFIs provide further reasons for guarantees extended by those institutions to engender a broader "relationship halo effect". MDBs' creditor positions benefit from the MDBs' preferred creditor status (IMF (2004), CRS (2017)). If an MDB's guarantee is called by investors, the amount paid under the guarantee typically becomes PCD of the country. This allows the MDB to charge low guarantee fees, since it will not be subject to a haircut, since the borrowers are disincentivized from defaulting on such obligations.[30] As many countries won't want to jeopardize their relationship with the WBG, they will be incentivized to not default on obligations to a member of the WBG.[31] Similar reasoning applies to debt guaranteed by DFIs. Creditor countries may not want to compromise future cooperation with the DFIs in question and the governments standing behind those DFIs.[32]

Another application of debt guarantees are debt swaps, in which part of a country's sovereign debt is extinguished or exchanged for new, cheaper debt. They have experienced a resurgence since the Seychelles' debt-for-nature swap (DNS) in 2015 (Table 1). Traditionally most debt swaps had been bilateral in nature, with a creditor country forgiving a debtor country's obligations in return for the latter implementing nature conservation projects (Chamos et al. (2022)). In a trilateral debt swap commercial debt is repurchased with the involvement of third parties like NGOs, banks, and philanthropies. With the value of the issuer's nature or climate commitments less than the savings from the swap, it combines debt reduction with positive nature and climate impact. In such a swap debt that preferably trades as a sizable discount is repurchased, with guarantee providers for any newly issued debt, and a party that helps to implement the swap and monitors its execution needed to conduct a debt swap. Therefore, debt swaps are complex and can take years to set up (Annex I).

Debt swaps may not be appropriate for every borrower country. While they help fund nature or climate projects in countries that have insufficient fiscal space to pay for the achievement of their nationally determined contributions, they do not provide a long-term solution to the issuer's debt problems since they are usually too small to meaningfully affect debt sustainability (Chamon et al. (2022)).[33]

[29] The term "implicit political risk mitigation" in lieu of "halo effect" to describe the same phenomenon (World Bank (2009)).

[30] While institutions like MIGA or the WBG's International Finance Corporation do not benefit from an explicit preferred creditor status, they can benefit from the WBG's overall relationship with a creditor country and therefore a perception of a quasi-PCS.

[31] Out of more than 1,000 insurance deals executed by MIGA from its inception to 2023, only about 1 percent resulted in a claim, of which 80 percent were due to war and significant civil disturbances. If an obligor indicates that it wants to default on guaranteed debt, MIGA starts negotiations with the obligor and the country authorities. These negotiations usually lead the obligor to abandon the contemplated declaration of default. It should be noted that after a default and prior to a debt restructuring the defaulting country might continue servicing its debts to particular creditors, for instance ECAs which provide it with needed short-term liquidity. As part of a debt restructuring, the set of creditors who will not be haircut and will be made whole for any deficiencies in debt service will usually include the obligor country's multilateral creditors.

[32] In the case of USAID sovereign loan guarantees, a default "… event [is] made unlikely due to the highly negative consequences that would result to the borrowing country … No defaults of guaranteed sovereign loans have occurred to date" (CRS (2017)).

[33] Belize's 2021 debt swap presents an exception. However, it can be considered a debt restructuring backed by a debt swap.

Some debt swaps have been criticized for being nontransparent and potentially coming with high costs.[34] The International Capital Markets Association (ICMA), whose guidelines constitute de-facto market standards for environmental and social debt issuances, has stated that the blue bonds issued as part of debt swaps are not green or blue bonds according to the relevant ICMA principles, denting their attractiveness (ICMA (2023b), swissinfo.ch (2023)). Some investors refrained from investing in the blue bonds issued as part of a debt swap since they saw insufficient debt relief or environmental spending commitments (Bloomberg (2023b), Alliance Bernstein (2024)). The idiosyncratic nature of debt swaps was brought up in conversations with CRAs and other stakeholders as a key factor in hampering their adoption at scale.

Table 1. Five Trilateral Debt-for-Nature Swaps

Country	Year	Amount Repurchased (USD mn; nominal)	Savings (USD mn; nominal)	Interest Savings (percent)	Spread at Issue (bps)	Guarantors	Ratings uplift (country to blue bond rating)
Seychelles	2015	21.6	1.4[1]	N/A	N/A		N/A
Belize	2021	553.0	189.0	N/A	N/A	DFC	from SD to Aa2
Barbados	2022	150.5	6.0	2.45	N/A	IDB; TNC[2]	from B to Aaa/Aa2[3]
Ecuador	2023	1628.0	972.0	N/A	200	DFC; IDB[4]	from B- to Aa2
Gabon	2023	500.0	N/A	N/A	200	DFC	from Caa1 to Aa2

[1] Plus USD5 million in grants.
[2] Second Loss.
[3] Final Rating is approximated.
[4] Liquidity Facility.
Source: IMF staff

Combining guarantees from more than one provider—co-guarantees—can help to combine resources, complement different types of guarantees, or provide capital relief for the guarantor(s). The combination of resources can be effective when one guarantee provider does not want to increase its exposure to a specific counterparty. Barbados's 2022 debt swap provides an example where two entities, the IDB and The Nature Conservancy (TNC), co-guaranteed the swap. Complementing one type of guarantee with another type has been quite effective in attracting investor interest when the second guarantee closes a gap in coverage (Box 2).

Co-guarantees help overcome the fragmentation in the supply of guarantee products which has hampered scalability and can result in costly issuances in the securities markets.[35] These products were not designed to enhance debt quickly in a scalable manner, which then could be funded in the capital markets, or to support sovereign debt. Co-guarantees and liquidity facilities, which close gaps in coverage while exposing investors to only one counterparty, bolster the scalability of guaranteed debt issuances.

[34] Based on conversations with investors and statements by observers (Latinadd (2023a), Latinadd (2023b), Carbon Pulse (2023)).

[35] "Fragmentation" can be the flipside of healthy competition. While competition can be of great benefit to both the borrower and the insured entities, its benefits are likely confined to the realm of project finance. Moving from individual projects to guarantees for large project or sovereign debt—where scale and appeal to institutional investors are priorities—makes standardization and simplicity paramount.

Box 2. The Application of Co-Guarantees

Combining insurance and guarantees or the addition of a liquidity facility can improve the credit worthiness of a bond. An example is the IDB's liquidity facility that pays up to six quarterly coupons on the so-called Galapagos Blue Bond, which is supported by DFC insurance and finances Ecuador's 2023 DNS (Columbia Threadneedle (2023)). Other examples are the EBRD's liquidity facility supporting MIGA's insurance policy for a hospital bond in Turkey (EBRD (2016), Standard and Poor's (2018)), and the EBRD's credit-enhancement facility backing a MIGA PRI policy for a bond financing six Egyptian solar power plants (Annex II; EBRD (2022)). Guarantees coupled with anchor investments by MDBs and DFIs have been beneficially employed in the support of securitizations and layered funds (see below).

Africa has seen an increased use of co-guarantees. The Africa Co-Guarantee Platform (CGP) was set up in 2018 under the guidance of the AfDB, together with five other African supranational organizations "… to bring together major guarantee and insurance providers for trade and investment, creating synergies and scale" (AfDB (undated)).[1] As of late 2022, the CGP's pipeline included 20 projects worth more than USD12 billion and it was working on backstopping African government sovereign bond issuances (AfDB (2022b)). The Islamic Corporation for the Insurance of Investment and Export Credit (ICIEC) provided an almost 50 percent backstop to a EUR400 million partial guarantee extended by the AfDB towards a EUR533 million bank loan that funds environmental and social projects in Côte d'Ivoire (ICIEC (2024)). This transaction combined risk-transfer and risk-sharing, with the lender only facing the AfDB as its counterparty.

Co-guarantees can allow guarantee providers that pursue different risk-return targets which can be embedded in business-specific modeling approaches. A first-loss loan guarantee provided by entity A can be supplemented by a second-loss guarantee from entity B. If entity A deducts the guarantee exposure from its capital in a linear fashion, whereas entity B utilizes a risk-based approach, modifying the lower and upper attachment point of B's exposure can result in an optimized coverage ratio for each provider, allowing for guarantee provision at a combined fee that each entity could not provide on its own. This approach is being used by MIGA, which houses the WBG's guarantee products since July 2024. Traditional IBRD guarantees are combined with MIGA product, and in consultations with banks who use the guarantees an optimal, fee-minimizing guarantee portfolio can be designed.

[1] These five entities comprise the Afreximbank, African Trade & Investment Development Insurance, the Islamic Corporation for the Insurance of Investment and Export Credit (ICIEC), and the African Union Development Agency, and GuarantCo, a contingent credit solutions provider that is part of the Private Infrastructure Development Group.

[2] Another bond guarantee was provided by the World Bank for a sovereign issuance by Columbia in 2001. This issuance matured on schedule and no default-related actions were triggered.

Source: IMF staff

Capital relief transactions can reduce regulatory capital requirements of banks and allow them to increase loans with positive environmental and social impact to EMDEs. Capital relief can be provided by market participants which are able to assume high-risk portions of loan books. Hedge funds, pension funds, and other institutional investors have been active in this space since the GFC, taking risks off banks' loan books (Cadwalader (2022), Livemint (2024)). The significant risk transfer in 2024 related to a £1.1bn energy loan portfolio from a bank to an investment fund provides an example how the ability of banks to provide financing towards the energy transition through capital relief can be bolstered (NatWest Group (2024)).[36] In capital relief

[36] Bank demand for capital relief through synthetic securitizations is discussed by Gonzalez and Triandafil (2023).

trades the non-bank counterparties take first-loss positions on loan portfolios. MIGA's capital optimization product allows globally operating banks to receive lower risk weights for the deposits that their subsidiaries must hold at EMDE central banks. This product has ramped-up quickly in recent years, with a USD1.85 billion transaction for HSBC Mexico approved at the end of 2023 (MIGA (2023b)) and has driven commitments by international banks to increase sustainable lending in EMDEs. The MacArthur Foundation provided a USD25 million, AAA rated first-loss unfunded guarantee to the Dutch development bank FMO for losses in its junior USD111 million tranche of the FMO SDG Loan Fund (Box 5), lowering FMO's capital requirements for the transaction significantly. Philanthropies with strong capital positions could follow this approach more often going forward. The AfDB's 2022 Room2Run deal transferred the risks on USD2 billion of sovereign loans to three commercial insurers, with a 20 percent share, and the UK's Foreign Commonwealth and Development Office (FCDO) taking on the remainder (ODI (2022)). The new lending enabled by the capital relief engendered by the transaction was committed to climate finance, split evenly between adaptation and mitigation.

Another type of co-guarantee is the guarantee of a guarantee. This can be of value in cases where some investors who benefit from the first guarantee lack confidence in the guarantee. For instance, in 2017 MIGA provided an NH guarantee in case the Government of Hungary would not make good on its guarantee of a loan provided by two banks to Hungary's state-owned Export-Import Bank (MIGA (2017)).

Catalytic capital can be employed outside the guarantee space to help attract private capital that would otherwise not have been invested in high-risk investments. While not taking on a first-loss position, investors that target returns which are below what most other total-return investors require can help catalyze the latter investors participation in commingled funds. For instance, the UAE's Altérra fund uses so-called first-in, capped-out capital to seed private equity (PE) funds to invest in climate projects in EMDEs. By being the first investor in a fund but realizing capital returns at the same time as investors that come later, Altérra's internal rate of return (IRR) will be lower. The first set of Altérra-financed investments will also allow follow-on investors to get a view of the performance of the initial investment(s) of the fund. "Capped-out" refers to Altérra limiting its returns to 6 percent per annum. This allows for the other investors in the fund to share the gains that would have accrued to Altérra under a pari passu distribution of gains once the fund's IRR exceeds 6 percent. Variations on how the distribution of risks and returns amongst providers of catalytic capital and total return investors can be employed. For instance, the African Agriculture Fund (AAF) had three share classes, with class C receiving a 6 percent IRR per annum and full return of capital before class A shares would receive any payout. Class C chares were directed at private investors and the class A shares at DFIs (Impactyield (2020)).[37] While such de-risking approaches have been applied to equity funds in the past, they can also be applied to fixed income funds.

Ratings uplift from guarantees is unlikely to provide the basis for EMDE sovereign debt issuance at scale. S&P currently does not provide an uplift for partially guaranteed sovereign debt, while Moody's and Fitch cap the uplift for such issuances essentially at three notches (essentially Moody's (2022), Fitch (2024a)). Ecuador's 2035 social bond received a one-notch upgrade from Fitch with a 75 percent IDB guarantee. Such a high coverage ratio does not result in a high mobilization ratio. Ratings uplift seems to have been allotted more conservatively in the last 10 years to partially guaranteed sovereign EMDE debt. To receive a high IG rating—for instance AA or better—a full guarantee would likely be required with the issuance then receiving the guarantor's rating (Table A V.2.).

[37] The AAF targeted an IRR of 17 percent. Realized returns could not be ascertained, but several DFIs decided to invest in a follow-on fund that also targeted food production (Phatisa (2021)).

There is no consensus as to the share of an obligation that a guarantee should cover. In practice, coverage ratios have ranged from 15 to 100 percent of an obligation. For project-related debt the "skin in the game" factor means some degree of risk participation on part of the guarantee recipient.[38] However, considering sovereign debt, the blue bonds issued as part of DNSs received full coverage through DFC insurance. Reasons behind this are the generally low credit ratings of the countries on whose behalf the blue bonds are issued, providing maximum cost reduction for them with blue bonds that are closely tied to the U.S.'s full faith and credit.[39] Partial coverage might result in little ratings uplift for the resulting blue bonds. Investors might assign very high spreads to such partially guaranteed bonds. For issuers with market access with high single-B or BB minus-rated debt, partial guarantees might be beneficial, whereas for issuers with spreads of about 200 bps or less over U.S. Treasuries or the Euro Mid-Swap rate should closely assess the economics of a guaranteed issuance. This assessment should include eliciting the market's view of a country which is considered to be of relatively high credit quality and wants to issue credit-enhanced bonds.[40] Even in a fully guaranteed transaction the guarantor's capital can come with multiplier effects if the guarantee amount impacts its capital base below 1:1, or in cases when part of the exposure is taken on by reinsurers.

Governments' debt sustainability is an important factor in an expansion of guaranteed debt provided to EMDEs. While guaranteed and collateralized debt will bring with it cost advantages, it generally carries non-concessional interest rates above the risk-free USD or Euro interest rates. Debt issuers and guarantors should ascertain that the receipts from credit-enhanced debt issuances go towards mitigation and adaptation projects that provide sufficient economic benefits to allow for the servicing of the new debt that was incurred, and make their case to their creditors and the CRAs.[41] This is of great importance for countries close to debt distress, but also in the case of countries that are not close to debt distress. Investors and CRAs will consider the total amount of debt incurred and include the subordination that they might become exposed to from guarantees that, when exercised, will result in PCD.

The governments receiving guarantees as well as the MDBs, DFIs, and governments providing guarantees should be as transparent as possible about the guarantees received or extended. This includes the modalities of the guarantees. This is especially relevant in cases where the government of the country at the receiving end of an external guarantee is itself a guarantee provider.[42]

ii. Collateralization

Collateralization describes the case when investors possession of assets belonging to the borrower in case the borrower defaults on a debt payment obligation. The assets which the lender can take possession off are the collateral. Similar to guarantees or insurance, collateralization can be partial or full, but the value of the collateral can also exceed the loan amount plus any unpaid interest. However, in the case of mortgages, auto

[38] For instance, USAID loan guarantees to EMDE-based banks generally cover 50 percent of new loan exposures to SMEs.

[39] The current system of climate projects can result in low private sector participation in climate investments in vulnerable countries, as the case of the Climate Investment Funds shows (NGFS (2023)). Although this could be partially due to small ticket sizes, it indicates also that the risks perceived by private investors are substantial, despite the use of guarantees in some transactions and the halo effects emanating from MDB and DFI participation in those projects.

[40] This point was emphasized in conversations with market participants.

[41] In the case of sustainability-linked bonds, the key performance indicators and sustainability performance targets of a debt issuance should be sufficiently ambitious to allow for the servicing of the new climate debt.

[42] Hungary's guarantee of loans provided to its Exim bank are an example for this. See page 22.

loans, or repos, the loans are usually overcollateralized at the outset of the transaction.[43] It should be noted that collateralization with existing assets—for instance, plant, equipment, inventory, or financial assets that are part of a company's ongoing operations—is usually less costly than the purchase of collateral for credit enhancement purposes.

While collateralized lending reduces creditor losses in case of default, other benefits of collateralized lending are a reduction in adverse selection and moral hazard on the borrowers' side, particularly in jurisdictions where lenders have limited ability to enforce debt contracts. These factors are prominent in lending when there exists asymmetric information, for instance if the lender knows less about the prospects of the project being funded than the borrower, or if the lender does not know the effort the borrower will devote towards the project. Collateralization therefore serves as a commitment device (Menkhoff et al. (2012)). Collateral is particularly of value when the loan amounts are large, a factor that makes defaults ceteris paribus more likely.

