

# Curbing *the* Cost of Borrowing for Businesses

*The Role of Bond Markets  
in Low- and Middle-Income  
Countries*

JUNE 2026

**EDITED BY:**

Paolo Mauro and Cesaire A. Meh



**WORLD BANK GROUP**

THE WORLD BANK  
IBRD • IDA

**IFC**

International  
Finance Corporation

## IFC

IFC — a member of the World Bank Group — is the largest global development institution focused on the private sector in emerging markets. We work in more than 100 countries, using our capital, expertise, and influence to create markets and opportunities in developing countries. In fiscal year 2025, IFC committed a record \$71.7 billion to private companies and financial institutions in developing countries, leveraging private sector solutions and mobilizing private capital to create a world free of poverty on a livable planet. For more information, visit [www.ifc.org](http://www.ifc.org).

### Disclaimer

Prepared by the International Finance Corporation.  
The opinions expressed in this publication are those of the authors.

For IFC, the findings, interpretations, views, and conclusions expressed herein are those of the authors and do not necessarily reflect the views of the Executive Directors of the International Finance Corporation or of the International Bank for Reconstruction and Development (the World Bank) or the governments they represent. Copying and/or transmitting portions or all of this work without permission may be a violation of applicable law. IFC does not guarantee the accuracy, reliability or completeness of the content included in this work, or for the conclusions or judgments described herein, and accepts no responsibility or liability for any omissions or errors (including, without limitation, typographical errors and technical errors) in the content whatsoever or for reliance thereon.



# Curbing the Cost of Borrowing for Businesses:

*The Role of Bond Markets in  
Low- and Middle-Income  
Countries*

# Acknowledgments

This report was prepared under the guidance of Paolo Mauro, acting director of the Private Markets Department within the Development Economics Vice Presidency at the World Bank Group.

The report was led by Cesaire A. Meh, manager of the Private Markets Department. The core authoring team comprised Pablo Hernando-Kaminsky, Imtiaz Ul Haq, Alvaro Pedraza, Nicolas Cogorno, and Kianna Freeman. Sergio L. Schmukler, research manager at the World Bank's Development Research Group, provided advice throughout the project.

The authors benefited from numerous interactions with researchers from academia and international policy institutions. Markus Brunnermeier from Princeton University, Shawn Cole from Harvard Business School, Amanda Dos Santos from Stern, New York University, and Sophie Sirtaine from the World Bank Group, peer reviewed the report. Roumeen Islam and Rapti Goonesekere from the International Finance Corporation (IFC) provided additional comments. Dilek Aykut, Marcio Cruz, Jeremias Huber, Florian Moelders, and Mariana Pereira-Lopez contributed with additional suggestions. Anusha Chari from the University of North Carolina, Gaston Gelos from the Bank for International Settlements, and Jean Pesme from the World Bank Group peer reviewed the original concept note for the report.

Chris Vellacott from IFC's publications team at the World Bank Group led editorial production with Irina Sarchenko who oversaw graphic design. Erik Churchill and Monica De Leon of World Bank Group communications led dissemination and promotion of the research. We also thank Adama Badji, Gleice De Marrocos, Sabrina Islam, Linette Malago, Fatima Yousofi for their exceptional administrative support.

This report is a product of IFC and the Private Markets Department within the Development Economics Vice Presidency at the World Bank Group.

# Contents

<b>Foreword</b> .....	<b>4</b>
<b>Main Messages</b> .....	<b>6</b>
<b>Overview</b> .....	<b>8</b>
<b>Introduction</b> .....	<b>15</b>
<b>Chapter 1: Mapping Corporate Borrowing Costs</b> .....	<b>21</b>
Corporate Borrowing Costs Across Countries .....	23
Within-Country Dispersion in Borrowing Costs .....	32
What Drives Corporate Borrowing Costs? Evidence from Existing Studies.....	34
<b>Chapter 2: Corporate Borrowing Costs Across Countries</b> .....	<b>43</b>
What Explains the Variation in Real Yields? .....	45
How Much of the LMIC-HIC Yield Spread is Accounted for by Firm Observables? .....	58
<b>Chapter 3: Policies to Reduce Corporate Borrowing Costs in LMICs</b> .....	<b>61</b>
Country Risk Premia and Macro-Financial Stability .....	63
Sovereign Benchmarks and Market Foundations.....	65
Deepening the Domestic Investor Base .....	68
International Integration .....	70
The Benefits of Information Disclosure .....	71
Areas for Future Research .....	76
<b>References</b> .....	<b>80</b>
<b>Appendixes</b> .....	<b>89</b>
Appendix A: Country and Economy Income Classifications.....	90
Appendix B: Data .....	92
Appendix C: LMIC Corporate Bond Yields Against Different Benchmarks.....	96
Appendix D: Financial versus Nonfinancial Firms.....	99
Appendix E: Real Yields Using Realized Inflation .....	102
Appendix F: Nominal Yields.....	110
Appendix G: Using Mean Real Yields Instead of Medians .....	118
Appendix H: Regression Tables Using Realized and Expected Real Yields.....	121
Appendix I: Regression Results When Considering Only Nonfinancial Firms .....	128
Appendix J: How Much of The LMIC-HIC Yield Spread is Accounted for by Firm-Level Observables (Domestic and International Markets)? .....	132
Appendix K: Machine-Learning Model for Predicting the Cost of Debt .....	134
Appendix L: Estimated Interest Payment Savings—An Illustration .....	139

# Foreword

**B**usiness owners need access to functioning capital markets to raise funds for expanding capacity, developing new products, buying technology, and generating the jobs that are the backbone of prosperity.

But it is an established reality that firms in emerging markets face bigger hurdles and pay higher interest on the money they borrow than their counterparts in advanced economies. Companies are starved of credit most in precisely those countries most in need of a thriving private sector.

This report proposes ways to fix that problem and unblock emerging-market entrepreneurs' access to investment capital both at home and abroad. World Bank Group economists looked at more than 300,000 bonds sold by 50,000 firms in 138 countries—nearly all of the corporate bond issuances in developing economies over

the past 35 years—and identified measures governments and business leaders in developing countries can take to unlock cheaper funding.

Opening economies to foreign investors is one way for governments to lower borrowing costs, easing the passage of money from abroad. This study also finds that introducing more robust standards of corporate disclosure leads to lower interest rates on the money that companies borrow. If investors find it easier to understand what they are backing, they are more inclined to risk their capital.

Meanwhile, sound management of a country's public accounts has a measurable impact on credit markets. A healthy fiscal position means a government can borrow more cheaply from international investors which this analysis finds has a knock-on effect on the interest charged to companies in the same country.

It is important not to rely too much on international investment because this leaves an economy vulnerable to external shocks. Shaking up a country's pensions system to establish privately managed retirement accounts creates local investment pools, feeding through to quantifiably lower bond yields for firms.

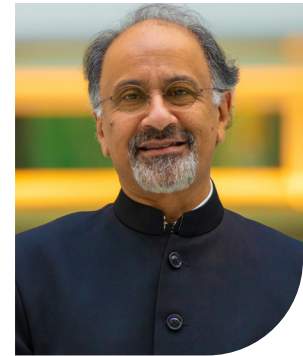
In sum, removing foreign investment barriers, strengthening domestic investor bases, improving corporate disclosure, and maintaining fiscal discipline allows emerging market businesses a fairer contest when competing with their peers abroad.

These steps would cut billions of dollars from the interest companies pay their creditors, freeing up money that can then be invested in growing businesses and hiring more workers, with benefits for development at a time when the needs are greatest.



**MAKHTAR DIOP**

Managing Director,  
International Finance  
Corporation



**INDERMIT GILL**

Chief Economist &  
Senior Vice President  
for Development  
Economics,  
World Bank Group

# Main Messages

**Companies in developing economies often struggle to borrow the funds they need to expand activity and hire more workers.** For them, the cost of borrowing is often steeper than it is in most advanced economies. But it can be lowered substantially, according to this global analysis of essentially all bond issuances over 35 years.

**The analysis finds that governments and business leaders in developing countries can act to curb the cost of borrowing.** Effective actions include lifting barriers to foreign investment, boosting the domestic investor base (for example, by promoting pension and other savings vehicles), and

disclosing more information about company prospects and finances. The World Bank Group study is centered on 330,000 bonds sold in domestic or international markets by 50,000 companies in 138 countries.

**Allowing foreign investors greater access to local capital markets increases the number of emerging market firms raising money via bonds, the study finds.**

It also reduces corporate borrowing costs for bonds issued in international markets by 1.2 percentage points. For example, even applying this result only to firms in the 47 least financially open countries, the estimated

interest-payment savings over the past decade would have totaled \$78 billion<sup>1</sup> on international issuances.

**To gauge the benefits of a larger domestic investor base, the study estimates the impact of pension reforms that introduced privately managed retirement accounts.**

These reforms helped build pools of domestic savings that could be invested in local capital markets. The resulting increase in available funding reduced yields on domestically issued corporate bonds by about 1.5 percentage points. Applying this result to firms in 34 countries where domestic pension markets remain small,

<sup>1</sup> All dollar references throughout the report are U.S. dollars unless otherwise stated.

this would have translated into an estimated \$25 billion in interest-payment savings over the past decade on domestic issuances. But further savings can be attained in all countries, through additional measures to broaden the investor base and to boost the supply of investable funds.

**Better disclosure regulation also helps unlock capital markets for emerging market corporations.** More corporate transparency reassures investors, making them more inclined to buy a company's bonds. This study finds an association between greater corporate transparency and falling borrowing costs, particularly in domestic bond markets.

**Sound management of public finances can also improve borrowing conditions for private companies.** A one-percentage-point drop in a country's sovereign bond yields is associated with a 76-basis-point decline in corporate yields in domestic markets and a 46-basis-point decline in international markets. Delivering these conditions may not be easy but can be a powerful avenue to support the performance of domestic private businesses.

**Developing the domestic bond market helps insulate companies from swings in global capital markets.** The study finds that a one percentage point rise in the U.S. federal funds rate is

associated with a 47 basis point increase in corporate interest rates when borrowing on international markets but only a 10-basis-point rise when borrowing domestically.

This evidence highlights how **targeted policy reforms could unlock growth** by making it easier for firms to access capital in economies where credit is traditionally harder to access.

# Overview

**High and uneven borrowing costs often constrain private sector development, especially for firms in low- and middle-income countries (LMICs).** When businesses face expensive financing, they invest less, adopt new technologies more slowly, and create fewer jobs. Elevated borrowing costs weaken firms' balance sheets and reduce their resilience to shocks, amplifying macroeconomic volatility. A better understanding of these costs and their drivers—including global-, country-, firm-, and bond-level factors—can provide clues for possible actions by policymakers and business leaders. Lowering the cost of borrowing would have implications that extend beyond financial markets, facilitating firms' investments and improving real economic outcomes.

**This report analyzes essentially all bond issuances globally, in domestic and international markets, between 1990 and 2024.** The data encompasses more than 330,000 bond issues, covering over 50,000 firms worldwide, spanning 87 low- and middle-

income countries and 51 high-income countries. This extensive dataset provides one of the most comprehensive cross-country assessments of corporate borrowing costs to date and substantially expands the evidence base on local-currency borrowing, which now accounts for the vast majority of LMIC corporate bonds. The report further integrates global, country-, firm-, and bond-level drivers within a unified empirical framework, enabling direct comparison of their relative importance and providing new evidence on how key policy interventions—such as pension reforms and market liberalization— affect firms' cost of debt.

**The findings reveal large and persistent differences in borrowing costs across countries and firms.<sup>2</sup>** These differences are economically meaningful: for example, firms operating in the same country and issuing in the same currency often face markedly different financing terms. The report explores the drivers of these patterns and potential avenues for reducing borrowing costs.

---

<sup>2</sup> Borrowing costs are measured as real yields on corporate bonds at issuance, adjusted for inflation and the currency of denomination. Real yields measure the true economic burden of borrowing, as inflation influences not only debt service obligations but also firms' revenues and input costs, thereby affecting their capacity to repay.

## Firms in Low- and Middle-Income Countries Face Higher Borrowing Costs

**Real yields on bonds issued by firms from low- and middle-income countries are higher on average than those for firms based in high-income countries.** From 2015 to 2024, median corporate borrowing costs in LMICs were 2 percentage points higher in real terms than in high-income countries.<sup>3</sup>

**Borrowing costs in low- and middle-income countries can vary substantially, both across and within countries.** Even within a LMIC country, the typical spread between lower- and higher-cost borrowers is 1.6 percentage points, almost as large as the average gap between LMICs and high-income countries (HIC).<sup>4</sup> This dispersion underscores that high borrowing costs are not uniform. Although many firms face expensive financing, others are able to borrow on relatively favorable terms.

## Global-, Country-, and Firm-Level Factors All Matter

**Variation in borrowing costs reflects a mix of global trends, country conditions, firm characteristics, and bond features.** Global-, country- and firm- level factors explain most of the variation in LMIC corporate yields while industry factors and bond design play a smaller role (**Figure O.1**). As shown in the report, country

factors exert more influence in LMICs than in richer economies. This is likely to reflect the fact that the economies of LMICs are more impacted by country-specific shocks than global economic cycles.

## The Estimated Influence of These Factors on Borrowing Costs Varies Widely

**Global financial conditions are found to have a large impact on borrowing costs for firms everywhere (**Figure O.2**).** A 1 percentage point increase in the U.S. federal funds rate is associated, on average, with a 10 basis point increase in costs for LMIC corporations when borrowing in domestic markets and a 47 basis point increase in international markets.

**Country level economic fundamentals, including economic growth and sovereign yields, also matter.** In LMICs, higher economic growth and income per person are associated with lower borrowing costs, particularly in domestic markets. For example, a 1 percentage point rise in real GDP growth corresponds to a 26 basis point decline in domestic market corporate yields. This trend suggests that robust economic expansion enhances cash flow and repayment capacity for corporations, thereby reducing perceptions of credit risk among investors. Sovereign borrowing costs also pass through to firms. A one percentage point rise in a country's sovereign yields is associated with

<sup>3</sup> A median (the observation above one half of the distribution and below the other half) is less influenced by extreme observations than is the case for the average. Using nominal rates, the corresponding LMIC-HIC (high-income country) gap is 2.7 percentage points for all bonds.

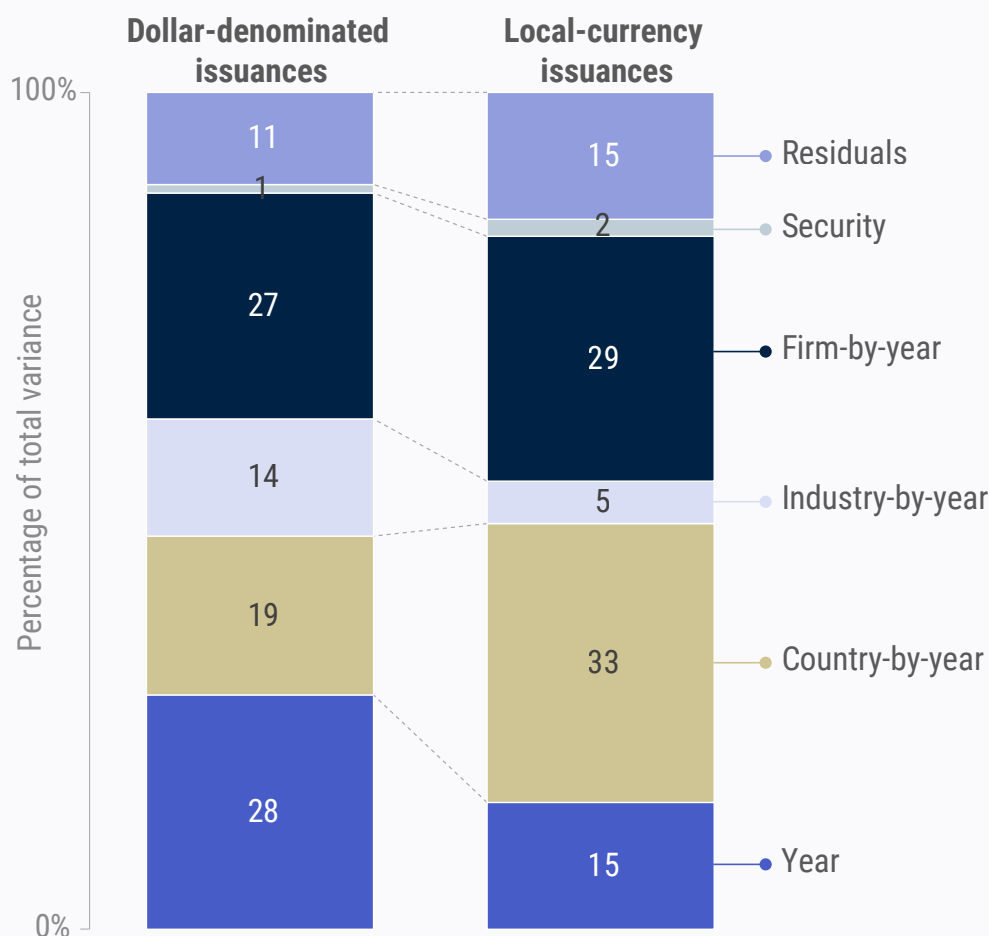
<sup>4</sup> This spread refers to the interquartile range—the yield difference between the 25th and 75th percentile in the within-country distribution for all bonds issued.

a 76 basis point increase in corporate yields in domestic markets and a 46 basis point rise in international markets.

**Firm-specific traits are crucial, especially where investor information is limited.** Larger firms tend to secure lower borrowing costs because lenders are reassured by their scale. For LMIC issuers, moving from the 25th to the

FIGURE O.1

### Decomposition of the Variation of Real Yields in Low- and Middle-Income Countries



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund’s World Economic Outlook.

**Note:** The figure reports the share of total variance in yields explained by each block in a sequential variance decomposition based on changes in adjusted R<sup>2</sup> across a sequence of regressions with (i) year fixed effects, (ii) country-by-year fixed effects, (iii) industry-by-year fixed effects, (iv) firm-by-year fixed effects, and (v) security-level characteristics. Bars are shown separately for real yields for dollar-denominated issuances (left panel) and real yields for local-currency bonds (right panel). “Year” captures year-specific forces common to all countries in the group under consideration (for example, global risk-free rates or global shocks).

75th percentile of firm size is associated with borrowing costs that are 78 basis points lower in domestic markets and 56 basis points lower in international markets. In international markets, firms from low- and middle-income countries with more debt face higher costs.

**Ownership structure and market experience also influence borrowing costs.** State-owned enterprises (SOEs) and subsidiaries of multinational corporations usually pay less to borrow because investors are reassured by the likelihood that the government or parent company would support the company if it ever came under pressure. For domestic market issuances in low- and middle-income countries, SOE issuers pay yields that are 50 basis points below non-SOEs. Subsidiaries are associated with 31 basis point lower yields. Firms that have previously raised money in debt markets also benefit from lower borrowing costs. LMIC firms that previously accessed both syndicated loan and debt markets see yields that are 23 basis points lower for bonds issued in domestic markets and 31 basis points less for bonds issued in international markets.

**Transparency is especially important for LMIC firms borrowing internationally.**

Unlisted LMIC firms pay 84 basis points more in borrowing costs than public companies when issuing in international markets. This reflects investor demand for standardized and credible information that listed firms are mandated to provide. In domestic markets, a listing appears to matter less because local investors often rely on

relationship-based networks for information.

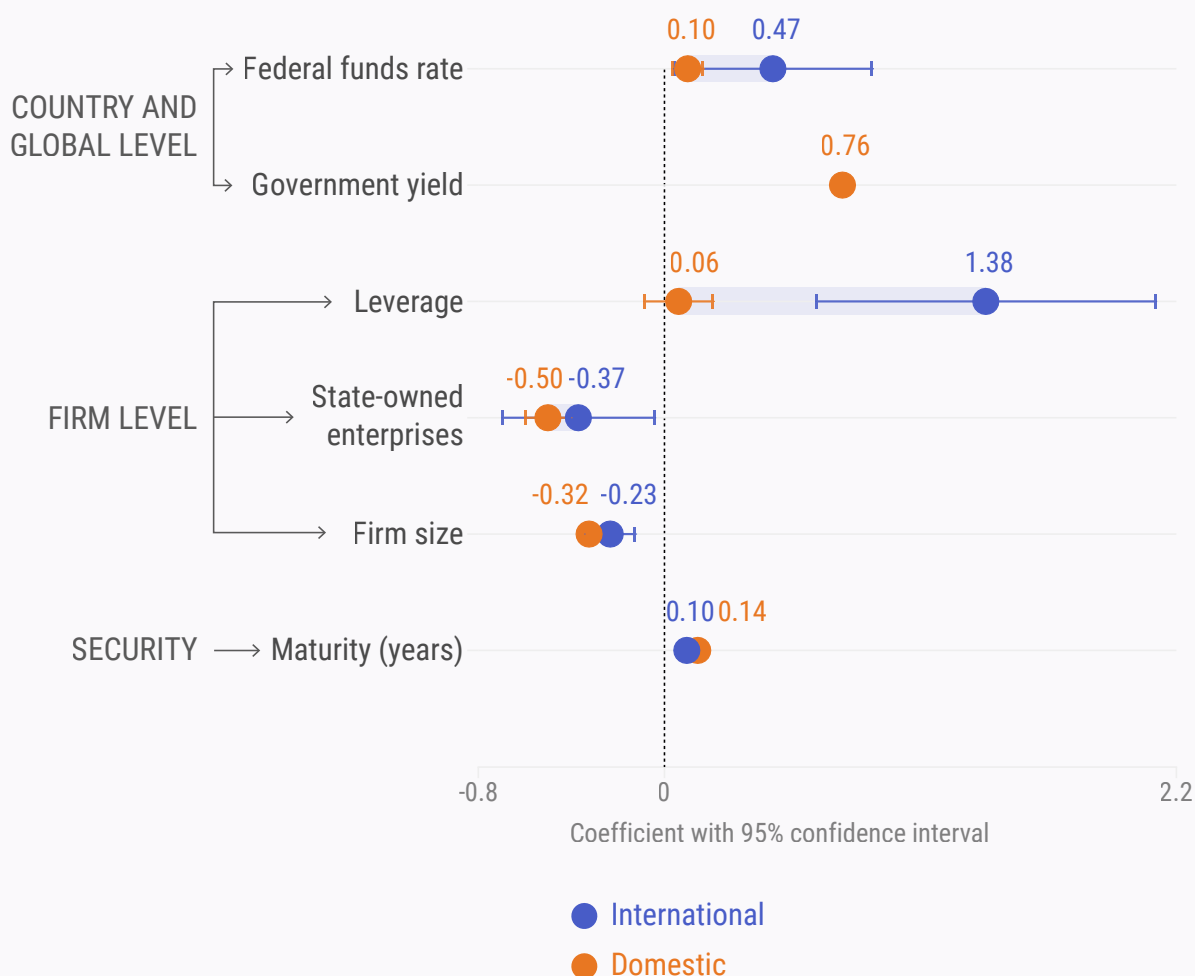
**How firms borrow also affects financing costs.** Longer-maturity bonds are associated with higher interest rates, especially in LMICs where future conditions are less predictable. For LMIC firms, each additional year added to a bond's maturity increases borrowing costs by 14 basis points in domestic markets and 10 basis points in international markets. The size of a bond and whether it is privately placed also affect costs. In international markets, larger bonds lower costs for high-income country corporations but raise them for LMIC companies. Private placements<sup>5</sup> are associated with moderately lower yields in domestic markets since they are often sold to known local investors who have better information about the issuer and therefore require a smaller premium. However, these transactions are associated with higher yields in international markets, consistent with thinner secondary trading and higher legal, documentation, and monitoring costs.

**The gap in corporate borrowing costs between low- and middle-income countries and high-income countries partly reflects the observable differences in firm types, bond characteristics, and macroeconomic (economic growth) conditions across the two groups.** Accounting for these characteristics reduces the LMIC-HIC gap by about a third. The remaining gap suggests that investors demand an additional risk premium when lending to LMIC corporates beyond these differences.

<sup>5</sup> Private placements are bonds sold directly to a small group of investors (often institutional), rather than offered broadly to the public through a public offering.

FIGURE O.2

### Estimates of the Global, Country, and Firm-Level Effects on Real Corporate Yields in Low- and Middle-Income Countries



**Source:** Calculations using issuance data from the Securities Data Company Platinum database and firm balance sheet data from Worldscope, both from London Stock Exchange Group, inflation data from the International Monetary Fund’s World Economic Outlook, sovereign data from Bloomberg and federal funds rate data from the Federal Reserve Economic Data database.

**Note:** This figure shows the results of the regression analysis using coefficient estimates for LMICs. Each point on the figure represents a regression coefficient. The horizontal bar attached to each point illustrates the 95% confidence intervals. The vertical dashed line at zero divides the chart: coefficients to the left of this line indicate lower yields, while those to the right indicate higher yields. All coefficient values are shown in percentage points, so a value of 1.0 equals 1 percentage point, or 100 basis points. Maturity is measured in years, so coefficients are per additional year of maturity. SOE is an indicator variable (0/1), so the coefficient compares firms with the attribute to firms without it. Size is the natural log of real assets, so the coefficient corresponds to proportional changes in assets (for example, a 10% increase in assets is about a 0.10 increase in log assets). Leverage (debt/assets) is a ratio; it is measured in percentage points (for example, a 10 percentage point increase corresponds to a 0.10 increase in the underlying ratio), so the coefficient should be interpreted as the effect of a 1 percentage point change in the corresponding ratio. Domestic sovereign yields and the federal funds rate are expressed in percent, so coefficients on these variables should be interpreted as the effect of a 1 percentage point change.

## Measures to Lower the Borrowing Costs of Firms

**Although firms' borrowing costs are heavily influenced by global and country developments, policymakers and firms can also take actions to reduce such costs.** The estimates confirm that country fundamentals, such as economic growth and macroeconomic stability, and firm-level fundamentals, such as profitability and balance sheet strength, play an important role.

**Sound fiscal management can reduce financing costs for both public and private issuers.** Given the strong estimated pass through from sovereign yields to corporate borrowing costs, policies that improve fiscal sustainability and reduce inflation uncertainty have important benefits for the private sector as well.

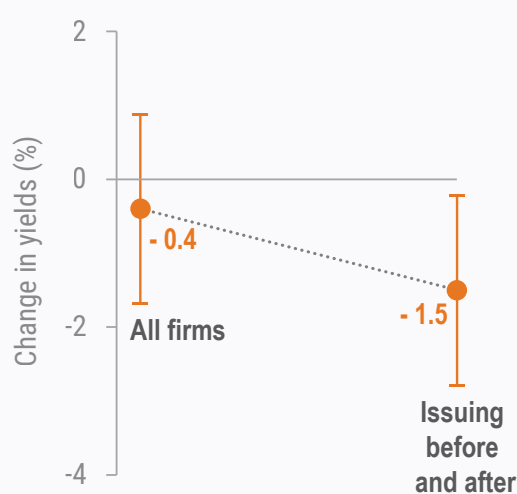
**Policies that increase investable savings can spur fundraising in capital markets and reduce borrowing costs.** For example, an analysis of the impact of moving to prefunded pension systems shows that such policies are associated with faster growth of domestic capital markets and lower borrowing costs. Mandating retirement contributions by workers in individually-funded accounts promotes the growth of private investment and pension funds, giving firms access to a new pool of savings at a lower cost. In LMICs that undertook such reforms between 1990 and 2024, domestic cumulative net capital issuances (as a share of GDP) increased roughly fivefold, and corporate yields declined by up to 150 basis points in the four years following the

reform (**Figure O.3**), highlighting the benefits of domestic capital market development.

**Similarly, international financial integration broadens external financing opportunities and lowers borrowing costs.** Capital account liberalization and associated openness measures enhance firms' access to global investors, leading to greater supply of financing and thus increased

FIGURE O.3

### Firms in Countries With Pension Reforms Experienced Lower Real Yields in Domestic Markets



**Source:** Calculations using Securities Data Company Platinum from London Stock Exchange Group, International Federation of Pension Fund Administrators, and World Bank World Development Indicators.

**Note:** The figure reports average treatment effects on real corporate bond yields for domestic issuances, shown for all issuers (firms) and separately for firms issuing both before and after reform. The sample includes 30 low- and middle-income countries (LMIC) that implemented major pension reforms introducing mandatory or quasi-mandatory individually funded programs between 1990 and 2024. Estimates come from an event-study design comparing reforming countries to LMICs that have not yet implemented—or never implement—similar reforms during the sample period. The event year is the first year a major reform is implemented in each country. Points denote mean estimates across bootstrap replications; bars show the 5th and 95th percentile range.

foreign bond issuances and lower borrowing costs for firms participating in international markets. The analysis finds yield compression for established international issuers, whereas average costs for all issuers do not change as higher-risk firms enter the market. Meanwhile, domestic issuance remained stable, indicating that LMICs implementing these reforms gain exposure to international markets without displacing domestic financing.