While many loans are issued on a collateralized basis to this day, sovereign bonds have been rarely collateralized since the retirement of most so-called Brady bonds in the 2000s. The urgent financial needs of the climate crisis have led to renewed interest in collateralized issuances of climate debt by EMDE-based issuers, especially low-rated sovereigns. This subsection therefore analyzes different ways of collateralization, the main historical example for collateralized EMDE sovereign debt (Brady bonds), how collateralized bonds can reduce funding costs, and how they compare with other types of credit enhancements. The approach taken in this subsection therefore differs from the analysis of guarantees, investment funds, and securitizations, which have been part of the EMDE climate finance landscape since 2015.

Brady bonds were central to the resolution of the 1980s emerging market sovereign debt crisis.[44] As part of a Brady bond exchange, the defaulted hard currency commercial bank loans of a participating country were exchanged into hard currency sovereign bonds whose principal was fully collateralized with U.S. Treasury bonds, with 12 to 18 months of coupon payments also often collateralized with U.S. Treasuries. However, once an issuer of Brady bonds had gained access to the international bond markets, Brady bonds proved to be expensive debt (Annex III). Most issuers of Brady bonds bought their outstanding Brady bonds back (Köhler (2003), Wall Street Journal (2003), Financial Times (2006)).

With transparency a key condition for scalable debt issuances for the funding of the climate transition, financial collateral is the focus of this section.[45,46] Sovereign debt that is collateralized with financial assets can take two forms: Debt collateralized with assets funded by the debt issuance itself ("self-collateralized") and

[43] This means that the collateral value exceeds the value of the loan. If the collateral's value falls below the loan amount at some point, the creditor may be able to demand additional collateral to have the full loan amount covered again.

[44] Named after then U.S. Treasury Secretary Nicholas Brady, under whose guidance this restructuring plan was developed and implemented. The Brady Plan has been credited with helping to initiate a notable turn to the better in the economic prospects of the participating countries (Arslanalp and Henry (2005), Shenai and Bolhuis (2023)). It should be noted that the Brady restructurings included significant structural reform programs guided by the IMF and the World Bank, with participating countries liberalizing their economies notably. The IMF and the World Bank provided concessional loans for the purchase of the U.S. Treasury collateral, to provide funding and to mitigate the negative carry the participating countries would have been otherwise incurring. Only two small Brady bond issuances from Albania and Vietnam were still outstanding as of mid-2024.

[45] Collateralization with commodities is complex due to the idiosyncratic nature of the commodity and the conditions of the commodity-producing country, impeding scalability of this approach.

[46] Transparency extends to government-provided guarantees, which should be fully disclosed in budget documents and included in economic and debt statistics.

collateralization from other sources.[47] Self-collateralization means using collateral that has been purchased with the receipts from the collateralized issuance itself. Importantly, this will usually result in negative carry, while collateral received from other sources can be cheaper to obtain. The collateral could be funded from the issuer's budget, or its funding could be subsidized by an MDB, DFI, or a donor.[48] Alternatively, a third party could provide collateral to the issuer at below market rates, potentially at no charge. The issuer of the collateralized bond will receive any interest payments due on the collateral prior to a default and may pass those on to the collateral donor if necessary.

Financial collateral should be of high credit quality and very liquid. Collateral must be of notably higher credit quality than the bond being supported since risky collateral exposes investors to a loss in value. Ideally, the credit quality of the issuer and the collateral value should be uncorrelated or negatively correlated, especially during risk-off periods when the values of many risky assets decline in tandem. Liquidity will allow for collateral liquidation without much adverse market impact.[49]

Financial collateral should be custodied with a reputable custodian operating within a transparent and reliable legal framework. Investors need to be confident that the collateral will be distributed on short notice upon default, or that the custodian can sell the collateral quickly and distribute the receipts to them. Such custody services could be provided by an International Central Securities Depository (ICSD) or a custody bank with the requisite technological expertise. They should be operating in a jurisdiction that is supportive of financial collateralization and asset transfers, and where court decisions are made quickly.

The maturity of the collateral is also important. Ideally, the collateral should mature at a time close to the maturity date of the enhanced bond. If that is not possible or desired, shorter-term securities could be selected. However, those would then have to be rolled over, adding operational complexity and cost to the collateralization process. It could also worsen the negative carry the issuer has to bear. The collateral currency should be generally the same as the currency of the enhanced issuance. Otherwise, currency hedges may have to be included, further increasing cost and complexity of the issuance. However, in the case of collateralized local currency debt of an EMDE issuer, hard currency collateral could offer a sweetener for the investors, especially if the collateral has no exposure to the issuer and is custodied overseas.[50]

[47] There is also sovereign repo, where financing is obtained by a government via the pledge of newly issued government bonds that provide the collateral for the repo loans. Those loans are normally heavily overcollateralized, and have been used in the past by Argentina, Ecuador, and Egypt, amongst others. The relatively short maturities of repos make sovereign repo contracts not a viable financing instruments for the longer-term finance needs of the climate transition. In addition, sovereign repos have so far been used by debtors with market access difficulties and can lead to adverse consequences for issuers. Sovereign repos are therefore not further discussed.

[48] One drawback of self-collateralized issuances is that gross debt is counted towards the IMF's calculation, so the value of the collateral adds to the country's debt. I.e., to obtain USD1 billion for climate investments via a self-collateralized issuance with a one-third collateralization ratio, USD1.5 billion is added to the country's gross debt. Another drawback is that to achieve the same amount of issuance receipts that can be applied towards the climate transition self-collateralized issuances require larger issuances and necessitate the purchase of more collateral than when collateral is funded from outside the issuance.

[49] The case of high correlation between the credit quality of the collateral provider and the value of the collateral is known to market participants as "wrong-way risk." For instance, an obvious case of wrong-way risk would occur if a sovereign provided its own debt as collateral for the credit-enhanced bond it issues. A deterioration in the sovereign's credit risk would simultaneously reduce the value of the collateral, increasing the total exposure of the investors in the collateralized bond. Sovereign repos represent wrong-way risk. However, the providers of the repo funding are sophisticated financial institutions which will demand significant overcollateralization and high lending margins to compensate for this risk.

[50] This would counteract any wrong-way risk that could emanate from the currency experiencing a severe devaluation at the time of a sovereign debt default.

Two main collateralization approaches prevail, whose mechanics are important. Traditionally so-called bilateral collateralization was used in many instances of financial collateralization, especially in securities repurchase transactions. In bilateral collateralization a borrower and a lender transact directly with each other. In recent years, especially following the GFC, tri-party repo and triparty collateralization have become more widely used. In a triparty collateralization, a third-party collateral agent safekeeps and tracks a borrower's securities portfolio which provides a pool of collateral securities.[51] The collateral agent is often the custodian of the underlying securities portfolio. This agent will then select a set of securities from the portfolio to become the collateral based on a set of requirements. If a security making up this collateral is sold, or does not fulfill the pre-specified minimum risk requirements underlying the transaction anymore, it will be removed from the set of collateral securities and replaced with other securities from the larger pool. If the margin requirement is not fulfilled, additional securities are added to the collateral portfolio. While this portfolio approach has many advantages, it might not be appropriate for the kind of collateralization replenishment envisioned here for sovereign bonds. The issuer may not want to be called upon to replenish the collateral.[52] While an issuer could use its FX reserve portfolio as the collateral pool, at the minimum the specific securities which have been segregated to serve as collateral cannot serve as FX reserves anymore. FX reserves are also property of the central bank, while sovereign bonds are usually issued by the government. Using FX reserves as collateral might therefore necessitate changes to the country's legal framework.

Comparing the main features of a guarantee with collateralization does not lead to unambiguous conclusions. The fact that the full amount of the collateral could be available to the creditors right after a default will constitute an advantage. There is no arbitration period, and no delay as in the case of a guarantee, whose payments take place over time in line with the originally scheduled debt service payments.[53] On the other hand, the investors are exposed to potential changes in the value of the collateral if the collateral pool is not being replenished to a minimum value. However, along the same lines, the value of a guarantee will depend on the continuing high credit quality of the guarantor. Collateral frameworks that rely on private sector custodians have not been tested yet, with there being the possibility of legal action by the sovereign issuer or other creditors to prevent the transfer or the sale of the collateral and to gain access to the collateral for themselves.[54,55] The concessional pricing of guarantees and insurance contracts provided by MDBs, DFIs, and other institutions provides a cost advantage for these kinds of credit support versus collateralization. While there exists a possibility for collateral being transferred to an issuer at low or no cost, or a donor mitigating the negative carry of the collateral through a subsidy, we are not aware such that an approach has been implemented. Wrong-way risk is more likely to be a factor affecting collateral but will likely be minimal in the case of guarantees

[51] For details on financial collateralization approaches see BNY Mellon (undated), Office of Financial Research (2016), and ICMA (2019).

[52] For instance, a low-income country may not want to have to provide scarce economic assets to top off collateral whose value may have declined due to a change in macro conditions.

[53] In some cases the investors in the enhanced bond can ask for acceleration, while in other cases they are legally prohibited or discouraged from doing so by the terms of the guarantee. WB PBGs are partial first-loss guarantees, which pay the contractual bond cash flows until the nominal value of the guarantee is exhausted.

[54] Incentives are slanted in favor of the guarantee: Guarantee providers will likely not make specious claims so they won't have to pay. If they did, their reputation as reliable guarantors would suffer. However, a country whose collateral is about to be sold may have an incentive to fight the collateral distribution and to try to repossess it, especially if it is in dire economic straits. Our conversations with an ICSD revealed that collateral would not be immediately distributed upon the filing of a claim. The validity of the claim for distribution has to be confirmed, and this decision will be made by a committee and may take a few days. For instance, it took this ICSD eight days to distribute certain repo collateral after the Lehman Brother's bankruptcy in 2008.

[55] The custodian for the collateral of the Brady bonds was the Federal Reserve Bank of New York. In cases of sovereign defaults involving Brady bonds the collateral was always properly transferred to the creditors.

provided by MDBs and many DFIs, since their credit quality is only marginally impacted by the stress events that affect EMDE issuer countries.

Based on a simple non-arbitrage approach used by many investors and imposing market equilibrium, self-collateralized bonds are unlikely to work when total return investors face an issuer with already outstanding bonds who wants to minimize the cost of debt.[56] This is different for guaranteed debt, if the guarantee is provided at a cost below market spreads. Guarantee fees have to be priced low enough to make up for any uncertainty and liquidity premiums that investors apply when pricing the guarantee.

In cases where ratings can be a key driver of investments self-collateralization may have a place. First, self-collateralized bonds could be of interest to investors who face significant regulatory constraints and are willing to invest mainly based on ratings due to regulatory guidance or a lack of credit research capacity. However, for this to occur, a large improvement in credit ratings would likely have to take place, which is not likely to happen (see subsection IV.B). Second, for issuers with no bonds outstanding the non-arbitrage pricing relationship cannot be established. Some investors might be more inclined to invest in such an issuance if there is no basis for using a no-arbitrage relationship.

Self-collateralization of Use-of-Proceeds (UoP) bonds may lead to non-alignment of the issuance with the relevant ICMA principles, which underlie most of these issuances. The ICMA principles for different kinds of climate securities have in effect become market standards, and not observing them could lead to less interest in the issuance. UoP bonds require the expenditure of 100 percent of the issuance receipts on projects that are in line with the purpose of the issuance, for instance climate mitigation and adaptation expenditures in the case of a green bond.[58]

An example of a quasi-sovereign entity issuing a collateralized bond is the sustainability-linked bond (SLB) issued by the Development Bank of Rwanda (BRD) in the local capital market in September 2023. USD10 million of concessional funding from the IDA was on lent by Rwanda's government to the BRD, which used these funds to purchase Rwandan government bonds that were used as collateral. This transaction was the first issuance of an SLB by a development bank globally and leveraged the collateral 2.5 times (World Bank (2023), Environmental Finance (2024), Pilar and Sayinzoga (2024)). The use of deal-specific financial collateral was helpful in this case. Rwanda's domestic capital market is developing, and this was the debut bond issuance of the BRD, so its pricing could not be compared to prices of outstanding BRD securities. The bond was followed by a second tranche in October 2024, also partially credit-enhanced through a WB lending operation.

iii. Climate Securitizations

Securitizations are proposed from time to time as a tool for funding climate projects, and infrastructure projects more generally, in EMDEs (G20 (2018a), European Commission EC (2024)). This is due to securitizations' ability to lower funding costs through risk-tranching, to finance portfolios of projects potentially spanning different jurisdictions, and the ability to include third-party credit enhancements more easily.

[56] It should be noted that the basic approach relies on some simplifying assumptions and does not account for the features employed in a specific guarantee. The approach used in this paper follows WB (2016b) applied to bond spreads rather than yields. See also IMF (2004), Appendix 8, and WB (2016a).

[58] For details see Lindner and Chung (2023).

The generic securitization structure is centered around an SPV, which contains a portfolio of assets, which can be commercial or retail loans or publicly traded securities. The purchase of these assets is funded through the issuance of securities, which constitute the liabilities of the securitization. These securities are usually risk-tranched in that some of these liabilities are first in line to cover any credit losses, with other ones more insulated from credit losses. Securitizations in principle constitute a scalable funding mechanism that can enable the transformation of illiquid assets (loans) into more liquid, publicly tradable bonds (e.g., tranched bonds), benefit from diversification of the underlying asset base, and appeal to investors that exhibit different degrees of risk aversion.

With regard to climate finance for EMDEs, securitizations could be used to (i) fund project loans; (ii) fund loans to sovereigns; and to (iii) provide capital relief for MDBs. [59] Portfolios of commercial loans have been securitized for a long time, and loans for climate projects in EMDEs could therefore also be securitized. Sovereign loans or bonds could also be securitization assets. For instance, this could be relevant for small island developing states, which by themselves may be unable to issue bonds on their own and cannot raise financing from larger institutional investors. The tranched nature of securitizations makes it easy for third parties like MDBs, DFIs, or philanthropies to provide credit enhancements. Securitizations could also be used to provide capital relief to MDBs or DFIs. For instance, the African Development Bank (AfDB) used a securitization to synthetically transfer part of the credit risk of a USD1 billion loan portfolio in 2018 to gain headroom for additional lending. The AfDB used securitizations to shift balance sheet risks from its loan book to private investors in 2018 and 2022 via a set of transactions labelled “Room2Run.” The first Room2Run deal was a securitization that synthetically shifted USD152.5 million of mezzanine risk related to 45 private sector loans, creating space for USD650 million of additional lending (Box 3).

[59] Various MDBs and DFIs have been supporting securitizations of EMDE assets, although this has not led to significant investments by AE-based investors. Many of these investments were geared towards support for funding particular projects in EMDEs and to bolster the development of the local capital markets (IFC (undated), IFC (2001).

Box 3. The AfDB's Room2Run Securitization

Originated in 2018, Room2Run was the first synthetic securitization of MDB assets at the portfolio level. The transaction shifts mezzanine risk on a USD1bn portfolio of pan-African private-sector loans to private investors. This portfolio consists of 45 loans from AfDB's non-sovereign lending book, spread among 16 African nations and 13 industry classifications. In exchange for mezzanine risk protection on the 2 to 17.25 percent tranche of the reference portfolio, amounting to US$152.5 million, AfDB will pay investors a floating rate plus spread. The transaction creates a risk capital reduction for AfDB, which translates into additional lending space of USD650m. By structuring the transaction as a synthetic securitization, the AfDB remained the lender of record and maintained its relationship with the borrowers. This allows for the loans to fully benefit from the operational benefits of having one counterparty as well as the Preferred Creditor Status (PCS) and the halo effects stemming from MDB lending.

However, the complex transactions took four years from start to finish, involving close cooperation between the AfDB, the EC, the bookrunner, and two anchor investors while developing the transaction. With MDBs not subject to regulatory oversight, the credit rating agency S&P had a central role in the transaction through its assessment of the capital relief that the deal provided the AfDB with.

While there was an expectation that other MDBs would follow in the footsteps of this transaction, no additional securitizations of MDB assets have been consummated since 2018. The fact that MDB loans charge interest rates at below market rates means that interest rate subsidies would often be required to place the securitization's bonds with investors. The originating MDB or donors would have to fund the needed subsidy, so the need for capital relief has to be significant for such a transaction to be undertaken. In 2022 the AfDB transferred the risk on USD2 billion of sovereign loans using a direct risk transfer to three commercial insurers and the UK's Foreign Commonwealth and Development Office (FCDO) rather than the securitization markets, in a deal also called Room2Run (ODI (2022).

Sources: PRI (2019), Kotecha (2022), ODI (2022), Risk Control (2019)

To notably increase the use of securitization for climate investments in EMDEs by AE-based private-sector investors requires at least one of the following to be implemented: (i) Legal certainty regarding asset transfers and sales; (ii) liquid capital markets; (iii) modified regulatory requirements; and (iv) competitive returns. Investors want legal certainty on the property transfer that is a key element of securitizations. This means that the legal code of the jurisdiction where the assets are located must be conducive to securitizations, and the adjudication of claims through the judicial process has to proceed in accordance with the applicable laws in a timely fashion. This requires sufficient legal capacity and experience, which can only be acquired over time. Liquid capital markets can help raise funding for securitizations quickly and cheaply. Regulatory capital requirements in AEs can effectively penalize securitizations compared to other, even riskier exposures (Segoviano et al. (2013), European Commission (2024)). This severely dampens demand by banks and insurance companies. Securitizations of EMDE assets will have to compete for investors' attention with AE assets, including HY bonds and loans, securitizations backed by AE-based assets, and private credit.[61] With AE-based investors not familiar with securitizations backed by EMDE assets, limited historical loss data, and the underlying debt likely very lumpy compared to the diversified asset pools common in AEs, it is not clear that

[61] Private credit has become a sub-asset class within fixed income on its own, with spreads in the U.S. over SOFR of 500-700 bps as of Spring 2024. At the same time, the spreads of AAA tranches of U.S. Collateralized Loan Obligations (CLOs) were approximately SOFR+150 bps. These spreads would mean notable competition for securitizations based on EMDE assets.

the desired low funding rates will be achieved. MDB loans to sovereigns are typically provided at concessional rates far below what private sector investors would charge given their risk, making it hard for a securitization based on EMDE sovereign collateral to provide attractive returns without subsidies.

The Asian Infrastructure Investment Bank (AIIB) has successfully engaged in securitizations of infrastructure loans.[62] The AIIB anchored a first Infrastructure Asset-Backed Security (IABS) issuance in June 2021 with USD60 million (Moody's (2021), AIIB (2022)), and anchored a second IABS with USD80 million (Box 4, AIIB (2024)). The 2021 securitization featured the world's first publicly issued securitization sustainability tranche backed by eligible green and social assets (Bayfront Infrastructure (2024)). While the securitizations were not limited to Asian infrastructure loans, they enabled some investors to access Asian infrastructure assets which they could not access previously (AIIB (2023a)). The following features of the AIIB-supported IABS helped overcome some of the aforementioned challenges: (i) The assets underlying the securitization were loans to private-sector borrowers, issued with market-like interest rates, helping to pay market rates on the securitization's liabilities; (ii) the loans were of relatively high quality, being mainly originated in middle- and high-income countries; and (iii) the loans issued in countries with speculative grade ratings benefitted from significant credit enhancements (Moody's(2021), Moody's 2023), GuarantCo (2023)). The 2023 transaction benefitted also from an anchor investment of the UK's FCDO.

[62] The 2021 deal included one bond besides loans.

Box 4. AIIB-supported Infrastructure Securitizations

The AIIB anchored an Infrastructure Asset-Backed Security (IABS) issuance in June 2021 with USD60 million (Moody's (2021), AIIB (2022)), and subsequently anchored a second IABS with USD80 million (AIIB (2024)). Both securitizations were sponsored and originated by Bayfront Infrastructure Management and contained sustainability tranches, with the loans that make up the securitizations' assets subject to Bayfront's environmental and social framework and its sustainable finance framework.

The 2021 securitization featured the world's first publicly issued securitization sustainability tranche backed by eligible green and social assets (Bayfront Infrastructure (2024)). While the securitization was not limited to Asian infrastructure loans, it enabled some investors to access to Asian infrastructure assets which they previously could not access due to regulatory or commercial restrictions (AIIB (2023)).

The class A1-SU sustainability notes of the later BIC IV transaction issued in 2023 are considered Secured Sustainability Standards Bonds according to ICMA principles. The AAA rated sustainability tranche was priced 7.5 bps tighter than the conventional AAA tranche, which was priced at the Secured Overnight Financing Rate (SOFR) + 150 bps. 87 percent of the sustainability tranche financed climate-related projects.

BIC IV shows how DFI support can enhance securitizations, with the AIIB anchoring the securitization with a commitment of up to USD80 million and GuarantCo and the FCDO committing guarantees and cash for the lower-rated tranches. The unrated Class D notes and the unrated preference shares amounted to USD13 million and USD25.6 million, respectively. The Class D notes, which supported the financing of sustainable and traditional infrastructure projects, benefit from a guarantee from GuarantCo covering principal and interest and were issued at a spread 140 bps tighter than the A3 rated Class C notes.

Bayfront acquired preference shares comprising 5% of the capital structure prior to the issue date which it will retain throughout the life of the deal. The FCDO, as part of its Mobilizing Institutional Capital Through Listed Product Structures (MOBILIST) program, acquired an additional USD5 million of the preference shares as an anchor investor.

Sources: The Asset (2023), The Banker (2024), ICMA (2022), ICMA (2023a), AIIB (2022), Mobilist (2023), Moody's (2021), GuarantCo (2023)

Securitizations are treated differently by the CRAs for ratings purposes than other debt and appeal to a different investor base than plain bonds, affecting their cost and liquidity. CRAs view securitizations through their securitization frameworks, which account positively for the diversification effects of the asset portfolio, guarantees, and liquidity facilities. The highly rated tranches of a securitization will attract investment-grade investors. However, many of those will perform their own in-depth analyses regarding the structural and legal properties of the securitizations they are interested in, as well as the underlying assets and the nature and quality of any guarantees. Securitization involving EM assets may therefore span distinct groups of portfolio managers and analysts at many asset management firms, leading investors to demand additional risk and analysis premiums. The bespoke nature of securitizations makes them generally less liquid than comparable plain vanilla bonds.

iv. Layered Climate Funds

Layered funds can provide exposure to fixed income climate investments in EMDEs while offering their investors access to diversified portfolios with low risk. Layered funds provide another avenue for MDBs and DFIs to promote investments in EMDEs' climate debt. Layered funds, which are structurally similar to securitizations, can help de-risk the positions taken by private sector investors through the provision of first-loss capital or first-loss guarantees. Layered funds allow for the implementation of investment programs that can accommodate the objectives of the institutions sponsoring them and the risk-return targets and other constraints of prospective investors. Examples of such funds include the International Finance Corporation (IFC)-supported AP EGO fund, the Sustainable Development Goals (SDG) loan fund managed by Allianz Global Investors (AllianzGI), launched at end-2023, and the planned dedicated public-private fund at the core of the European Commission's (EC's) Global Green Bond Initiative. Funds supported by MDBs and DFIs can be expected to benefit from the aforementioned "halo effects."

A fund structure can appeal to both sponsors and managers of the fund as well as to its investors: (i) Funds can allow for active trading inside the structure, whereas securitizations are largely passive vehicles; (ii) funds will not require a credit rating, while usually all but the riskiest tranches of a securitization are rated;[63] (iii) fund tranches may not have to be marked-to-market, allowing investors to show stable valuations even in times of high asset price volatility; (iv) most of these funds are closed-end so capital cannot be withdrawn prematurely; (v) de-risking can be applied to specific tranches; (vi) funds can combine more than one guarantor or combine guarantees with collateralization; and (vii) other features, for instance the ability of the fund's board to prohibit certain investors from investing in it (Box 5).

[63] The lack of a credit rating will prevent a re-rating of the mezzanine and the senior tranches in case significant credit losses lead to a depletion of the equity tranche, or if a notable worsening of the credit worthiness of the underlying debt occurs.

Box 5. Selected Case Studies: Credit-Enhanced Layered Funds

The AP EGO Fund

The concept for the Amundi Planet Emerging Green One (AP EGO, or EGO) fund was developed by the IFC, which selected the Paris-based asset management firm Amundi as the portfolio manager (PM). The EGO fund's objective is the investment in green bonds issued by EMDE-based financial institutions (FIs), targeting specifically systemic banks with a Medium-Term Note program in place. Any bond the AP EGO fund can invest in requires a credit rating and a listing on a securities exchange. The AP EGO fund had raised USD1.42bn by the time of its February 2018 closing, when it was the world's largest green bond fund.

EGO is registered and regulated in Luxembourg, with its liabilities distributed across a senior, mezzanine, and a junior tranche making up 90, 3.75, and 6.25 percent of the liabilities, respectively. The AP EGO fund is closed end, limited to a life of 12-years with a 7-year investment period followed by 5-year run-off period. Its shares are listed on the Luxembourg Stock Exchange, allowing investors to sell and buy shares. The fund's shares were not rated by a CRA, but simulations that showed that the credit quality of the senior tranche would have been equivalent to a BBB rating helped attract investors. With not enough green bonds issued by EMDE-based FIs available for purchase at the time of the EGO fund's closing, the bulk of the fund's assets were initially invested in conventional EMDE sovereign bonds. Those sovereign bonds were being sold off over time and traded for green bonds issued by banks, with all of the fund's assets to be invested in green bonds by 2025. The EGO fund is actively managed, with Amundi having discretionary, albeit limited, trading authority. This scope provided for active management prevented the EGO fund from receiving credit ratings for any of its tranches, since the CRAs would have restricted the PM's ability to trade more than was deemed desirable by the sponsor and the PM.[1] Annual management fees are 40 bps. Fund returns are not benchmarked.

Investors in the junior and the mezzanine tranches were the IFC (which provided USD256 million as an anchor investor), the EIB, the European Bank for Reconstruction and Development (EBRD), and Proparco, as well as private investors; investors in the senior tranche were seven European pension funds, and three insurance companies (IFC (2018), Patterson (2023)), which supplied 77 percent of the fund's assets under management (AUM) (Musca and Samama (2019)).[2]

To bolster the fund's ability to source bonds from EMDE-based FIs, the fundraising was accompanied by a Technical Assistance (TA) program that improved the capacity of EMDE-based FIs to issue green bonds. This program was instrumental in notably increasing the supply of green bonds that the AP EGO fund could purchase. The AP EGO fund and this TA initiative complemented each other in terms of the growth of the green bond market achieved and the improved ability of the AP EGO fund to source bonds.

The AP EGO fund is subject to a comprehensive and detailed ESG policy, developed around the three pillars of (i) issuer exclusion based on ESG scores; (ii) the assessment of the green bond frameworks, focusing on transparency and disclosure; and (iii) ensuring high performance standards of the green bonds acquired (Amundi (2018)). This ESG policy and a thorough reporting framework were key to attracting private-sector investors to the fund.

Box 5. *(continued)*

The Allianz-FMO SDG Loan Fund

Allianz Global Investors (AllianzGI) and the Dutch entrepreneurial development finance bank FMO announced the closure of the USD1.1 billion SDG Loan Fund in November 2023. FMO provided USD111 million in first-loss capital to this layered fund, with another USD1 billion committed to the senior tranche by other investors, including Allianz and the Swedish financial services firm Skandia. In addition, the FMO's capital contribution benefits from a USD25 million, AAA rated first-loss unfunded guarantee from the John D. and Catherine T. MacArthur Foundation. This provided notable capital relief for FMO which operates under European Union's banking regulations which impose hefty bank capital charges for taking what it considers an equity position in a securitization. The fund will take participations in loans originated by FMO. FMO is the portfolio manager, with AllianzGI being the alternative investment fund manager. (Allianz (2023), Convergence (2023b)). The fund will end in 25 years, with a weighted average life of the senior tranche of 7–8 years (Convergence (2023b)). The public-to-private capital mobilization ratio of the fund is 1:9, at the high end of what is generally achieved (Convergence (2023a) and Convergence (2023b)).

This fund follows the risk sharing approach pursued by the IFC through its loan syndication programs, through which institutional investors participate in the returns of the IFC's lending, while being able to benefit from the immunities and privileges that the IFC enjoys for its loan book (IFC (2021)).[3,4] The IFC's and other MDBs sales of loan participations are in financial terms similar to the way in which the SDG Loan Fund operates, although via a different legal structure.

[1] The fund's investment guidelines restrict mainly regional, individual country, and credit risk exposures. Specifically, they prohibit investing in countries (i) that are on an exclusion list containing 12 countries; (ii) that score highly with regards to corruption; or (iii) that are on a list of high-risk countries maintained by the French bank Crédit Agricole (except if the PM determines otherwise). Only securities listed on a regulated market that carry a credit rating by a major CRA are eligible for purchase. These constraints were augmented by concentration constraints to limit regional, sovereign, and single issuer exposures, as well as additional provisions (Amundi (2018)).

[2] For some investors the AP EGO fund it was the first time that they invested in an actively managed EMDE fixed income fund. The AP EGO fund is not open to U.S. investors.

[3] As noted in IFC (2021), bank regulators exempt participations in its B-loan program from mandatory country risk provisioning.

[4] Other approaches that provide private sector investors the opportunity to invest alongside MDBs or DFIs are the IFC's Managed Co-Lending Portfolio Program and the EBRD's A/B loan program (EBRD (2019), IFC (2021)). The business models of some portfolio management firms are centered around B loan participations and similar assets (ILX (undated)).

Sources: IMF staff

The regulatory treatment of a layered fund can be similar to the treatment of a securitization, leading to potentially adverse capital treatment and discouraging investments by insurers, banks, and DFIs (European Commission (2024)). For instance, under Solvency II many tranched funds are considered by European national supervisors as "non-simple, transparent and standardized" securitizations, leaving insurance companies with significant disadvantages with regards to capital charges when investing. Banks may have to use a risk weight of 1,250 percent for triple B rated tranches, resulting in a need to back the investment with capital at a 1:1 ratio. In a potentially much riskier non-tranched equity fund, a look-through approach would lead to a need for only 49 percent of capital.[64]

[64] A USD25 million first-loss guarantee from the Mac Arthur Foundation for the FMO's exposure to the Allianz-FMO SDG Loan Fund provided a way for FMO to substantially reduce the capital charge for its own first-loss guarantee it provides for the Fund.

IV. Capital Market Considerations

A. The EMDE Investor Base: Who Buys What, Why, and How?

The fragmentation of the fixed income investor base is an impediment to a quick adoption of credit-enhanced debt at scale, a factor that is unlikely to change in the medium term. Investors are separated into IG and HY, emerging market (EM) and non-EM, structured product specialists, sustainability-focused and general investors, amongst other categorizations. In addition, CRAs, index providers, and consultants impact the decision-making processes of asset managers and end investors. This fragmentation is rooted in the complexity of the fixed income markets, which requires specialized skills and experience by the staff that analyzes and makes investment decisions with regards to those instruments. In turn, the end investors on whose behalf the investments are made subject the portfolio managers they have hired to sets of explicit and implicit restrictions, which leads to risk aversion on the managers' part with regards to new investment products and approaches.

On the side of institutional investors, the demand for EMDE fixed income assets and their pricing is significantly affected by the separation between IG and HY asset managers, and between passive and active EMDE managers. These distinct groups of asset managers have differing risk tolerance, which in conjunction with the complexities and the granular structure of the fixed income markets leads to non-linearities in the demand for EMDE bonds, and makes it hard to derive clear-cut conclusions about the demand for credit-enhanced EMDE bonds within the confines of the traditional risk-return framework, The demand for EMDE fixed-income debt by banks, insurance companies, and pension funds is subject to regulation or institutional rules, which generally results in high risk aversion on part of these types of investors and reduces incentives for holding EMDE debt.

The asset allocation approaches popular with AE-based asset owners can impede their move into EMDE assets.[65] The traditional 60:40 model that pervades the asset allocation between equities and fixed income for pension funds in AEs, regulatory restrictions, and competition from AE investments represent headwinds for increasing allocations from AE to EMDE assets. In the 60:40 approach, equities with a 60 percent allocation represent the risky asset, with the remaining 40 percent of a portfolio allocated to fixed income, which represents the safe asset. The returns of the fixed income component are ideally negatively correlated with equity returns. However, with EMDE debt part of the fixed income asset class, the correlation between equity and fixed income returns would likely increase if the higher risk, lower-rated EMDE bonds were to make up a significant share of fixed-income allocations. During periods of global risk-off the correlation of the returns of equities and higher-risk EMDE bonds can become positive. To ensure a negative correlation, the 40 percent fixed income allocation is therefore mostly occupied by high-quality bonds like AE sovereign debt, disadvantaging EMDE bonds.