**Stronger regulatory disclosure requirements are associated with lower corporate borrowing costs and higher issuance volumes.** Countries with stronger mandated transparency, particularly requirements related to audited financial statements, ownership structures, compensation disclosure, and board information, tend to have lower corporate yields and higher issuance volumes, which is consistent with increased investor information. Firm-level measures can also complement country-level reforms to reduce the cost of borrowing and increase bond issuance. Firms that improve corporate governance, transparency, and financial reporting can lessen borrowing costs even within existing institutional constraints.

**Overall, the evidence confirms that, although there is no single quick fix, actions by policymakers and firms can make a dent in borrowing costs.** The most impactful measures, such as those to improve a country's fiscal sustainability or a firm's financial strength, are the most challenging ones and take time. But the evidence also suggests that improving transparency both at the country and the firm level, and increasing the supply of financing through both domestic capital market expansion and international opening can make a material difference. Assiduous reforms in this direction can make financing more affordable, thereby enabling firms to invest, expand, and innovate.

# Introduction

**AUTHORS:**

**Paolo Mauro**

**Cesaire A. Meh**

**A**ccess to affordable finance is central to firms' ability to invest, grow, and create jobs. However, costly financing often remains an obstacle, particularly in low- and middle-income countries (LMICs).<sup>6</sup> Higher borrowing costs raise companies' hurdle rates for investment, compress profit margins, weaken balance sheets, and reduce resilience to shocks. At the macroeconomic level, persistently high borrowing costs can dampen private investment, impede technology adoption, restrict employment, and lower productivity growth.<sup>7</sup> Conversely, low and stable borrowing costs can foster dynamism and support sustained economic growth.

This report aims to deepen understanding of the factors underlying the cost of borrowing for corporations, by examining the yields of bonds issued in domestic and international markets between 1990–2024, across more than 130 countries.<sup>8</sup> As documented in recent work (Meh & Schmukler, 2025), corporate bonds have become an increasingly important and accessible source of debt finance in LMICs.<sup>9</sup> Indeed, more firms are using bond issuance, and the average issuance size has gradually declined in recent years. These trends reflect a deepening of financial markets and a shift from reliance on bank loans. Although firms issuing bonds on capital markets still represent a fraction of the total number of firms in an economy, they usually account for a large share of national income and are linked to smaller companies as providers or purchasers. Moreover, capital

market financing for corporations can free up bank loans or other resources for smaller firms.<sup>10</sup>

This report contributes to existing literature in three ways. First, it provides systematic cross-country evidence on the cost of borrowing for firms across low-, middle-, and high-income economies. Much of the existing literature focuses on high-income or upper-middle-income countries, with relatively limited evidence on corporate bond pricing in lower-income settings. This represents an important gap from both a policy and firm perspective, as companies in these countries typically face more binding financing constraints alongside substantially higher borrowing costs. This report addresses this gap by analyzing a large and comprehensive dataset of corporate bond issuances, which includes over 75,000 bond sales

---

<sup>6</sup> About 19% percent of firms in LMICs, on average, consider access to finance as their biggest obstacle, based on the World Bank Group's Enterprise Surveys. Low- and middle-income country groupings follow the World Bank's income classifications as of 2005 (Appendix A).

<sup>7</sup> See Brunnermeier & Krishnamurthy (2020) for the macroeconomics of corporate debt.

<sup>8</sup> By focusing on bonds, this report considers only a subset of corporates' debt—it does not analyze loans from banks or non-bank intermediaries. The other component of corporates' external finance—equity—will be analyzed in complementary work. Internal finance consists of firms' own profits or proceeds generated by the sale of firms' own assets.

<sup>9</sup> Previous studies have analyzed various aspects of corporate bond markets—for example, BIS (2019); Pagano et al. (1998); World Bank (2017, 2020); Calomiris et al. (2022). See also chapter 1.

<sup>10</sup> For a recent report on how to boost finance for small and medium-sized enterprises, see Carvajal & Bebczuk (2019).

by more than 15,000 firms across 87 LMICs (31 upper-middle-income, 33 lower-middle-income, and 23 low-income). In addition to its broad geographic coverage, the dataset spans more than three decades, exceeding the temporal scope of most existing studies.

Second, the report provides a comprehensive analysis of local-currency corporate bond issuances in LMICs. Existing evidence on corporate borrowing costs in these markets has been constrained by data limitations, with most studies focusing on foreign-currency bonds—typically U.S. dollar issuances in international markets.<sup>11</sup> However, a substantial and growing share (almost 90 percent) of LMIC corporate bond issuances is currently denominated in local currency within domestic markets.<sup>12</sup> These are particularly important for first-time and infrequent issuers which rarely access international markets. At the same time, barriers to entry in local bond markets have declined, as reflected in a reduction in average issuance sizes, contrasting with international markets where issuance sizes have tended to increase. Even for the subset of LMIC firms that can access both markets, domestic and international bond

markets serve distinct financing roles. Pricing in local-currency markets therefore remains a central determinant of firms' overall cost of capital (Gozzi et al., 2015).<sup>13</sup> This report addresses the gap by examining over 250,000 local-currency bonds, substantially expanding the empirical evidence on domestic corporate bond markets in LMICs.

Third, it systematically analyzes the relative importance of global, country, firm, and bond-level drivers within a unified empirical framework, enabling direct comparability across competing factors. Although many of these drivers have been documented in prior studies, evidence remains fragmented across datasets, countries, currencies, and methodologies.<sup>14</sup> By bringing these elements together in a consistent cross-country setting, the report provides a robust basis for comparing effect sizes and assessing the generalizability of existing findings across a broad range of markets.

This integrated framework also enables a more policy-relevant assessment of the constraints shaping corporate borrowing costs. Building on this foundation, the report further examines the impact of select policy interventions—such as

---

<sup>11</sup> Relevant studies include Durbin & Ng (2005), Dittmar & Yuan (2008), Cavallo & Valenzuela (2010), Dailami (2010), Gozzi et al. (2015), Garay et al. (2019), Bevilaqua et al. (2020), and Li et al. (2021). All these focus on hard currency LMIC bonds except for Bevilaqua et al. (2020), which examines local-currency bonds but only those issued in international markets. In addition, market indexes (such as JPMorgan's CEMBI), while valuable for tracking risk premiums, tend to be similarly restricted to hard currency bonds by LMICs. Furthermore, they typically cover a limited number of large, liquid bonds and thus do not capture the majority of LMIC corporate bond issuers.

<sup>12</sup> The few studies examining local-currency yields cover individual countries or only a handful of LMICs, primarily large upper-middle income countries. For example, Timmer (2018) includes two lower middle-income countries and no low-income countries in its sample of 18 emerging markets. Similarly, Abraham et al. (2021) covers only two lower middle-income and no low-income countries in their sample.

<sup>13</sup> Even among LMIC firms that can issue in both markets, international bonds are typically larger, longer-maturity, and with fixed rates, whereas domestic bonds are smaller and more tailored to local-currency and shorter-term needs, indicating that the two markets are functionally segmented rather than close substitutes.

<sup>14</sup> Table 1.1 (Chapter 1) provides a structured overview of representative studies for each of these factors.

pension reforms, capital market liberalization, and inclusion in global bond indexes—on corporate borrowing costs. These exercises provide new cross-country evidence on the transmission of structural and institutional reforms to firm-level financing conditions, an area where empirical evidence remains limited.

This report builds on a recent study—*Financing Firm Growth: The Role Capital Markets in Low- and Middle-Income Countries*—which documented the central and rising role of bond and equity markets and their impact in supporting private-sector investment, job creation, and growth in LMICs. That previous study thus focused on quantities—who borrows, from where, through what instruments, and in what amounts. Although access to finance is critical, the cost of financing is equally important. Indeed, a complete picture requires considering both prices and quantities. Accordingly, this report complements the earlier analysis with an examination of the price of financing, focusing on bonds.

## Determinants of the Cost of Borrowing—Main Questions

The report examines the factors underlying corporations' borrowing costs, with a view to identifying potential actions to reduce such costs.

A firm's cost of borrowing depends on its ability to convince lenders that its business is commercially viable and that it will be able and willing to repay its obligations. Not all of this is within the firm's control. The company's owners, managers, and workers play a crucial role. But global, national, or other economic developments also impact the firm's financial prospects. Similarly, institutional and political factors shape the environment in which firms operate. For instance—perhaps reflecting some of these factors—firms in LMICs face higher borrowing costs, on average, than their comparable peers in advanced economies.<sup>15</sup>

To illustrate through a partial list of examples, such potential determinants of the cost of borrowing include, at the global level, policy interest rates in the core advanced economies or measures of global uncertainty and risk aversion. At the country level, they include economic growth, the government's cost of borrowing (in turn reflecting sovereign credit risks), or the level and volatility of inflation. At the firm level, they include ownership (private or public), measures of profitability or leverage; at the security level, maturity, amount issued or offering type (public or private placement).

---

<sup>15</sup> Some have suggested that gaps in the cost of borrowing between advanced and emerging/developing economies exceed what would be justified, based on actual default and recovery experience (see, for example, Remolona et al., 2008). This question will not be addressed in the present report, because default and recovery information is not systematically available for all bonds whose yields at issuance are analyzed here. Instead, the report will take a pragmatic approach, seeking to identify the various levers of possible action to reduce borrowing costs for firms in emerging market and developing economies.

This variegated and complex array of possible factors suggests—and the report will confirm—that there is no simple or singular way of reducing the cost of borrowing, but a wide range of actions by policymakers and firms can, over time, make a material difference.

The report analyzes the following issues:

- **How high are borrowing costs and how much do they vary for firms across the globe?** Combining a bird's-eye perspective on the data with a review of previous studies on the determinants of corporate yields, Chapter 1 documents the variation in borrowing costs across countries, over time, across markets and currencies, and firm-level characteristics, and prepares the ground for in-depth analysis.
- **What determines an individual firm's borrowing costs?** Econometric analysis in Chapter 2 estimates the impact of global financial developments, country-level conditions (such as the economic growth rate or the yield on government bonds), company-specific features (such as size and leverage), and design features of each bond (such as its maturity). The analysis also explores whether these influences differ for firms in LMICs compared with HICs.
- **Measures to curb the cost of borrowing.** Chapter 3 looks at actions that policymakers or companies can take to alleviate investor concerns, boost the growth of bond markets, and reduce the cost of borrowing. Such steps encompass government policies and reforms to improve macroeconomic stability and reduce the likelihood of government default, as well as the provision of transparent information, both by firms directly and with support from government policies and institutions.



## CHAPTER 1

# Mapping Corporate Borrowing Costs

### AUTHORS:

Nicolás A. Cogorno

Imtiaz Ul Haq

## *Key Messages*

**Corporate borrowing costs generally decline when income per capita increases but vary widely across low- and middle-income countries (LMIC).** Real bond yields tend to fall as economic development rises. Even so, countries at similar income levels exhibit large differences in median borrowing costs, underscoring the role of factors beyond income levels.

**Firms in high-income countries (HIC) enjoy lower borrowing costs than their peers in LMICs.** Median corporate borrowing costs in LMICs are about 2 percentage points higher in real terms (2.7 percentage points in nominal terms) than in HICs, and this gap has generally persisted over time.

**Borrowing costs vary widely across firms within countries, including LMICs.** Even within the same country, currency of issuance, and time period, firms face markedly different borrowing costs, with the variation reaching as high as several percentage points.

**High and uneven borrowing costs reflect multiple factors rather than a single cause.** The documented patterns point to the combined influence of global financial conditions, domestic macroeconomic and institutional factors, and firm-level characteristics. These are all factors which this chapter identifies based on previous studies, to set the stage for more detailed empirical analysis in the following chapter.

**This chapter provides an overview of the main features of the data on corporate bond yields at issuance, adjusted for expected inflation and matched to the currency of denomination. It explores broad patterns that emerge within the wide variation across individual issuances. For example, it documents how the cost of corporate borrowing varies across countries, depending on their level of economic development. But it also highlights that costs vary widely even among countries at similar income levels. Likewise, firms operating in similar macroeconomic and institutional environments often face markedly different financing conditions. Together, these patterns suggest that borrowing costs reflect not only broad macroeconomic and sovereign factors, but also market- and firm-level characteristics. The chapter thus turns to synthesizing insights from previous studies on potential drivers of such borrowing costs, to provide context for the more detailed empirical analysis of specific drivers in Chapter 2.**

## Corporate Borrowing Costs Across Countries

Corporate bond yields differ markedly across countries (**Figure 1.1**, based on the within-country median of real yields for dollar-denominated bonds in panel A, and for local-currency bonds in panel B—see **Box 1.1** for methodology and **Box 1.2** for evidence on the rising importance of local-currency bonds in LMICs).<sup>16</sup> On this basis, two facts stand out: (i) borrowing costs faced by firms are inversely related to a country's income level; and (ii) there is significant variation even across countries with similar income levels, reflecting multiple factors such as political stability (for example, fragile, conflict or violence affected situations tend to be above the line of best fit) or capital market depth and liquidity (for example, small states also tend to be above the line).

Data on corporate bond issuances show a decline in yields as GDP per capita increases, for both dollar- and local-currency denominated bonds. This pattern likely reflects higher risks of default or greater uncertainty about inflation (and thus about ex-post real interest yields) in LMICs, for which investors demand compensation. In turn, such risks may stem in no small part from institutional quality, political instability, or government policies. For example, empirical research finds that high sovereign risk feeds into persistently higher private sector borrowing costs (Li et al., 2021). In other words, when governments are perceived as risky or unstable, local firms also tend to pay more to borrow, with adverse consequences on aggregate private investment and economic growth. Fragile and conflict-affected countries illustrate this mechanism; these countries often exhibit especially high sovereign risk and thus tend to be associated with higher corporate yields than the median LMIC.

<sup>16</sup> The figures in this chapter report medians to reduce the influence of outliers (e.g., China; excluding it does not materially affect the results). The main patterns remain qualitatively similar when using means instead (Appendix G). For comparability, all figures are also presented in nominal terms in Appendix F.

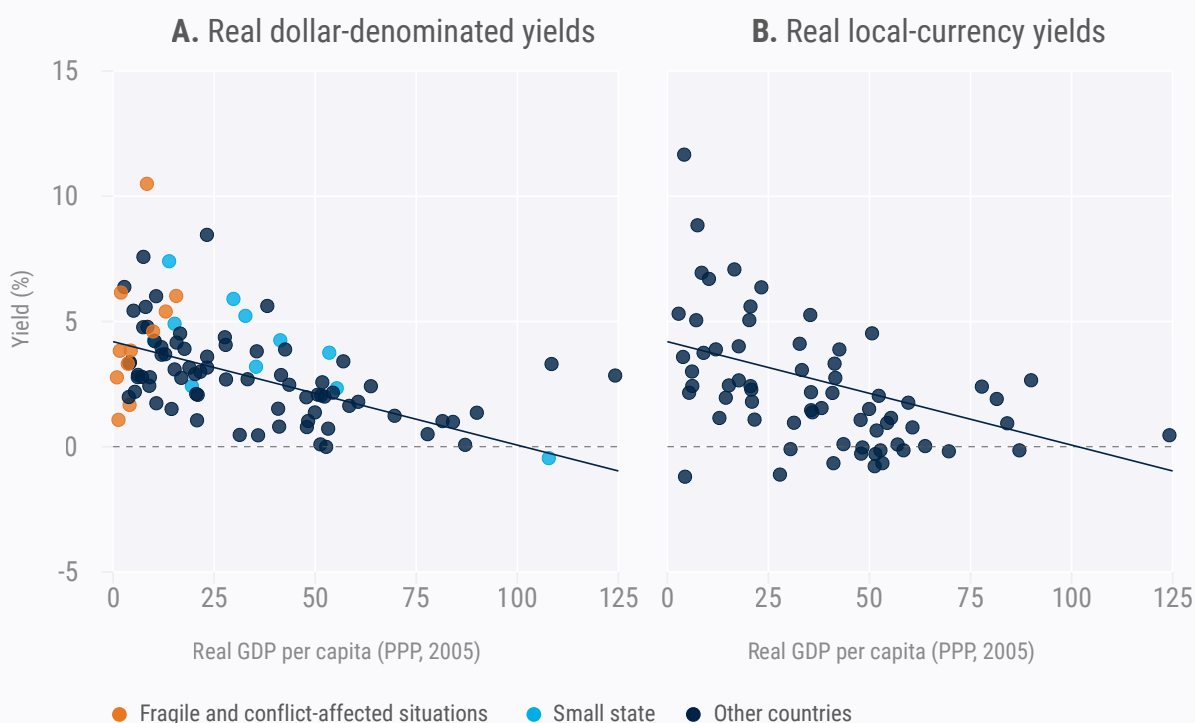
Borrowing costs decline with income similarly for both local-currency bonds and dollar-denominated bonds. As countries become richer, they not only exhibit lower sovereign risk and greater macroeconomic stability, but also develop deeper and more liquid capital markets,

supported by broader domestic investor bases and more reliable sovereign yield benchmarking.

The sizable variation around the trend line in **Figure 1.1**, reflecting different yields for countries with similar GDP per capita, suggests that factors other than economic development

FIGURE 1.1

### Corporate Bond Yields Across Countries, 2015-2024 (Medians)



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group, inflation data from the International Monetary Fund World Economic Outlook and GDP data, Small States and Fragile and Conflict-Affected Situations from the World Bank's World Development Indicators.

**Note:** This figure depicts real yields (calculated using expected inflation at the time of issuance, from the International Monetary Fund's World Economic Outlook) against real GDP per capita, with each point representing a country. For each country, the median yield is calculated by pooling all dollar-denominated bond issuances (panel A) or all local-currency bond issuances (panel B) between 2015 and 2024. In panel A, countries that are members of the Small States Forum or classified as Fragile and Conflict-Affected Situations (FCS) are explicitly identified. A country is classified as FCS if it was designated as such at any point between 2015 and 2024. Due to limited data availability for local-currency bonds in these economies, small states and FCS countries are flagged only in the dollar-denominated bond sample. Real GDP per capita for 2005 is measured in purchasing-power-parity terms and expressed in thousands of constant 2021 dollars. GDP = gross domestic product.

## Measuring the Cost of Borrowing for Firms

This report focuses on the real cost of borrowing for firms using corporate bonds yields at issuance in primary markets, appropriately adjusting for the currency of denomination. This allows us to cover a larger set of firms and countries than previous studies, which instead rely on secondary-market yields. Information based on secondary markets offers important advantages such as high-frequency availability, broad coverage, and suitability for analyzing time-varying risk premia, market integration, and investor sentiment. In deep and liquid markets, secondary-market yields can also approximate the pricing terms faced by frequent, investment-grade issuers. Primary and secondary markets, however, serve distinct economic functions, and yields in the two markets need not coincide. Primary-market yields reflect the terms at which firms raise new funding, whereas secondary-market yields also incorporate contemporaneous trading conditions and preferences of a different set of investors (Brugler et al., 2022; Goldstein et al., 2021). As a result, secondary-market prices may differ from the pricing that a comparable new issuance would command. These considerations are especially relevant for firms that issue infrequently or whose bonds trade thinly—features common among firms in LMICs (Goldstein & Hotchkiss, 2020). In such cases, secondary-market yields may be unavailable, infrequently updated, or disproportionately influenced by idiosyncratic trading frictions. By contrast, primary issuances typically benefit from underwriter support and targeted investor outreach, which can facilitate price discovery and placement.

One consideration in using primary markets is that during periods of stress, issuance may be selective, with financially stronger firms more likely to access markets, implying a selection effect (Eichengreen & Mody, 1998). As a result, observed issuance yields reflect the equilibrium price of debt conditional on market access, rather than the full distribution of borrowing costs faced by all firms, implying that crisis-period increases in borrowing costs may be understated if weaker firms are rationed out of issuance. This selection effect, however, is relevant for our analysis as we are interested in estimating the cost of new borrowing by firms, rather than the counterfactual cost that would prevail if all firms retained market access. Furthermore, using secondary yields for estimating the cost of new borrowing assumes firms can raise additional funding at terms comparable to those on outstanding debt, which may not be the case (Boyarchenko & Elias, 2024). Focusing on issuance-level yields therefore complements existing approaches by measuring the cost of debt as experienced by firms at the point of financing.

The analysis uses real (rather than nominal) yields as the appropriate measure of the economic burden of debt from the perspective of the borrowing firm, because the prices of a firm's outputs and inputs are influenced by inflation over time. Nominal yields can differ across countries simply due to differing inflation, even if the underlying real cost of capital is similar. For cross-country comparisons of funding costs, it is essential to consider these inflation differences. Using real yields—adjusting nominal yields by inflation—puts all bonds on a more comparable basis by removing the portion of yield that compensates for local inflation. Indeed, higher inflation in many developing economies explains a substantial portion of higher nominal yields.

## BOX 1.1 (CONTINUED)

---

The (ex-ante) real yield on a bond of maturity  $T$  denominated in currency  $C$  is computed as:

$$r_c(T) = i_c(T) - \pi_c(T)$$

where  $i_c(T)$  is the nominal yield in currency  $C$  at maturity  $T$ , and  $\pi_c(T)$  is the expected annualized inflation rate for currency  $C$  over the same horizon  $T$ . Expected inflation is taken from the International Monetary Fund's World Economic Outlook (WEO) forecasts (at the time of bond issuance) of consumer price inflation for the country in question. All terms are measured at the same maturity.

A firm considering whether to issue a bond in local or foreign currency would compare the nominal yield in local-currency terms  $i_L$  with the nominal yield on a dollar-denominated bond  $i_{US}$  plus the expected depreciation of the local currency versus the dollar over the bond's horizon  $e$ . For the purposes of this large cross-country study, the expected depreciation is assumed to equal the expected difference between the inflation rate in the country in question and the United States (an assumption of so-called "relative purchasing power parity.") Under that assumption and abstracting from other factors, the firm would issue in local currency if the real yield on its local-currency bond is below the real yield it would pay on a dollar denominated bond. In fact,  $i_L - i_{US} + e = r_L - r_{US} + (\pi_L - \pi_{US} + e)$ , where the term in brackets equals zero under relative purchasing power parity.

Expected inflation from the WEO is matched to the bond's currency of denomination (not the issuer's country). Since yields to maturity are quoted at an annual rate, this compounded inflation measure is then converted into an annualized  $T$ -year inflation rate to match the bond's annualized yield.<sup>1</sup> Since WEO projections are only reported up to five years ahead, maturities extending beyond 2029 are handled by carrying forward the 2029 projected inflation rate to the remaining years. The findings in this chapter are qualitatively similar if realized inflation is used instead of expected inflation (Appendix E).

For chapters 2 and 3, realized inflation is used as a proxy for expected inflation (a so-called "perfect foresight" assumption, which does not bias the results unless inflation errors are systematically related to other variables); using realized inflation also results in the ex-post or actual real interest rate. This approach makes it possible to exploit the full sample from 1990, because inflation projections for a large sample of countries are only available from 1999 onward. As before, actual inflation is drawn from the WEO, matched to the bond's currency of denomination (not the issuer's country). For bonds that mature within the observed WEO sample (i.e., through 2024), inflation over the bond's life is computed by compounding realized WEO CPI annual inflation rates over the corresponding bond's maturity horizon. For bonds that mature after 2024, realized WEO inflation is used up to 2024 and WEO inflation projections are used for the remaining years beyond 2024. As before, maturities extending beyond 2029 are handled by carrying forward the 2029 projected inflation rate.

---

<sup>1</sup> Let  $T$  be years to maturity and let  $\pi_{t+1}, \dots, \pi_{t+T}$  be the annual expected inflation rates from the WEO (for the bond's currency) from issuance year  $t$  to maturity. Cumulative expected inflation over the bond's life is

$$\prod_{s=1}^T (1 + \pi_{t+s})$$

To put inflation on the same annualized basis as the yield to maturity, we use the constant annual rate  $\pi^{ann}$ , where

$$\pi^{ann} = \left( \prod_{s=1}^T (1 + \pi_{t+s}) \right)^{1/T} - 1$$

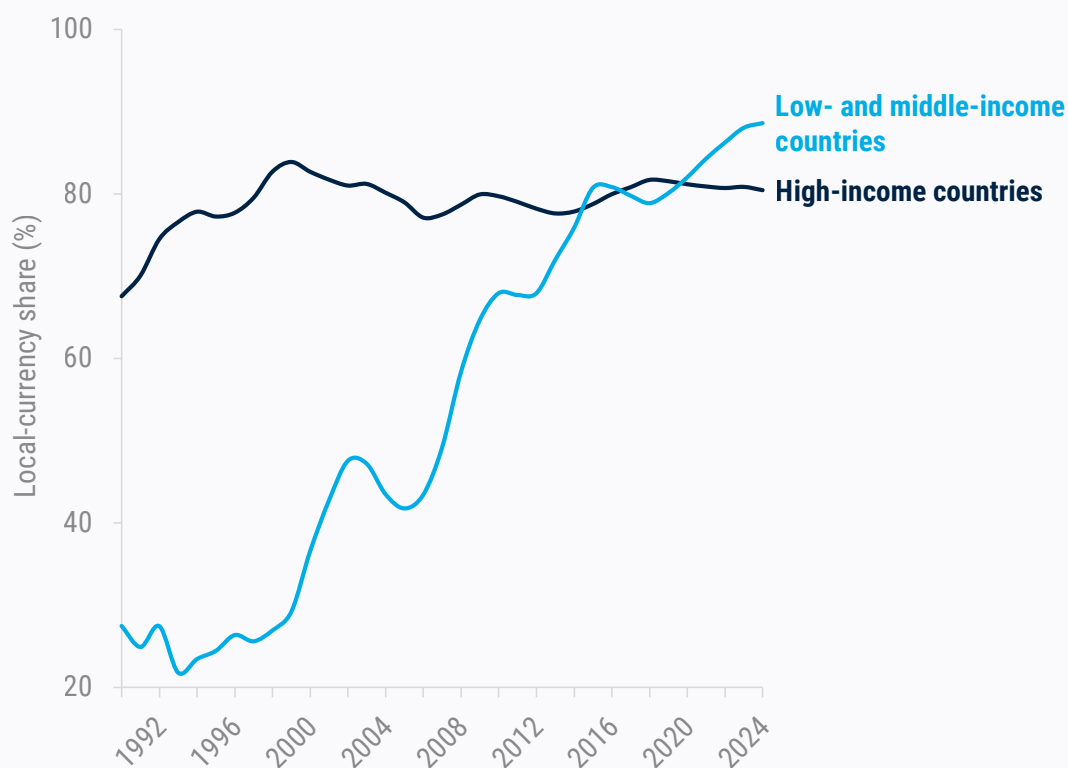
## BOX 1.2

## Rising Importance of Local-Currency Financing for LMIC Corporates

Local-currency issuance as a share of corporate bond issuance in LMICs rose from less than 30 percent in the 1990s to almost 90 percent in 2024, narrowly overtaking the share in high-income countries (Figure 1.2.A). The share rose in all LMIC regions over time, though unevenly (Meh and Schmukler, 2025). Moreover, some issuers (especially smaller, younger, and first-time issuers) may have access only to local capital markets. Thus, an accurate depiction of corporate financing conditions in LMICs can no longer neglect local-currency borrowing.

FIGURE 1.2.A

### Share of Local-Currency Issuances as a Percentage of All Issuances, by Country Income Group



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group.

**Note:** This figure shows the share of local-currency issuances by income category. For each income category, the share is calculated as the number of bonds issued in domestic currency in a given year divided by the total number of bonds issued by firms in that income group in the same year. The series are plotted as three-year moving averages, where each value represents the mean of the previous year, the current year, and the following year. For the first and last years of the sample, the moving average is calculated using only the two available adjacent years. Income categories follow the World Bank's 2005 country income group definitions.

also matter to investors.<sup>17</sup> These factors may stem, for example, from institutional differences such as weaker creditor rights, slower courts, less predictable regulation, or uneven enforcement of contracts. Political instability, conflicts, or the risk of expropriation may also be a source of concern. In turn, these factors can reduce expected recovery values in distress and lengthen the resolution process. A higher yield may thus be required ex-ante to compensate investors.

Variation around the trendline may also reflect differences in capital market development. Corporate bond markets in LMICs are often shallow and segmented, with a narrow domestic institutional investor base, limited market making, high informational asymmetries, and relatively illiquid secondary trading. Thin liquidity widens bid–ask spreads and raises the yield that investors require to hold corporate bonds, particularly for longer tenors or lower-rated issuers (Zhou & Wei, 2023). Small states are particularly prone to such scale-related constraints in capital market development.