Regulatory constraints coupled with other factors result in banks, insurance companies, and pension funds holding less EMDE bonds than they would otherwise do (CRS (2023), ODI (2024)). Regulatory restrictions combined with high perceived risk and behavioral biases lead European insurers and pension funds to invest far less in EMDEs than they could (ODI (2024)). While regulatory reforms could provide a precondition for

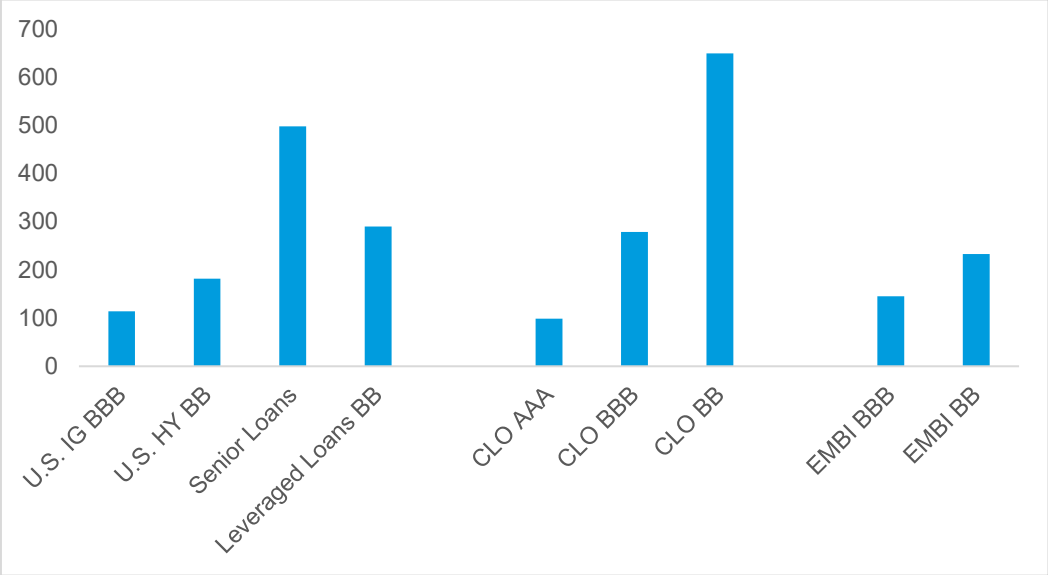
[65] While our focus is on the climate investments in EMDEs, to achieve the large fund flows from AEs to EMDEs that are necessary for funding EMDEs' climate transition, an increase in the EMDE allocations of AE-based investors has to come first.

greater investments in EMDEs by these institutions, it is not clear by how much their EMDE investments would increase.

Debt originated by EMDE issuers is facing considerable competition: From the HY bonds of AE-domiciled companies, but also the new burgeoning "private credit" asset class, which represents loans given to companies that cannot access the bond markets, or do not find bank credit available at the right conditions. These funds can average spreads of about 500 and more above SOFR,[66] constituting tough competition for EMDE sovereign debt, where the spreads of B rated sovereigns with market access stood at 453 bps as of end-August 2024 (Figure 3).

Figure 3. Selected Spreads/Discount Margins in the USD Fixed Income Markets[1]

(bps; as of 8/31/2024)[2]



[1] Option-adjusted spreads for U.S. IG and HY and EMBI; Discount margin for all others.
[2] CLO and leveraged loan data as of 7/31/2024.
Sources: Bloomberg; Aristotle Pacific Capital; Fidelity; J.P. Morgan; Nuveen

The AE-based investors can be separated into active and passive. The former consider the global macro and liquidity environment as well as changes in the credit and economic fundamentals affecting individual countries when investing. Passive investors try to track index returns closely. AE-based dedicated EMDE mutual funds and ETFs have lost market share in recent years, both in the hard currency bond markets as well as in EMDE local currency bond markets. They were replaced by EMDE-based investors as well as non-dedicated AE-based investors (J.P. Morgan (2024)).

This division of the investor space can make it hard to place new types of bonds, like credit-enhanced securities. For instance, active managers who manage portfolios benchmarked against the investment grade Bloomberg U.S. Aggregate Index might prefer buying U.S. corporate bonds or mortgages, which they might be more attuned to. An active manager can easily replace an EMDE bond with bonds issued by a U.S.

[66] SOFR is a USD short-term interest rate benchmark.

corporation. Even large passive funds may not invest in many bonds included in their benchmark, due to the impracticability of buying all the issues that make up the benchmark.[67] This could leave issuances from EMDE-based issuers, which only make up a small part of the Bloomberg U.S. Aggregate Index, underrepresented in actual portfolios.

Conversations with dedicated EMDE bond investors have revealed reservations about credit-enhanced debt. Active core EMDE bond investors aim to outperform their benchmark and compete with each other in this. Credit-enhanced debt carries reduced exposure to the issuer by design, resulting in reduced carry and lower returns during a rally than bonds trading on the issuer's standalone credit. While enhanced bonds will usually outperform during sell-offs, conversations with investment managers showed that many prefer to change the risk parameters of their portfolios in ways that optimize their portfolios more flexibly in line with their views and proprietary portfolio models.[68]

Investment-grade investors have other concerns regarding credit-enhanced EMDE debt. While IG managers can own credit-enhanced debt that is rated BBB minus or better, the inclusion of such bonds into IG benchmarks does not guarantee the purchase of such bonds by active or passive IG investors. Any newly issued credit-enhanced bonds will at the outset constitute a small share of the relevant benchmarks and not attract the attention of many managers. At a sufficiently high spread active investment-grade managers will look at those securities and purchase them. However, depending on the type of the enhancement, the conditions attached to it, and the guarantor, at the large asset managers several departments might possibly analyze the enhancement and provide inputs into the investment decision. Sovereign debt, U.S. Agency debt, straight corporate or supranational bonds, or highly rated structured bonds will compete with the enhanced debt. Only if spreads are deemed sufficiently high will an investment be considered.[69] Reputational risk is another issue that came up in conversations with investment managers: If the issuer of credit-enhanced debt defaults, the manager will have to deal with the failure to pay, even if the recovery on the bonds will be substantial. Institutional clients may hold this investment against them, especially since the underlying credit was originally outside their investment mandate.

This system impedes the adoption of credit-enhanced debt. With riskier and more complex debt instruments requiring different skills and experience on the part of investors, the segmentation of the investor space can be expected to prevail in the medium term. However, multi-sector, multi-asset, and hedge funds can invest across asset comprising more narrowly defined benchmarks and can help bridge severe valuation gaps between sub-asset classes in fixed income. The providers of credit-enhancements will have to adopt to this market reality. Another consequence of this fragmentation is that if the standalone credit is HY rated and the credit-enhanced bond is IG rated, while gaining IG investors, many of the original EMDE investors will be lost. It is not clear that there will be a net gain in terms of the AUM available to invest in the enhanced bonds in the short term.

[67] For example, the Vanguard Total Bond Market Index Fund with more than USD302 billion in AUM contained 11,220 bonds as of June 30, 2024, 2,397 (about 18 percent) less than its benchmark, the Bloomberg U.S. Aggregate Index. Bond indices differ from equity indices like the S&P500 in that an underrepresented issuance does not result in a large tracking error. The performance contributions of missing bonds can be replicated using risk modeling, regressions, or a matrix approach.

[68] In meetings with asset managers this point was made repeatedly, with many interlocutors referring to a non-arbitrage valuation approach they use. For example, anyone who wants to take a USD100 million position with 30 percent risk reduction in country X's bonds could simply buy only USD70 million of those bonds and buy USD30 million of U.S. Treasury bills. More generally, the related point was made that the asset owners behind those funds generally expect EMDE exposure, and do not want to pay active management fees for exposure to non-EMDE investment-grade assets.

[69] As one investor noted: "… and we will look at the spread. The spread is really important."

In conversations with Fund staff several investors explained that they look at fully guaranteed EMDE debt as high-quality debt of the guarantor with some shortcomings.[70] Some investors have their structured product groups analyzing them. Dedicated EMDE investors will generally not be interested in this debt since it usually trades at yields below what the issuing countries' plain debt yields. Besides the bonds' environmental benefits, investors invest in fully guaranteed EMDE climate debt (like blue bonds) because of yields which are often far above the yields of the plain debt of the guarantor (for instance, see Financial Times (2023)).

Investors with a strong impetus to invest sustainably, but low ability to take on risk, and less than average investment capacity are natural investors in de-risked instruments or layered funds. Often smaller or medium-sized endowments or pension plans they often fit the following three criteria: (i) They do not have the budget to pay the large number of staff members with requisite expertise to analyze the credit risk and sustainability credentials of the issuers; (ii) they have a low risk tolerance, related to their lack of capacity, regulations that might impact them, and public scrutiny they are subject to; and (iii) they are subject to regulations and stakeholder pressures that compel them to make climate investments, including in EMDEs. Gaining diversified exposure to EMDE investments through a fund with reduced downside risk is thus desirable from their perspective. The AP EGO fund provides a case in point, with almost half of its investors being European pension funds (Box 5). A fund has also the benefit of providing a reduced-volatility investment if its liabilities are not marked-to-market.

Investors with a sustainability mandate require reliable information about a country's climate goals and specific bonds issued in support of climate adaptation and mitigation. They want to ensure that the climate objectives they are supporting are achieved. A lack of sufficiently ambitious climate targets and reliable and standardized data and reporting in EMDEs is reportedly one factor holding back investments (IMF (2022)). While this point is not directly related to the financial risks and the way investment instruments are structured, gaps in these regards can be reasons for reduced interest by investors in the climate debt issued by EMDEs. Sustainable investors also need in-depth information about the climate outcomes associated with investing in EMDEs so they can assess the success of their investments. Country authorities should make the necessary data and information available to maximize investor interest in their country' sustainable securities. The Galapagos blue bond issued as part of Ecuador's 2023 debt-for-nature swap allows for the investors to declare an event of default in case that if Ecuador repeatedly fails to abide by its nature commitments under the swap, putting teeth into the county's environmental pledges (Galápagos Life Foundation (2023)).

Some large pension funds in AEs will conduct their EMDE investments and investment analysis in-house and may have their own sustainability or ESG departments conducting research and compliance. However, not all EMDEs may benefit from those funds' investments. Even funds that target climate and environmental outcomes must take social and governance concerns into account when investing. One large European pension fund only invests in countries with minimum human rights and governance credentials, restricting its EMDE investments mainly to large middle-income countries.

[70] For instance, a DFC-insured bond could be compared other U.S. government or U.S. Agency-guaranteed debt, or potentially U.S. agency-guaranteed mortgages.

B. The Role of Credit Rating Agencies

CRAs fulfill the role of third-party assessors, with their ratings used by regulators, asset owners, asset managers, and in fixed-income indices. The importance of CRAs in the investment processes derives from their use (i) as inputs for regulatory capital requirements of banks, insurers, and pension funds; (ii) as boundaries for inclusion in fixed income indices; and (iii) their use by asset owners as inputs into asset allocation decisions and the risk limits they impose on their managers. It is not only the credit ratings by themselves that are of importance to investors and other stakeholders in the investment process, but also the CRAs' methods, which have become ingrained throughout the ecosystem of credit investing. Internal credit assessments compiled by investors are usually couched in the alphabetical scales used by the CRAs, although they could use methodological approaches that are different from the ones used by the CRAs.

While credit ratings impact bond spreads and therefore issuance costs, the relationship between spreads and ratings is far from perfect. The impact of credit ratings on bond spreads above and beyond available public fundamental information has been well-established in the literature.[72] The spreads of issuers whose credit ratings are close can be quite different, suggesting that the marginal investors are likely active EMDE investors and not the investment flows engendered by sovereign credit ratings (Annex V).

Some stakeholders have advocated for a reevaluation of EMDE credit risk assessments by investors and CRAs, and for a more comprehensive inclusion of the positive effects of EMDEs' climate investments and on many EMDEs' strong economic performance. However, empirical evidence on this issue is inconclusive (Annex V). CRA representatives have noted that the incidence and severity of weather-related events due to global warming will be a negative for most EMDEs given the impact of such events on the countries' economic foundations and the emergency and reconstruction costs their governments will have to bear.

Ratings actions surrounding debt buybacks and exchanges have been criticized as overly harsh by many observers, a point that has come to the forefront during debt swaps. CRAs employ the concept of a "distressed exchange," which tries to capture cases when an issuer whose debt trades at a significant discount offers to exchange its debt for cash or new debt at prices that can be notably below par value. Distressed exchanges can result in a "selected default" rating, which describes the case when a borrower is not current on some obligations but continues to make timely payments on its other obligations. However, there can exist a high degree of judgment in calling an exchange distressed, with different CRAs judging the same debt swap differently (Annex V, Fontana-Raina and Grund (2022), OMFIF (2023)). The expectation to receive a selected default rating, even for a short period, can discourage a country from pursuing a debt swap.

Credit enhancements often lead to rating uplifts, although the effects differ by type of debt and across CRAs. The positive effects of external enhancements can easily be incorporated into the structured bond ratings process and the ratings of project debt, where they have the most positive ratings effects (Annex V).

On the sovereign ratings side, Fitch and Moody's have provided ratings uplifts for the loss given default (LGD) reduction of multilateral guarantees. The halo effects of guarantees provided by MDBs have been positives in past ratings decisions (Annex V). A three-notch uplift is currently the most Moody's or Fitch will provide for partially enhanced sovereign debt. Since 2013 it has been S&P's policy to not provide any uplift on partially

[72] See Kiff et all. (2012), Binici et al. (2018), Covitz and Harrison (2003), and Ammer and Clinton (2004).

guaranteed sovereign bonds (Annex V). An analysis of the ratings uplift provided by CRAs for partially guaranteed sovereign debt and conversations with investors has shown that the impact of partial guarantees on sovereign EMDE bonds' credit ratings have decreased over time (Annex V).

The J.P. Morgan EM bond indices and the Bloomberg Aggregate Indices are widely used by fixed income managers, end investors, and other stakeholders as portfolio benchmarks.[86] Comparing a portfolio's performance against the performance of its benchmark provides information on what performance portfolio managers added versus their benchmark's returns. The J.P. Morgan EM indices cover both IG and HY bonds issued by EMDE-based issuers, with the Bloomberg Aggregate indices focused on IG debt. In recent years both index families have added sustainability-focused indices.[87]

Credit-enhanced sovereign bonds have been included in J.P. Morgan's EM bond indices since October 2020, with the Bloomberg U.S. Aggregate Index including USD-denominated credit enhanced bonds with an IG rating. For inclusion in the J.P. Morgan EM indices the credit enhancement must cover less than 50 percent of the debt obligation (J.P. Morgan (2023)).

Index inclusion improves a bond's investability significantly but by itself is not a guarantee for the large-scale adoption of a bond by investors. While index inclusion of a country that until then was not part of an index will mean portfolio inflows and lower rates than previously (Broner et al. (2020)), it does not imply inclusion of any specific security in particular portfolios, and it does not mean that bonds will be priced in alignment with other bonds that are similar with regards to most other characteristics. If credit-enhanced bonds were to make up a notable share of an index it can be expected that both passive and active investors will make meaningful allocations to those bonds. This suggests that significant issuance volumes that establish credit-enhanced bonds as a noticeable part of popular indices would be one way to make them a sub-asset class within fixed income, which could help to attract meaningful portfolio flows to these bonds and lead to them trading with low spreads to fair value.

D. The IMF's Resilience and Sustainability Trust

The IMF, under the auspices of its Resilience and Sustainability Trust (RST), has been using its convening power to catalyze new programmatic funding approaches at the country level (Box 6). Each RST country's government, its development partners, and participants in its real and financial sectors are encouraged to come together to develop a country-specific, holistic program for climate change mitigation and adaptation. The approach is centered around project preparation facilities (PPFs) and associated funding facilities, with MDBs, DFIs, and other entities providing TA and funding. Under the auspices of the RST, for instance, Barbados and Rwanda have both set up PPFs, with Barbados establishing a Blue Green Bank and Rwanda a green investment facility (Ireme Invest). The fiscal space from the RST allows governments to provide seed capital to

[86] Other providers of fixed-income indices are, for instance, FTSE Russell, Citigroup, Bank of America, S&P. We focus on the J.P. Morgan EM bond and Bloomberg Aggregate Indices due to their relevance in the marketplace. For instance, the most popular of the J.P. Morgan EM hard currency indices, the EMBI Global Diversified Index, has become the most popular benchmark in its class, with about USD342 billion following it as of end-2021 (J.P. Morgan (2022)).

[87] To be included in a bond index several criteria have to be fulfilled, comprising maturity, type of bond, amount outstanding, and currency denomination, amongst others. See, for example, Bloomberg (2023c) and J.P. Morgan (2024).

such facilities alongside other partners. Projects that are integrated into a PPF and financed through the linked funding facility can become more attractive to private sector investors.

Box 6. The IMF's Resilience and Sustainability Facility

The IMF's Resilience and Sustainability Facility (RSF) can currently provide up to USD48 billion in funding to about 143 eligible countries to reduce risks to their balance of payments. RSF funding provides low-cost, long-term financing to participating countries undertaking reforms related to climate change and pandemic preparedness. An RSF program complements the IMF's existing lending toolkit which comes with a traditional IMF program. A country can receive between 75 to 150 percent of its IMF quota under RSF program, with an absolute cap of 1 billion Special Drawing Rights (about USD1.3 billion). RSF loans are for a term of 20 years, with a 10 ½ year grace period, and carry concessional margins over the SDR short-term rate. Interest rates are capped at 2 ¼ percent for some low-income countries. They are typically disbursed within 36 months of commitment.

The IMF can play a catalytic role in climate finance through its policy advice, surveillance, program lending, and capacity development. EMDEs with limited fiscal space can benefit most from an IMF RSF program. As of end-October 2024, 20 RSF programs had been approved, USD9 billion committed, and USD2.5 billion disbursed. The IMF uses its convening power in each RST country based on a three-pronged approach consisting of project preparation facilities, financing platforms, and capacity development. This approach comprises Governments, MDBs, DFIs, donors, philanthropies, the private sector, and other stakeholders.

As with all IMF lending facilities, RSF loans are provided to the Government of the recipient country. RSF funds can only support budget financing of the Government and cannot be earmarked for specific projects. However, RSF loans create fiscal space for Governments to fun climate projects. Governments may substitute the funds they had planned for climate investments with RSF funds to reduce the financing cost of those investments, or utilize the fiscal space created by their RSF to undertake additional climate investments or projects advancing pandemic preparedness.

By bringing together the partners relevant to the climate planning and finance process in RST countries, the IMF aims at improving coordination between ministries, government agencies, MDBs, DFIs, and other entities involved in climate finance, project planning, and project implementation. Oher important benefits of the IMF-led approach is a reduction in informational asymmetries and the creation of project pipelines that boost market confidence into governments' climate investment plans, in turn increasing the private sector's willingness to commit financially.

V. Structuring Credit-Enhancements for EMDE Climate Debt: The Way Forward

Significant capital flows from AEs to EMDEs must take place to finance the climate transition of EMDEs, with most of those coming in the form of debt. Given high perceived risks associated with investing in EMDEs, credit enhancements can play a key role in the facilitating these capital flows. While the extant system of credit enhancement provision has facilitated the funding of large amounts of private sector funding for projects and for sovereign borrowers, many market participants and other stakeholders indicate that there is scope for reforms that would allow for the deployment of financial instruments at greater scale based on improved coordination between different credit enhancement providers. To enable wide market acceptance, simplicity, standardization, and speed-to-market of credit-enhanced debt will be paramount.

A. Improving the Existing Framework

Climate investments in EMDEs have the potential to bolster economic growth in EMDEs, improve their resiliency to extreme weather events, and can lead to significant reductions in worldwide GHG emissions compared to business-as-usual scenarios. To enable the requisite scale of climate investments, regulators and supervisors should consider if the existing capital frameworks for banks and insurance companies related to climate-related debt are appropriate. If the economic and financial benefits of assets with positive environmental impact are included in the determination of capital charges, significant investments from banks, insurance companies, and some DFIs could become available. Climate securitizations and layered climate funds could be beneficiaries of such changes. Any changes to the current capital frameworks have to be based on the underlying credit risks of the covered assets.

The scaling up of credit risk transfer from banks to institutional investors, pension funds, and entities in the broader public sector would increase the capacity of the global financial system to take on the risks associated with EMDE climate finance. Institutional investors, from hedge funds to pension funds have been taking on bank credit risk in the aftermath of the GFC. MIGA's capital optimization program is a good example of how an international FI can increase the ability of banks to provide sustainable funding. It also provides an example of how the cooperation between players that follow different business models and distinct approaches to risk and return can lead to a deepening and widening of the investor base.[88]

Combining credit risk transfers by MDBs and DFIs with their loan origination capacity can significantly expand the loan books that those institutions can carry. However, there exist some principal and operational reasons that may limit the ability of MDBs and DFIs to move to an originate and distribute model in which most risks are shouldered by private sector investors. If a significant share of this risk is no longer held by the MDBs, the PCS treatment of MDB loans might become eroded (ODI (2024)). Also, the MDBs and the countries receiving loans from them may not have the capacity to originate many more high-quality projects than currently in the short-to-medium term.

[88] Such credit risk transfers should be conducted in a transparent manner, with the entities that take on the risk reporting on it in their annual reports, for instance. Excessive risk concentration on the part of the on-takers should be avoided.

The use of securitizations should be explored more deeply. They can provide a tool for the synthetic transfer of risk from MBDs' and DFIs' loan books to private sector investors as well as the direct funding of non-sovereign climate loans in EMDEs. Besides expanding the headroom for new loans by MDBs and DFIs, synthetic risk transfer transactions can familiarize the market with EMDE climate debt and prepare the way for securitizations that are based on assets originated outside the EMDE and DFI ecosystem. Securitizations provide a convenient way to provide credit enhancements and benefit from diversification across their underlying assets.[89] Securitizations can use both small and large loans as assets, which can span different countries, a feature that can help fund projects in small states. Securitizations also convert non-tradable assets (loans or synthetic credit exposures) into tradable, more liquid assets (securitization tranches), helping to lower funding costs in the long term.

For direct securitizations of non-sovereign loans to work in practice governance and legal frameworks have to allow for the transfer of asset ownership to Special Purpose Vehicles (SPVs), including to externally based SPVs. Some securitizations may necessitate subsidies from donors to make their interest rates sufficiently attractive to investors. It can be expected that the need for such subsidies will decrease over time once investors gain confidence in the performance of the securitizations. Where needed, country authorities should improve their legal systems and promote the establishment of bankruptcy courts and staffed with the necessary experts. These efforts can be supported by TA from development partners.

Layered funds can play a role alongside the other instruments mentioned. Their risk transfer and risk reduction mechanisms work in the same way as in securitizations, and guarantees can be incorporated along similar in both types of instruments. However, layered funds appeal to a narrower section of investors than securitizations and will likely be less liquid than the more easily tradable tranches of securitizations.[90] Layered funds will therefore likely be instruments with reduced scalability. To improve the ability of investors and CRAs to assess layered funds, the ability to trade the asset portfolio outside narrowly prescribed boundaries should be avoided.

The role of philanthropies as providers of first-loss or catalytic capital should be expanded. Philanthropies can commit capital through direct investments in the subordinate tranches of securitizations or layered funds, or they can provide guarantees that can reduce the risk weights of EMDE climate securities. Philanthropies with sufficient capital strength and risk-taking ability can support DFIs' guarantees applied to layered funds and securitizations. The resulting reductions in risk capital can underpin new lending or guarantees by those DFIs (Box 5).

Guarantees should contain the least necessary amount of optionality on the part of the issuers and guarantors. Co-guarantees should be designed so that investors only face one single counterparty, to reduce uncertainty faced by investors and in line with the principle of "simplicity" that investment structures should adhere to whenever feasible. When two or more entities guarantee a bond issuance, for instance PRI by guarantee provider A together with a liquidity backstop from provider B, an effort should be made to have one of the guarantee providers be the one and only entity faced by investors. This will reduce analysis time on the part of investors and reduce the potential for any snags occurring in the payout process, however unlikely those might be. Many investors will be assessing both entities involved in the guarantee, even if the CRAs provide a high IG

[89] The AfDB's 2018 Room2Run securitization and the AIIB's Infrastructure Asset-Backed Securities are examples that used synthetic approaches and loan securitizations, respectively, with guarantees integrated in both cases.

[90] For instance, see the AP EGO Fund and the Allianz-FMO SDG Loan Fund (Box 5).

credit rating for the issuance. Anything that reduces complexity and uncertainty faced by investors will increase the issuance's acceptance by investors and help reduce the yields of guaranteed debt.

The repackaging of partially guaranteed debt into debt issuances based on the standalone credits of the guarantor and the receiver of the guarantee should be pursued when appropriate. These so-called repack deals allow the targeting of investors according to their distinct risk preferences and have been used in the past. Repacks reduce complexity and can reduce the need for second-guessing of the behavior of issuers and guarantors after a default. The repacked debt can be expected to price closer to what would be suggested by an arbitrage-free approach based on market prices.

EMDE climate debt collateralized with financial collateral can provide benefits when it enables market access or when no other marketable debt is outstanding. A careful assessment of debt issuances which use financial collateral should be applied, given the potential for unfavorable cost-benefit tradeoffs compared to guaranteed debt. This is especially true in the case of self-collateralized debt, which in most cases will have financial benefits for the issuer only if it enables market access or no other marketable debt is outstanding.

There exists scope for greater clarity on the part of CRAs regarding the ratings of partially guaranteed debt. This includes sovereign debt as well as the assessment of multiple guarantees, and the role played by loss given default in the ratings process. While the CRAs generally qualify their ratings as "opinions," greater transparency will benefit the sustainable finance markets.

Credit-enhanced sovereign debt, while cheaper for the borrower than non-enhanced debt, can still add to debt sustainability pressures. Since sovereigns are in the best position to access the debt markets, especially as low-income countries are concerned, sovereign bonds seem like the obvious choice for the funding of the climate transition for many EMDEs. However, MDBs, DFIs, and country authorities have to be mindful that countries that have been flagged as being at high risk of debt distress have limited room to add to their government debt. The use of guarantees or other mechanisms to lower interest costs does not necessarily solve this problem.[91] The preferred creditor nature of MDB guarantees can subordinate commercial debt, a factor that is considered by CRAs and investors when evaluating sovereign borrowers. To maintain debt sustainability, sovereigns should strengthen their growth prospects through structural reforms and development of their capital markets. The positive contribution of adaptation and mitigation projects to economic growth and resiliency should be central to countries' long-term economic and fiscal plans, with the role of private sector contributions clearly delineated.

B. Extending the Existing Framework

To amplify the payoffs from the limited guarantee resources available and maximizing the beneficiaries' benefits, guarantees at the instrument level should be used to support the debt of countries that face significant credit challenges—mainly LICs—while portfolio-level guarantees should be used to enhance portfolios of EMDE debt. To receive notable uplift from ratings agencies, full guarantees for individual issuances of climate bonds or blue bonds by countries with market access challenges should be considered, given the CRAs criteria and investor considerations. Even then there can be leverage of public resources, as the example of the DFC-

[91] The policy argument is that countries whose debt sustainability is questionable should not be paying market-based interest rates, but rather concessional funding or grants (World Bank (2022)). See also page 23.

guaranteed blue bonds show. LICs, whose debt trades with wide spreads, would receive the most cost benefit from a full guarantee. With the spreads on the non-guaranteed bonds of EMs much tighter, and their guarantee fees often not much lower than the fees LICs face, the savings that many middle-income countries could achieve would be generally small. However, the loans of SOEs and private sector companies of middle-income countries could become assets of securitizations or layered funds. MDBs and DFIs could increase their roles as guarantors of tranches or anchor investors. Securitizations can be also credit-enhanced internally, which will help to establish EMDE climate securitizations which will not need external support in the long term.

Speed to market is required by many private sector investors, while a fast transition to net zero is needed to limit global temperature increases to 1.5°C. To achieve the former goal, the project-focused approach of MDBs, DFIs, and entities in the multilateral guarantee framework needs to be augmented by financing approaches that allow for fast turnaround times and are scalable. The latter goal can be accomplished by combining support for government climate debt issuance for countries where debt sustainability concerns are not an issue, with MDBs and DFIs working together on co-guarantees of bonds and portfolio-level approaches that can support government climate debt issuances and private sector funding of EMDE climate projects.

Standardized product templates for credit-enhanced securities should be developed and promoted, with the goal of them becoming the basis for repeat issuances. MDBs and DFIs should coordinate the design of fixed-income products and use issuance experiences, and investor and issuer feedback to improve those designs. However, it will be key for MDBs and DFIs to stick with approaches that have been positively received by investors and build on those.

Close coordination amongst guarantee providers will bolster scalability. This cooperation can allow for the combination of resources towards scalable EMDE debt finance and the design of securities and funds that benefit from co-guarantees. The World Bank Group Guarantee Platform that became operational in July 2024 provides a template for such cooperation (World Bank (2024)). In addition, co-investments by public entities that fund projects and private sector investment should help the projects benefit from those entities' halo effects.

Simplicity and replicability of debt issuance and guarantee provision are key. Once simple, standardized guarantee products have been identified that find investor acceptance and are acceptable to the guarantee providers, they should be replicated and actively marketed. Thematic debt could provide another avenue that could increase investor appeal. For instance, debt extended to renewables projects could be assembled into securitizations. This will appeal to the preferences of specific investors, as well as the topical concerns of distinct providers of credit support and catalytic funding.

The marketing of newly designed climate securities must be approached as a core element of the placement process for new EMDE climate securities. While it is important to have all preconditions for an issuance in place, the complexity of credit-enhanced instruments and the fragmentation of the fixed income markets make it paramount to have them accepted by investors who can become trailblazers for these new products. Initial distribution of the new enhanced EMDE bonds should therefore focus on active investors, while also making use of anchor investors. Active investors should be approached first since there is no certainty that passive investors will buy such bonds at scale at the start of an issuance program, and active investors will likely be the marginal price setters. Once these more sophisticated investors have embraced this new sub-asset class, other investors are more likely to follow, with passive funds coming in once it has become sizeable. Investors from the MDB, DFI, and the sustainable investor space can be solicited as anchor investors, with pension funds

and their consultants also targeted as part of marketing and informational campaigns. Sustainability-focused investors are another group that should be pursued. To increase awareness of the new types of securities to be issued, non-deal roadshows could be held by the entities providing credit support—MDBs, DFIs, philanthropies, and other entities. Such an approach is in line with the engagement of the WB during the marketing of the Ghana 2030 bond (World Bank and Rothschild (2016)).

However, to build a funding system that works without MDBs, DFIs, and other public institutions, a period of explicit subsidies for certain funding approaches may have to be considered. Over the medium-to-long term MDB and DFI involvement should be primarily reserved for less bankable projects like adaptation projects and developing countries with low levels of local capital market development, limited capital availability, and high perceived country risks.

Credit enhancements that extend beyond sovereign debt to project-related and corporate climate debt should be considered. Debt accumulated away from the government means that this funding will not affect debt sustainability adversely. The securitization of climate loans via collateralized loan obligations could provide an avenue to funnel private funding to climate projects. Securitizations present a more scalable and ultimately cheaper sub-asset class than layered funds. Diversified exposures to project debt with IG or BB credit ratings would provide a good foundation for achieving high ratings of those securitizations' liabilities.

If policymakers want to establish guaranteed climate bonds as a sub-asset class within fixed income, a long-term approach will be needed, underpinned by support from AEs and others. Establishment of a sub-asset class relies on a steady stream of follow-on offerings to gain credibility and for new types of securities issued to reap the benefits of liquidity and an expanding market. The development of markets for new types of securities may take a few years. This means that in the meantime their spreads are wider that what some stakeholders might consider fair, while liquidity for the newly introduced products will be low. If the goal is for credit-enhanced EMDE bonds to become a sub-asset class within fixed income, investors have to be exposed to a recurring flow of new product. For this to occur, a set of potential issuers has to be available for future issuances, while subsidies to pay for potential reductions of guarantee fees or interest rates for the benefit of low-income countries may have to be provided. Those payments would decrease once the spreads on the guaranteed issuances have declined.

Annex I. Debt-for-Climate Swaps

Debt swaps first became a debt restructuring tool during the late 1980s and have been executed in larger sizes with a focus on commercial bonded debt starting with Belize's 2021 debt swap. With many EMDEs not current on their external debt service in the 1980s, while their natural resources were degrading, debt-for-nature swaps (DNSs) were considered as a win-win, allowing for the lowering of the debt load of countries participating in the swaps while improving their ecosystems through the nature-related projects they committed themselves to funding (Congressional Research Service (CRS) (2018), Chamon et al. (2022)). In a DNS a portion of a developing country's external sovereign debt is forgiven or repurchased, coupled with future investments in environmental conservation projects. DNSs executed between 1989 and 2015 covered USD2.6 billion par value of debt, resulting in USD1.2 billion of nature-related spending (Chamos et al. (2022)).

Debt-for-climate swaps (DCSs) work similarly to DNSs, with the future investments focused on climate projects.[1] DCSs usually involve the following elements: (i) An EMDE that faces market-access challenges (in cases when commercial debt is repurchased); (ii) the ability to buy back some of the country's FX-denominated debt at a discount, or a development partner willing to cancel part of the country's debt; (iii) the ability of the sovereign to commit to long-term environmental projects; (iv) the availability of organizations that can help structure and monitor the DCS's performance; and (v) donors or development partners who are willing to make financial contributions in the form of guarantees or insurance. The value of the issuer's climate commitments is less than the savings from the debt swap, therefore combining debt reduction with positive climate impact.

DCSs require setting up country-specific operational frameworks that can take a few years to arrange. A DCS where debt to a multilateral or bilateral creditor will be cancelled is called a "bilateral swap." A swap where commercial debt is repurchased with the involvement of a third parties like an NGO, philanthropies, and banks is called a "trilateral swap" (Chamos et al. (2022)). Bilateral DCSs can be easier to execute since financing or external guarantees usually do not have to be secured, and market reactions do not have to be considered. DCSs involve the setup of an entity in the debtor country that oversees the implementation of the climate projects. To achieve significant savings for the borrower country, the new debt issued as part of a trilateral swap operation should be less than the amount of debt to be extinguished and carry notably lower interest rates than the borrower country would have to pay in the market on its own. In a generic swap the country will owe new debt to an SPV, to which it will make debt service payments. The SPV is the issuer of another set of debt that external investors purchase and which funds the repurchase of the original debt. A bank needs to support a trilateral swap by conducting the bond repurchase and finding investors that buy the debt issued by the SPV.