**Figure 1.1** shows that firms in these countries tend to face median yields above the line (that is, higher than that predicted by GDP per capita alone).

Overall, the figure indicates that income per capita is a strong but incomplete predictor of corporate borrowing costs. Additional factors at the country, sector, and firm level will be explored in detail later in the report.

### *A Persistent LMIC-HIC Yield Gap*

An alternative perspective on development-related, cross-country differences focuses on the gap in corporate borrowing costs between LMICs and HICs. This disparity amounts to approximately 2 percentage points (based on the median yield in each income category) and is evident for both real dollar-denominated and local-currency yields (**Figure 1.2**, panel A).<sup>18</sup>

**Figure 1.2** (panel B) further shows that median real yields increase monotonically as income levels decline, across both dollar-denominated and local-currency bonds. For dollar-denominated bonds, median yields are similar across LMIC income categories, with the largest differential emerging between LMICs and HICs. For local-currency bonds, yields are similar for low- and lower-middle-income countries but not for other income groups. This pattern suggests that the most substantial reductions in corporate borrowing costs in domestic markets are associated with transitions into higher income brackets, rather than incremental improvements at the lower end of the income distribution. It also implies that the relative cost advantage of local-currency borrowing is not

<sup>17</sup> Although institutions and capital markets tend to become more developed as countries become richer (contributing to the correlation between corporate yields and GDP per capita), the fit of this empirical association is far from perfect.

<sup>18</sup> For comparison purposes, the LMIC-HIC (median) spread for local-currency bonds is approximately 4 percentage points in nominal terms (it remains the same for dollar-denominated bonds). Additionally, Appendix C compares LMIC yields to alternative benchmarks for comparison purposes.

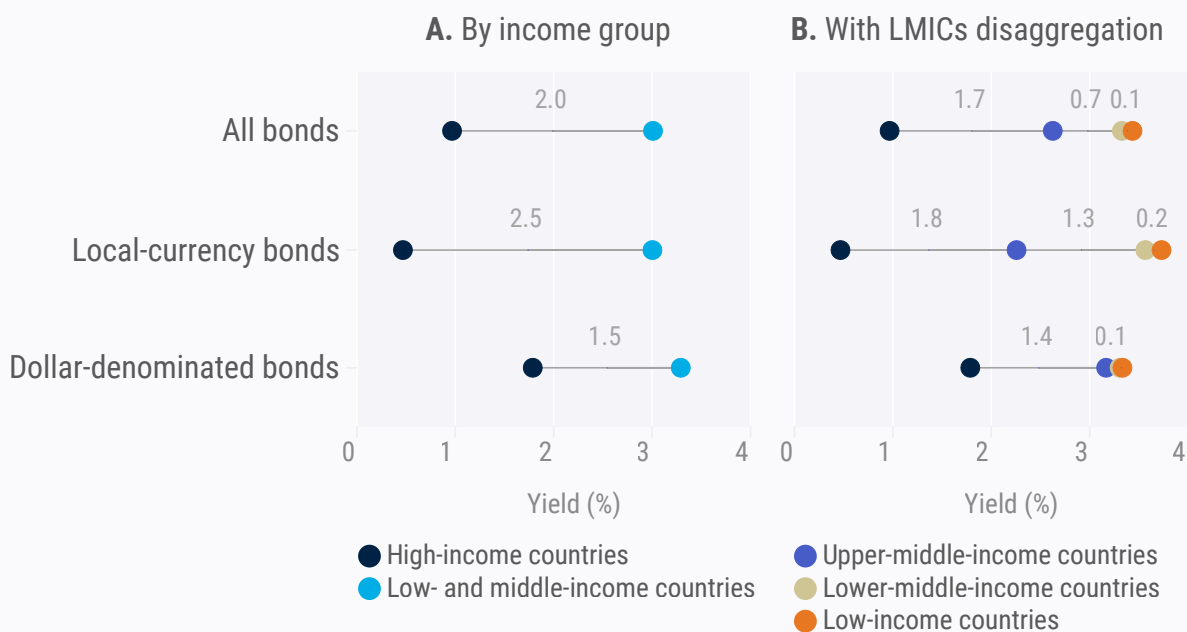
inherent, but depends critically on the depth, diversification, and functioning of domestic capital markets. This has important policy implications, as discussed in Chapter 3.

During the sample period under consideration, the LMIC-HIC spread is larger for local-currency

bonds relative to dollar-denominated bonds. In part, this reflects exceptionally low interest rates for high-income countries prior to the resurgence of inflation in 2021–2022. Accommodative monetary policy in advanced economies compressed sovereign yield curves, anchoring corporate pricing at historically low

FIGURE 1.2

### Corporate Bond Real Yield Spread Between Low- and Middle-Income Countries and High-Income Countries, 2015–2024

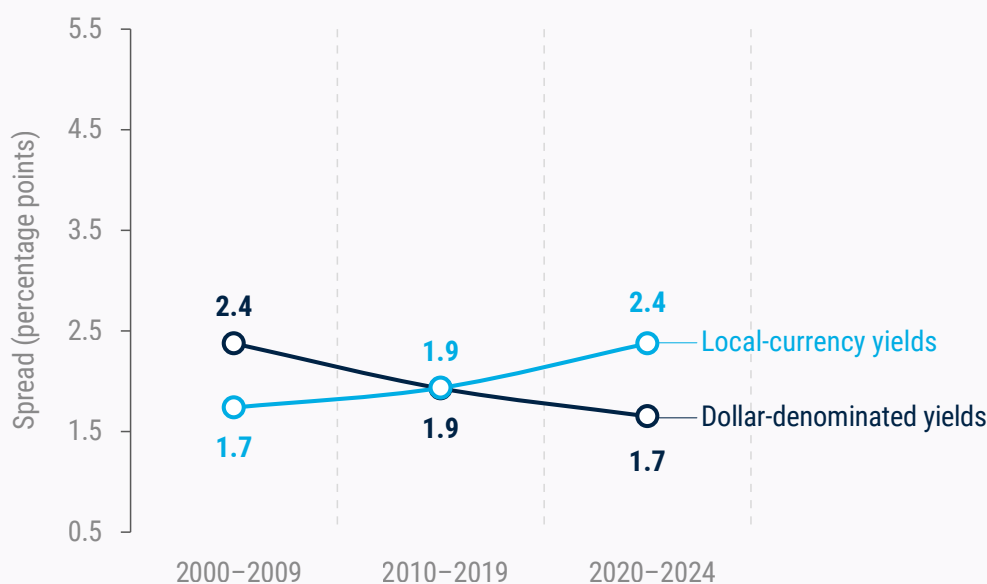


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund World Economic Outlook.

**Note:** This figure displays the median real yields (adjusting for expected inflation) for dollar-denominated bonds, local-currency bonds, and the full bond sample by income group, along with the corresponding yield spreads. In panel A, countries are classified into two groups: high-income and low- and middle-income countries. In panel B, countries are divided into four groups: high-income, upper-middle-income, lower-middle-income and low-income countries. For each year, the median yield is first calculated for the distribution of all issuances by firms of a given country. These country-year medians are then aggregated to obtain the median yield for each income category across all years. Yield spreads (in percentage points) between the groups are annotated in both panels. For both panels, income classifications are based on 2005 World Bank country income group definitions. GDP = gross domestic product.

FIGURE 1.3

### Corporate Real Yield Spread Between Low- and Middle-Income Countries and High-Income Countries, 2000–2024



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund World Economic Outlook.

**Note:** This figure presents the median real yield spreads (adjusting for expected inflation) between low- and middle-income countries and high-income countries for dollar-denominated and local-currency bonds. For each year, the median yield is first calculated for each country. These country-level medians are then aggregated to obtain the median yield for each income category. Finally, the yield gap between the two income groups is calculated for that year. The figure reports decade averages of these spreads. Income categories follow the World Bank's 2005 country income group definitions.

nominal levels.<sup>19</sup> Furthermore, the local-currency LMIC-HIC gap also reflects differences in the domestic investor base, which is deeper and more stable in HICs, supported by pension funds, insurance companies, and other institutional investors. This investor base enhances market liquidity and thus compresses liquidity premia,

contributing to lower real borrowing costs. This contrasts with LMIC domestic market dynamics (especially for low- and lower-middle-income countries), where monetary policy was less accommodative, the domestic investor base more limited, and capital markets less developed.<sup>20</sup>

<sup>19</sup> The average sovereign yield in many advanced economies in our sample was lower than that of the United States during this period.

<sup>20</sup> Empirical evidence also suggests that international markets tend to be more accessible to more established (older, larger) firms in LMICs (Gozzi et al., 2010); this selection may result in dollar-denominated bonds having lower yields than local-currency bonds due to the differences in the composition of the issuers.

The yield differential between LMICs and HICs firms has generally persisted over time (**Figure 1.3**), though its size has fluctuated somewhat. During global 'risk-on' episodes characterized by low global interest rates and a search for yield among investors, LMIC corporate spreads versus HICs compressed, especially for dollar-denominated bonds as these were more accessible to international investors than LMIC local-currency instruments (Remolona et al., 2008). Conversely, the LMIC-HIC spread often widened during 'risk-off' episodes (Chari et al., 2020). Flight-to-quality dynamics led investors to reallocate portfolios toward advanced-economy assets, leaving LMIC issuers to face higher borrowing costs or even loss of market access (Gubareva et al., 2022). LMIC firms thus experience not only higher average borrowing costs, but also greater volatility and cyclicalities in those costs relative to peers in HICs.

The enduring nature of the spread suggests that, despite economic convergence and greater integration in the global economy, LMICs still face challenges related to institutional quality, political instability, economic volatility, and perhaps lingering investor biases or information gaps. Moreover, the structure of the firms' landscape also differs between LMICs and HICs.

## Within-Country Dispersion in Borrowing Costs

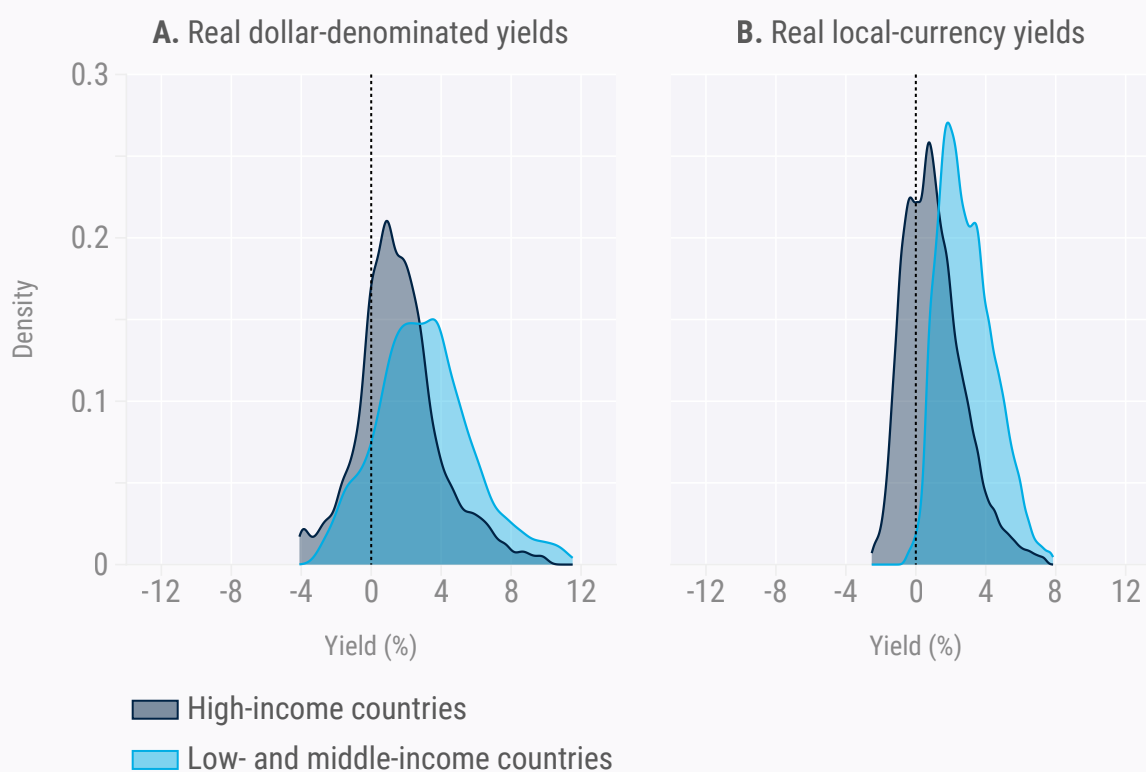
Considering the full distribution of yields in LMICs and HICs, the cross-country patterns documented above hold, but the wide dispersion and sizable overlap of the two distributions are equally striking (**Figure 1.4**), indicating the

need to consider factors well beyond country income groups.

For both dollar-denominated (panel A) and local-currency bonds (panel B), the mean and median of the distribution for LMIC corporate yields are to the right of those for HICs. The LMIC distributions also have thicker right

FIGURE 1.4

### Distribution of Corporate Real Yields in High-Income and Low- and Middle-Income Countries, 2015–2024

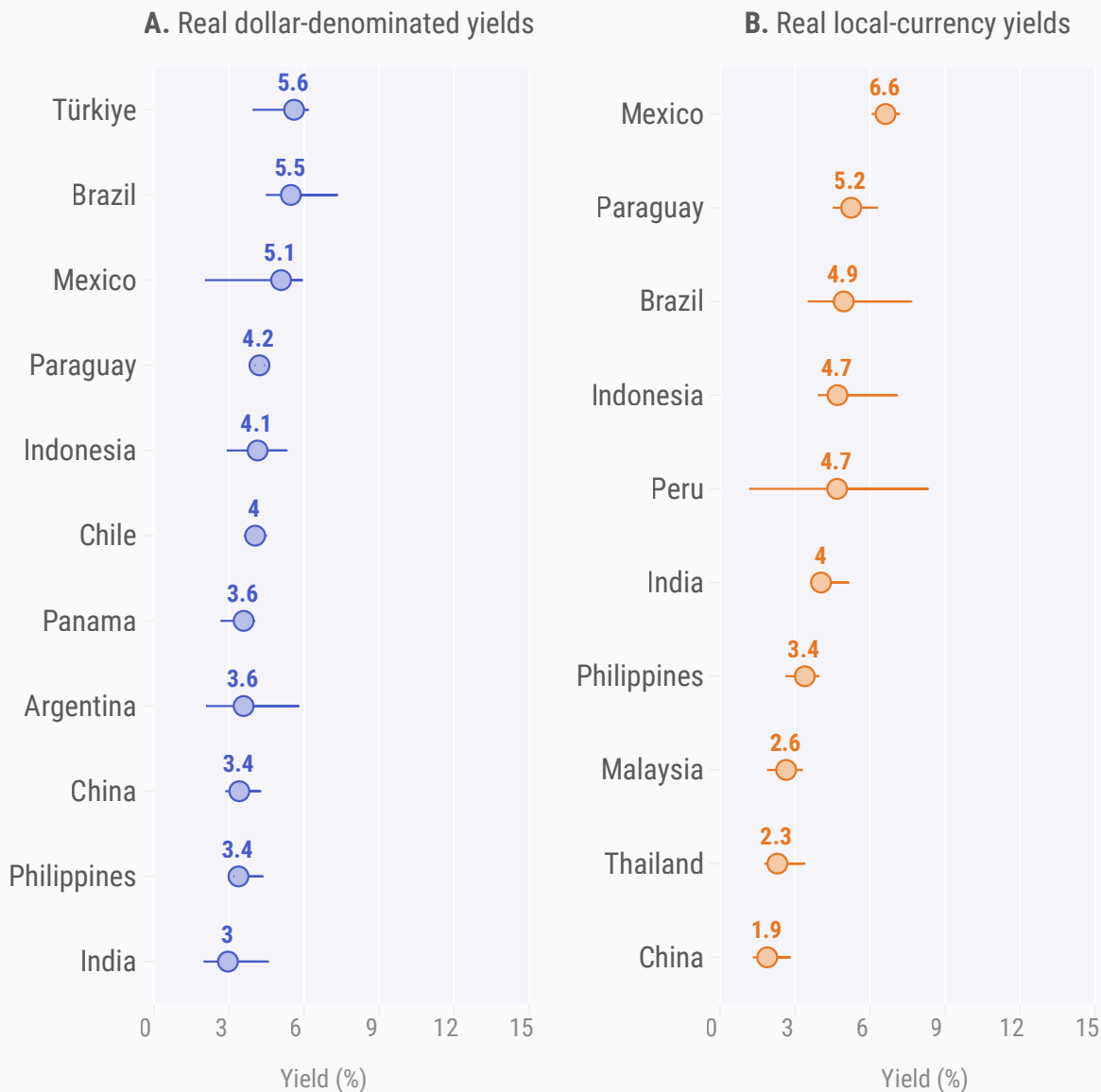


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund World Economic Outlook.

**Note:** This figure presents the distribution of real yields (adjusting for expected inflation) for all issuances, grouping separately high income countries and low- and middle-income countries. Panel A shows dollar-denominated bonds, while panel B shows local-currency bonds. To improve clarity, the lowest and highest 1% of yields within each income category are excluded from the figure. Income categories follow the World Bank's 2005 country income group definitions.

FIGURE 1.5

## Corporate Bond Yield Dispersion in Low- and Middle-Income Countries, 2023–2024



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund World Economic Outlook.

**Note:** This figure reports the median real corporate bond yield and the interquartile range (25th–75th percentiles), adjusting for expected inflation, for low- and middle-income countries. Panel A shows dollar-denominated bonds, while panel B shows local-currency bonds. Countries are included only if they have at least eight corporate bond issuances over the period 2023–2024. Income categories follow the World Bank's 2005 country income group definitions.

tails (expensive borrowing).<sup>21</sup> In contrast, HIC corporate yields extend further into negative territory, partly owing to unusually low real interest rates in advanced economies for most of the 2015–2024 sample period.

Even so, a wide range of factors will be required to explain the observed dispersion and substantial overlap of the distributions.

Although **Figure 1.4** highlights differences in the overall distribution of yields across income groups, it does not distinguish whether dispersion arises primarily across countries or within them. **Figure 1.5** delves into the within-country variation in corporate borrowing costs for several LMICs. For each country, the figure reports the median real yield alongside the interquartile range (25th–75th percentile) of issuance-level yields over 2023–2024, shown separately for dollar-denominated and local-currency bonds.<sup>22</sup>

Borrowing costs vary widely within individual LMICs, even among firms issuing in the same currency and over the same period. The interquartile range often spans several percentage points (median 1.6 percentage points), indicating that firms operating under the same macroeconomic and institutional environment face markedly different financing conditions. This within-country dispersion is economically meaningful, comparable to the 2-percentage-point LMIC–HIC gap in median borrowing costs.

## What Drives Corporate Borrowing Costs? Evidence from Existing Studies

As outlined in the previous section, the cost of borrowing through corporate bond issuance is influenced by a wide range of factors. These can be grouped into global, country-specific, and firm-level (as well as bond-specific) factors. This section reviews each in turn, drawing on existing studies, whose findings are summarized in **Table 1.1**.

### *Global Factors*

Global financial conditions influence corporate borrowing costs in LMICs via global pricing of risk and the availability of cross-border capital. This has been documented in previous studies emphasizing the closely related aspects of global interest rates and investor risk sentiment.

### **Global Interest Rates and Liquidity**

International interest rates in major financial centers (often proxied, for example, by U.S. Treasury rates) contribute to setting the baseline for corporate yields across the world. The transmission of U.S. monetary policy to dollar-denominated bonds occurs primarily via adjustment of the underlying short-term rate, whereas the impact on local-currency bond yields often takes place as domestic policy and other rates adjust to prevent excessive international capital flow reversals. For emerging

<sup>21</sup> This may suggest that investors are particularly sensitive to downside risk in debt pricing for LMIC firms. For example, Cavallo & Valenzuela (2010) document that corporate bond spreads are more sensitive to risk increases than decreases in emerging markets.

<sup>22</sup> The interquartile range shows the spread of the middle 50 percent of observations in the data—between the 25th percentile (below which one-quarter of observations fall) and the 75th percentile (below which three-quarters fall).

TABLE 1.1

## Factors Driving Borrowing Costs—Findings From Previous Studies

	Factor	Findings	Representative Studies
GLOBAL FACTORS	<b>Global interest rates and liquidity</b>	Tighter global liquidity conditions (often proxied by higher U.S. Treasury yields) raise borrowing costs for LMIC firms, for both dollar-denominated bonds and local-currency bonds (especially if local monetary policy follows suit).	Adrian et al., 2024; Gandolfo & Mauro, 2025; Timmer, 2018
	<b>Global risk sentiment</b>	Higher global risk aversion (often proxied by rising VIX) leads to higher yields for LMIC firms, especially for lower-rated issuers and dollar-denominated bonds.	Rozada & Yeyati, 2006; Zinna, 2013; Goel & Papageorgiou, 2021; Cavallo & Valenzuela, 2010; Remolona et al., 2008
		Sharp rises in costs in one LMIC can spill over through market contagion to other LMICs.	Dell'Erba et al., 2013; Dungey et al., 2002
COUNTRY FACTORS	<b>Sovereign credit risk</b>	For the most part, corporate yields closely track sovereign yields.	Li et al., 2021; Dittmar & Yuan, 2008; Corsetti et al., 2014; Acharya et al., 2014; Agca & Celasun, 2012
		On occasion, yields for some corporates can be lower than sovereign yields, especially in LMICs during periods of high sovereign stress.	Durbin & Ng, 2005; Borensztein et al., 2007; Bevilacqua et al., 2020
	<b>Macroeconomic conditions</b>	Higher domestic interest rates raise corporates' cost of debt, particularly for local-currency bonds.	Li et al., 2021; Timmer, 2018
		Inflation uncertainty can increase corporate yields.	Kang & Pflueger, 2015
	<b>Financial market development</b>	A stable or predictably managed currency may lower currency risk premiums on local-currency corporate bonds.	Gadanecz et al., 2014; International Monetary Fund 2015
		Deeper local bond markets and capital openness broaden the investor base, reducing liquidity premiums and yields.	Hameed et al., 2019; Timmer, 2018; GFSR, 2020
<b>Institutional and regulatory environment</b>	Strong property rights can insulate corporate risk from sovereign risk, lowering spreads for firms in LMICs. Investor protection laws also matter.	Bai & Wei, 2017	
FIRM AND BOND FACTORS	<b>Credit quality</b>	Firms with stronger balance sheets, higher earnings, and lower leverage can borrow at lower yields, due to lower credit risk. Credit ratings synthesize many of these factors.	Cavallo & Valenzuela, 2010; OECD, 2015;
		Corporate bonds with lower credit ratings are more sensitive to changes in sovereign risk.	Li et al., 2021
	<b>Firm size, experience, and ownership</b>	Larger firms and those with previous issuances tend to enjoy lower yields.	Collin-Dufresne et al., 2001
		State-owned enterprises (SOEs) often borrow at lower spreads.	Li et al., 2021
	<b>Firm governance</b>	Firms with better corporate governance face lower yields, especially in LMICs with weaker legal protection, lower transparency, and poorer government quality.	Zhu, 2014; Claessens & Yurtoglu, 2013; Lin et al., 2011; Johnson et al., 2000; Ball et al., 2013;
	<b>Industry</b>	Industry risk profiles matter. Cyclical and commodities-linked sectors often face higher yields than their counterparts.	Garay et al., 2019
	<b>Bond features</b>	Bonds that are longer-term, lower in seniority, uncollateralized, illiquid, and with weaker covenants tend to have higher yields.	Li et al., 2021; Hameed et al., 2019

economies with exchange rates that are more flexible and monetary policies that retain greater independence, this link may be weakening. The relationship between U.S. policy rates and LMIC yields also seems to have changed in recent years. During emerging market financial crises of the 1980s and 1990s, an increase in U.S. rates was usually followed by a bigger rise in emerging market rates, that is, a rise in emerging market spreads (Kamin & von Kleist 1999, Mauro et al., 2002). But in the last few years, emerging market spreads for government bonds (Adrian et al., 2024) and corporate bonds (Gandolfo & Mauro, 2025) have remained broadly stable against the backdrop of gyrations in the policy interest rates of the main global financial centers.

### Global Risk Sentiment

Investor risk appetite is a significant driver of bond yields, both sovereign and corporate, in LMICs.<sup>23</sup> Periods of heightened global risk aversion are typically associated with generalized spread widening for emerging-market assets, as investors demand higher compensation for bearing risk. These episodes operate through several reinforcing channels: they tighten dealer and investor balance sheets, reduce risk-bearing capacity, trigger fund outflows and asset sales, and weaken secondary-market liquidity. These mechanisms tend to affect bonds issued by LMIC firms more strongly than those issued by HIC firms. Empirical studies also find that lower-rated

issuers—more prevalent among LMIC firms—and dollar-denominated corporate bonds exhibit greater sensitivity to global risk sentiment (Goel & Papageorgiou, 2021). Moreover, the effects of risk-off episodes are asymmetric. Adverse shocks to risk appetite have larger marginal impacts on yields than comparable improvements during risk-on periods. Spikes in the VIX, the so-called fear index that measures market volatility, also tend to coincide with tighter global financial conditions and a stronger dollar, further tightening financing conditions for LMIC borrowers with currency mismatches, particularly those reliant on dollar-denominated debt.

Relatedly, contagion in one market can spill over. Conversely, during periods of heightened risk appetite even lower-rated LMIC firms may temporarily benefit from strong inflows and borrow at unusually narrow spreads. Events such as the Russian default of 1998 led to indiscriminate selloffs across most LMIC bonds, driving yields up across fundamentally diverse firms. Subsequent evidence suggests that such contagion may have become less pronounced since the 1990s (Didier et al., 2006).

---

<sup>23</sup> Global risk appetite is often proxied by indicators of financial market volatility or credit risk, such as the VIX—a measure of expected volatility in the U.S. equity market derived from options prices on the S&P 500—as well as global credit spreads or financial conditions indexes.

## Country-Level Factors

A country's institutions, policies, and economic developments shape the operating environment for firms, influencing their performance, risk profile, and ultimately their borrowing costs. In bond markets, a country's sovereign yields are usually the most prominent reflection of that nation's perception among investors and serve as a reference point against which corporate bonds are priced.

### Sovereign Credit Risk and Macroeconomic Stability

A country's sovereign credit situation heavily influences local corporate borrowing costs. Higher sovereign borrowing costs typically translate into higher costs for most domestic firms. Previous empirical studies found an almost one-to-one long-run pass-through from sovereign yields to corporate yields in emerging markets (Li et al., 2021). **Figure 1.6** shows that corporate issuance yields in emerging market economies are typically within about 2 percentage points of the corresponding sovereign yield, and in the majority of cases corporate yields exceed those of the sovereign.<sup>24, 25</sup> The case of Argentina reflects unusual circumstances, where some corporates issued while the sovereign was in default and thus unable to sell new bonds and therefore,

the reported sovereign yield is taken from the secondary market.