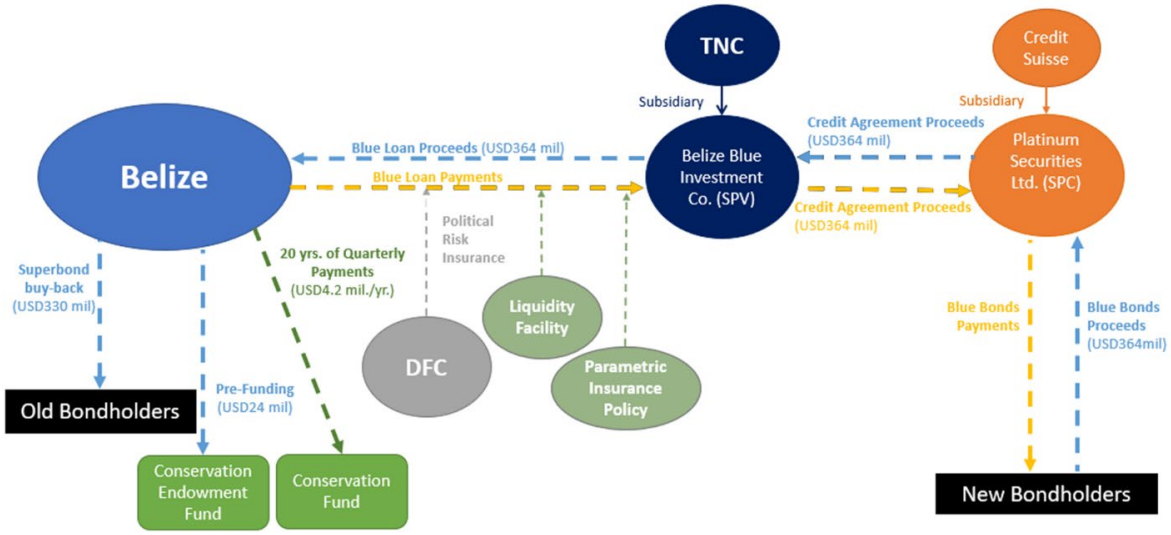
Belize's 2021 trilateral DNS provides a good example for a debt swap due to its relative simplicity (Figure A I.1). Belize had stopped making coupon payments on its sole outstanding Eurobond, the so-called Superbond, with the bond trading around 40 cents on the dollar of par value for most of 2021. The substantial discount to par allowed the Government of Belize (GoB), TNC, and Credit Suisse, together with DFC, to put into place the financial structure for the repurchase of the Superbond and to ensure environmental commitments from the GoB. The Superbond (USD553 million par amount) was repurchased from the bondholders for 55 cents on the dollar, or USD330 million in total. A blue bond in the amount of USD364 million was issued to repurchase the

[1] Given the structural similarities between DCSs and DNSs, examining the latter provides a blueprint for the analysis of DCSs.

Superbond, fund a Conservation Endowment Fund (USD24 million), and provide the first USD10 million funding for a debt service reserve account. The bond was issued by an entity set up by Credit Suisse to raise funds from and distribute funds to the holders of the blue bond (Platinum Securities Ltd.). A TNC-operated SPV (Belize Blue Investment Corporation (BBIC)) received the issuance receipts and transferred them to the GoB. The DFC provided PRI, part of which was reinsured by private sector reinsurers. The BBIC is also the beneficiary of a reserve account that covers up to 24 months of interest payments, mitigating the potential for investors to miss out on coupon payments while the DFC's PRI policy undergoes arbitration in case it being activated.[2] The BBIC is also the beneficiary of a parametric insurance policy that can make one debt service payment (coupon and interest) if a hurricane fitting the policy's conditions hits Belize.

Most debt swaps consist of two pillars: The financial pillar and the environmental pillar. In this case GoB committed to pay USD4.2 million (mostly in local currency) into an independent conservation fund over 20 years. It also provided USD24 million to fund a Conservation Endowment Fund, which will be invested and provide funding for the Conservation Fund after year 20.

Figure A I.1. Belize's Debt-for-Nature Swap (2021)



Sources: Fontana-Raina and Grund (2022); TNC (2021); IMF staff

This DNS includes many elements that are common to debt swaps. However, each DNS is case-specific and can contain variations on both the financial and the environmental pillars. For instance, Barbados's 2022 DNS included guarantees by the IDB and TNC, and the repurchase of local and FX-denominated debt. This DNS also included specific types of nature- and marine-related commitments by the authorities.

DCSs are not necessarily the first-best choice to achieve the twin goals of debt reduction and funding for climate projects in EMDEs (Chamos et al. (2022)). Most past debt swaps do not provide a long-term solution to the issuer's debt problems since they are usually too small to meaningfully affect debt sustainability.[3] In other

[2] The reserve account was funded with an initial payment of USD10 million from the bond issuance.
[3] Belize's 2021 debt swap can be seen as an exception. However, it can be considered a debt restructuring backed by a debt swap.

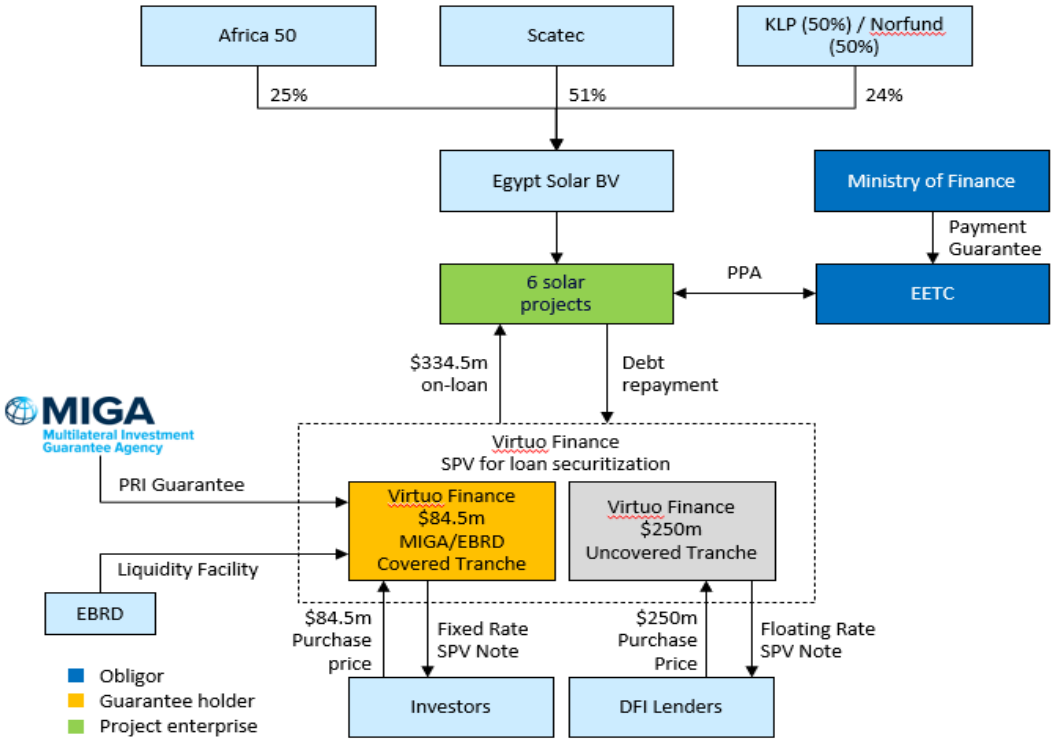
cases, alternative financing mechanisms—for instance, concessional loans or grants—can be superior to DCSs for funding climate mitigation or adaptation projects. However, DCSs can be a viable means of funding climate-positive projects for the countries whose fiscal space is insufficient to pay for the achievement of their nationally determined contributions (Chamon et al. (2022)). A further advantage of DCSs and DNSs is that their climate commitments are usually funded in local currency, reducing some of the FX risk that was associated with the original external debt.

Annex II. An Example of a Co-Guarantee: MIGA PRI Supported by an EBRD Liquidity Facility

Six Egyptian solar power plants with 65 megawatts capacity each were refinanced with bonds in 2022. The first tranche of this issuance, with a principal amount of USD84.5 million, was covered by MIGA PRI and a EBRD Credit Enhancement Facility to cover any lapsed coupon payments during arbitration proceeding. The uncovered second tranche, whose principal amount was USD250 million, was subscribed to by four DFIs (EBRD, DFC, FMO, and DEG, a German development finance institution). The MIGA/EBRD covered tranche received a BBB+ rating from Germany's Scope CRA. MIGA's PRI covers a total of USD98.3 million, which includes the principal amount, interest, and fees, for a tenor of 19 years. Risks covered comprise breach of contract, expropriation, currency inconvertibility and transfer restrictions, and war civil disturbance. The bond is certified under the Climate Bonds Initiative's Climate Bonds Standard.

The structure of the bond is straightforward (Figure A1.1). The inclusion of the additional guarantee that Egypt's Ministry of Finance had provided for the power purchase agreement between the solar projects and the Egyptian Electricity Transmission Company shows how additional contracts and guarantees can impact a project. Variations of the basic guarantee structure can be the direct backup of one guarantee by a co-guarantor, who is not visible to the creditors, or a guarantee being extended to the payments from the projects to the SPV, rather than of the SPV itself.

Figure A II.1. The Scatec Green Project Bond (Egypt)



Source: MIGA

Annex III. The Cost of Bond Guarantees and Collateralization: Brady Bonds and the Ghana 2030 Bond

This annex analyzes the pricing of collateralized, guaranteed, and insured sovereign Bonds. While no issuances of collateralized bonds have taken place at scale in recent years, the trading of Brady Bonds starting in 1990 provides an indication how investors valued collateralized sovereign bonds. The subsection below looks at the pricing of Brady Bonds, and describes how many issuers, once they had market access, decided to repurchase their Brady bonds.

With collateralized, guaranteed, and insured sovereign bonds rare, we analyzed the trading history of the Ghana 2030 bond, and find that it traded expensive from the issuers' perspective after accounting for the value of the guarantee. This bond, issued in 2015, benefitted from a 40 percent first-loss World Bank guarantee. We find that the secondary-market spreads of this bond traded above Ghana's standalone risk as reflected in its unguaranteed Eurobonds. This is in line with the theoretical results regarding self-collateralized bonds presented in Annex IV. Profit-maximizing investors, which are equivalent to total return investors, will hold

these bonds only if their return exceeds what they can achieve by investing in instruments already available to them.

Therefore, one reason that for a sovereign to issue collateralized, guaranteed, or insured bonds is if it otherwise would not have market access—reportedly like Ghana in 2015 at the time of issuance of the 2030 bond—or if there exist reasons to appeal to stakeholders that need a specific ratings uplift that could be achieved through collateralization.

Brady Bonds

Considering the spreads of Brady bonds is especially instructive given that they constitute a sub-asset class which was extremely liquid in the 1990s. Most Brady bonds followed two main structures, either the fixed-coupon par bonds, or the floating-rate discount bonds. This commonality helped reduce the time and effort required by investors for the analysis of those securities. The relatively large size of that market (USD156 billion by 1996 (IMF (1997)) and the large size of some issuances meant that liquidity in this market was relatively high. This was borne out by estimated turnover of 17 times the outstanding amounts in that market in 1996 (IMF (1997)). For comparison, 65 percent of the U.S. corporate bond market turned over 2017, and 68 percent of U.S. equities turned over in 2019 (Office of Financial Research (2019), FRED Economic Data). Brady bonds traded with a relatively narrow bid-offer spread of 25 cents per USD100 par amount (Qian (2021)). However, this apparent liquidity in the Brady bond market was not accompanied by low spreads with which the Brady bonds traded versus the uncollateralized debt of the same countries, exemplified by their Eurobonds. The stripped spreads of Brady bonds were generally much higher than the spreads of the uncollateralized Eurobonds of the issuing countries (Buckberg and Kaune (1996), IMF (1997), Kamin and von Kleist (1999)). The stripped spreads are calculated by removing the guaranteed parts of the cash flows of the Brady bonds and then calculating the spreads over the U.S. Treasury curve of the remaining unguaranteed cash flows, which represented standalone country risk. Some of the spread differences to Eurobonds issued by the same countries are striking (Table A III.1.), although maturity differentials and other factors impair the comparability of the spreads across different instruments.[4] To summarize, Brady Bonds traded expensive versus Eurobonds from the issuers' perspectives. For the examples listed not only the stripped, but also the spreads derived from the quoted prices of the secured bonds exceeded the spreads on the Eurobonds of the applicable countries (Table A III.1.).

[4] For instance, Brady Bonds' maturities usually exceeded the maturities of the Eurobonds and in the case of the par bonds, Brady Bonds had step-up coupons versus the normally fixed coupons of the Eurobonds.

Table A III.1. Brady Bond vs. Eurobond Spreads for Selected Issuers[1,2]

Country	Date	Brady Bonds				Eurobonds
		Discount		Par		
		Quoted	Stripped	Quoted	Stripped	
Argentina	11/1/1995	734	1,295	655	1,144	197
Brazil	5/22/1995	698	1,073	927	990	415
Mexico	6/15/1995	553	1,048	488	883	524
Venezuela	9/10/1993	288	646	306	535	292

[1] Discount bonds were floating-rate bonds, par bonds carried fixed coupons.

[2] "Quoted" spread refers to the spread of a bond based on its quoted price. Stripped spread is the theoretical spread that remains of the bond's cash flows after the guarantees are removed.

Source: Buckberg and Kaune (1996)

Additional testimony for the high cost of Brady bonds are the repurchase operations that the issuers themselves conducted. Once EM countries started to have reliable market access, they started to repurchase the higher cost of Brady bonds and replaced them with newly issued Eurobonds or bonds issued in the U.S. Yankee market. "Furthermore, the countries that initially issued Brady bonds are now issuing non-collateralized debt at spreads which frequently are lower than those on outstanding Brady bonds" (Kamin and von Kleist (1999)). This process started in the mid-1990s and went on until 2006 (IMF (1997)). Mexico retired the remainder of its Brady Bonds in 2003 (Wall Street Journal (2003), Köhler (2003)), while Brazil's announcement in early 2006 that it intends to buy back all its remaining Brady bonds precipitated a rally in EM bond prices (Financial Times (2006)). As of late 2023, only two small Brady bond issuances remain, one by Albania and one by Vietnam.

The reasons for the wider spreads of the Brady bonds are not clear. Market participants mentioned liquidity, but this would have implied lower, not higher spreads for the Brady bonds. Others mentioned the concern that Brady bonds would be put at a disadvantage versus newly issued Eurobonds during a future restructuring (Buckberg and Kaune (1996), IMF (1997)). An issuer wanting to restructure its debts may have looked at the collateral that the investors received as a payment that should be deducted from their eventual recovery. These loans were subject to the preferred creditor status of these institutions, making them non-restructurable. From the issuers perspective it may look like that they had paid for the privilege of the investors to receive the collateral on their partially collateralized bonds after a debt default.

Despite the fact that Brady bonds constituted a large and fairly liquid market, investors and traders effectively added a spread penalty on the Brady bonds, making them expensive debt for the issuers.

The Partially Guaranteed Ghana 2030 Bond

With Ghana's government facing a lack of funds and no market access in the Fall of 2015, it issued a USD1 billion bond maturing in 2030, supported by a USD400 million World Bank policy-based guarantee (PBG).[5] Over the subsequent years the country was able to issue significantly more external debt in the Eurobond market. The availability of unsecured bonds that matured within a few years of the 2030 bond allowed for the calculation of estimated spreads for the Ghana 2030 bond. The estimated spread at the time is calculated as a linear combination of the spread of the nearby bond and the spread of a World Bank bond maturing close to the Ghana 2030.[6] We find that the stripped spreads of the Ghana 2030 were above the spreads of the unsecured bond used for comparison (Table A III.2.).[7]

Table A III.2. Selected Spreads of the Ghana 2030 Bond vs. Comparators

	Yield (percent)		GHA 2030: Excess Spread (bps)	
Pricing Date	GHA 2030	Comparator[1]	Full Bond[2]	Single-Standing[3]
12/31/2015	10.50	11.89	255.1	425.2
12/31/2016	8.41	8.31	246.1	410.2
12/31/2017	6.37	6.29	157.4	262.4
12/31/2018	8.88	9.16	233.6	389.4
12/31/2019	6.98	7.31	153.7	256.2
12/31/2020	6.08	6.58	180.6	300.9
12/31/2021	8.73	10.92	174.2	290.3

[1] The comparator bond is the Ghana 2026 bond through 2017 and the Ghana 2029 thereafter.

[2] The excess spread of the full bond is calculated as the spread over U.S. Treasuries of the Ghana 2030 minus the linearly interpolated spread of the comparator and a WB bond with a nearby maturity, minus the comparator's spread. This difference would be zero if there was no spread premium associated with the Ghana 2030.

[3] The single-standing excess spread is defined as the excess spread as defined in footnote 2, divided by 0.6, minus the comparator's spread. The division by 0.6 allocates the bond's excess spread to its risky part and subtracting this spread from the comparator's spread shows how "expensive" the risky debt part is.