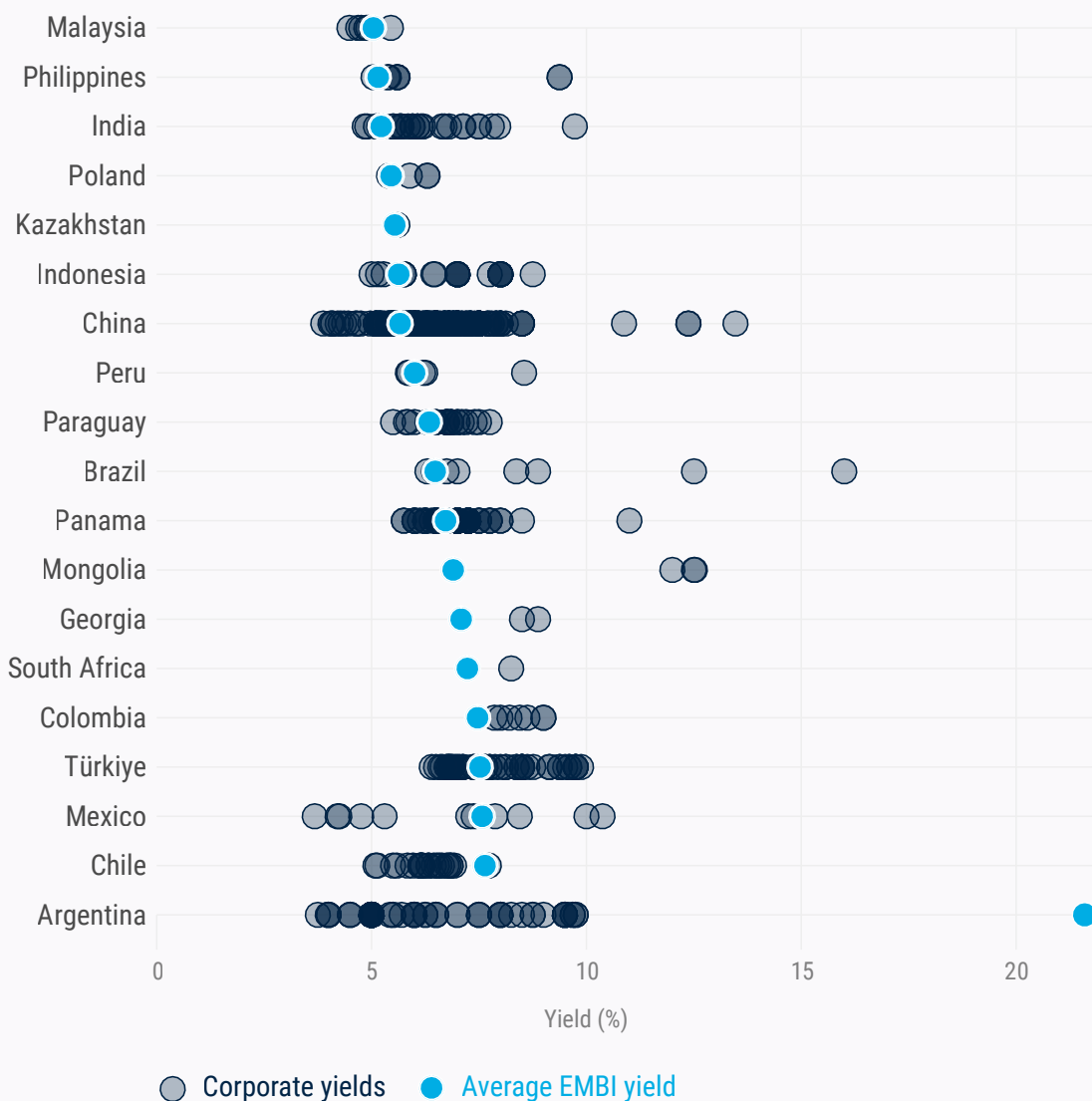
Sovereign and corporate yields may be correlated for several reasons. First, corporates and sovereigns share global financing conditions and country risk factors such as macroeconomic developments and policies. Second, the sovereign yield curve provides a benchmark for pricing corporate debt. This reduces incomplete information in the corporate debt market and is especially useful when bond markets are less developed (Dos Santos, 2024). Third, when a country's sovereign debt nears the market's ability to absorb it, sovereigns can crowd out local firms' borrowing or even transfer credit risk to local firms. As sovereign yields rise, corporate yields may need to keep pace to attract investors. Moreover, investors may expect that a government facing fiscal pressure would reallocate resources from the private sector (for example, through higher taxes or reduced support measures), thereby increasing firms' effective credit risk. Additionally, concerns that high sovereign debt may be resolved through inflationary finance can raise inflation expectations and inflation risk premia, which are priced into sovereign yields and transmitted to corporate borrowing costs through benchmark pricing. Elevated sovereign risk can also weaken the value of government guarantees and

<sup>24</sup> The 90% confidence interval for the LMIC group (excluding Argentina) spans 3.8 percentage points. However, the dispersion of corporate yields differs substantially across countries (e.g., wider distributions in Brazil than in Poland).

<sup>25</sup> Throughout this report, we exclude 18 bonds with quoted yields that are not comparable to standard fixed-rate bond yields. Such bonds are: (i) primarily dollar-linked domestic bonds that are denominated in dollars but settle in local currency at an official exchange rate under capital controls, so pricing reflects local liquidity conditions and demand for foreign exchange hedging rather than a market-clearing dollar funding cost; or (ii) small or illiquid issues set in highly segmented placements (sometimes involving only one buyer) with little or no competitive price discovery, therefore with no market-clearing price; or (iii) bonds with embedded optionality such as convertibles or callable structures with a likelihood of exercise, for which 'yield-to-worst' is reported instead of 'yield-to-maturity' in the database.

FIGURE 1.6

### Corporate and Sovereign Yields for Low- and Middle-Income Countries, 2023–2024



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and JPMorgan Emerging Markets Bond Index (EMBI) data from Bloomberg.

**Note:** This figure includes all dollar-denominated corporate bond yields issued in 2023–24 across the sample countries (563 observations). Each grey dot represents an individual corporate bond issuance, with darker shades indicating higher concentrations of issuances. Each blue dot denotes the average EMBI (secondary market) sovereign yield across the months in which corporate issuances occurred in that country. Low- and middle-income countries included are those with available EMBI data and at least one dollar-denominated bond issuance in 2023–2024.

impair financial intermediation by damaging the balance sheets of domestic banks heavily exposed to sovereign debt. In particular, high external sovereign debt is found to lead to high corporate yields.

Sovereign credit risk also tends to impose an upper limit on corporate credit ratings (the “sovereign ceiling”), constraining how low borrowing costs can fall for corporates in the same country. However, there are exceptions, as illustrated in **Figure 1.6**.<sup>26</sup> This can happen when firms generate substantial foreign currency revenues, hold assets offshore, or operate internationally, reducing their exposure to domestic fiscal or exchange-rate pressures. Large exporters, subsidiaries of multinational companies with strong parent guarantees, or some state-owned enterprises with stable export revenues may indeed trade at tighter spreads than their sovereign, particularly during sovereign fiscal stress.

Bond design and legal features can also generate corporate yields below sovereign yields. Unlike sovereign bonds, which are typically unsecured, corporates can choose to issue secured debt backed by robust assets or collateral, or otherwise protected by ring-fencing,<sup>27</sup> protective covenants, or offshore payment structures that limit government interference. These features improve recovery value and therefore reduce investment risk.

### **Domestic Interest Rates and Inflation Uncertainty**

Beyond sovereign credit risk, corporate yields are influenced by a country’s general macroeconomic conditions, especially domestic interest rates and the inflation outlook. A higher domestic policy rate raises corporations’ cost of debt, particularly for local-currency bonds. This transmission is documented to be almost one for one. Inflation uncertainty can similarly push real yields up, as investors demand compensation for inflation risk and currency depreciation. Additionally, a credible commitment to a stable or predictably managed currency may lower currency risk premiums on local-currency corporate bonds. However, a rigid peg without adequate reserves can be risky. Investors would likely require higher yields on local bonds as compensation for the risk of devaluation or ensuing inflation.

### **Financial Market Development**

LMICs with more developed domestic bond markets and a broad base of local investors generally exhibit lower volatility and lower risk premia on corporate debt. In less developed markets, thin trading and a scarcity of long-term investors lead to a liquidity premium on corporate bonds. Additionally, countries with open capital accounts and fewer restrictions often see lower yields, as foreign investors can more freely enter the market, diversifying and

<sup>26</sup> Accordingly, the major credit rating agencies (S&P, Moody’s, and Fitch) revised their methodologies in the late 1990s to allow corporate ratings to exceed the sovereign rating.

<sup>27</sup> Ring-fencing refers to legal or structural arrangements that isolate specific assets or revenue streams, such as export receipts or project revenues, so that they are dedicated to servicing debt and are protected from claims by other creditors or diversion by the issuer.

expanding the investor base. However, a large local institutional investor presence can stabilize demand for bonds when foreign investors retreat, dampening yield spikes during global sell-offs.

### **Institutional and Regulatory Environment**

Strong investor protections, the rule of law, and protection of property rights can reduce perceived risks of government interference or expropriation that might hurt corporate solvency. Research shows that in countries with strong institutions that protect property rights, private firms are better insulated from sovereign troubles. Creditor rights and efficient bankruptcy processes are also relevant as they influence recovery values and thus yields. Research suggests that general property rights matter more for mitigating corporate-to-sovereign risk transfer than do narrow measures of contractual rights such as protection of creditor or minority shareholder rights.

### *Firm-Level and Bond-Specific Factors*

Within the same country and macroeconomic environment, firm characteristics and bond features contribute to variation in corporate bond yields.

#### **Credit Quality**

Stronger company balance sheets, with less leverage, more liquidity, and better capitalization, alongside higher earnings reduce the likelihood of default, resulting in lower yields. The volatility of income is also important, as research finds it to be a strong proxy for business risk. Credit ratings aim to synthesize many of these factors to reflect overall firm credit risk. A company with an investment grade rating will generally face much lower yields than a speculative-grade firm in the same market. Research shows that corporate bonds with lower credit ratings are also more sensitive to changes in sovereign risk.<sup>28</sup> The estimation in this study does not use credit ratings for two reasons. First, ratings are not available for all firms and their use would reduce the sample size. Second, the study's objective is to analyze the fundamental determinants of the cost of borrowing, and the rating agencies use similar variables to capture closely related concepts such as default likelihoods and expected recovery rates.

---

<sup>28</sup> Many firms in LMICs are unrated by credit rating agencies, leading to even higher yields due to informational gaps (OECD & WBG, 2015). Credit ratings are especially important for institutional investors, which comprise a large segment of corporate bond market demand (OECD, 2015).

### Firm Size, Experience, and Ownership

Larger firms and those with more fundraising experience usually enjoy lower yields. Size often correlates with lower perceived default risk due to more diversified operations, greater market power, higher visibility to investors and the higher likelihood of state protection from insolvency if they are deemed too big to fail. It also usually means higher liquidity for that firm's bonds as bigger firms issue larger bonds which trade more and attract institutional investors, leading to tighter spreads. Small firms, by contrast, may need to offer a yield premium to attract investor interest, especially if their bonds are illiquid or unfamiliar. Some studies also note that state-owned enterprises (SOEs) often borrow at somewhat lower spreads due to explicit or implicit government backing. However, SOE yields can quickly rise if the sovereign itself is in distress. Yields on government-linked firms' bonds tend to move in close alignment with sovereign yields (Li et al., 2021).

### Corporate Governance

Firms with better corporate governance tend to face lower yields due to improved firm performance, lower monitoring costs by investors, and reduced expropriation risk.<sup>29</sup> Greater disclosure can reduce uncertainty and bring down yields, though the quality and materiality of the disclosure is key. Ownership structure (particularly wedges between

control and cashflow rights) can also influence borrowing costs due to tunneling risk,<sup>30</sup> especially for lower-rated firms. Relatedly, international issuances by LMIC firms signal greater transparency, which often spills over into lower yields on bonds in domestic markets. Better governance and disclosure are more influential in lowering bond yields in countries characterized by weak legal protections and low transparency, suggesting that firm-level governance can partially substitute for country-level governance.

### Industry

Corporate bond yields can systematically differ by industry, reflecting sector-specific risk factors. Cyclical and commodities-linked sectors (e.g., oil & gas, mining, and construction) often face higher yields in relation to bonds in the same currency, due to volatile earnings, whereas sectors with stable cash flows (consumer staples, utilities) usually enjoy lower yields. Some studies find that industry effects are significant drivers of spreads, especially in countries with political and macroeconomic stability (Garay et al., 2019). This suggests investors price in sector risks such as commodity price fluctuations for energy firms or regulatory risk for telecoms. Financial sector corporate yields can be influenced by banking sector health and regulations.

<sup>29</sup> Corporate governance refers to the set of internal ownership, control, monitoring, and disclosure arrangements through which a firm constrains managers and controlling shareholders in order to protect outside investors, including creditors.

<sup>30</sup> Tunneling refers to the extraction of resources from a firm by controlling shareholders—often through related-party transactions or asset transfers—that benefits insiders at the expense of minority shareholders and creditors.

## Bond Features

Several aspects of a bond's design also affect its yield, though for the most part these are found to be less influential than other factors (Longstaff et al., 2005). Longer-term bonds carry higher yields than short-term bonds, reflecting greater uncertainty over a longer horizon and higher interest rate risk. The currency of denomination is another factor. A local-currency bond may have a different yield than a hard-currency bond from the same issuer due to

exchange rate risk and investor segmentation (Gozzi et al., 2015). Many LMIC firms issue in foreign currency to tap global investors. Any mismatch (currency risk) will be priced in by investors, often raising yields for unhedged foreign-currency debt if the local currency is expected to depreciate. Other bond features can be more significant, such as seniority, callability, and collateral. The impact of select bond features on bond yields, along with other factors, is empirically examined in the next chapter.

## CHAPTER 2

# Corporate Borrowing Costs Across Countries

**AUTHOR:**

Pablo Hernando-Kaminsky

# Key Messages

**Corporate borrowing costs are influenced by a mix of global, country-specific, and firm-level circumstances.** For dollar-denominated issuances in both high-income countries (HIC) and low- and middle-income countries (LMIC), global and firm-specific factors each account for one quarter to one third of the total variation in real yields. They are followed by country factors. In LMICs, country factors underlie a larger share of total variation than firm-level factors in local-currency issuance, whereas that ranking is reversed for HICs. It is likely that greater volatility of country circumstances in LMICs partly accounts for this finding. In contrast, HIC borrowers are more tightly linked to global markets and tend to be less affected by local shocks. Industry factors account for one tenth and security design factors account for the smallest share.

**Global factors, such as interest rates in the main financial centers, have a large impact on borrowing costs for firms everywhere.** For LMIC corporates, on average, a rise in the U.S. federal funds rate of 1 percentage point is associated with a 47 basis point increase in costs when borrowing internationally and a 10 basis point rise when borrowing domestically.

**Country-level factors like economic growth and sovereign yields have a large impact.** For example, in LMIC domestic markets, a 1 percentage point increase in real GDP growth is linked to 26-basis-point lower yields. Sovereign borrowing costs pass through strongly to corporates: a 1 percentage point increase in sovereign yields corresponds to corporate yields that are 76 basis points higher in domestic markets.

**Firm-specific traits are important, especially for LMIC issuers, where investors often have less reliable information.** Larger firms tend to secure lower borrowing costs in both domestic and international markets because their solid financials provide reassurance, especially in LMICs.

Firms with more debt face higher costs across markets, and this penalty is steeper for LMIC firms, reflecting concerns about default risk. Moreover, in international markets, LMIC companies that are not publicly listed face higher borrowing costs.

**The ownership and history of a company also play a role.** State-owned enterprises (SOEs) and subsidiaries of multinational corporations usually pay less to borrow, as investors believe they are safer due to government or parent company support. For example, SOE issuers (compared with non-SOEs) are associated with yields that are 50 basis points lower in LMIC domestic markets. Firms that have previously raised money in debt markets also get better rates.

**How firms borrow also makes a difference,** even though observable bond features explain a relatively small share of overall yield variation once issuer and country factors are taken into account. Longer maturities carry higher borrowing costs, especially in LMICs where future conditions are less predictable. Each extra year raises real yields by 14 basis points in domestic markets and 10 basis points in international markets. Private placements slightly reduce yields in domestic markets but increase yields in international markets, consistent with more informed local placement at home and higher liquidity and transaction premia abroad.

**Circling back to the HIC-LMIC gap in costs, analysis that includes observable firm- and bond-level characteristics results in a narrower gap.** The gap between HICs and LMICs in borrowing costs is estimated to be one quarter smaller when the estimation includes firm- and bond-level characteristics, and one third less when also including the country's yearly economic growth rate (to capture cyclical developments). This suggests that the HIC-LMIC gap reflects not only institutional, policy, or perception differences but also a different composition of the firms' landscape.

**B**uilding on the initial findings and list of potential determinants of the cost of borrowing from Chapter 1, this chapter estimates the impact of several specific factors. To do so, it uses a new, detailed dataset drawn from London Stock Exchange Group's SDC Platinum Database, which contains transaction-level information on bond issuances from 1990 to 2024 around the globe (see Box 2.1). The analysis examines yields at the time bonds are issued, covering both domestic and international markets, as well as bonds issued in both hard and local currencies. Yields are expressed in ex-post, real terms, considering actual (observed) inflation (or forecast inflation for the period beyond 2025).

## What Explains the Variation in Real Yields?

This section begins by measuring how much each type of factor—global trends, country-level conditions, firm-specific characteristics, and bond design—contributes to differences in borrowing costs using a variance decomposition approach. The analysis then turns to the impact of specific variables within these categories using panel regressions. The estimation is undertaken separately for different markets (international or domestic) and country income groups (HICs or LMICs), allowing for comparisons across settings.

### *Breaking Down Yield Variation*

A variance decomposition approach is used to break down the variation in yields into parts linked to global, country, firm, and security level characteristics, for the sample period under consideration. The relative importance of each part depends on (i) the impact that a certain type of characteristic has on yields (for example, the impact of firm-level variables such as firm profitability) and on (ii) the extent to which such characteristics vary in the data (for example,

the extent to which firm-level variables such as profitability vary across firms).<sup>31</sup> Box 2.2 provides further details.

**For dollar-denominated issuances, year-effects (that is, global factors) explain a similarly large share of yield variation in HICs and LMICs. Much of the remaining explained variation is split evenly between firm- and country-level components in LMICs but is more concentrated in firm-level factors in HICs.** For dollar issuances, global factors account for 28 percent of total variance in both groups. Country-by-year effects account for more variation in LMICs (19 percent) than in HICs (5 percent), perhaps reflecting the higher frequency and greater amplitude of economic shocks and macroeconomic volatility in LMICs compared with HICs. Conversely, firm-by-year effects are larger in HICs (37 percent) than in LMICs (27 percent). Industry-by-year effects account for one tenth of the variation, whereas security characteristics explain less, with the residual variation unattributed to the factors under consideration.

<sup>31</sup> Regression analysis (Section 2.2) focuses only on (i).

**For local-currency bonds, yield variation in LMICs is more tightly linked to country-specific conditions, whereas variation in HICs is shaped more by global forces.** In HICs,

global factors explain 42 percent of total variance, with additional contributions from country-by-year (18 percent), firm-by-year (24 percent), and industry-by-year (7 percent). In LMICs, country-by-year effects are the largest component (33 percent) and firm-by-year effects remain substantial (29 percent), whereas global effects account for 15 percent. These results are consistent with the view that business cycles in HICs move more closely together across countries than in LMICs, where country-specific shocks are more prevalent.

#### BOX 2.1

### Data on Corporate Bond Issuance, Firm Level Characteristics, and Other Variables

This chapter combines transaction-level bond issuance data with firm financial statements and macroeconomic indicators to study corporate borrowing costs across countries and over time. The primary database used in this chapter is the Securities Data Company Platinum database from London Stock Exchange Group, which provides transaction-level coverage of global corporate bond issuances. The analysis uses primary-market bond issuances spanning 1990–2024 across 138 countries and distinguishes between high-income countries and low- and middle-income countries using the World Bank income group classification as of 2005. See Appendix B for more details on the data.

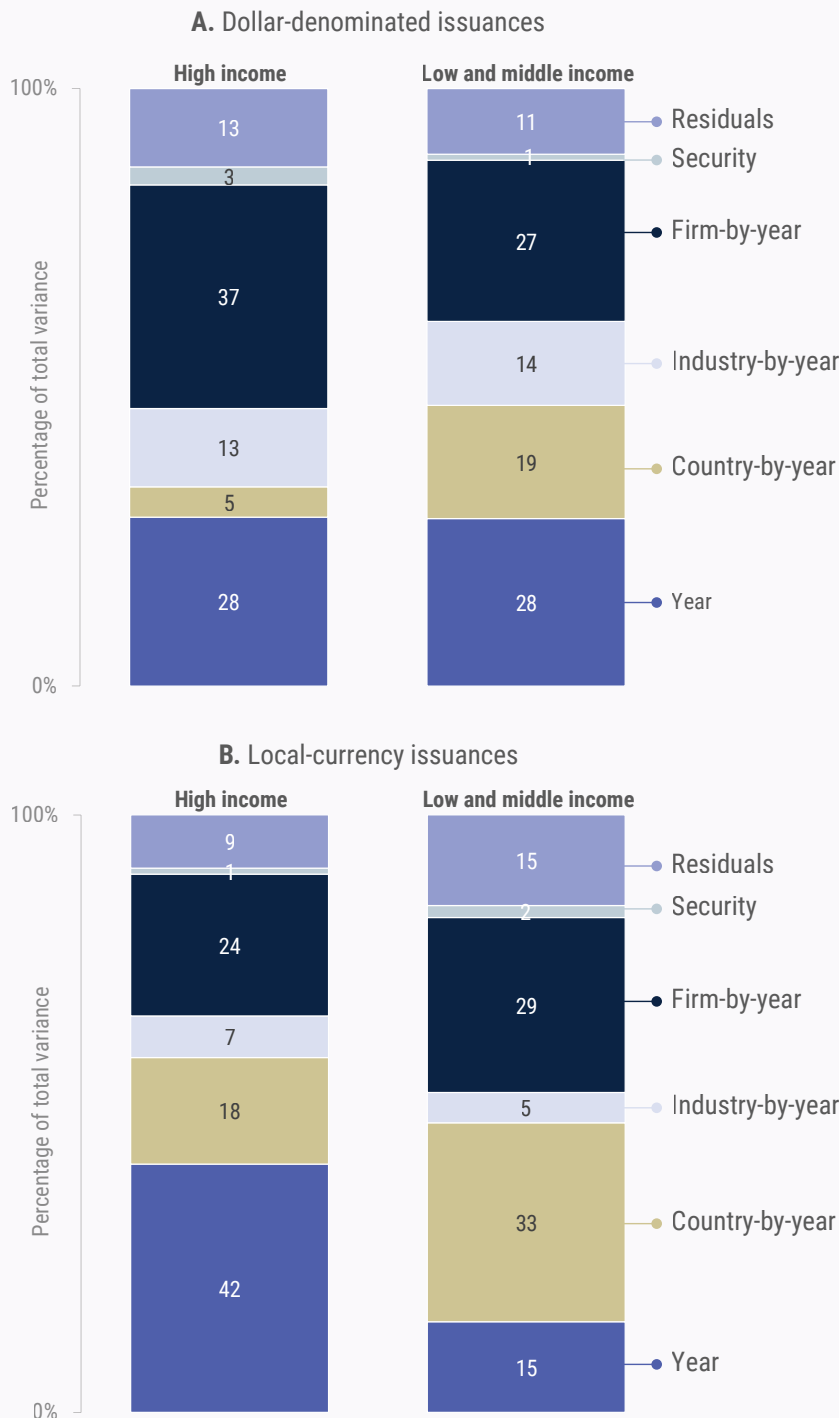
The Securities Data Company reports the yield to maturity for each bond at issuance, which is used as the measure of borrowing cost. The chapter focuses on real yields, calculated as nominal yields minus inflation matched to the currency of denomination, with inflation annualized to match the annualized yield to maturity. The company also provides key security characteristics, including the issuance amount, maturity, currency, and the market of issue. Bonds are considered international if they are issued outside the borrower's home country.

To characterize firms, the issuance data are merged with the Worldscope database from London Stock Exchange Group, which provides annual financial statement information for public companies worldwide. Key firm characteristics include size, profitability, leverage, and tangibility (see **Table 2.1** for variable definitions).

Country variables, including real GDP growth and real GDP per capita, are drawn from the World Bank's World Development Indicators, whereas inflation data are taken from the International Monetary Fund's World Economic Outlook. Country variables, including real GDP growth and real GDP per capita, are drawn from the World Bank's World Development Indicators.

FIGURE 2.1

### Variance Decomposition of Real Yields



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from International Monetary Fund's World Economic Outlook.

**Note:** The figure reports the share of total variance in real yields explained by each block in a sequential variance decomposition based on changes in adjusted R<sup>2</sup> across a sequence of regressions with (i) year fixed effects, (ii) country-by-year fixed effects, (iii) industry-by-year fixed effects, (iv) firm-by-year fixed effects, and (v) security-level characteristics. Bars are shown separately for high-income countries and low- and middle-income countries. Panel A reports results for dollar-denominated issuances, and panel B reports results for local-currency bonds. "Year" captures year-specific forces common to all countries in the group under consideration (for example, global risk-free rates or global shocks).

## BOX 2.2

## Variance Decomposition Methodology

The decomposition is implemented by estimating a sequence of regressions and recording the adjusted  $R^2$  after each step. The increase in adjusted  $R^2$  when a new set of variables is added may be interpreted as the share of yield variation accounted for by that set. The sequence starts with year fixed effects (dummy variables taking the value 1 for a given year and 0 for all other years), which here may be interpreted as reflecting common shocks equally affecting all countries in the sample. It then replaces those with country-by-year fixed effects, then industry-by-year fixed effects, then firm-by-year fixed effects, and finally observed security-level characteristics.<sup>1</sup> This ordering separates common global, time-varying forces from country-specific conditions, then from sectoral and firm-level components, and lastly from contract features.<sup>2</sup> Since the sets of variables are not orthogonalized, the decomposition is order dependent. When components overlap in the variation they explain, earlier sets absorb

shared explanatory power and the incremental contribution of later sets can be understated. Since the analysis is conducted separately for HICs and LMICs, the resulting shares should be interpreted as within-sample allocations of explained variation across layers. When interpreting the results, it is important to recall that the overall yield dispersion is larger in the sample consisting of LMIC corporates than for HIC corporates.

---

<sup>1</sup> Country-by-year fixed effects are included in the industry-by-year step because they absorb all factors common to firms in the same country and year, while industry-by-year fixed effects capture shocks common to an industry in a given year across countries. Since these fixed effects vary along different dimensions, the latter do not absorb the former. Including both allows the analysis to isolate industry-specific variation net of country-year conditions.

<sup>2</sup> Since the sources of variation are nested, the decomposition must proceed from more aggregated to less aggregated levels. In our setting, year fixed effects are more aggregated than country-by-year fixed effects, and country-by-year fixed effects are more aggregated than firm-by-year fixed effects. Each country-year observation belongs to one year, and each firm-year observation belongs to one country-year cell. As a result, if the more disaggregated fixed effects are entered first, they absorb the variation attributed to the more aggregated fixed effects and mechanically leave them with no incremental explanatory power. For example, if firm-by-year fixed effects are entered before country-by-year fixed effects, they absorb the country-by-year variation; similarly, if country-by-year or firm-by-year fixed effects are entered before year fixed effects, they absorb the year-level variation.

## *Estimating the Impact of Specific Factors*

Having examined the relative importance across broad components, the analysis now turns to the role of specific variables within each category. The determinants of corporate borrowing costs are examined using panel regressions, with the real yield to maturity for individual bonds at issuance as the outcome variable, capturing the terms at which firms raise new funding.<sup>32</sup> Yields are related to issuance characteristics, firm-level features, country conditions, and global variables. To compare pricing relationships across environments, the regressions are estimated separately for domestic and international market bonds issued by firms in LMICs and HICs.<sup>33,34</sup> **Box 2.3** provides further details.<sup>35</sup>

## **Global and Country Characteristics**

**Higher policy rates in core advanced economies are associated with higher corporate yields globally.**<sup>36</sup> A 1 percentage point increase in the U.S. federal funds rate is associated with a rise in LMIC corporate yields of 10 basis points in local markets and 47 basis points on international markets. The corresponding effects for HIC corporates are 25 basis points in domestic markets and 28 basis points in international markets. This pattern is consistent with higher U.S. rates raising global benchmark rates, which tends to increase required returns globally. Likewise, higher U.S. rates can pull investors toward U.S. assets, so they demand a higher yield on LMIC bonds.

**Higher economic growth is associated with lower corporate yields, most clearly in domestic markets.** In domestic markets, a 1 percentage point increase in real GDP growth is associated with a 26 basis point decline in LMIC yields and a 6 basis point decline in HIC yields.

<sup>32</sup> To complement the analysis presented in this chapter, Appendix K presents a machine-learning model developed to predict the cost of debt using the same comprehensive dataset of transaction-level bond information. Whereas econometric models provide interpretability and a structured framework to relate yields to observable factors, the machine-learning approach serves as a robustness and validation tool focused on prediction, which is generally more accurate because the method allows for non-linear relationships and interaction terms. Convergence in the findings across these complementary methodologies underscores the robustness of the empirical findings.

<sup>33</sup> China is excluded from the LMIC sample in Chapter 2 but not in Chapter 1. This is because China can have an outsized influence in regression-based exercises where the number of observations matters directly. In Chapter 1, the descriptive figures are constructed using country-level medians, so China's large number of bond observations does not mechanically dominate the results, but in Chapter 2 the analysis would be overly influenced by its firms' large number of bond issuances.

<sup>34</sup> In earlier analysis, only dollar- and local-currency bonds were examined to keep the comparison clean and avoid mixing currencies with different pricing environments. In the panel regression analysis, all observations are included so the sample is split by market of issuance (domestic versus international) instead of currency. Market and currency are highly correlated in the data: most domestic market bonds are denominated in local currency, while most international market bonds are denominated in foreign currency, with the majority in dollars.

<sup>35</sup> Appendix H provides the regression tables using both realized and expected inflation. Appendix I provides the regression tables for nonfinancial firms.

<sup>36</sup> The results are similar (unreported) when using the global financial cycle measure from Miranda-Agrippino & Rey (2020) instead of the U.S. federal funds rate. Easier global financial conditions are associated with lower corporate yields. The two variables are not used in the same specifications because they are highly collinear.

## BOX 2.3

## Regression Equation

To quantify the contribution of key risk factors and structural characteristics to the cost of debt, a series of panel regressions is estimated using the real yield to maturity at issuance as the outcome variable. By incorporating detailed issuance-level data alongside firm characteristics and macroeconomic indicators, the analysis provides a comprehensive view of the drivers of debt costs across different markets. The following regression is estimated:

$$Y_{ijct} = \beta_1 D_{it} + \beta_2 F_{jt} + \beta_3 C_{ct} + \beta_4 G_t + \alpha_m + u_{ijct}$$

In this specification,  $Y_{ijct}$  denotes the cost of debt for issuance  $i$  by firm  $j$  in country  $c$  at time  $t$  (year). The vector  $D_{it}$  captures issuance-level characteristics.  $F_{jt}$  reflects firm-level attributes.  $C_{ct}$  represents country-level variables at time  $t$ . The term  $G_t$  captures global conditions common across countries in period  $t$ . Fixed effects ( $\alpha_m$ ) are included to control for unobserved differences over time and across groups, where  $m$  indexes the fixed-effects structure used in each specification. As additional variables are introduced in each step of the analysis, the fixed effects change to absorb the relevant unobserved differences for that model. For example, when focusing on security factors, issuer-by-year fixed effects are used, which absorb time-varying issuer conditions as well as common time and country-level influences. When focusing on firm characteristics, country-by-year fixed effects are used, which absorb shared macroeconomic and sovereign conditions. Currency fixed effects are also included to absorb differences across currencies, such as typical inflation environments, monetary regimes, and market conventions, that can shift yield levels even for otherwise similar bonds. A baseline specification is first estimated with only issuance-level characteristics  $D_{it}$ . The model is then expanded sequentially by adding firm-level variables  $F_{jt}$ , country-level variables  $C_{ct}$ , and global-level variables  $G_t$ .

The regressions are estimated separately for four categories of issuances. The first category consists of domestic market bonds issued by firms from low- and middle-income countries (LMICs). The second category covers international market bonds issued by LMIC firms. The third category includes domestic market bonds issued by firms from high-income countries (HICs). The fourth category comprises international market bonds issued by HIC firms.

Estimated coefficients are compared across LMICs and HICs to assess whether the observable factors are associated with different yield responses. These estimates should be interpreted as correlations rather than causal effects.

Whereas the cost of debt is observed at the issuance date, other variables are available at different frequencies. For example, firm-level characteristics are typically available only annually from financial statements. To combine different sources, we link each issuance to the annual firm, country, and global data for its issuance year.

TABLE 2.1

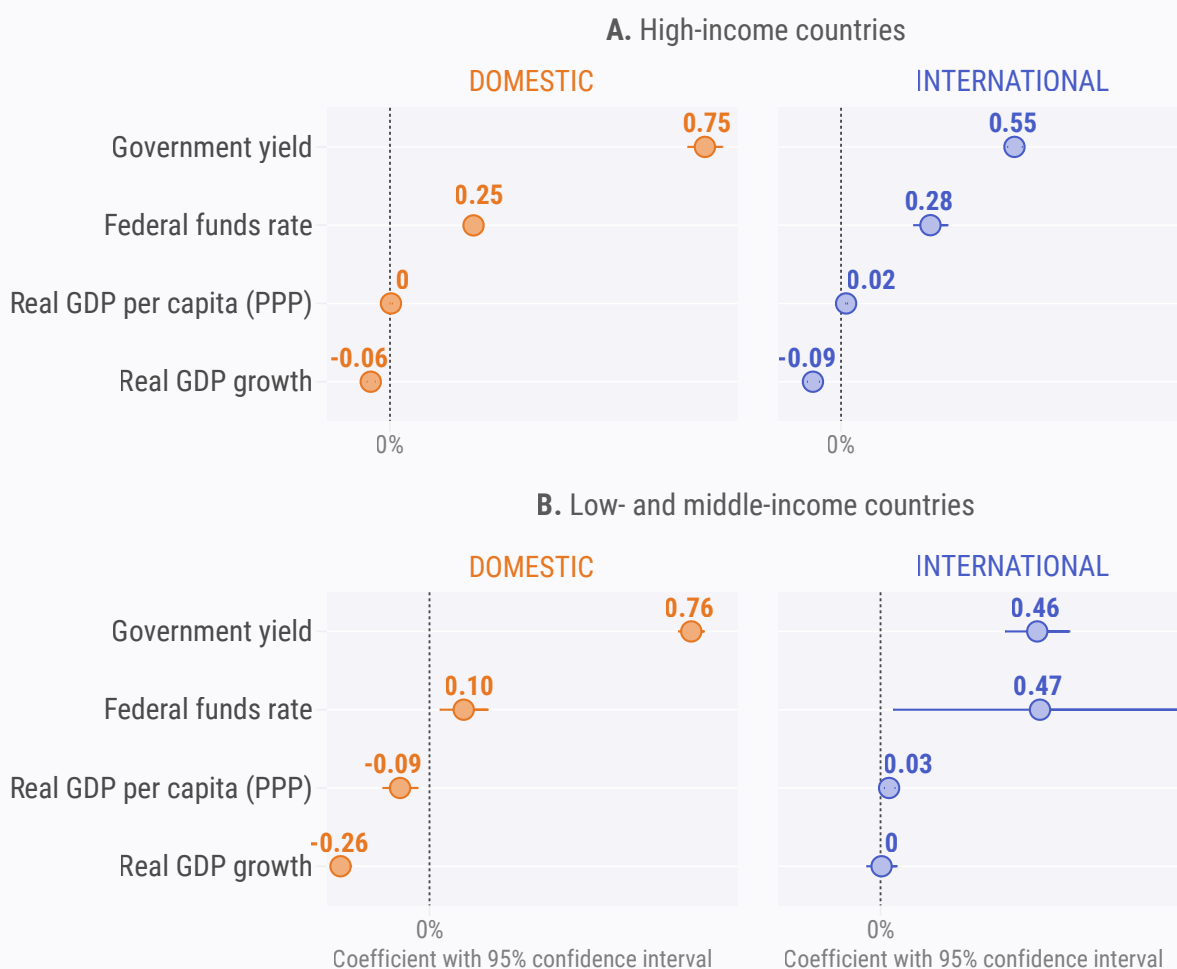
## Variable Definitions

Variable	Definition
<b>Private status</b>	Indicator equal to 1 if the issuer is privately held (not publicly listed) at the time of issuance; 0 if publicly listed.
<b>First bond issuance</b>	Indicator equal to 1 if the bond is the issuer's first observed bond issuance in the sample; 0 otherwise.
<b>Loan and bond market access</b>	Indicator equal to 1 if the issuer has access to both bond and syndicated loan markets, based on historical issuance in each market; 0 otherwise.
<b>SOE</b>	Indicator equal to 1 if the issuer is a state-owned enterprise; 0 otherwise.
<b>Subsidiary (domestic parent)</b>	Indicator equal to 1 if the issuer is a subsidiary whose ultimate parent is domiciled in the same country as the issuer; 0 otherwise.
<b>Subsidiary (international parent)</b>	Indicator equal to 1 if the issuer is a subsidiary whose ultimate parent is domiciled in a different country; 0 otherwise.
<b>Size</b>	Log of real total assets.
<b>Profitability</b>	Operating income divided by total assets, expressed in percent.
<b>Leverage</b>	Total debt divided by total assets.
<b>Tangibility</b>	Net property, plant, and equipment (PPE) divided by total assets.
<b>Amount issued</b>	Log of the real amount issued.
<b>Maturity</b>	Time to maturity at issuance, measured in years.
<b>Private placement</b>	Indicator equal to 1 if the issuance is classified as a private placement; 0 otherwise.
<b>Real GDP growth</b>	Annual growth rate of real GDP, expressed in percent.
<b>Real GDP per capita</b>	GDP per capita, PPP (constant 2021 international thousand \$).
<b>Domestic government yield</b>	Real secondary-market sovereign yield measured at the time of issuance of the corporate bond under consideration, expressed in percent. For LMICs, yield from the GBI-EM index; for HICs, the 10-year government local-currency bond yield.
<b>International government yield</b>	Real secondary-market sovereign yield measured at the time of issuance of the corporate bond under consideration, expressed in percent. For LMICs, yield from the EMBI index; for HICs, the 10-year government dollar-denominated bond yield.
<b>Federal funds rate</b>	U.S. federal funds rate measured at the time of issuance of the corporate bond under consideration, expressed in percent.

**Note:** This table defines the variables used in this chapter. Security characteristics are measured at issuance using London Stock Exchange Group's SDC deal information. Firm variables are constructed from annual LSEG's Worldscope financial statements. Macroeconomic variables are taken from the World Bank's World Development Indicators, Bloomberg, and the Federal Reserve Economic Data database.

FIGURE 2.2

### Regression Estimates of Global and Country Factors



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group, inflation data from the International Monetary Fund’s World Economic Outlook, GDP data from the World Bank’s World Development Indicators, sovereign data from Bloomberg and federal funds rate data from the Federal Reserve Economic Data database.

**Note:** This figure shows the results of the regression analysis using coefficient estimates. Each point on the figure represents a regression coefficient. The horizontal bars attached to each point illustrate the 95% confidence intervals. The vertical dashed line at zero divides the chart: coefficients to the left of this line indicate lower yields, while those to the right indicate higher yields. The figure includes separate panels for low- and middle-income and high-income country issuers. All coefficient values are shown in percentage points, so a value of 1.0 equals 1 percentage point, or 100 basis points. Real GDP growth and interest rates (domestic and international sovereign yields, and the federal funds rate) are expressed in percent, so coefficients on these variables should be interpreted as the effect of a 1 percentage point change. Real GDP per capita (PPP) is expressed in thousands of dollars, so coefficients should be interpreted as the effect of a \$1,000 change in income per person.

In international markets, the relationship is not statistically significant for LMICs but remains so for HICs. This pattern reflects stronger growth improving firms' cash-flow prospects and repayment capacity, which reduces the risk investors perceive and the yield they require.

**Higher income per capita is linked to lower corporate yields within LMIC domestic markets.**

A \$1,000 increase in real GDP per capita corresponds to a 9 basis point decline in yields. Income per capita is used as a broad proxy for development and captures several closely related features, such as institutional quality, macro stability, and financial market depth.<sup>37</sup> The decline in yields is consistent with richer LMICs having more predictable policies, stronger institutions, and more developed financial systems, which reduce risk premia and liquidity costs. It also fits with deeper financial development in higher-income economies, where larger domestic investor bases and better market infrastructure can lower liquidity premia and reduce required returns. In addition, richer countries often operate under more credible monetary frameworks and exhibit lower inflation volatility, which can translate into lower real borrowing costs.

**Corporate yields move strongly with sovereign yields in both domestic and international markets.**<sup>38</sup> In domestic markets,

a 1 percentage point increase in the sovereign yield is accompanied by a rise in corporate yields of 76 basis points in LMICs and 75 basis points in HICs. In international markets, a 1 percentage point increase in the sovereign yield corresponds to 46 basis points higher LMIC corporate yields and 55 basis points higher HIC yields. This reflects investors using sovereign yields as a benchmark for pricing corporate bonds, and higher sovereign yields push up corporate yields by drawing investor demand toward government bonds and leaving less room for corporate financing (Dos Santos, 2024).

**Firm Characteristics**

**Larger firms borrow at lower cost across markets and income groups.**

Moving from the 25th to the 75th percentile of firm size is linked to a 78 basis point lower yield for LMIC issuers in domestic markets and a 56 basis point lower yield in international markets. For HIC issuers, the corresponding associations are a 56 basis points lower yield in domestic markets and an 78 basis point lower yield in international markets.<sup>39</sup> This pattern may reflect the fact that larger, more diversified firms are typically regarded as safer borrowers, with more stable cash flows and less volatile earnings. It may also stem from information advantages. Larger firms typically disclose more, receive greater analyst coverage, and have longer track records, which

<sup>37</sup> These measures tend to move together, so income per capita is used to limit multicollinearity.

<sup>38</sup> Central bank policy rates are not included because they are highly collinear with sovereign yields in the sample, so including both would leave little independent variation to identify separate effects.

<sup>39</sup> The effect is 22 basis points larger for LMIC issuers than for HIC issuers in domestic markets. One possible explanation is that firm size carries more information in LMIC domestic markets, where smaller issuers may face greater information frictions, thinner trading, and a narrower investor base. In that setting, larger firms may benefit more from visibility, disclosure, and easier placement, which increases the yield discount tied to size.

reduces uncertainty for investors. In addition, larger issuers typically place bonds more easily and trade more actively after issuance, which lowers liquidity premia and contributes to cheaper borrowing.

**Leverage increases borrowing costs for LMIC firms, though only in international markets.**<sup>40</sup> In international markets, leverage correlates with increased yields across both groups of economies, though the impact is substantially greater in LMICs. Specifically, issuers from LMICs moving from the 25th to the 75th percentile of leverage experience a 54 basis point increase in yields, compared to only 35 basis points for HIC issuers. High leverage, therefore, appears to signal to investors a greater default risk in international markets, especially when the debt is in hard currency. The effect is 19 basis points larger for LMIC firms, which may reflect their greater exposure to macro shocks, such as exchange-rate depreciations, commodity price swings, and sudden stops, which can make high leverage riskier and therefore more costly. In domestic markets, the leverage coefficient is close to zero for LMICs.<sup>41</sup> For HIC domestic issuances, moving from the 25th to the 75th percentile of leverage increases real yields by 33 basis points.

**Higher profitability is associated with lower yields for corporates in both income groups.**<sup>42</sup> When profitability rises from the 25th percentile to the 75th percentile, yields decrease by 10 basis points for LMIC issuers in domestic markets and 24 basis points for LMIC issuers in international markets. The corresponding declines for HIC issuers are about 17 basis points in domestic markets and 23 basis points in international markets. This pattern is consistent with profitability acting as a signal of credit quality. More profitable firms can often borrow more cheaply because stronger cash flows make debt service easier. Higher profits also signal stronger credit quality, giving investors more confidence based on financial statements and track records and reducing uncertainty.

**State-owned enterprises (SOEs) borrow at lower yields.** SOE issuers (compared with non-SOEs) are associated with yields that are 50 basis points lower for LMIC issuers in domestic markets and 37 basis points lower for LMIC issuers in international markets. In HICs, SOE status is associated with yields that are 38 basis points lower in domestic markets and 26 basis points lower in international markets.<sup>43</sup> These results may come from implicit guarantees, with investors assigning a higher probability of government support in distress, including

<sup>40</sup> Leverage is defined as total debt divided by total assets, constructed from annual Worldscope financial statements.

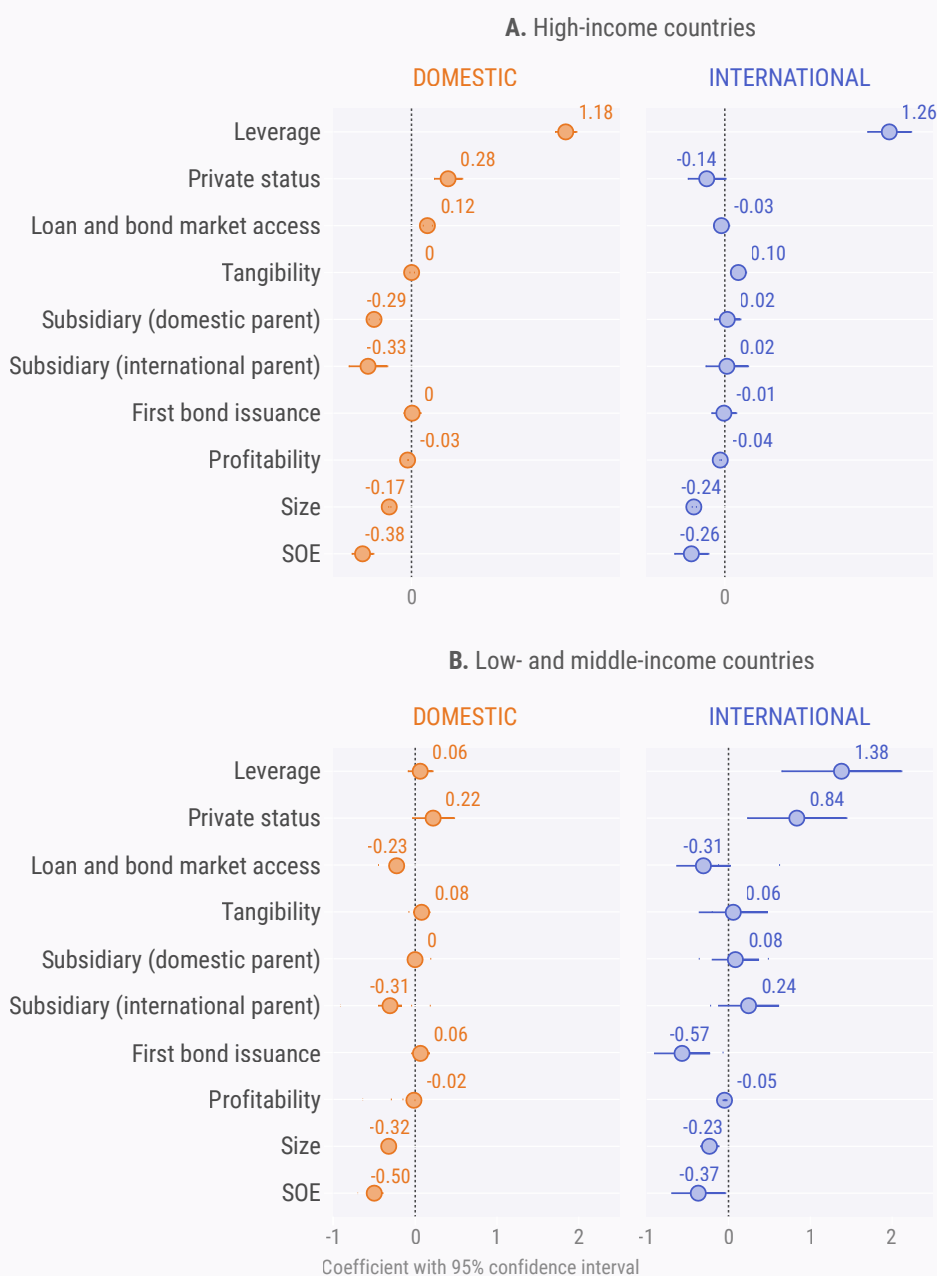
<sup>41</sup> For LMIC issuers in domestic markets, within-country-year dispersion in leverage is relatively small. This limited dispersion implies that, among the firms accessing domestic bond markets in a given year, leverage does not vary much, leaving little scope for investors to differentiate issuers based on how indebted they are.

<sup>42</sup> Profitability is winsorized at the 1st and 99th percentiles.

<sup>43</sup> Compared with HICs, the SOE discount is about 12 basis points larger for LMIC issuers in domestic markets and 11 basis points larger for LMIC issuers in international markets. One possible explanation is that government backing may reduce perceived risk by more in LMICs, where macro volatility is often higher and capital markets are thinner, making implicit support more valuable when liquidity conditions tighten or rollover risk rises. See Geng (2019).

FIGURE 2.3

## Regression Estimates of Firm-Level Factors



**Source:** Calculations using issuance data from the Securities Data Company Platinum database and firm balance sheet data from Worldscope, both from London Stock Exchange Group, and inflation data from the International Monetary Fund's World Economic Outlook.

**Note:** This figure shows the results of the regression analysis using coefficient estimates. Each point on the figure represents a regression coefficient. The horizontal bars attached to each point illustrate the 95% confidence intervals. The vertical dashed line at zero divides the chart: coefficients to the left of this line indicate lower yields, while those to the right indicate higher yields. The figure includes separate panels for low- and middle-income and high-income country issuers. All coefficient values are shown in percentage points, so a value of 1.0 equals 1 percentage point, or 100 basis points. Private status, first bond issuance, loan and bond market access, SOE, and subsidiary are indicator variables (0/1), so coefficients compare firms with the attribute to firms without it. Size is the natural log of real assets, so coefficients correspond to proportional changes in assets (for example, a 10% increase in assets is about a 0.10 increase in log assets). Profitability ( $[\text{operating income}/\text{assets}] \times 100$ ) is expressed in percent and winsorized at the 1st and 99th percentiles. The coefficient should be interpreted as the effect of a 1 percentage point change in profitability. Leverage (debt/assets), and tangibility (net PPE/assets) are ratios; they are measured in percentage points (for example, a 10 percentage point increase corresponds to a 0.10 increase in the underlying ratio), so coefficients on these variables should be interpreted as the effect of a 1 percentage point change.

bailouts, which lowers required yields. It may also stem from preferential access to domestic banks, state-owned lenders, or policy programs, which can reduce rollover risk.<sup>44</sup> Markets may also price a lower likelihood of default and higher expected recoveries for SOEs.

**A similar discount applies to subsidiaries of multinational companies in domestic markets, with no clear effect in international markets.** Subsidiaries are associated with yields that are 31 basis points lower for LMIC issuers in domestic markets and 33 basis points lower for HIC issuers in domestic markets. This may arise because investors view multinational parent companies as providing explicit or implicit backing through cash support and guarantees.

**Established access to syndicated loan and bond markets is generally associated with lower yields for LMIC issuers.** Having established access to both debt markets is linked to yields that are 23 basis points lower for LMIC issuers in domestic markets and 31 basis points lower for LMIC issuers in international markets. This is consistent with market access operating as a form of certification and reputation. Prior access signals that the firm has met disclosure, rating, and underwriting standards, reducing information frictions. It also aligns with repeat-issuer effects, whereby established borrowers develop an investor following and face smoother placement, thereby lowering issuance premia. The association is concentrated in LMICs and may reflect greater investor uncertainty, which

makes track records especially valuable and reduces the extra return investors demand from firms with established access.

**A sizeable premium is priced for non-listed LMIC corporates in international markets.**

Non-listed LMIC issuers are associated with yields that are 84 basis points higher in international markets. This pattern is consistent with lack of transparency being priced more heavily internationally, since non-listed firms disclose less and international investors rely more on standardized public information, ratings, and comparable disclosure.

### Security Characteristics

This section examines how observable bond features relate to yields, since security design can influence borrowing costs by affecting repayment risk and how easily bonds trade. At the same time, the variance decomposition assigns a relatively small share of overall yield variation to the security-characteristics layer once country and issuer factors are taken into account. This can be explained by the fact that some bond features are priced in economically meaningful ways, but they vary less than country conditions and firm characteristics in the broad cross-country sample. In addition, not all contract terms are observed consistently in a large cross-country issuance dataset. Features such as collateral, callability, and other embedded options are not measured in a comparable way for all bonds, so part of the role of contract design may show up in the residual

<sup>44</sup> Access to lower cost borrowing for SOEs may tilt the playing field in their favor compared with other firms, thereby reducing the degree of competition in the economy, all else being equal. For a broader discussion of SOEs, see World Bank (2023).

or be captured indirectly by other variables. The results in this section should therefore be read as the pricing of the bond features observed in the data, rather than a complete accounting of all contractual terms that can affect yields.

**Longer maturities are associated with higher borrowing costs in both domestic and international markets, with a steeper maturity premium in LMICs than in HICs.** In domestic markets, an additional year of maturity is accompanied by yields that are 14 basis points higher for LMIC issuers, compared with 9 basis points for HIC issuers. In international markets,

FIGURE 2.4

## Regression Estimates of Security Factors



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from International Monetary Fund's World Economic Outlook.

**Note:** This figure shows the results of the regression analysis using coefficient estimates. Each point on the figure represents a regression coefficient. The horizontal bars attached to each point illustrate the 95% confidence intervals. The vertical dashed line at zero divides the chart: coefficients to the left of this line indicate lower yields, while those to the right indicate higher yields. The figure includes separate panels for low- and middle-income and high-income countries issuers. All coefficient values are shown in percentage points, so a value of 1.0 equals 1 percentage point, or 100 basis points. Amount issued is the natural log of the real amount issued, so coefficients correspond to proportional changes in issuance size (for example, a 10% larger issue corresponds to about a 0.10 increase in log amount). Maturity is measured in years, so coefficients are per additional year of maturity. Private placement is an indicator variable (0/1), so coefficients compare private placements to public issues.

an additional year is accompanied by yields that are 10 basis points higher for LMIC issuers and 8 basis points higher for HIC issuers. This pattern comes from longer-term bonds exposing investors more to changes in interest rates and to uncertainty far into the future. It may also reflect the difficulty of assessing repayment risk many years ahead, especially in LMICs where inflation, exchange rates, and policy conditions can be more volatile.

**Larger issuances are associated with lower yields in HICs but higher yields in LMICs in international markets.** For HIC issuers in international markets, a larger issuance is linked to yields that are 8 basis points lower, as bigger tranches tend to be easier to trade and therefore require a smaller liquidity premium. Large issues are also more likely to qualify for major bond indexes, which can bring in more demand from passive and benchmarked investors and lower yields (Calomiris et al. 2022). In contrast, for LMIC issuers in international markets, a larger issuance is linked to yields that are 16 basis points higher, which may partly be because many deals still fall short of the size thresholds for major bond indexes, so scaling up does not always bring the same index-related demand. Investors may also view bigger LMIC deals as riskier because a larger amount must be repaid, which can raise concerns about repayment ability and losses in default.

**Private placements are associated with lower yields in domestic markets but higher yields in international markets.**<sup>45</sup> In domestic markets, private placements are associated with yields that are 5 basis points lower in LMICs and 4 basis points lower in HICs. This is consistent with deals being placed with known local investors who have better information about the issuer and therefore require a smaller premium. In international markets, private placements carry a yield premium. They are associated with yields that are 12 basis points higher for LMIC issuers in international markets and 11 basis points higher for HIC issuers in international markets. This may reflect that these bonds trade less, which raises liquidity premia, and that investors face higher legal, documentation, and monitoring costs that they require compensation for.

## How Much of the LMIC-HIC Yield Spread Is Accounted for by Firm Observables?

**The previously noted gap in borrowing costs between LMICs and HICs likely stems from a host of factors.** As shown in Chapter 1, bond yields are generally higher for LMIC corporates than for HIC corporates. This may reflect a mix of country factors—economic, institutional, or related to policies—firm-level characteristics, and bond features. Building on the regression analysis in the previous section, the extent to which the gap remains after differences in firm- and security-level characteristics across LMICs

<sup>45</sup> Private placements are bonds sold directly to a small group of investors (often institutional), rather than offered broadly to the public through a public offering. This classification is taken from London Stock Exchange Group's SDC Platinum database.

and HICs are taken into account can be assessed. Put differently, it can be examined whether higher yields in LMICs mainly reflect differences in the types of firms and bonds observed, or whether a residual gap persists even among comparable issuers.

**The gap declines by one quarter to one third when considering observable security, firm, and country characteristics.**

In a regression including only year fixed effects and a dummy variable for whether a corporate is in a LMIC, the estimated gap (the coefficient on the LMIC dummy) amounts to 1.22, meaning that LMIC issuers borrow at yields 122 basis points above HIC issuers within the same year (**Table 2.2**, column 1).<sup>46</sup> In subsequent specifications, groups of further determinants of yields are added (security-level characteristics in column 2, firm-level characteristics in column 3, and real GDP growth in column 4). Security- and firm-level characteristics are those used in the previous sections. At the country level, only real GDP growth is used, because it captures cyclical factors, whereas other variables such as real GDP per capita, sovereign yields, or institutional

variables would be highly collinear with either the LMIC dummy or the long-lasting country features that are typically seen as synonymous with the LMIC-HIC divide. The estimated gap declines as more groups of variables are added, to 78 basis points in column 4.<sup>47</sup> Thus, observable differences in bond design, issuer composition, and economic growth conditions together account for one third of the original gap.<sup>48</sup>

**A residual gap remains even after observable security and firm characteristics, and real GDP growth are included.**

Part of this gap may reflect bond and firm details that are not observed consistently in the data, such as guarantees or collateral and seniority.<sup>49</sup> It may also reflect obligations that are not fully visible in standard financial statements, including legal or regulatory contingencies such as pending lawsuits or tax disputes.<sup>50</sup> These details matter because they affect how likely repayment is and how much investors expect to recover if something goes wrong. The residual may also reflect policy uncertainty, which can raise the premium investors require even for otherwise similar issuers.

<sup>46</sup> The sample of firms under consideration includes those for which all variables are available for the subsequent specifications. All specifications include year fixed effects and are estimated on a common sample so that changes in the LMIC coefficient reflect added controls rather than changes in observations. The difference in sample of firms and sample period, and the fact that this is an estimated dummy coefficient in a linear panel regression instead of a median explain why this initial gap differs from the 200 basis points obtained in Chapter 1.