Sources: Bloomberg, IMF Sovereign Debt Metrics, and IMF staff calculations

The Ghana 2030 was not necessarily cheap on an all-in basis when gauged by secondary market spreads, especially if the guarantee fee is factored in. The Ghana 2030 blended yield plus 30 bps exceeded the yield of the comparator at the year ends 2016-2018. A blended spread plus guarantee fee above the country's standalone spread indicates that the guaranteed issuance was expensive for the country. The imputed single-standing excess spread on a stripped basis shows that there is an extra cost attached to the guaranteed issuance compared to an unguaranteed issuance. Related to Table A III.2. showing a reduction in the excess spread of the Ghana 2030 over time, it has been shown that the gross spread of the Ghana 2026 bond the guaranteed issuance was positively correlated with changes in the issuer's credit risk (IMF (2017)).

[5] Ghana paid 75 bps/annum for the first-loss USD400 million guarantee. For instance, if a coupon payment was missed, the WB would pay that amount to the investors. Additional missed debt service payments would be made until USD400 million was reached.

[6] Since the Ghana 2030 amortized at a rate of one-third of its par amount between 2028 to 2030, October 14, 2029 was the date which was used as the basis for the selection of the peer securities.

[7] While the methodology used to calculate the stripped spreads represents an approximation—it assumes a constant 40 percent cover by the guarantee—it is one way to value the impact of the guarantee and reflects market practice.

Annex IV. A Market-Based Approach to Guaranteed and Collateralized Bonds Valuation

A simple formula-based approach can help to clarify the issuance decision underlying collateralization and guarantees. For the cases of a guaranteed bond and a self-collateralized bond, assuming an issuer who wants to minimize the cost of debt, under simplifying, but general assumptions, the issuance decision in favor of the credit-enhanced debt can be summarized in spread terms by these two formulas for the cases of a guarantee and self-collateralization, respectively:

(1) $sr_{grt} > \text{prm} * w_{grt}$

(2) $sr_{coll} > (s_{conv} - s_{coll}) * c$

where $sr_{grt} = (s_{conv} - s_{grt})$ indicates the spread savings from third-party guarantee at a share w_{grt} of the bond's value that is guaranteed, and $sr_{coll} = (s_{conv} - s_{coll})$ is equal to the spread savings of a self-collateralized bond with collateralized share c, respectively. prm is the premium to be paid to the guarantee provider in percent, c the share of the collateral as part of the bond issuance. In both cases the spread savings have to exceed the cost of guarantee or collateral coverage times the share of the guaranteed or collateralized debt.

Including an investor valuation approach together with market equilibrium shows that guarantees are likely to be the superior to self-collateralization.

(3) $s_m = w_{grt} * s_{grt} + (1 - w_{grt}) * s_{conv}$

(4) $s_m = c * s_{coll} + (1 - c) * s_{conv}$

(5) $s_{inv} = s_m + s_{prem}$

Equations 3 and 4 define the arbitrage-free spread s_m the investors expect to receive if they were purchasing a debt instrument of the issuer representing its standalone credit with share w or c, and investing the remainder in an obligation representing the credit of the guarantor, or investing in the collateral, respectively. Equation 5 denotes the spread expected by the investors, who want the spreads they can already receive in the market plus a spread premium s_{prem} they will demand for the uncertainty, potential payout delays, and complexities associated with guaranteed or collateralized debt.[8] Using equations 3 and 4, with 1 and 2, respectively, and then combining with 5 in each case leads to market equilibrium relationships that have to hold if the investors are profit-maximizing:

(6) $(s_{conv} - \text{prem} - s_{grt}) * w > s_{prem}$

(7) $-s_{prem} > 0$

Equation 6 states that for a given s_{prem} a high coverage ratio w makes it more likely for the issuer to gain from the guarantee. A higher guarantee premium and a lower quality guarantee provider will reduce the benefits of

[8] Various investors indicated that they use the non-arbitrage approach that is formalized here.

the guarantee for the issuer. Equation 7 shows that the self-collateralized approach is not viable if investors demand a positive spread premium. The reason for this lies in the easily available arbitrage opportunity for such an instrument. The rating of the collateralized bond does not matter; only spreads are relevant. The more the guarantee premium is below the market spread of the issuer, the greater is the benefit of the guarantee.

Annex V. Credit Rating Agencies

Credit rating agencies can be compared to gatekeepers of the bond markets. With many EMDEs facing funding challenges and subject to low credit ratings, the CRAs' responses to the issuance of climate debt are of high importance for the investor acceptance of such new debt. The CRAs' assessments are especially important for the investor acceptance of innovative instruments like credit-enhanced debt and new financing approaches like debt-for-nature or debt-for-climate swaps. The CRAs therefore attract much attention by the stakeholders in the climate finance area, and this paper describes their methodologies as they affect climate finance in EMDEs.

CRAs provide information on an issuer's ability to make good on its debt service obligations, usually expressed on a qualitative scale grom AAA (highest credit quality) to D (default). A major ratings threshold is provided by a rating moving from the BBB- or better category—so-called investment grade ratings—to BB+ or below, the so-called high yield (HY) credit ratings. The active management of HY bonds is largely conducted by specialized managers who have the capacity to conduct detailed credit analysis and potentially are able to participate in a debt restructuring if needed. HY bonds trade at much wider spreads compared to IG bonds, sometimes leading to large jumps in an issuer's spreads when its bonds are downgraded from IG to HY, the so-called ratings cliff.

CRAs fulfill the role of third-party assessors, with their ratings used by regulators, asset owners, asset managers, and in fixed-income indices. The importance of CRAs in the investment processes derive from their use (i) as inputs for regulatory capital requirements of banks, insurers, and pension funds; (ii) as factors for security inclusion in fixed income indices; and (iii) their use by asset owners as inputs into asset allocation decisions and the risk limits they impose on their managers (Box A V.1.). Asset owners and regulators largely lack the capacity to assess the credit quality of thousands of borrowers globally while asset managers may be perceived as having conflict-of-interests when opining on an issuer's credit quality, hence the demand for the less conflicted risk assessments provided by CRAs.

While unregulated investors do not have to abide by the CRAs' methods, these methods have nonetheless become ingrained throughout the ecosystem of credit investing. Internal credit assessments, even if they were arrived at independently from CRAs, are usually couched in the alphabetical scale used by CRAs. But beyond the ratings scale some investors use other principles employed by CRAs in their internal credit rating processes. For instance, the sovereign ratings ceilings that CRAs often apply to issuers are used by some investors when they conduct their own credit-worthiness assessments. Similarly, the approach to rate an issuance that is fully guaranteed by two entities in line with the rating of the lower-rated guarantor is also used by some investors, although their assessment might show that the security has a higher creditworthiness than

the one indicated by the lower rating.[9] Guaranteed bonds and securitization tranches are deeply affected by the CRAs' approaches, with issuers building the ratings into the structuring process of an issuance.

Box A V.1. Background on Credit Rating Agencies[1]

CRAs fulfill the role of third-party assessors, whose assessments are used by regulators, asset owners, asset managers, and the providers of fixed-income indices. Asset managers and regulators can have a conflict-of-interest when opining on an issuer's credit quality, as well as many asset owners and managers not possessing the capacity to conduct in-depth credit analysis. Regulators benefit from the use of third-party assessment of credit quality too, since at times political pressures and bureaucratic processes may prevent credit assessment to take place in a timely manner.

Key sources of relevance of credit ratings in investment processes derive from ratings' use (i) as inputs for regulatory capital requirements of banks and insurers; (ii) as thresholds for bonds' inclusion in fixed income indices; and (iii) their use by asset owners as inputs into asset allocation decisions. Point (i) can lead regulated institutions do not purchase certain assets with a low rating if their capital requirements are deemed too high, contributing to ratings cliffs. Point (ii) refers to the providers of fixed income indices using credit ratings as important inputs in the construction of their indices, which in turn are used by many investors and fund providers as benchmarks. These benchmarks are key to the risk management of funds that use them, limiting the degree by which a fund's holdings, especially of risky assets, can deviate from its benchmark's components. Point (iii) refers to many asset owners aligning their credit risk preferences to credit ratings, often restricting or prohibiting any bonds with a rating below certain thresholds and limiting their asset allocation to certain low-rated bonds.

The reliance of investors, asset owners, and regulators on CRAs has been criticized by many stakeholders, although no workable alternative to the current system has been found so far. One fundamental drawback of the current system of credit ratings is that the issuer pays for the rating. This gives rise to a conflict of interest in that issuers will be tempted to "agency-shop" by selecting the CRAs for an upcoming rating which provide the highest ratings to attract the widest universe of investors. This incentive mechanism was viewed as having been a major reason for the large share of AAA-rated non-agency mortgage-backed securities which experienced severe downgrades over short periods of time during the GFC (Segoviano et al. (2013)).2 The European sovereign debt crisis of 2010-2012 led the EU's banking regulators to develop approaches that would reduce the dependence of regulated FIs and the capital markets on CRAs. However, the core dependencies of the financial system on CRA credit ratings were not substantially reduced. The CRAs became subject to greater regulatory oversight, with their sales and analytical functions being separated and other constraints on their operations being implemented. Otherwise, the importance of CRAs in the financial markets has likely increased versus the pre-GFC period due to their operations having expanded into index provision, economic forecasting, the distribution of ESG-related services and scores, and increased data sales.

[9] Investors may prefer to follow the footsteps of the CRAs out of a penchant for conservativeness, or to mitigate reputational concerns after a credit event has occurred.

Box A V.1. *(continued)*

The credit rating business is essentially an oligopoly across the three CRAs Moody's, S&P, and Fitch. Their market share is about 95 percent. While some new CRAs have emerged after the GFC, they have made only limited inroads, with KBRA having captured some notable market share in the U.S. structured product market. DBRS and Scope are the two only CRAs accepted into the Eurosystem for the use by the ECB and national central banks besides the big three CRAs. The issuer pays-business model still prevails, so the new entrants are subject to the same conflicts of interest as the big three. This is reflected in regulators' decisions as to which CRAs can be used for risk capital calculations and bond index providers' use of credit ratings in index design. The quality of the credit ratings provided by domestic CRAs in EMDEs has been questioned by some observers (for example, see Sharma (2024)).

[1] For an overview of CRAs and details of sovereign credit ratings see Livingston (2020) and Bhatia (2002), respectively.

[2] Deficiencies in the models used to derive the ratings of the tranches of private-label mortgage securities, like inappropriately low default correlations of the factors driving defaults and losses contributed to these events.

While credit ratings impact bond spreads and therefore issuance costs, the relationship between spreads and ratings is not a simple one. The impact of credit ratings on bond spreads above and beyond available public fundamental information has been well-established (Kiff et all. (2012), Binici et al. (2018)). However, their importance is not contemporaneous since much of the impact of ratings changes on bond spreads occurs prior to a change in a rating. When a CRA puts an issuer on a "watchlist" prior to a potential change in a rating it leads to moves in spreads (Covitz and Harrison (2003)). The impact of CRAs' actions also differs across different types of bonds (Ammer and Clinton (2004)). Especially in fast-moving markets, active investors can react faster to changes in fundamentals, while credit ratings changes, especially if they are impactful, may take time (Covitz and Harrison (2003)).

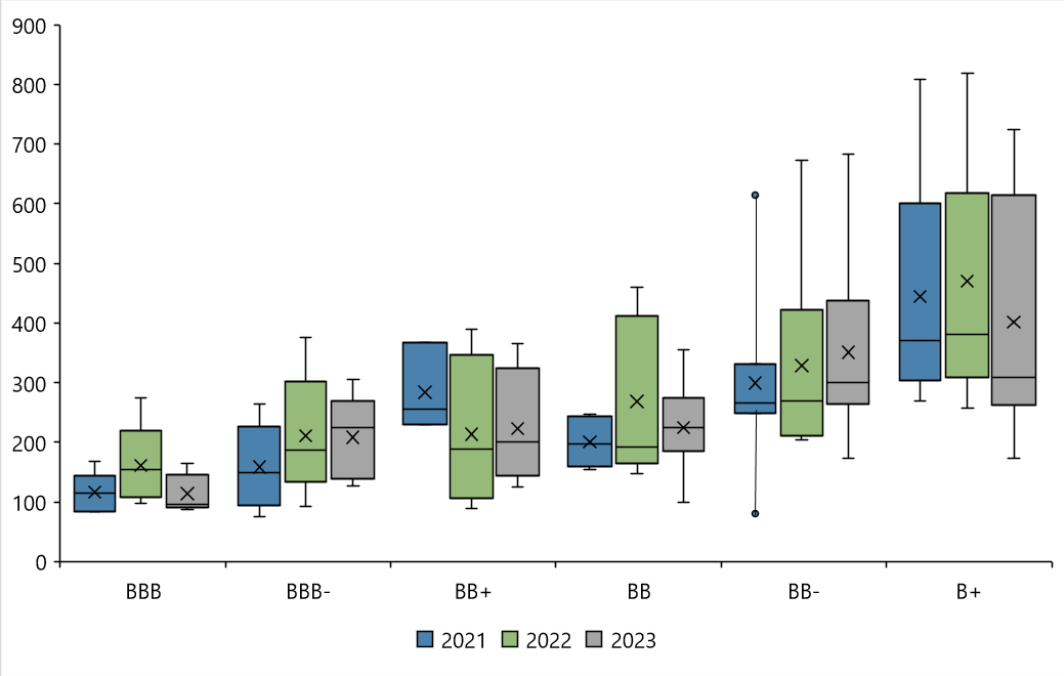
While high credit quality allows for the purchase of a bond by a wider pool of investors, it does not imply tight spreads. If the bonds are not part of a group bond which most investors view as low-risk and which therefore are traded without much consideration to the underlying credit quality—examples are the bonds of the most highly rated sovereign, U.S. Agency bonds, or bonds issued by MDBs—active investors conduct their own credit analysis. Looking at EMDE spreads at three different points in time—end-2021, end-2022, and the end of the third quarter 2023—spreads generally increase with lower ratings, although this may not hold for adjacent notches (Figure A V.1.). However, the distribution of spreads for each ratings notch is very wide and is skewed to the right, with the average spread usually above the median. Therefore, it can be rare for an EMDE sovereign bond to price close to the average or the median spread of the bonds that comprise the credit rating notch it falls into. The spread will likely be in line with investor perceptions of the underlying credit, together with the liquidity of any specific issuance and bespoke factors like a guarantee associated with the bond. While CRA ratings and investors' views, as expressed through spread, will generally be broadly aligned—they are largely based on the same publicly available information—our data indicate that the markets value EMDE sovereigns on their own merits.[10] Our analysis indicates that in the EMDE sovereign space, especially at the lower end of the ratings spectrum, active investors are the marginal investors and therefore the price setters. Passive funds

[10] CRAs do receive confidential information from the entities they rate which will enter the ratings process. Besides the institutional effects mentioned above which can lead to credit ratings having an impact on spreads beyond what is embodied in publicly available information, investors might credit CRA ratings for including non-public information.

and investors that do not conduct their own research might buy large amounts of bonds, but their buy and sell decisions are not likely to move prices at the issuer level (Figure A V.1.).[11,12]

Figure A V.1. EMDE Spread Distribution by Notched Sovereign Ratings

(BBB to B+; bps)



Notes: Ratings provided represent the average of ratings from the three largest rating agencies. If the average rating includes a decimal value, it is rounded down to the nearest rating notch. An "x" represents the mean, the bar in each box the median of the spread distribution for each notch. The box for each ratings notch indicates the interquartile range. The two dots indicating the interquartile range of the 2021 BB- notch represent outliers, defined as values that are either lower or greater than 1.5 times the interquartile range. Data are as of each year-end.

Sources: Fitch Connect; S&P RatingsDirect; Moody's; Bloomberg; IMF Sovereign Debt Metrics; and IMF staff calculations

We do observe a spread cliff when going from IG to HY—that is from the BBB minus to the BB plus rating—only at end-2021, not at end-2022 or end-2023. While the spread distribution from the BBB- to the BB+ notches noticeably increased at end-2021, the means and the medians of the spread distributions of these ratings notches were virtually identical at end-2022 and end-2023. The most notable upward shift in the spread distributions occurs consistently across all three year-ends when moving from BB minus to B plus, with the means and the medians of the B plus spread distributions exceeding the means and medians of the BB minus spread distributions in the same year, respectively. It should be noted that the interquartile spread ranges significantly overlap for the same year for the BB minus and B plus data, supporting our earlier contention that CRA ratings for EMDE sovereigns provide broad indications for bond pricing.