<sup>47</sup> Part of the remaining cross-country difference in corporate borrowing costs may reflect investor demand for higher yields because of concerns about LMIC features such as greater policy uncertainty, weak contract enforcement, capital controls, limited FX liquidity, or the risk of restrictions on cross-border payments. These factors can raise required returns for LMIC corporates beyond what is implied by observable security-, firm-, and country-level characteristics alone.

<sup>48</sup> Similar results were obtained considering domestic markets or international markets separately (see Appendix J).

<sup>49</sup> Seniority and collateral can affect expected recovery values in a default because they determine the order in which creditors are paid and whether a claim is backed by specific assets. Senior secured creditors are typically repaid earlier and recover more, while junior or unsecured creditors are paid only after senior claims are satisfied.

<sup>50</sup> Legal and regulatory risk can raise the cost of debt by creating uncertain future cash outflows (for example, through lawsuits, settlements, or tax liabilities) and by lowering expected recovery in stress episodes. See Arena (2018).

**Part of the residual may also reflect perceptions about how risky LMIC firms truly are.** Galizia & Lund (2025) point to a disconnect between sovereign risk ratings and the default performance of corporations and note that relying too heavily on sovereign ratings can lead to corporate risk in emerging markets being misjudged. For example, they find that in lower-income countries the average default rate for private borrowers was 6 percent, compared

with 14 percent that would be expected based on sovereign credit ratings. They also find that this divergence narrows significantly as country income levels increase. This type of wedge can translate into higher required yields for LMIC firms even when observable characteristics look similar.

TABLE 2.2

### Low- and Middle-Income to High-Income Country Spread in Real Issuance Yields With Sequential Controls (All Markets)

	(1)	(2)	(3)	(4)
<b>Low- and middle-income countries</b>	<b>1.220***</b> <b>(35.88)</b>	<b>1.080***</b> <b>(31.11)</b>	<b>0.901***</b> <b>(25.02)</b>	<b>0.776***</b> <b>(16.00)</b>
N	81,769	81,769	81,769	81,769
R-squared	0.27	0.31	0.35	0.35
Year FE	Yes	Yes	Yes	Yes
Security Factors	No	Yes	Yes	Yes
Firm Factors	No	No	Yes	Yes
Real GDP growth	No	No	No	Yes
Sample	Common	Common	Common	Common
Years	1990-2024	1990-2024	1990-2024	1990-2024

*t* statistics in parentheses

\*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$

**Source:** Calculations using issuance data from the Securities Data Company (SDC) Platinum database and firm balance sheet data from Worldscope, both from London Stock Exchange Group, inflation data from the International Monetary Fund's World Economic Outlook, and GDP data from the World Bank's World Development Indicators.

**Note:** The dependent variable is the real yield to maturity at issuance for all firms. Results are shown for all markets pooled. Columns (1)-(4) report pooled regressions that sequentially add controls. Column (1) includes only an indicator for LMICs. Column (2) adds security characteristics: amount issued, maturity, and private placement. Column (3) additionally includes firm characteristics: private status, first bond issuance, loan and bond market access, SOE, subsidiary, size, profitability, leverage, and tangibility. Column (4) further adds real GDP growth. All regressions include year fixed effects and use heteroskedasticity-robust standard errors. Specifications in columns (1)-(4) are estimated on a common sample, so the set of observations is identical across columns. The spread in Column (1) is not directly comparable to the spread shown in Chapter 1 because Chapter 1 reports results for 2015-2024, whereas these regressions use the full period 1990-2024. The estimation sample is also smaller than in the SDC-only analysis because merging SDC with Worldscope reduces coverage, as Worldscope primarily covers publicly listed firms and firm-level variables are not uniformly populated for all issuers. FE = fixed effects.

## CHAPTER 3

# Policies to Reduce Corporate Borrowing Costs in LMICs

### **AUTHORS:**

Kianna R. Freeman

Alvaro Pedraza

Imtiaz Ul Haq

## Key Messages

**Government policies to ensure monetary and fiscal stability can lower the cost of borrowing for firms.**

Durable reductions in both sovereign yields and corporate borrowing costs require credible fiscal trajectories, stable inflation, and consistent policy frameworks that compress country risk spreads and anchor the pricing of private debt.

**Sovereign benchmark quality reduces corporate borrowing costs and shapes transmission.**

Beyond the level of country risk, the depth, liquidity, and reliability of the sovereign yield curve determine how risk is priced and transmitted to corporates. Clear issuance strategies, liquid reference maturities, transparent debt management, and inclusion of sovereign bonds in major global bond indexes reduce liquidity and term premia and enhance firms' access to capital markets.

**Deepening the domestic investor base reduces borrowing costs in local markets.**

Reforms that mobilize long-term domestic savings broaden participation in local-currency bond markets and enable new firms to enter bond markets. For incumbent issuers, the estimated borrowing cost reduction of a pension reform, for example, amounts to roughly 150 basis points.

**International financial integration widens external financing options.**

Capital account liberalization and related openness reforms expand firms' access to global investors, increasing foreign bond issuance. For companies already accessing international capital markets, yield compression from such reforms is estimated at around 120 basis points.

**Stronger regulatory disclosure frameworks are associated with lower corporate yields.**

Countries with stronger mandated transparency—particularly regarding audited financial statements, ownership structures, compensation disclosure, and board information—tend to have lower corporate yields and higher issuance volumes.

**At the individual firm level, measures to improve corporate governance and transparency can complement strong fundamentals.**

Beyond profitability and strong balance sheets, firms that improve corporate governance, transparency, and financial reporting can reduce borrowing costs even within existing institutional constraints.

**This chapter adopts a policy lens to the cost of corporate borrowing in low- and middle-income countries (LMIC), examining the levers available to reduce financing costs. It considers both dollar and local-currency bond markets, with a particular focus on the latter given their central importance for firms in LMICs. Access to international bond markets remains limited for most firms (especially smaller and non-exporting companies) making local-currency instruments the primary avenue for market-based financing. However, our findings indicate that local-currency borrowing costs remain elevated in many LMICs (see Figure 1.2). This pattern points to important structural constraints in domestic capital markets and underscores a key policy challenge. Developing deeper and more diversified local-currency bond markets is critical not only for expanding access to finance, but also for reducing the cost of borrowing faced by LMIC firms.**

The previous chapters show that corporate bond yields in LMICs are shaped by a plethora of global-, country-, and firm-level factors. Thus, although no single measure can quickly and durably curtail the cost of borrowing, assiduous actions on the part of both policymakers and firms can, over time, make a material difference. Policymakers can act to reduce sovereign risk premia, broaden the investor base, and strengthen market foundations. Firms, in turn, can not only improve their profitability and balance sheets, but also enhance governance, transparency, and disclosure to position themselves closer to the pricing frontier as country conditions improve.

In *Financing Firm Growth* (2025), we examined many of these same policy areas through the lens of quantities—how reforms affect issuance volumes and total firm financing. Here, we complement that perspective by focusing on prices, asking not only whether policy changes shift market access, but whether they also translate into lower borrowing costs for firms.

The chapter is organized around five channels for reducing corporate borrowing costs in

LMICs: (i) sovereign risk and macro-financial stability; (ii) sovereign benchmark quality and market foundations; (iii) domestic investor-base deepening; (iv) international financial integration; and (v) firm-level credibility and governance. The central message is that durable reductions in the cost of capital require sustained improvements in sovereign risk, market infrastructure, and firm credibility. None of these are quick fixes. Lowering borrowing costs is ultimately the result of consistent policy reform and institutional strengthening over time.

## Country Risk Premia and Macro-Financial Stability

The first and most fundamental lever for reducing corporate borrowing costs in LMICs is lowering country risk premia and strengthening macro-financial stability. Fiscal sustainability, inflation stability, and consistent policy frameworks shape country risk, which in turn anchors the pricing of corporate debt (International Monetary Fund, 2019).

The evidence in Chapter 2 shows that sovereign borrowing costs are tightly linked to corporate

financing conditions in LMICs. Movements in government bond yields translate directly into changes in corporate real yields, particularly in local-currency markets. Macro-financial fundamentals also matter directly. Stronger growth, higher income levels, and more stable inflation environments are associated with lower corporate borrowing costs. Beyond current macro conditions, expectations about fiscal capacity, monetary discipline, and resilience to shocks also shape firms' cost of financing. When inflation volatility is high or fiscal trajectories are uncertain, investors demand higher compensation for holding longer-term debt, raising both term premia and rollover risk for firms.

Longstanding advice in these areas is further underpinned by evidence in the previous chapters on the sizable impact of sovereign yields on corporate borrowing costs in LMICs. From a policy perspective, three dimensions are central: fiscal sustainability; policy predictability and institutional quality; and monetary stability.

- **Fiscal sustainability.** Credible debt dynamics reduce sovereign risk premia and lower the baseline cost of capital for the private sector. Consolidation efforts that stabilize or reduce public debt ratios compress sovereign spreads (David et al., 2019).
- **Policy predictability and institutional quality.** Transparent fiscal rules, independent monetary authorities, and consistent regulatory frameworks reduce policy uncertainty that is often priced into sovereign and corporate spreads alike (Collin-Dufresne et al., 2001; Johnson et

al., 2000; Claessens & Yurtoglu, 2013; Zhu, 2014; Keita et al., 2021). Even in the absence of immediate changes in growth or debt levels, improvements in institutional stability can lower country risk premia by reducing perceived tail risks.

- **Monetary stability.** Credible monetary policy frameworks lower inflation risk premia and support the development of longer-maturity debt markets. Low and stable inflation reduces uncertainty about real returns, especially in local-currency markets (BIS, 2019).

Although credible monetary policy frameworks reduce inflation risk premia and support longer-maturity debt markets, there is an important short-run trade-off. Tight monetary policy raises policy rates and, mechanically, the benchmark over which corporate spreads are priced, thereby increasing borrowing costs, especially in local-currency markets where yields adjust quickly (Timmer, 2018; Bank of Mexico, 2022; Bank of Korea, 2023).

Over time, however, successful disinflation and anchored inflation expectations can reduce inflation and term premia, lowering the cost of capital. The net effect therefore depends on credibility and persistence. Temporary tightening that stabilizes inflation can ultimately ease financing conditions, whereas prolonged high-rate environments driven by fiscal imbalances or unanchored expectations may sustain elevated borrowing costs.

On international markets, macro-financial stability is reflected in lower default risk premia for both sovereign and corporate borrowers.

The implication is straightforward. Though firms can take meaningful steps to improve their financing conditions, sustained reductions in borrowing costs are difficult to achieve if country risk premia remain elevated. Lowering country spreads and strengthening macro-financial stability establish the pricing foundation upon which other reforms can operate effectively.

## Sovereign Benchmarks and Market Foundations

If sovereign risk and macro-financial stability determine the level of country risk premia, sovereign bond markets determine how that risk is priced and reflected into corporate borrowing costs. In LMICs, corporate bonds, whether issued domestically or internationally, are typically priced relative to sovereign benchmarks. The depth, liquidity, and reliability of the sovereign yield curve shape how sovereign risk premia are passed through to corporate borrowers (Li et al., 2021). A well-functioning sovereign yield curve can compress borrowing costs by establishing clear reference rates across maturities and reducing uncertainty around the term structure used for pricing. The sovereign yield curve thus underpins not only government debt markets but also the pricing of private credit and the broader cost of capital in the economy. Evidence suggests that the expansion of sovereign bond supply can facilitate corporate issuance by improving price discovery in domestic bond markets (Dos Santos, 2024).

## *Building a Reliable Sovereign Yield Curve*

A reliable sovereign yield curve performs three essential functions. First, it provides a reference rate across maturities against which corporate spreads are priced. Second, it supports price discovery and secondary-market trading, lowering liquidity premia. Third, it facilitates maturity extension by anchoring expectations about long-term rates and rollover risk.

In many LMICs, sovereign issuance is concentrated in a narrow set of maturities, benchmark bonds are small or infrequently reopened, and secondary-market liquidity is limited (OECD, 2025). These structural features raise uncertainty about pricing and exit risk, increasing the compensation investors require to hold longer-term instruments. Corporate issuers priced off such benchmarks face higher term and liquidity premia, even when underlying macro conditions are improving.

Against that backdrop, policy measures to ameliorate the sovereign yield curve include:

- Predictable issuance calendars and regular reopenings to build large, liquid benchmark bonds;
- Concentration of issuance in key maturities to enhance market depth;
- Transparent debt-management strategies and clear communication with investors;
- Development of primary dealer systems and secondary-market trading infrastructure.

## BOX 3.1

## Sovereign Benchmark Recognition and Repricing: Evidence From EMBI Inclusion

Actions aimed at attracting foreign investors enhance the availability of capital for domestic borrowers, potentially leading to reduced borrowing costs. Inclusion in major global bond indexes is an example that provides a clean empirical setting. It generates a well-defined increase in foreign demand for sovereign debt, allowing us to examine whether this demand shock spills over to corporate financing.

The inclusion of sovereign bonds in the JPMorgan Emerging Markets Bond Index (EMBI), represents a structural shift in the investor base. JPMorgan determines index eligibility based on transparent criteria, including income classification, market accessibility for foreign investors, and minimum standards for liquidity and tradability of external sovereign debt. Once a country enters the index, benchmark-constrained funds—both passive and active managers tracking the EMBI—must allocate capital to its sovereign bonds (Pandolfi & Williams, 2019). This mechanical increase in demand deepens secondary-market liquidity and compresses liquidity premia embedded in sovereign yields. Consistent with the growing literature on index inclusion effects (Claessens & Yafeh, 2012; Boone & White, 2015), entry into widely tracked global bond indexes can trigger benchmark-driven inflows that lower sovereign borrowing costs and, through the sovereign benchmark channel, reduce corporates' external funding costs as well. Survey evidence from market participants indicates broad agreement that inclusion in an internationally recognized bond index should constitute a distinct and desirable milestone for emerging markets (Demekas & Nerlich, 2020).

A natural concern is that increased demand for sovereign bonds could crowd out corporate issuance by absorbing a larger share of global investor portfolios. If benchmark-driven inflows merely redirect capital toward government debt, private borrowers could face tighter financing conditions.

The evidence from EMBI inclusion episodes does not support the crowding-out argument. Panel A of Figure 3.1 shows that the number of bond-issuing firms relative to GDP does not decline following inclusion. If anything, the point estimates suggest a modest increase in the number of firms accessing bond markets, although the estimates are not statistically precise. The absence of a decline in market participation indicates that increased sovereign demand does not displace corporate borrowers from capital markets.

Panel B highlights the main pricing effect. Corporate borrowing costs decline in international bond markets following EMBI entry. The effect is most pronounced for firms that were already issuing internationally prior to inclusion. For these incumbent issuers, yields fall by 64 basis points, indicating improved access to global capital at lower cost.

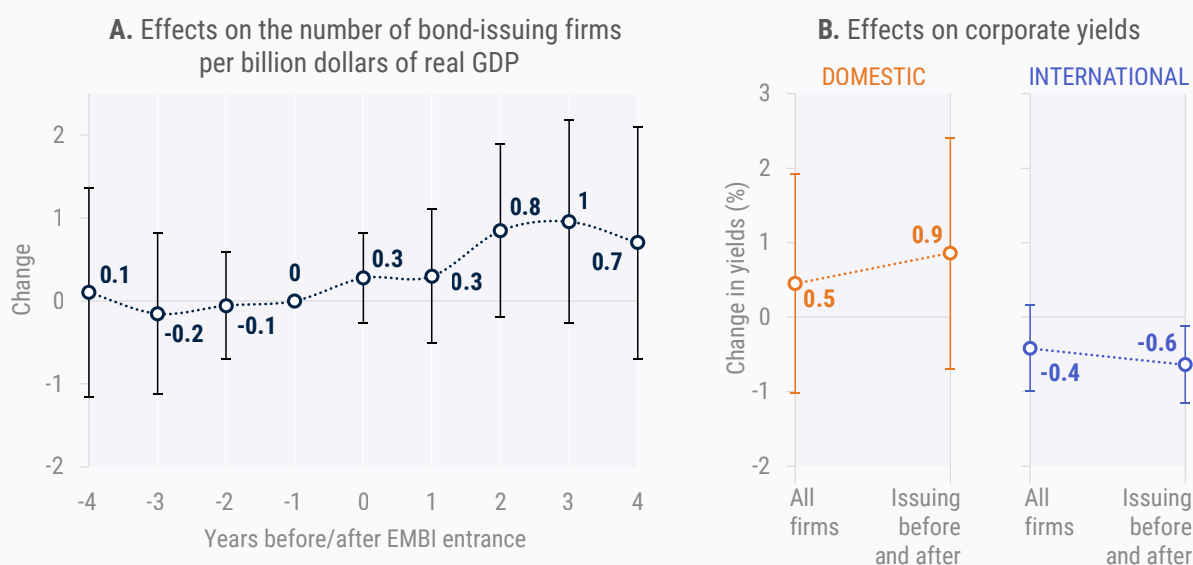
## BOX 3.1 (CONTINUED)

These patterns are consistent with a sovereign benchmark channel. The primary effect of EMBI inclusion is increased demand for sovereign debt, which compresses sovereign yields. When the sovereign benchmark reprices downward, corporate borrowing costs adjust because international corporate yields are typically priced relative to the sovereign curve. As sovereign risk premia decline and global investors expand their exposure to the country, incumbent corporate issuers benefit from lower external financing costs.

Taken together, these results reinforce a central message of earlier chapters: sovereign benchmarks anchor corporate pricing, especially in international markets. When sovereign bonds are included in major global indexes, the repricing of sovereign risk is transmitted directly to corporate borrowing costs, allowing firms to obtain cheaper financing.

FIGURE 3.1

## Sovereign Index Inclusion and the Corporate Bond Market



**Source:** Calculations using Securities Data Company Platinum from London Stock Exchange Group, JPMorgan Emerging Markets Bond Index, and World Bank World Development Indicators.

**Note:** The figure reports the effects of sovereign inclusion in the JPMorgan Emerging Markets Bond Index (EMBI) on corporate bond issuance and borrowing costs in 60 LMICs. Estimates come from an event-study design comparing countries entering the EMBI to LMICs that are not yet included—or never included—during the sample period. The event year is the first year a country's sovereign bonds enter the EMBI. Panel A reports the change in the number of bond-issuing firms per billion dollars of real GDP (constant 2020 prices), relative to the year before sovereign index inclusion. Panel B reports average treatment effects on real corporate bond yields for domestic and international issuances, shown for all issuers and separately for firms issuing both before and after entry. Point mean estimates across bootstrap replications; bars show the p5–p95 interval. GDP = gross domestic product.

These actions do not directly alter sovereign risk premia, but they improve the transmission of country risk pricing into corporate markets. By strengthening benchmark liquidity and transparency, policymakers can reduce the structural components of corporate borrowing costs that stem from market fragmentation rather than fundamentals.

The discussion above emphasizes how the depth and liquidity of the sovereign yield curve influence corporate borrowing costs through benchmark pricing and liquidity premia. A natural question, however, is whether improvements in sovereign market functioning— independent of changes in macroeconomic fundamentals—translate into measurable declines in corporate yields. **Box 3.1** examines this question using sovereign inclusion in a major global bond index as an empirical setting to isolate the effect of benchmark strengthening on corporate financing conditions.

## Deepening the Domestic Investor Base

Policies that broaden the domestic institutional investor base play a central role in improving corporate financing conditions in LMICs, particularly in local-currency bond markets (Meh & Schmukler, 2025). By expanding the pool of long-term, professionally managed domestic savings, countries can strengthen demand for local-currency debt, reduce liquidity premia, and support longer maturities. Unlike improvements in sovereign risk pricing or benchmark infrastructure, which lower the economy-wide pricing of risk, expanding the investor base primarily works by strengthening the demand

for domestic securities. Pension reforms provide a useful illustration of this mechanism. By channeling household savings into institutional investors, they generate a measurable increase in demand for domestic securities and offer one of the clearest empirical settings to estimate how a larger investor base affects firms' borrowing costs.

### The Entry Effect: Expanding Access to Domestic Bond Markets

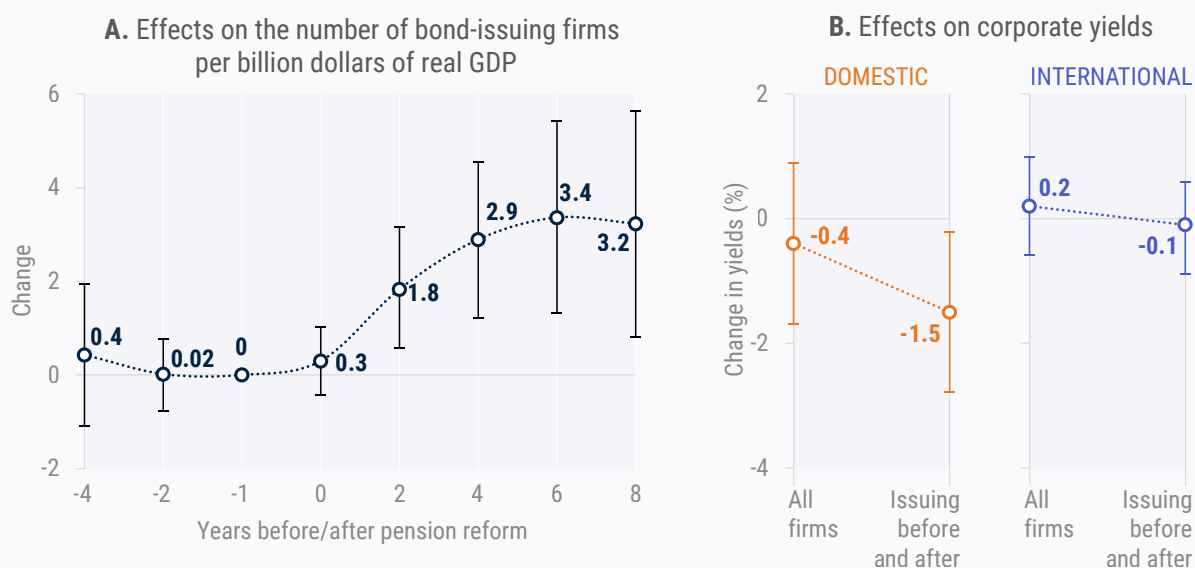
**Figure 3.2** illustrates the impact of pension reforms on access to capital markets in 30 LMICs. Panel A shows a steady rise in the number of firms issuing bonds in the years after pension reforms are implemented. This pattern suggests that reforms promoting funded pension systems broaden participation in bond markets by increasing the pool of domestic institutional investors with long-term investment horizons. As demand for fixed-income assets grows, more firms access bond financing, supporting the development of domestic debt markets.

### The Incumbent Effect: Yield Compression Among Established Issuers

Panel B examines how pension reforms affect corporate borrowing costs. Considering all firms, the average cost of borrowing does not change significantly after the reform, but this may reflect entry from new, higher-risk issuers. Focusing instead on incumbent firms—those issuing bonds prior to the reform—helps isolate changes in pricing conditions from composition effects driven by the entry of new issuers which may carry higher yields. These results indicate a substantial decline in the cost of domestic bond financing. Real domestic yields for incumbent

FIGURE 3.2

## Pension Reform and the Corporate Bond Market



**Source:** Calculations using Securities Data Company Platinum from London Stock Exchange Group, International Federation of Pension Fund Administrators, and World Bank World Development Indicators.

**Note:** The sample includes 30 LMICs that implemented major pension reforms introducing mandatory or quasi-mandatory individually funded programs between 1990 and 2024. Estimates come from an event-study design comparing reforming countries to LMICs that have not yet implemented—or never implement—similar reforms during the sample period. The event year is the first year a major reform is implemented in each country. Panel A reports the change in the number of bond-issuing firms per billion dollars of real GDP (constant 2020 prices), relative to the year before the reform. Panel B reports average treatment effects on real corporate bond yields for domestic and international issuances, shown for all issuers and separately for firms issuing both before and after reform. Points denote mean estimates across bootstrap replications; bars show the p5–p95 interval. GDP = gross domestic product.

issuers fall by roughly 150 basis points relative to pre-reform levels, representing a meaningful reduction in the cost of long-term funding.<sup>51</sup>

The pricing effects are concentrated in domestic bonds. We find no evidence of comparable yield compression in international bond issuances following pension reforms. This pattern is consistent with the mechanism at work: pension reforms expand the pool of

domestic institutional investors, increasing demand for local-currency corporate debt. As demand for these assets rises, firms issue bonds at lower yields.

Cross-country differences in pension fund investment rules help clarify the mechanism. The decline in domestic corporate borrowing costs after pension reforms is larger in countries where pension funds face fewer restrictions

<sup>51</sup> To put this magnitude into context, applying the estimated decline in domestic real yields to domestic bond issuance by firms in 34 LMICs with no pension reform based on private accounts, or with only small private pension markets, would have reduced interest payments by about \$25 billion over the past decade. See Appendix L for details.

on investing in corporate securities and are less concentrated in sovereign debt.<sup>52</sup> This pattern suggests that expanding the domestic institutional investor base can improve corporate borrowing conditions by increasing demand for corporate debt directly, not only by strengthening demand for government securities.

## International Integration

Rather than expanding domestic demand or lowering sovereign risk premia, liberalization events, such as capital account openings or other measures that increase financial openness, primarily relax constraints on firms' access to international financing. By reducing barriers to cross-border investment and foreign participation, these reforms allow firms to tap into deeper foreign capital markets, increasing the supply of financing from foreign investors and in turn lowering borrowing costs (Bekaert et al., 2005; Larrain & Stumpner, 2017).

### The Entry Effect: Expanding Access to International Issuance

**Figure 3.3** examines the effects of financial liberalization on corporate bonds. Panel A shows a steady rise in the number of firms issuing bonds following liberalization. The number

of issuers increases progressively in the years after these reforms. This pattern is consistent with evidence that financial openness allows firms with sufficient scale, productivity, and visibility to attract foreign investors. For these firms, liberalization expands the feasible set of financing options by opening access to deeper and more competitive global markets.

### Yield Compression in Foreign Markets

Firms experience an average decline of 120 basis points in foreign bond yields relative to pre-liberalization levels, representing a meaningful reduction in the cost of financing (**Figure 3.3**, Panel B).<sup>53</sup> This decline reflects the core mechanism emphasized in the literature: by easing capital controls and restrictions on foreign participation, liberalization exposes firms to a broader investor base and allows access to deeper pools of global savings, lowering the cost of capital.<sup>54</sup>

By contrast, the response of domestic bond markets is more muted. In principle, capital account liberalization could lower domestic borrowing costs by facilitating foreign participation in local-currency bond markets. In practice, however, foreign investors tend to remain more active in international bond markets, where securities are typically

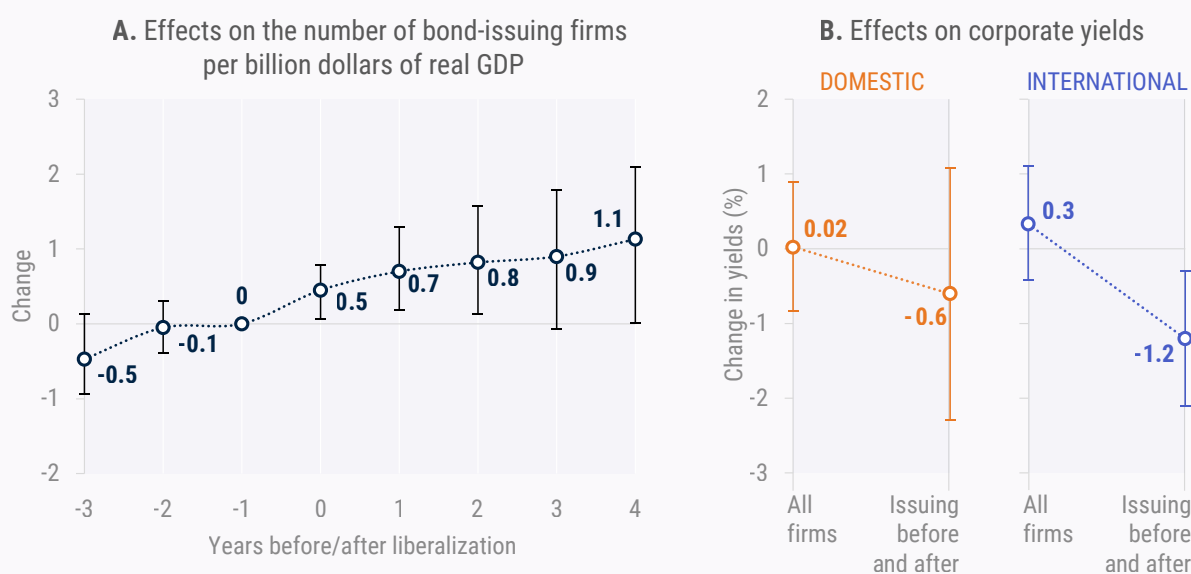
<sup>52</sup> The comparison splits the pension-reform episodes in Panel B of Figure 3.2 by whether the allowed share of domestic fixed-income investment in non-government securities is above or below the sample median. The decline in domestic corporate borrowing costs is about 60 basis points larger where this limit is more flexible.

<sup>53</sup> To put this estimate in perspective, applying the yield decline to international bond issuance by firms in 47 LMICs with substantial remaining scope for capital-account liberalization would have reduced interest payments by roughly \$78 billion over the past decade. See Appendix L for details.

<sup>54</sup> The decline in borrowing costs following liberalization is especially pronounced among financial firms. This likely reflects their central role as primary intermediaries in cross-border capital flows. Furthermore, the standardized regulatory oversight and reporting frameworks characteristic of financial institutions make them more accessible for foreign investors to evaluate than nonfinancial firms.

FIGURE 3.3

## Liberalization and the Corporate Bond Market



**Source:** Calculations using Securities Data Company Platinum from London Stock Exchange Group, the Chinn–Ito capital account openness database, and World Bank World Development Indicators.

**Note:** The figure examines 24 major capital account liberalization episodes in LMICs between 2000 and 2021, defined as increases of more than 1.5 standard deviations in the Chinn–Ito index. Estimates come from an event-study design with staggered treatment timing, comparing liberalizing countries to LMICs that have not yet liberalized—or remain untreated—during the sample period. The event year is the year of the liberalization episode in each country. Panel A shows the change in the number of bond-issuing firms per billion dollars of real GDP (constant 2020 prices), relative to the year before the liberalization episode. Panel B reports average treatment effects on real corporate bond yields for domestic and international issuances, shown for all issuers and separately for firms issuing both before and after liberalization. Points denote mean estimates across bootstrap replications; bars show the p5–p95 interval. GDP = gross domestic product.

issued in hard currency and market depth is greater. Consistent with this pattern, we find little evidence of a strong direct effect on domestic borrowing costs. Although domestic yields decline by about 60 basis points following liberalization, the estimates are not statistically precise.

Together with the evidence on pension reforms, these results highlight two distinct but complementary pathways to lower corporate borrowing costs in LMICs: one operating through the deepening of domestic investor

bases, and the other through improved access to global capital markets.

## The Benefits of Information Disclosure

Improving the regulatory environment governing corporate transparency is an important channel through which policymakers can reduce corporate borrowing costs. In bond markets, where investors have limited control rights and depend heavily on publicly available information, disclosure rules can affect the

risk premium embedded in corporate yields. When financial reporting standards are weak or disclosure obligations are limited, investors may face greater uncertainty about firms' ownership structures, governance arrangements, and financial prospects. That uncertainty can be priced into higher required returns.

**Figure 3.4** illustrates the cross-country relationship between regulatory transparency requirements and corporate borrowing costs. The figure plots median real corporate bond yields against the World Bank's extent of corporate transparency index, which captures regulatory requirements related to disclosure of ownership stakes, managerial compensation, audits, and financial prospects. Higher values indicate stronger mandated transparency. The negative relationship shown in the figure implies that countries with more robust disclosure regulations are associated with lower median corporate yields.

This relationship is consistent with the broader evidence in the report. Chapter 2 shows that country-level characteristics account for a substantial share of the variation in corporate yields in LMICs, particularly in local-currency markets. Part of this country effect reflects macroeconomic and sovereign risk, but part also captures institutional features that shape how investors assess firm-level risk. Regulatory transparency requirements can reduce the institutional component of uncertainty by standardizing the information available to creditors and improving its credibility.

Regulations requiring annual financial statements to be externally audited by independent auditors strengthen confidence in

reported financial data. Mandatory and timely disclosure of significant ownership stakes reduces uncertainty about control structures and related-party exposures, which are especially salient in settings characterized by concentrated ownership (common in LMICs). Public disclosure of managerial compensation and information on board members increases visibility into governance arrangements and incentive alignment. Requirements to disclose financial prospects and material risk factors improve investors' ability to assess expected cash flows and downside risks. Together, these measures may reduce information asymmetries and lower the information risk premium embedded in bond yields.

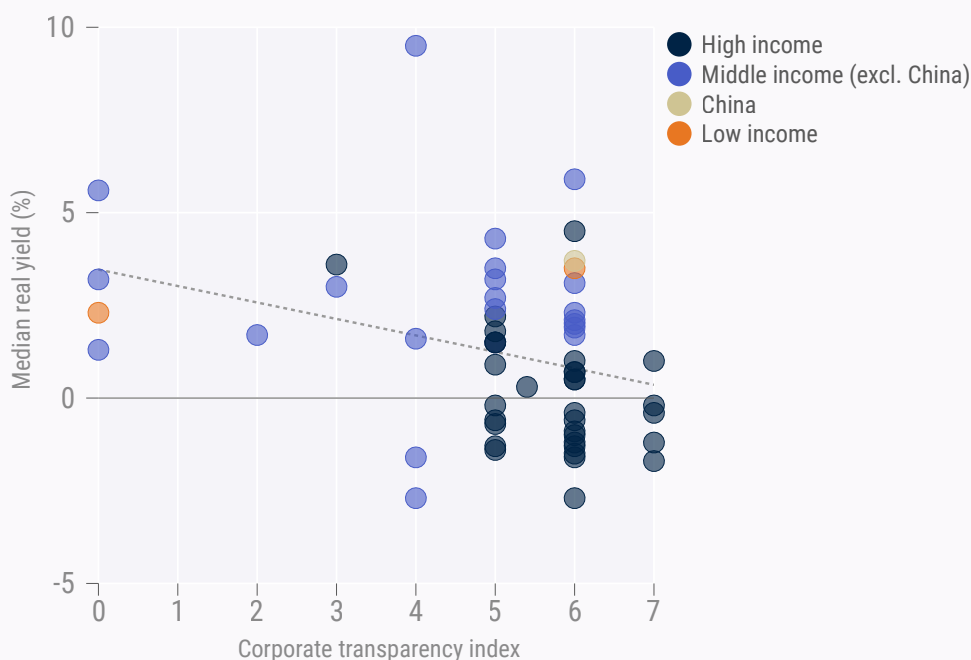
Stronger disclosure regulation can also broaden the effective investor base, complementing reforms discussed earlier in the chapter. Institutional investors—both domestic and foreign—often operate under internal or regulatory mandates that require standardized, audited financial information. When disclosure rules meet recognized standards and are credibly enforced, a larger pool of investors is willing to hold corporate bonds. Increased participation enhances competition and market depth, which can compress required yields. Moreover, clearer and more consistent disclosure improves price discovery and reduces the dispersion of investor beliefs, contributing to more efficient pricing around sovereign benchmarks.

Stronger disclosure regulation also has implications beyond pricing. Evidence from the Financing Firm Growth report (2025) shows that improvements in the corporate transparency framework are associated with

FIGURE 3.4

## Better Disclosure Is Correlated With Lower Local-Currency Corporate Yields

*Corporate transparency and corporate bond real yields (medians, 2014–2020)*



**Source:** Calculations using data from the Securities Data Company (SDC) Platinum database from London Stock Exchange Group, World Bank Doing Business 2020 (World Bank 2020), and GDP data from the World Bank's World Development Indicators.

**Note:** This figure plots the cross-country relationship between corporate disclosure and corporate bond market yields. Each point represents a country. For each country, the yield measure is the median real yield (nominal yield adjusted for realized inflation) calculated by pooling all local-currency corporate bond issuances during 2014–2020. Corporate disclosure is measured by the World Bank Doing Business 2020 "extent of corporate transparency index," an index ranging from 0 to 7 (higher values indicate greater disclosure) based on regulations governing corporate transparency and disclosure. Data for the transparency index are available only for 2014–2020 (inclusive), and a country is included only if it has at least three annual observations. For each outcome and the transparency index, country-level medians over 2014–2020 are plotted. The dotted line shows the fitted regression line for these datapoints, controlling for real GDP per capita. Marker colors indicate countries' income categories. Real GDP per capita is measured in purchasing-power-parity (PPP) terms (2005 base year), and income categories follow the World Bank's 2005 income group classification. GDP = gross domestic product.

higher bond issuance volumes and broader market participation. By reducing informational barriers and increasing investor confidence, stronger disclosure rules expand the set of firms able to access capital markets and increase the amount of financing raised. In this sense, transparency reforms can operate on both the price and quantity margins. They lower borrowing costs for firms already active in bond

markets and facilitate entry by new issuers. As with other reforms discussed in this chapter, increased participation can mechanically raise average observed yields if new entrants are riskier than incumbents. Nonetheless, for these firms, access to bond markets often represents an improvement relative to alternative funding sources.

The impact of transparency reforms depends critically on enforcement. Formal regulatory provisions that are weakly implemented are unlikely to make a dent in borrowing costs. Investors price not only the existence of disclosure rules but also their credibility and consistency. Effective supervisory capacity, audit oversight, and meaningful sanctions for misreporting are therefore essential complements to statutory reform.

Whereas macroeconomic stability and sovereign risk reduction anchor the baseline cost of capital, strengthening the regulatory disclosure environment can help to address the informational wedge that drives corporate spreads above that baseline. The evidence suggests that enhancing corporate disclosure requirements—particularly in areas related to audited financial statements, ownership transparency, compensation disclosure, and

### BOX 3.2

## How Can Firms Reduce Their Borrowing Costs?

Beyond country-level reforms, firms themselves can take concrete steps to lower their cost of debt. Corporate governance actions are most effective when monitoring, transparency, and contractual protections reinforce one another to reduce agency conflicts and information asymmetries. Although cross-country firm-level data on corporate governance measures are limited in LMICs, evidence from single-country and cross-listed firm studies provides consistent insights into how governance choices affect debt pricing. The discussion below summarizes select firm-level measures associated with lower borrowing costs.

**Controlling-Shareholder Expropriation:** In LMICs, ownership is often highly concentrated and opaque, and the dominant agency problem faced by creditors is the risk of expropriation by controlling shareholders—through tunneling, related-party transactions, or risk-shifting—rather than conventional manager-shareholder conflicts (Johnson et al., 2000). Empirical studies show that weaker protection against such expropriation is associated with higher bond yields, lower credit ratings, and greater sensitivity of spreads to firm-specific shocks (Lin et al., 2011). Firms can mitigate these risks by simplifying ownership and group structures, improving transparency of intra-group transactions, and adopting formal related-party transaction policies that require independent review and disclosure.

**Board Oversight:** Strong boards (independent, director expertise, active audit committees) reduce borrowing costs by improving oversight and financial reporting integrity (Anderson et al., 2004; Bhojraj & Sengupta, 2003). Formal board independence can often be more nominal than real in LMICs. Therefore, investors will respond positively when board structures credibly constrain controlling shareholders and strengthen monitoring.

**Disclosure and Transparency:** Voluntary improvements in disclosure are especially important in LMIC bond markets, where information frictions, limited analyst coverage, and weaker disclosure norms raise required risk premia. Firms that provide timely, consistent, and detailed financial reporting, clear disclosure of debt structures, maturity profiles, and use of proceeds, and regular investor communication reduce information risk priced by bondholders. An extensive body of literature shows that higher-quality financial

board information—can be a practical and scalable policy lever to narrow the cost of debt gap faced by firms in LMICs.

These policy measures can be further supplemented by actions firms can undertake on this front. In LMICs—where investors face greater uncertainty regarding enforcement, information quality, and recovery in distress—voluntary corporate governance improvements by firms can meaningfully reduce corporate bond

yields, often with effects comparable to, or larger than, formal regulatory changes. **Box 3.2** outlines some of these measures that are documented to lower corporate borrowing costs.

#### BOX 3.2 (CONTINUED)

reporting and voluntary disclosure are associated with tighter credit spreads, higher credit ratings, and improved access to public bond markets (Bharath et al., 2008; Ashbaugh-Skaife et al., 2006). Firms from weaker institutional environments that voluntarily subject themselves to higher disclosure standards—through cross-listing or adoption of international reporting practices—are able to issue bonds at lower yields and longer maturities, and rely more on public rather than private debt markets (Ball et al., 2013).

**Audit Quality:** Audit quality provides a form of ‘portable credibility’, particularly for internationally issued bonds. The use of high-quality external auditors, combined with strong audit committee oversight, improves confidence in reported financials and covenant compliance, and is associated with narrower bond spreads. Although much of the direct evidence is drawn from advanced economies, this channel is widely viewed as especially valuable in LMICs, where alternative mechanisms for verifying firm information are weaker (Anderson et al., 2004; Claessens & Yurtoglu, 2013).

**Creditor Protections:** Firms can also reduce borrowing costs by strengthening bond-level governance features under their control. These include covenants limiting leverage, asset sales, and dividend payouts; collateral or guarantees; and change-of-control protections. Such contractual features reduce expected losses in distress and constrain post-issuance agency problems, lowering required yields (Klock et al., 2005; Lin et al., 2011). For internationally issued bonds, the choice of governing law and enforcement venue further enhances creditor protection and can partially substitute for weaker domestic institutional environments (Ball et al., 2013).

The effectiveness of firm-level governance measures is conditional on the surrounding institutional and legal environment. Evidence shows that strong firm governance has the largest impact on borrowing costs in countries with weaker investor protection and legal enforcement, where governance improvements substitute for institutional deficiencies. In stronger institutional settings, governance and institutions tend to be complementary (Zhu, 2014). This implies that voluntary firm-level governance actions can be particularly powerful in LMICs, provided that legal and regulatory frameworks supporting basic contract enforcement are in place.

To sum up, borrowing costs are strongly influenced by fundamental factors at the global, country, and firm levels, and there are consequently no quick fixes to reduce the cost of borrowing. Even so, actions by policymakers and firms can make a dent in these costs. Policymakers can take measures to reduce country risks by improving macroeconomic stability, fostering the development of domestic financial markets, and enhancing firms' access to international capital. Likewise, better corporate governance and disclosure of information can reassure investors. Such actions on the part of policymakers and firms can, over time, make financing more affordable, to foster productive investment and expansion of economic activity.

## Areas for Future Research

This report documents patterns in corporate borrowing costs across countries and firms, identifies key drivers of yield variation, and evaluates the effects of selected policy reforms. Several important questions, however, lie beyond its current scope. The areas below outline a potential agenda for future work that complements the analysis in this report.

First, additional work can refine the identification of reforms examined in this chapter. Although the report links yields to macroeconomic conditions, institutional quality, and market development, reforms are often endogenous and bundled, complicating identification. Future work could exploit discrete policy changes and quasi-experimental variation to isolate causal effects. Policy-relevant topics may include possible crowding out of corporate issuances by sovereign issuances, easing portfolio restrictions on local institutional

---

### BOX 3.3

## Country Case Studies: *Peru and the Philippines*

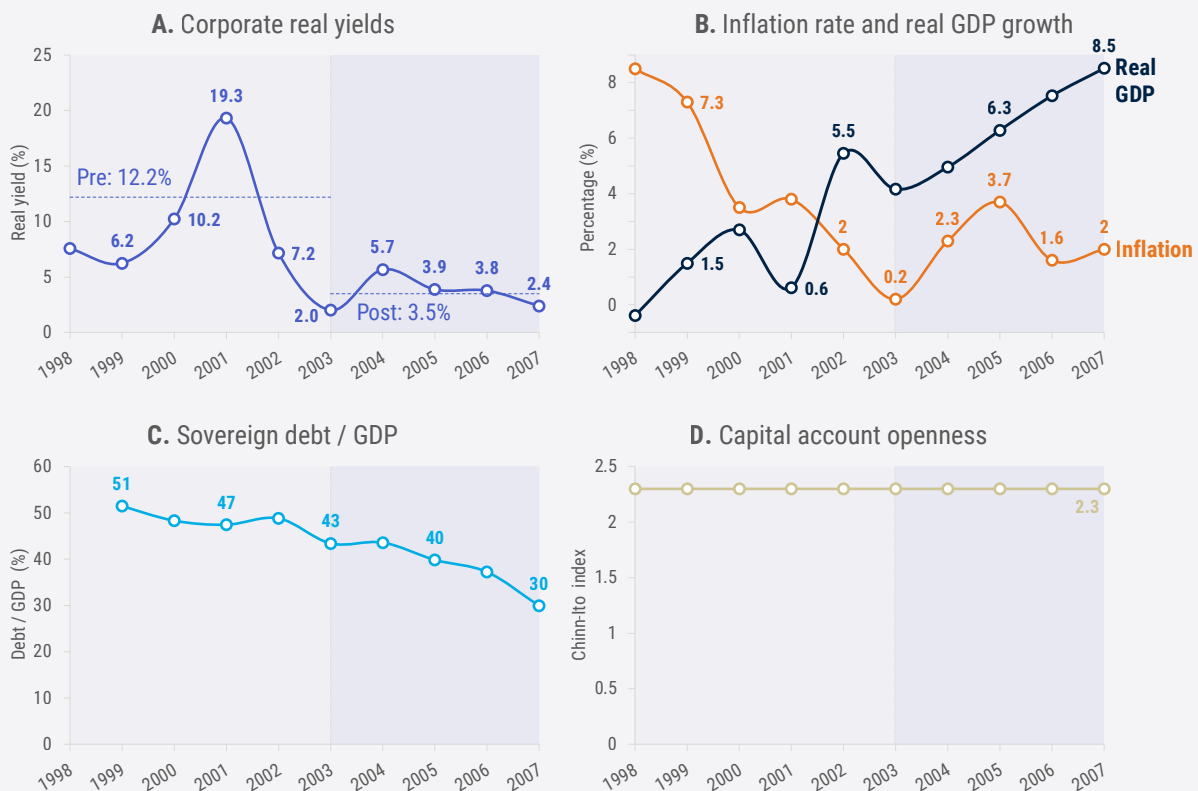
The experiences of Peru and the Philippines illustrate a central message of this chapter: **reductions in corporate borrowing costs rarely result from a single reform.** These two cases were selected because they experienced some of the sharpest and most sustained declines in corporate borrowing costs in the sample. In both countries, corporate yields fell alongside improvement in monetary stability, macroeconomic performance, fiscal positions, and access to foreign capital.

**Peru**

Peru provides one of the clearest examples of this cumulative repricing process (**Figure 3.5**). Between 2003 and 2007, real corporate bond yields declined sharply. This decline followed a sustained reduction in inflation and coincided with stronger economic growth and a marked fall in sovereign debt as a share of GDP. Capital account openness was already high and remained broadly unchanged over the period. The episode therefore points primarily to the effects of stronger macroeconomic stability and lower sovereign risk on corporate financing conditions. In the language of this chapter, Peru illustrates how improvements in the macroeconomic and sovereign foundations of debt pricing can translate into materially lower borrowing costs for firms.

FIGURE 3.5

**Peru: Macroeconomic Conditions and Corporate Borrowing Costs, 2003–2007**



**Source:** Calculations using data from the Securities Data Company Platinum database from London Stock Exchange Group, World Bank Doing Business 2020 (World Bank 2020), and GDP data from the World Bank’s World Development Indicators.

**Note:** The figure presents a country case study (Peru) over the period 1998–2007, highlighting the evolution of corporate borrowing costs and key macro-financial indicators. Panel A shows real corporate bond yields. Panel B reports inflation and real GDP growth. Panel C presents sovereign debt as a share of GDP. Panel D shows capital account openness measured by the Chinn–Ito index. The shaded region denotes the post-reform period, beginning in 2003. Dotted lines in Panel A indicate average real yields in the pre- and post-reform periods. Over this period, inflation declined from about 5 percent to 2 percent, real GDP growth increased from roughly 2 percent to 6 percent, and sovereign debt fell from about 49 percent to 39 percent of GDP. Corporate real yields declined by approximately 3 percentage points during this period of fiscal consolidation and macroeconomic stabilization, while capital account openness remained broadly unchanged. The figure illustrates the joint evolution of macroeconomic stability and sovereign risk alongside changes in corporate borrowing costs. GDP = gross domestic product.

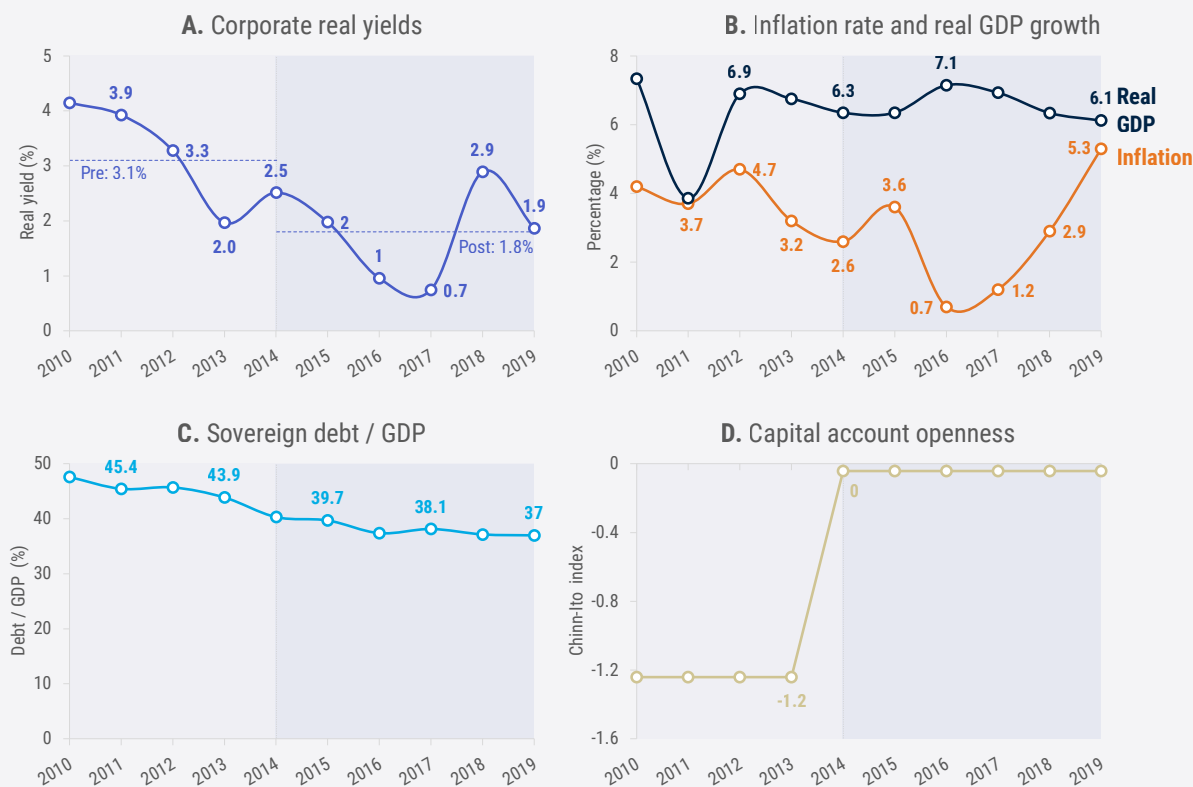
## The Philippines

The Philippines illustrates a complementary pathway (**Figure 3.6**). In the second half of the 2010s, real corporate bond yields fell markedly. In this case, the decline coincided with a marked opening of the capital account in 2014, alongside inflation that remained generally stable, solid economic growth, and a continued decline in sovereign debt relative to GDP. This suggests that financial opening can facilitate lower borrowing costs when it takes place within a stable macroeconomic environment. In the framework of this chapter, the Philippine episode shows how improved access to external capital can amplify the gains from stronger macroeconomic conditions and lower sovereign risk.

Taken together, these two cases point to the compounding nature of reform. Sustained improvements in macroeconomic stability and sovereign fundamentals can lower the baseline price of risk faced by corporate borrowers, although greater financial openness can facilitate those gains by expanding access to foreign capital. In both countries, lower corporate borrowing costs reflect complementary reforms pursued over time rather than the effect of any single policy change. The broader lesson is that durable declines in corporate borrowing costs are most likely when reforms improve both the macroeconomic foundations of debt pricing and firms' effective access to capital markets, with scope for further work to refine the identification of specific reform channels.

FIGURE 3.6

## The Philippines: Macroeconomic Conditions and Corporate Borrowing Costs, 2014–2019



**Source:** Calculations using Securities Data Company Platinum from London Stock Exchange Group, the Chinn–Ito capital account openness database, and World Bank World Development Indicators.

**Note:** The figure presents a country case study (Philippines) over the period 2010–2019, highlighting the evolution of corporate borrowing costs and key macro-financial indicators. Panel A shows real corporate bond yields. Panel B reports inflation and real GDP growth. Panel C presents sovereign debt as a share of GDP. Panel D shows capital account openness measured by the Chinn–Ito index. The shaded region denotes the post-reform period, beginning in 2014. Dotted lines in Panel A indicate average real yields in the pre- and post-reform periods. Over this period, the Chinn–Ito index increased from about  $-1.2$  to  $0$ , indicating a marked opening of the capital account; inflation declined overall, while corporate real yields fell by approximately 1.2 percentage points. These patterns are consistent with a period of financial liberalization alongside stable macroeconomic conditions. The figure illustrates the joint evolution of macroeconomic stability, sovereign risk, and financial openness alongside changes in corporate borrowing costs. GDP = gross domestic product.

investors, expanding retail investor participation, updating market infrastructure, and improving the information environment.

Second, the role of underwriters and market intermediation remains underexplored. Underwriters influence pricing through certification, distribution, and liquidity provision, yet their role is not prominent in the current analysis. Future research could examine how underwriter reputation, their fees, market concentration, and the mix of domestic versus international intermediaries affect issuance yields, particularly in thinner markets where limited intermediation capacity may itself raise borrowing costs.

A third area relates to monetary policy transmission and central bank interventions. Although global conditions are shown to matter, the relative roles of domestic policy rates, inflation expectations, and monetary credibility are not fully disentangled. Future work could better separate monetary transmission from credit risk channels in sovereign pass-through, while also assessing the impact of unconventional tools—such as asset purchases and liquidity facilities—on corporate bond pricing. The interaction between financial repression and corporate spreads is a related issue that warrants systematic analysis.

Fifth, future research could examine nonlinear and asymmetric responses of borrowing costs to macro-financial conditions. Financing conditions may deteriorate more sharply in downturns than they improve in expansions, particularly for riskier firms, implying that linear models understate vulnerabilities during stress episodes. Testing for such asymmetries would provide a

more complete understanding of how financing constraints evolve over the cycle.

A related but distinct question is whether corporate bond markets stabilize or amplify economic fluctuations. Although they can provide an alternative source of financing when bank credit contracts, they may also transmit global shocks more rapidly, increasing volatility. The net effect likely depends on the investor base, with long-term institutional investors providing stability relative to more liquidity-sensitive funds. Linking bond market activity to firm investment and macro-outcomes would help clarify whether market development enhances resilience or introduces new fragilities.

Lastly, this report focuses on bond yields from the borrower's perspective. It does not assess realized risk-adjusted returns to investors, and whether observed yields represent fair compensation for risk. Comparing issuance yields with ex post returns—decomposed into defaults, recoveries, and excess returns—would help distinguish between risk-based pricing and market inefficiencies such as segmentation or limited competition. Linking yields to realized default outcomes would also help to identify possible investor misperceptions of risks related to LMIC firms.

Taken together, these directions build on the analysis in this report by further sharpening causal identification, enriching institutional analysis, and broadening the set of outcomes examined. Advancing along these dimensions could help pinpoint more specific reforms and further strengthen the policy relevance of the findings for reducing borrowing costs for firms in low- and middle-income countries.