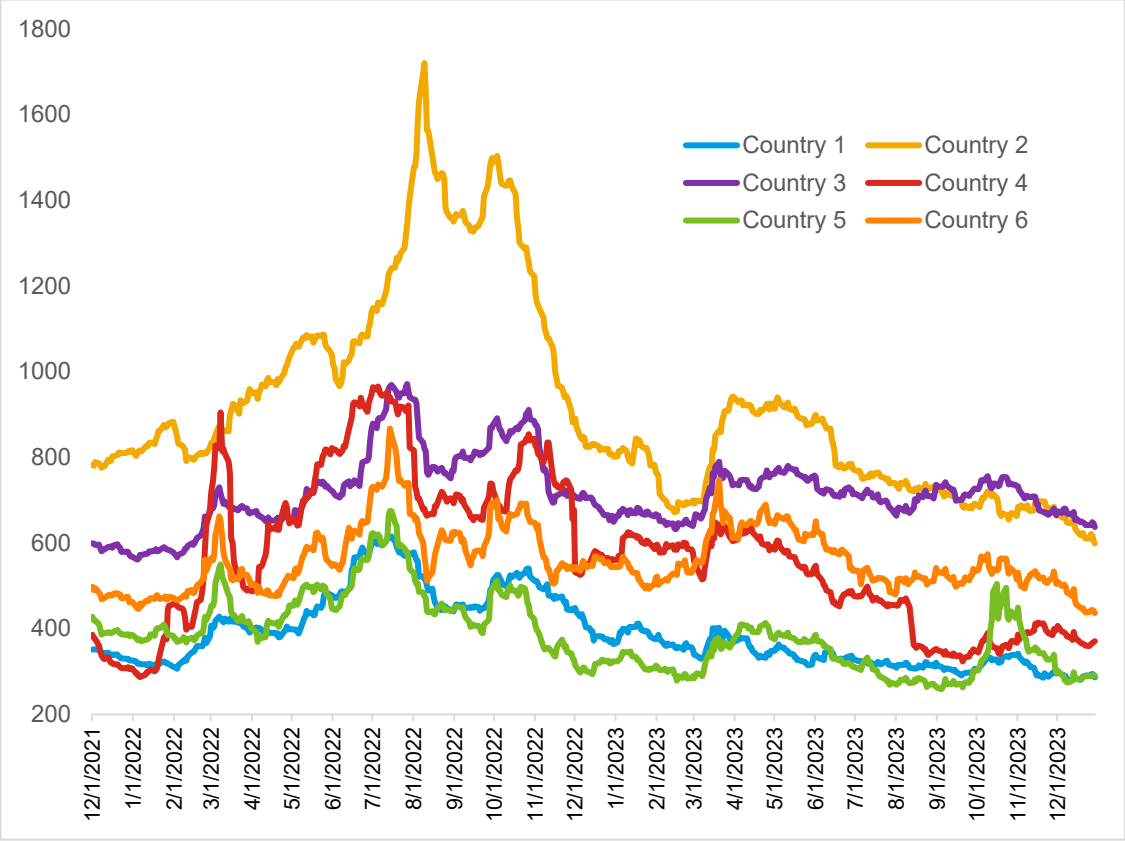
[11] Our empirical findings are in line with the arguments made by Lamont (2024) with regards to equities.

[12] This statement should be qualified for index in/exclusion changes. Those change are demand factors that can affect prices. However, once the price impact of such flows has dissipated, active investors' valuations will prevail. For the impact of capital flows on EMDE local currency debt markets, see Arslanalp et al. (2020).

The time series of spreads for six B plus rated countries from end-2021 to end-2023 shows significant variation in spread levels over time, with some notable changes in the order of issuers (Figure A V.2.). For instance, the country with highest spreads over most of the period tightened considerably versus the country that had the second-highest spread over most of the period and traded tighter than it at the end of 2023. Country 6 exhibited notable spread widening in the Spring of 2023, likely due to political developments. The spread of country 5 widened in the Fall of 2023, likely due to regional developments, and tightened thereafter. To summarize, we find that cross-sectionally at a given point in time, as well as across time, CRA credit ratings constitute imprecise indicators of a sovereign's credit risk as expressed by market prices.[13]

Figure A V.2. Spreads for Selected B Plus-Rated Countries

(in bps; December 1, 2021 – December 31, 2023)



Notes: The six countries' spreads stayed at the composite B plus rating from Dec. 2021 – Dec. 2023. For the methodology underlying the composite ratings approach see the notes section of Figure A V.1.

Sources: Fitch Connect; S&P RatingsDirect; Moody's; Bloomberg; IMF Sovereign Debt Metrics; and IMF staff calculations

Some stakeholders have advocated for a reevaluation of EMDEs credit risk, based on EMDEs' economic performance, although empirical evidence on this issue is inconclusive. This is sometimes rephrased as EMDEs being held to stricter standards than AE-based issuers, resulting in increases in debt costs for issuers

[13] Incidentally some investors impute market-based ratings by aligning an issuer's bond spread with a range for spreads which the investors believe pertain to a particular rating. This allows for judging if market spreads make too much or too little allowance for credit risk. The CRA Moody's Investor Services has been calculating market-implied ratings since 2002 (Moody's (2019)).

which are not well-supported by the true country risk. The borrowing costs of Sub-Saharan Africa (SSA) countries have attracted particular attention, with the IMF's Managing Director and the French President supporting a re-evaluation of African countries' credit risks (Fofack (2021)). While the data show that SSA countries did pay higher spreads than other EMDE countries, the evidence as to whether these spreads are justified by fundamentals has been contradictory; conclusions vary with different empirical approaches and datasets (see Gbohoui et al. (2023)). Including certain governance-related variables not used by other empirical researchers in the past shows that the excess spreads paid by SSA borrowers can be partly explained by a lack of transparency in government operations, underdeveloped debt management, and high informality of economies (Gbohoui et al. (2023)).[14]

With climate change a long-term problem, it has been suggested that the horizons applied by CRAs and investors in their credit analysis should be extended when EMDEs climate investments are evaluated (United Nations (2022)). One approach is that a country's investments in climate change mitigation and adaptation will improve its long-term economic performance and should therefore lead to improved credit ratings and more positive views by investors. But with CRAs' rating horizons currently around three to five years (Bhatia (2002), United Nations (2022)), the positive effects of a country's climate investments will likely not lead to an improvement in its ratings. However, there is also the longer-term "through the cycle" element to the CRAs' credit ratings, which maintains that periodic business cycle effects should not influence ratings markedly; otherwise, large numbers of issuers would be down- or upgraded periodically in unison (Kiff et al. (2012), Slapnik and Lončarski (2021), Fitch (2023)). There can be a contradiction between these two ratings drivers, in that a systemic economic crisis could lead to downgrades of many issuers that share certain common characteristics if there is an expectation on the part of a CRA that those issuers have suffered more fundamental damage to their debt servicing ability. CRA representatives have noted that the incidence and severity of weather-related events due to global warming will be a negative for most EMDEs given the impact of such events on the countries' economic foundations and the emergency and reconstruction costs their governments will have to bear. Regarding the effects of climate investments, the CRAs currently do not provide large-scale ratings benefits for those. Rather, they want to see evidence of any benefits before making them the basis for improved ratings.[15]

Ratings actions surrounding debt buybacks and exchanges have been criticized as overly harsh by some stakeholders. This issue has come to the forefront during debt swaps. CRAs employ the concept of a "distressed exchange," which tries to capture cases when an issuer whose debt trades at a significant discount due to an elevated probability of default offers to exchange its debt for cash or new debt at prices notably below par value. Distressed exchanges in most cases result in a "selected default" rating, which describes the case when a borrower is not current on some of its obligations but continues to make timely payments on its other obligations. There is a possibility that creditors participate in such an exchange because they see a high chance of an imminent default (Standard and Poor's (2023)). However, there is a high degree of judgment in calling an exchange distressed, with different CRAs judging the same debt swap differently (Fontana-Raina and Grund (2022), OMFIF (2023)). Belize's debt swap took place when its sole outstanding U.S. dollar bond was in default, with S&P rating Belize's debt at that time "selective default," while Moody's had rated Belize and

[14] While the three largest CRAs emphasize the relevance of governance, institutions, and political factors in their sovereign ratings decisions (S&P (2017), Moody's (2022), Fitch (2023)), these results suggest that some governance factors are not appropriately included in those ratings processes.

[15] For instance, while a solar plant will reduce the need for fuel imports and will make a country more resilient to disruptions to their fuel supply after a storm, solar plants could be damaged during a storm. CRAs want to see more tangible evidence on this issue before modifying credit ratings.

Ecuador at Caa3, or just above default (Table A V.1.). The differential treatment of Ecuador's debt swap by the three CRAs shows how the same facts can lead to different conclusions, with Moody's viewing the swap as a default event, while Fitch and S&P did not. Swaps have not led to an improvement in ratings, since so far, they have led to the retirement of relatively small amounts of debt (Standard and Poor's (2024)).

Table A V.1. Credit Rating Changes around Debt Swaps

(before, during, and after the swap)

Country	Date[1]	Fitch			Moody's			S&P		
		before	during	after	before	during	after	before	during	after
Belize	11/4/2021	-	-	-	Caa3	Caa3[2]	Caa3	SD	SD[3]	B-
Barbados	9/20/2022	-	-	-	Caa1	Caa1	Caa1	B-	B-	B-
Ecuador	5/9/2023	B-	B-	B-	Caa3	Caa3[2]	Caa3	B-	B-	B-
Gabon	8/14/2023	B-	B-	B-	Caa1	Caa1	Caa1	-	-	-

[1] First settlement date

[2] The exchanges were declared events of default by Moody's.

[3] The exchange was declared an event of default by S&P.

Note: A "-" indicates no available rating

Sources: Bloomberg; Fitch; Moody's; S&P; LatinFinance (2023); OMFIF (2024)

Credit enhancements often lead to rating uplifts, although the effects differ by the underlying type of debt and across CRAs. The effects of guarantees on credit ratings are most clearly discernible in the case of structured project debt. In structured bonds subordination and other internal features enhance the ability of the senior tranches to pay. External enhancements can easily be incorporated into the quantitative elements of a structured bond ratings process. Similarly, with projects exposed to construction delays or delays in receiving payments from their clients, project bonds enhanced by liquidity facilities can receive ratings uplifts since such facilities can improve a project's ability to make timely debt service (Standard and Poor's 2022)).

Credit enhanced sovereign debt is subject to different treatment by the three major CRAs. A credit enhancement from an MDB or a DFI can benefit both from the direct support of the enhancement as well as an associated halo effect. The former provides a reduction in the loss given default (LDG) of a bond, the latter a reduction in the probability of default (PD). CRAs generally place greater emphasis on the PD, with LGD of higher importance for HY issuances (Moody's (2015)). Regarding sovereign ratings, Fitch and Moody's have provided ratings uplifts for the LGD reduction of multilateral guarantees. Halo effect-related factors coupled with considerations of the expected behavior of country authorities during a default on WB-guaranteed bonds were part of past ratings decisions (Box 1). A three-notch uplift is currently the most Moody's or Fitch will provide for partially enhanced sovereign debt. S&P, on the other hand, is not providing any uplift on partially guaranteed sovereign bonds since 2013 (Standard and Poor's (2013), Standard and Poor's (2017), Moody's (2022), Fitch (2024a)).[16]

[16] Some of the reasons that underlie this decision are summarized in Standard and Poor's (2013), which refers to debt restructuring that involved Brady bonds and the recoveries that materialized under the WB guarantees for Argentina's issuance of six zero-coupon bonds in 1999: "… Brady bondholders received no higher recovery than other bondholders. Typically, Brady bondholders received more than the present value of the highly rated collateral, but no more than unsecured creditors. Sovereign issuers incorporated the value of the collateral in determining the terms of their distressed exchange offerings. Precedent suggests they may do the same with a partial guarantee, leaving little benefit to debtholders. … The preferred creditor treatment of multilateral guarantors providing a partial sovereign debt guarantee does not improve creditworthiness either. … Through 2002, Standard and Poor's rated several sovereign issues with partial guarantees from the International Bank

(continued…)

The impact of guarantees on sovereign EMDE bonds' credit ratings has decreased over time (Table A V.2.).[17] The WB's innovative guarantee structure that supported the issuance of six zero-coupon bonds by Argentina in 1999 in 11 notches of uplift for the fully covered insurance and 3 and 5 notches of uplift for the bonds that had no explicit coverage. This guarantee effectively achieved six times leverage at issuance. Colombia's 2001 USD1 billion WB-supported bond received three and four notches of uplift. However, Ghana's 2015 issuance that received a much more substantial 40 percent WB guarantee received only two notches uplift from Fitch and Moody's based on reduced LGD.[18] Ecuador's social bond issued in 2020 received only a one-notch uplift from Fitch, despite a 75 percent IDB guarantee.[19]

Table A V.2. Credit Ratings Changes for Enhanced Sovereign-Related Bonds

Bond Type	Country	Year	Size (USD million)	1st Guarantor	Coverage (perc.)	2nd Guarantor	Coverage: Principal (perc.) or coupons	Ratings Uplift (Notches)		
								Fitch	Moody's	S&P
Sovereign Bond	Argentina[1]	1999	1,500	World Bank	16.7			5/11		3/11
	Colombia	2001	1,000	World Bank	15.9			3	4	3
	Ghana	2015	1,000	World Bank	40.0			2	2	
	Ecuador	2020	400	IDB	75.0			1		
Blue Bond	Belize	2021	364.00	DFC	100.0	Debt service reserve account	24 months of coupons		16	
	Barbados[2]	2022	146.50	IDB	66.7	TNC	33.3		16/14	
	Ecuador	2023	656.02	DFC	100.0	IDB	6 quarterly interest payments		16	
	Gabon	2023	500.00	DFC	100.0				14	

[1] The guarantee covered six zero-coupon bonds, with the nearest maturity receiving 11 notches of ratings uplift and the others five or three notches of uplift by Fitch and S&P, respectively.

[2] Two tranches with different levels of protection were issued, with the IDB guaranteeing USD100 million, and TNC a USD50 million tranche.

Sources: Fitch; Moody's; S&P; Fontana-Raina and Grund (2022); IMF staff calculations

Sovereign debt restructurings are resolved through negotiations between the defaulting issuer and its creditors, as "a sovereign's debt can never be legally discharged in bankruptcy; debt relief can only be obtained with the creditors' consent. Despite efforts by some members of the international community … to promote such a measure, there is no formal national or international bankruptcy mechanism for sovereigns." (Buchheit et al. (2019)). This prevents the application of uniform rules for credit enhanced or other debts. Sovereign restructurings are negotiations between the sovereign and its creditors, with both sides free to make proposals

for Reconstruction and Development ("World Bank") and the Inter-American Development Bank on the basis of preferred creditor considerations. However, in the wake of how these fared in the Argentina default, we suspended this approach." Standard and Poor's does not provide ratings uplift to partially guaranteed sovereign debt to this day. It should be noted that the experience of the Ghana 2030 bond, partially guaranteed by the WB, and Ecuador's 2035 social bond, partially guaranteed by the IDB, provided investors with much more positive experiences than the cases cited by Standard and Poor's above (Box 1).

[17] Some consulted investors conveyed that they had noticed similar trends.

[18] The number of notches of uplift is provides only a rough indication of the improvement in credit quality. For different standalone ratings of an issuer, the same number of notches of uplift will correspond to different improvements in credit quality given the non-linearity of the relationship between changes in ratings and changes in credit quality.

[19] This bond was not sold to end investors but purchased by an SPV which in turn issued USD300 million of AAA-rated notes and UDS100 million of single B-rated notes—B minus being Ecuador's standalone credit rating at the time—in a repack structure.

reflective of their preferences.[20] A cash-strapped government might want to make a restructuring proposal which provides all creditors approximately the same recovery, including any payouts from credit enhancements. While this is one way the defaulting government might proceed, developments during a restructuring can also take a more positive turn for credit-enhanced debt. This was the case for Ecuador's 2035 social bond, which was left out of the country's 2020 debt restructuring.[21] However, the absence of a sovereign bankruptcy court means that there will always exist uncertainty about the treatment of credit-enhanced debt, even when the enhancement is not subject to uncertainty and can be paid out quickly, like in the case of the Brady bonds. Ghana's 2022 default highlighted the centrality of how credit-enhanced debt is treated within a debt restructuring. The WB-guaranteed Ghana 2030 bond and non-guaranteed external Ghana bonds were issued under new collective action clauses, which left open the possibility that only part of the USD400 million WB guarantee might have been paid out (Financial Times (2022)). However, the WB ended up paying out the remaining part of its guarantee, after having paid three coupons, and the unprotected part of the guaranteed bond was treated in the restructuring like the other senior unsecured debt of Ghana, as had been envisioned when Fitch and Moody's rated the bond in 2015.[4] Fitch estimated the total payout to holders of this issuance could amount to up to 70 percent of nominal value, significantly more than the 55 percent recovery that the holders of the other unsecured Ghana bonds will likely have recovered based on market prices in early October 2024 (Bloomberg (2024)).[5]

[20] Corporate debt restructuring in AEs, on the other hand, follow established legal principles, relying on time-honored judicial procedures with expert judges, lawyers, and valuation specialists providing the supporting infrastructure.

[21] Likely factors for the government to propose excluding this bond from the restructuring were the high share of the guarantee, which would lead to 75 percent of the bond's par amount to become preferred creditor debt, mitigating the benefits from its restructuring, and that some new, sustainable investors had been attracted to this bond, which the country may not have wanted to offend. The small amount of the issuance meant that the creditors were not reducing the pool of debt up for restructuring by much after excluding this bond.

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