# References

- Abraham, F., Cortina, J. J., & Schmukler, S. L. (2021). The Rise of Domestic Capital Markets for Corporate Financing: Lessons from East Asia. *Journal of Banking & Finance*, 122, 105987. <https://doi.org/10.1016/j.jbankfin.2020.105987>
- Acharya, V., Drechsler, I., & Schnabl, P. (2014). A Pyrrhic Victory? Bank Bailouts and Sovereign Credit Risk. *Journal of Finance*, 69(6), 2689–2739. <https://doi.org/10.1111/jofi.12206>
- Adrian, T., Colla, P., & Shin, H. S. (2013). Which Financial Frictions? Parsing the Evidence from the Financial Crisis of 2007 to 2009. *NBER Macroeconomics Annual*, 27(1), 159–214.
- Adrian, T., Gaspar, J.-M., & Kammer, A. (2024, January 31). Emerging Markets Navigate Global Interest Rate Volatility. *International Monetary Fund Blog*. Retrieved from <https://www.imf.org/en/blogs/articles/2024/01/31/emerging-markets-navigate-global-interest-rate-volatility>
- Agca, S., & Celasun, O. (2012). Sovereign Debt and Corporate Borrowing Costs in Emerging Markets. *Journal of International Economics*, 88(1), 198–208. <https://doi.org/10.1016/j.jinteco.2012.02.009>
- Anderson, R. C., Mansi, S. A., & Reeb, D. M. (2004). Board Characteristics, Accounting Report Integrity, and the Cost of Debt. *Journal of Accounting and Economics*, 37(3), 315–342. <https://doi.org/10.1016/j.jacceco.2004.01.004>
- Arena, M. P. (2018, February). Corporate Litigation and Debt. *Journal of Banking & Finance*, 87, 202–215. Retrieved from <https://doi.org/10.1016/j.jbankfin.2017.10.005>
- Ashbaugh-Skaife, H., Collins, D. W., & LaFond, R. (2006). The Effects of Corporate Governance on Firms' Credit Ratings. *Journal of Accounting and Economics*, 42(1–2), 203–243. <https://doi.org/10.1016/j.jacceco.2006.02.003>
- Bai, J., & Wei, S.-J. (2017). Property Rights and the Cost of Capital: Evidence from Cross-Country Firm-Level Data. *Journal of Financial Development*, 7(1), 1–29. <https://doi.org/10.1142/S2010139217500136>
- Ball, R., Sudarshan J., & Lakshmanan S. (2012). Audited Financial Reporting and Voluntary Disclosure as Complements: A Test of the Confirmation Hypothesis. *Journal of Accounting and Economics* 53(1–2): 136–166. (Published online 2012, issue dated 2013.)

- Ball, R. T., Hail, L., & Vasvari, F. P. (2018). Equity Cross-Listings in the U.S. and the Price of Debt. *Review of Accounting Studies*, 23(2), 385–421. <https://doi.org/10.2139/ssrn.1426586>
- Bank for International Settlements. (2019). Establishing Viable Capital Markets. *CFGs Papers No. 62*. Retrieved from <https://www.bis.org/publ/cgfs62.htm>
- Bank of Korea. (2023). *Monetary Policy Report*. March. Retrieved from <https://www.bok.or.kr/fileSrc/eng/ddb322431766e264eca6806b61c07a4b/1/202305021042171330.pdf>
- Bank of Mexico. (2022). *Quarterly Report: April–June 2022*. Retrieved from <https://www.banxico.org.mx/publications-and-press/quarterly-reports/%7B495CA43B-0866-5B68-B30E-8B1E1B29BA07%7D.pdf>
- Barry, E., & Mody, A. (1998). What explains changing spreads on emerging-market debt: fundamentals or market sentiment?
- Bekaert, G., Harvey, C. R., & Lundblad, C. (2005). Does Financial Liberalization Spur Growth? *Journal of Financial Economics*, 77(1), 3–55.
- Bevilaqua, J., Hale, G., & Tallman, E. (2020). Corporate Yields and Sovereign Yields. *Journal of International Economics*, 124, 103303.
- Bharath, S. T., & Shumway, T. (2008). Forecasting Default with the Merton Distance to Default Model. *Review of Financial Studies*, 21(3), 1339–1369. <https://doi.org/10.1093/rfs/hhno44>
- Bhojraj, S., & Sengupta, P. (2003). Effect of Corporate Governance on Bond Ratings and Yields: The Role of Institutional Investors and Outside Directors. *Journal of Business*, 76(3), 455–475. Retrieved from <https://www.jstor.org/stable/10.1086/344114?seq=1>
- Boone, A. L., & White, J. T. (2015). The Effect of Institutional Ownership on Firm Transparency and Information Production. *Journal of Financial Economics*, 117(3), 508–533. Retrieved from <https://doi.org/10.1016/j.jfineco.2015.05.008>.
- Borensztein, E., Cowan, K., & Valenzuela, P. (2007). Sovereign Ceilings 'Lite'? The Impact of Sovereign Ratings on Corporate Ratings in Emerging Market Economies. *International Monetary Fund Working Paper WP/07/75*. International Monetary Fund.
- Borensztein, E., Cowan, K., & Valenzuela, P. (2013). Sovereign Ceilings 'Lite'? The Impact of Sovereign Ratings on Corporate Ratings. *Journal of Banking & Finance*, 37(11), 4014–4024.
- Boyarchenko, N., & Elias, L. (2024). *Corporate Credit Conditions Around the World: Novel Facts Through Holistic Data* (Federal Reserve Bank of New York Staff Report No. 1074). Federal Reserve Bank of New York. Retrieved from <https://leolias1.github.io/CreditConditionsAroundTheWorld.pdf>
- Breiman, L. (2001). Random Forests. *Machine Learning*, 45(1), 5–32.
- Brugler, J., Comerton-Forde, C., & Martin, J. S. (2022). Secondary Market Transparency and Corporate Bond Issuing Costs. *Review of Finance*, 26(1), 43–77. Retrieved from <https://academic.oup.com/rof/article/26/1/43/6321248?login=true>

- Brunnermeier, M., & Krishnamurthy, A. (2020). The Macroeconomics of Corporate Debt. *The Review of Corporate Financial Studies*, 9, 656–665.
- Calomiris, C. W., Larrain, M., Schmukler, S. L., & Williams, R. (2022). Large International Corporate Bonds: Investor Behavior and Firm Responses. *Journal of International Economics*, 137, 103624.
- Carvajal, A. F., & Bebczuk, R. (2019). *Capital Markets Development: Causes, Effects, and Sequencing—A Literature Review*. World Bank. Washington, DC: International Bank for Reconstruction and Development / The World Bank.
- Carvajal, A. F., & Didier, T. (2024). *Boosting SME Finance for Growth: The Case for More Effective Support Policies*. World Bank Group. Washington, DC: World Bank.
- Cavallo, E. A., & Valenzuela, P. (2010). The Determinants of Corporate Risk in Emerging Markets: An Option-Adjusted Spread Analysis. *International Journal of Finance and Economics*, 15(1), 59–74. Retrieved from [https://www.imf.org/-/media/websites/imf/imported-full-text-pdf/external/pubs/ft/wp/2007/\\_wp07228.pdf](https://www.imf.org/-/media/websites/imf/imported-full-text-pdf/external/pubs/ft/wp/2007/_wp07228.pdf)
- Chari, A., Dilts Stedman, K., & Lundblad, C. (2020). Capital Flows in Risky Times: Risk-On/Risk-Off and Emerging Market Tail Risk. *International Monetary Fund Conference Paper*. Retrieved from <https://www.imf.org/-/media/files/conferences/2020/arc/chari-anusha-et-al.pdf>
- Chen, T., & Guestrin, C. (2016). XGBoost: A Scalable Tree Boosting System. In *Proceedings of the 22nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (pp. 785–794). ACM. <https://doi.org/10.1145/2939672.2939785>
- Claessens, S., & Yurtoglu, B. B. (2013). Corporate Governance in Emerging Markets: A Survey. *Emerging Markets Review*, 15, 1–33. <https://doi.org/10.1016/j.ememar.2012.03.002>
- Collin-Dufresne, P., Goldstein, R. S., & Martin, J. S. (2001). The Determinants of Credit Spread Changes. *Journal of Finance*, 56(6), 2177–2207. <https://doi.org/10.1111/0022-1082.00402>
- Corsetti, G., Kuester, K., Meier, A., & Müller, G. J. (2014). Sovereign Risk and Belief-Driven Fluctuations in the Euro Area. *Journal of Monetary Economics*, 61, 53–73. <https://doi.org/10.1016/j.jmoneco.2013.10.011>
- Dailami, M., Masson, P. R., & Padou, J. J. (2008). Global Monetary Conditions Versus Country-Specific Factors in the Determination of Emerging Market Debt Spreads. *Journal of International Money and Finance*, 27(8), 1325–1336.
- Dailami, M. (2010). Sovereign Debt Distress and Corporate Spillover Impacts. *World Bank Policy Research Working Paper* 5380.
- David, A., Guajardo, J., & Yopez, J. (2019). *Regional Economic Outlook: Western Hemisphere*. International Monetary Fund. Retrieved from <https://www.imf.org/-/media/files/publications/reo/whd/2019/october/english/sovereign.pdf>

- Dell'Erba, S., Hausmann, R., and Panizza, U. (2013). Debt Levels, Debt Composition, and Sovereign Spreads in Emerging and Advanced Economies. *Oxford Review of Economic Policy* 29(3): 522–547
- Demekas, D. G., & Nerlich, A. (2020). Creating Domestic Capital Markets in Developing Countries: Perspectives from Market Participants. *EMCompass Note* 77. International Finance Corporation. Retrieved from <https://www.ifc.org/content/dam/ifc/doc/mgrt-pub/emcompass-note-77-creating-domestic-cap-markets-dev-countries.pdf>.
- Denis, D. J., & Mihov, V. T. (2003). The Choice Among Bank Debt, Non-Bank Private Debt, and Public Debt: Evidence from New Corporate Borrowings. *Journal of Financial Economics*, 70(1), 3–28.
- Didier, T., Hevia, C., & Schmukler, S. L. (2012). How Resilient and Countercyclical Were Emerging Economies During the Global Financial Crisis? *Journal of International Money and Finance*, 31(8), 2052–2077.
- Didier, T., Mauro, P., & Schmukler, S. L. (2006). Vanishing Financial Contagion? *Journal of Policy Modeling*, 28(7), 775–791. <https://doi.org/10.1016/j.jpolmod.2006.07.003>
- Dittmar, R. F., & Yuan, K. (2008). Do Sovereign Bonds Benefit Corporate Bonds in Emerging Markets? *Review of Financial Studies*, 21(5), 1983–2014. <https://doi.org/10.1093/rfs/hhn015>
- Dos Santos, A. (2024). The Development of Domestic Bond Markets. *Job Market Paper*. [https://adossantos.s3.us-east-1.amazonaws.com/jmp\\_ads.pdf](https://adossantos.s3.us-east-1.amazonaws.com/jmp_ads.pdf)
- Dungey, M., Fry, R., González-Hermosillo, B., & Martin, V. (2002). International Contagion Effects from the Russian Crisis and the LTCM Near-Collapse. *IMF Working Paper* WP/02/74. International Monetary Fund.
- Durbin, E., & Ng, D. (2005). The Sovereign Ceiling and Emerging Market Corporate Bond Spreads. *Journal of International Money and Finance*, 24(4), 631–649. <https://www.sciencedirect.com/science/article/pii/S0261560605000355>
- Eichengreen, B., & Mody, A. (1998). What Explains Changing Spreads on Emerging Market Debt: Fundamentals or Market Sentiment? *NBER Working Paper* No. 6408. <https://doi.org/10.3386/w6408>
- Ferri, G., Liu, L.-G., & Majnoni, G. (2001). The Role of Rating Agency Assessments in Less Developed Countries: Impact of the Proposed Basel Guidelines. *Journal of Banking and Finance*, 25(1), 115–148. [https://doi.org/10.1016/S0378-4266\(00\)00119-9](https://doi.org/10.1016/S0378-4266(00)00119-9)
- Friedman, J. H. (2001). Greedy Function Approximation: A Gradient Boosting Machine. *Annals of Statistics*, 29(5), 1189–1232. <https://doi.org/10.1214/aos/1013203451>
- Gadanecz, B., Miyajima, K., & Urban, J. (2014). How Might EME Central Banks Respond to the Influence of Global Monetary Factors?, BIS Papers chapters, in: Bank for International Settlements (ed.), The

- transmission of unconventional monetary policy to the emerging markets, volume 78, pages 45-69, Bank for International Settlements.
- Galiay, A., & Maurin, L. (2015). *Drivers of Banks' Cost of Debt and Long-Term Benefits of Regulation—An Empirical Analysis Based on EU Banks*. European Central Bank.
- Galizia, F., & Lund, S. (2025, March 25). *Are Emerging Market Risks for Private Investors Overstated? What the Data Show*. Retrieved from <https://blogs.worldbank.org/en/voices/are-emerging-market-risks-for-private-investors-overstated-what-the-data-show>
- Gandolfo, J. & Mauro, P. (2025). *How Emerging Market Companies are Withstanding Global Interest Rate Shifts*. World Bank. <http://hdl.handle.net/10986/42807> License: CC BY-NC 3.0 IGO
- Garay, U., González, M., Rosso, J., & Hernandez, R. (2019). Country and Industry Effects in Corporate Bond Spreads in Emerging Markets. *Journal of Business Research*, 102, 191–200. <https://doi.org/10.1016/j.jbusres.2019.01.070>
- Geng, Z., & Pan, J. (2024). The SOE Premium and Government Support in China's Credit Market. *The Journal of Finance* 79, no. 5: 3041-3103.
- GFSR. (2020). *Global Financial Stability Report: Chapter 3 – Emerging and Frontier Markets*. Washington, D.C.: International Monetary Fund. Retrieved from <https://www.imf.org/-/media/files/publications/gfsr/2020/april/english/ch3.pdf>
- Gilchrist, S., Wei, B., Yue, V. Z., & Zakrajšek, E. (2022). Sovereign Risk and Financial Risk. *Journal of International Economics*, 136, 103603.
- Goel, R., & Papageorgiou, E. (2021). Corporate Financing Trends and Balance Sheet Risks in Latin America. *Global Financial Stability Note* No. 2021/004. Washington, D.C.: International Monetary Fund. Retrieved from <https://www.imf.org/-/media/files/publications/gfs-notes/2021/english/gfsnea2021004.pdf>
- Goldstein, I., Koijen, R., & Richmond, R. (2021). Banking Network and the Pricing of Financial Intermediation. *SSRN Working Paper* No. 3865234. Retrieved from [https://download.ssrn.com/21/06/11/ssrn\\_id3865234\\_code1884.pdf](https://download.ssrn.com/21/06/11/ssrn_id3865234_code1884.pdf)
- Goldstein, M. A., & Hotchkiss, E. S. (2020). Providing Liquidity in an Illiquid Market: Dealer Behavior in US Corporate Bonds. *Journal of Financial Economics*, 135(1), 16–40.
- Goldstein, M. A., Hotchkiss, E. S., & Nikolova, S. (2021). Dealer Behavior and the Trading of Newly Issued Corporate Bonds (SSRN Working Paper). *SSRN Electronic Journal*. Retrieved from <https://doi.org/10.2139/ssrn.1022356>
- Gozzi, J., Levine, R., & Schmukler, S. (2010). Patterns of International Capital Raisings. *Journal of International Economics* 80(1): 45–57.

- Gozzi, J. C., Levine, R., Martinez Peria, M. S., & Schmukler, S. L. (2015). How Firms Use Corporate Bond Markets Under Financial Globalization. *Journal of Banking & Finance*, 58, 532–551. <https://www.sciencedirect.com/science/article/pii/S0378426615000941>
- Gubareva, M., Borges, M. R., & Vieira, E. F. S. (2022). Determinants of Corporate Bond Yield Spreads in Emerging Markets. *Research in International Business and Finance*, 60, 101606. <https://doi.org/10.1016/j.ribaf.2021.101606>
- Hameed, A., Grigg, A., & Anderson, C. (2019). Corporate Debt in Emerging Economies: Trends, Characteristics, and Policy Implications. *BIS Papers No. 102*. Retrieved from [https://www.bis.org/publ/bppdf/bispap102\\_e\\_rh.pdf](https://www.bis.org/publ/bppdf/bispap102_e_rh.pdf)
- Hernando-Kaminsky, P. D. (2025). *Crowding Out and Banking Crises*. No. 11145. The World Bank. <https://doi.org/10.1596/1813-9450-11145>
- Houston, J., & James, C. (1996). Bank Information Monopolies and the Mix of Private and Public Debt Claims. *The Journal of Finance*, 51(5), 1863–1889. <https://doi.org/10.1111/j.1540-6261.1996.tb05229.x>
- International Monetary Fund. (2019). Emerging and Frontier Markets: Mind the Debt. *Global Financial Stability Report: Lower for Longer*. Washington, DC: IMF
- International Monetary Fund. (2015). *Global Financial Stability Report: Vulnerabilities, Legacies, and Policy Challenges*. Washington, DC: International Monetary Fund
- Johnson, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2000). Tunneling. *American Economic Review*, 90(2), 22–27. <https://doi.org/10.1257/aer.90.2.22>
- Kamin, S., & von Kleist, K. (1999). The Evolution and Determinants of Emerging Market Credit Spreads in the 1990s. *BIS Working Papers No. 68*, May 1999. Bank for International Settlements, Basel.
- Kang, J., & Pflueger, C. E. (2015). Inflation Risk in Corporate Bonds. *Journal of Finance*, 70(1), 115–162. <https://doi.org/10.1111/jofi.12195>
- Keita, K., Leon, G., & Lima, F. (2021). Do Financial Markets Value Quality of Fiscal Governance? *Open Econ Rev*, 32, 907–921. <https://doi.org/10.1007/s11079-021-09652-4>
- Klock, M. S., Mansi, S. A., & Maxwell, W. F. (2005). Does Corporate Governance Matter to Bondholders? *Journal of Financial and Quantitative Analysis*, 40(4), 693–719. <https://doi.org/10.1017/S0022109000001940>
- Larrain, M., & Stumpner, S. (2017). Capital Account Liberalization and Aggregate Productivity: The Role of Firm Capital Allocation. *The Journal of Finance*, 72(4), 1825–1858.
- Li, D., Magud, N. E., Werner, A., & Witte, S. (2021). The Long-Run Impact of Sovereign Yields on Corporate Yields in Emerging Markets. *International Monetary Fund Working Paper No. 2021/155*. Washington, D.C.: International Monetary Fund. <https://doi.org/10.5089/9781513573410.001>

- Lin, H., Wang, J., & Wu, C. (2011). Liquidity Risk and Expected Corporate Bond Returns. *Journal of Financial Economics*, 99(3), 628–650. <https://doi.org/10.1016/j.jfineco.2010.10.004>
- Longstaff, F., Mithal, S. & Neis, E. (2005). Corporate Yield Spreads: Default Risk or Liquidity? New Evidence from the Credit Default Swap Market. *Journal of Finance* 60(5): 2213–2253.
- Mauro, P., Sussman, N. & Yafeh, Y. (2002). Emerging Market Spreads: Then Versus Now. *Quarterly Journal of Economics* 117(2): 695–733.
- Meh, C. A., & Schmukler, S. L. (Eds.). (2025). *Financing Firm Growth: The Role of Capital Markets in Low- and Middle-Income Countries*. World Bank Group / International Finance Corporation. Retrieved from <https://openknowledge.worldbank.org/entities/publication/d109c573-99a2-4215-9561-ced423fcb60c>
- Miranda-Agrippino, S., & Rey, H. (2020). US Monetary Policy and the Global Financial Cycle. *The Review of Economic Studies*, 87(6), 2754–2776.
- Mullainathan, S., & Spiess, J. (2017). Machine learning: An Applied Econometric Approach. *Journal of Economic Perspectives*, 31(2), 87–106. <https://doi.org/10.1257/jep.31.2.87>
- OECD. (2015). *Growth Companies, Access to Capital Markets and Corporate Governance*. Paris: Organisation for Economic Co-operation and Development. Retrieved from [https://www.oecd.org/en/publications/growth-companies-access-to-capital-markets-and-corporate-governance\\_ffddc128-en.html](https://www.oecd.org/en/publications/growth-companies-access-to-capital-markets-and-corporate-governance_ffddc128-en.html)
- OECD. (2025). *Global Debt Report 2025, Financing Growth in a Challenging Debt Market Environment*. Retrieved from [https://www.oecd.org/en/publications/2025/03/global-debt-report-2025\\_bab6b51e.html](https://www.oecd.org/en/publications/2025/03/global-debt-report-2025_bab6b51e.html)
- Pagano, M., Panetta, F., & Zingales, L. (1998). Why Do Companies Go Public? An Empirical Analysis. *Journal of Finance*, 53(1). <https://www.jstor.org/stable/117434?seq=1>
- Pandolfi, L., & Williams, T. (2019). Capital Flows and Sovereign Debt Markets: Evidence from Index Rebalancings. *Journal of Financial Economics*, 132(2), 384–403.
- Remolona, E., Scatigna, M., & Wu, E. (2008). The Dynamic Pricing of Sovereign Risk in Emerging Markets: Fundamentals and Risk Aversion. *BIS Quarterly Review*. Retrieved from [https://www.bis.org/repofficepubl/arpresearch\\_fs\\_200612.02.pdf](https://www.bis.org/repofficepubl/arpresearch_fs_200612.02.pdf)
- Rey, H. (2020). The Global Financial Cycle After Lehman. *American Economic Review Papers & Proceedings*, 110, 523–528. <https://doi.org/10.1257/pandp.20201075>
- Rozada, M. G., & Yeyati, E. L. (2006). Global Factors and Emerging Market Spreads. *IADB Working Paper*. Washington, D.C.: Inter-American Development Bank. Retrieved from <https://publications.iadb.org/en/publications/english/viewer/Global-Factors-and-Emerging-Market-Spreads.pdf>
- Si, D. K., Wang, M., & Ding, H. (2023). Capital Account Liberalization and Corporate Maturity Mismatch: The Role of Bank Competition. *Pacific-Basin Finance Journal*, 82, 102137.

- Sy, A. N. R. (2002). Emerging Market Bond Spreads and Sovereign Credit Ratings: Reconciling Market Views with Economic Fundamentals. *Emerging Markets Review*, 3(4), 380–408. [https://doi.org/10.1016/S1566-0141\(02\)00043-2](https://doi.org/10.1016/S1566-0141(02)00043-2)
- Timmer, Y. (2018). Emerging Market Corporate Bond Yields and Monetary Policy. *Emerging Markets Review*, 36, 130–143. <https://doi.org/10.1016/j.ememar.2018.04.001>
- Varian, H. R. (2014). Big Data: New Tricks for Econometrics. *Journal of Economic Perspectives*, 28(2), 3–28. <https://doi.org/10.1257/jep.28.2.3>
- World Bank Group, International Monetary Fund, and OECD. (2015). Capital Market Instruments to Mobilize Institutional Investors to Infrastructure and SME Financing in Emerging Market Economies. *Report for the G20*. Washington, DC: World Bank. DOI: 10.1596/23326.
- World Bank. (2017). *Promoting the Use of Capital Markets for Infrastructure Financing: Lessons for Securities Markets Regulators in Emerging Market Economies*. Washington, DC: World Bank.
- World Bank. (2020). *Capital Markets Development: A Primer for Policymakers*. Washington, DC: World Bank.
- World Bank. (2020). *Doing Business* [Database]. World Bank Group. <https://archive.doingbusiness.org>
- World Bank. (2023). *The Business of the State*. World Bank. Retrieved from <https://www.worldbank.org/en/publication/business-of-the-state>
- Zhou, Y., & Wei, X. (2023). Corporate Bond Spreads and ESG Performance: Evidence from Emerging Markets. *Finance Research Letters*, 53, 103661. <https://doi.org/10.1016/j.frl.2023.103661>
- Zhu, F. (2014). Corporate Governance and the Cost of Capital: An International Study. *International Review of Finance*, 14(3), 393–429.
- Zinna, G. (2013). Sovereign Default Risk Premia: Evidence from the Default Swap Market. (*Bank of England Working Paper No. 468*). Bank of England. <https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2012/identifying-risks-in-an-emerging-market-sovereign-and-corporate-bond-spreads.pdf>

---

# Appendixes

## Appendix A: *Country and Economy Income Classifications*

To ensure that the number of countries in each group stays constant over time, this report adopts a static definition of low- and middle-, and high-income countries based on the World Bank's income group classifications from 2005. Changing the classifications would complicate the analysis since changes could obscure whether trends were due to more countries entering capital markets or to changes in countries' income status.

The World Bank assigns countries to income groups based on gross national income (GNI) per capita, expressed in dollars. In 2005, the thresholds were

**Low-income: ≤ \$875**

**Lower-middle-income: \$876–\$3,465**

**Upper-middle-income: \$3,466–\$10,725**

**High-income: > \$10,725**

To keep income classification thresholds fixed in real terms, the thresholds are adjusted for inflation by the World Bank using the Special Drawing Rights (SDR) deflator, a weighted average of the gross domestic product (GDP) deflators of China, Japan, the United Kingdom, the United States, and the euro area. In total, there are 87 low- and middle-income countries (31 upper-middle-income, 33 lower-middle-income and 23 low-income), and 51 high-income countries.

TABLE A.1

## Countries, Economies, Special Regions, and Territories Examined in the Report

<b>High income</b>	New Zealand	Oman	Maldives (*)
Andorra	Norway	Panama	Marshall Islands (*) (**)
Aruba	Portugal	Poland	Morocco
Australia	Puerto Rico	Romania	Nicaragua
Austria	Qatar (*)	Russian Federation	Paraguay
Bahamas, The (*)	Saudi Arabia	Saint Lucia (*)	Peru
Bahrain (*)	Singapore	Serbia	Philippines
Belgium	Slovenia	Slovak Republic	Sri Lanka
Bermuda	Spain	South Africa	Syria (**)
British Virgin Islands	Sweden	Trinidad and Tobago (*)	Thailand
Canada	Switzerland	Türkiye	Ukraine (**)
Cayman Islands	Taiwan, China	Uruguay	<b>Low income</b>
Cyprus (*)	Turks and Caicos Islands (UK)	Venezuela, RB (**)	Bangladesh
Denmark	United Arab Emirates	<b>Lower-middle income</b>	Burundi (**)
Faroe Islands	United Kingdom	Albania	Cambodia
Finland	United States	Armenia (**)	Central African Republic (**)
France	<b>Upper-middle income</b>	Azerbaijan (**)	Ethiopia (**)
Germany	Argentina	Belarus	Ghana
Gibraltar (UK)	Barbados (*)	Bolivia	India
Greece	Botswana (*)	Brazil	Kenya
Greenland	Chile	Bulgaria	Lao PDR (**)
Hong Kong SAR, China	Costa Rica	China	Liberia (**)
Iceland (*)	Croatia	Colombia	Madagascar (**)
Ireland	Czechia	Djibouti (*) (**)	Mongolia
Isle of Man	Equatorial Guinea (*)	Dominican Republic	Mozambique (**)
Israel	Estonia (*)	Ecuador	Myanmar (**)
Italy	Gabon (*)	Egypt	Nigeria (**)
Japan	Hungary	El Salvador	Pakistan
Korea, Rep.	Latvia	Georgia	Senegal
Kuwait	Lebanon (**)	Guatemala	Sudan (**)
Liechtenstein	Libya (**)	Honduras	Tanzania
Luxembourg	Lithuania	Indonesia	Togo (**)
Macau	Malaysia	Iran	Uzbekistan
Malta (*)	Mauritius (*)	Jamaica (*)	Viet Nam
Monaco	Mexico	Kazakhstan	Zimbabwe (**)
Netherlands		Kiribati (*) (**)	

(\*) Member countries of the Small States Forum.

(\*\*) Countries classified as *Fragile and Conflict-Affected Situations (FCS)*. A country is classified as FCS if it was designated as such at any point between 2015 and 2024.

**Source:** The classification year of countries into income groups is 2005 using the World Bank income categories.

**Note:** This table presents the countries, economies, special regions, and territories included in this report, classified by income category. It also explicitly identifies countries that are members of the Small States Forum or classified as *Fragile and Conflict-Affected Situations*.

## Appendix B: Data

This report relies on several data sources to analyze the cost of debt for firms across countries and over time. The core dataset for bond yields and their characteristics is the Securities Data Company (SDC) Platinum database from London Stock Exchange Group, which aims to provide the most comprehensive transaction-level coverage of global bond issuance over the past few decades.<sup>55</sup> The analysis uses a large panel of primary-market corporate bond issuances spanning 1990–2024 and 138 countries, distinguishing between high-income and low- and middle-income countries using the World Bank income group classification as of 2005. The sample size, currency composition, and the number of issuing firms, overall and by income group, are reported in **Table B.1**.

The SDC reports the yield to maturity for each bond at issuance, which is used as the measure of borrowing cost for bonds. The SDC also provides security-level attributes such as issuance amount, maturity, and currency of denomination. Since part of the analysis involves comparing the cost of debt between domestic and international markets, the SDC crucially specifies the market of issuance. Bond issuances are classified as domestic or international by comparing the market location of issuance with the residence of the issuing firm. The country of residence is interpreted broadly as the country where the firm primarily operates. In most cases these coincide, but they can differ for some multinationals and for issuers that borrow through offshore holding companies. A bond is considered international if it is issued in a market

TABLE B.1

### Sample Composition

	Total	High income	Upper-middle income	Lower-middle income	Low income
<b>Bond issuances (all currencies)</b>	338,076	262,860	15,028	47,449	12,739
<b>Bond issuances (local currency)</b>	254,687	191,883	8,954	41,748	12,102
<b>Issuing firms</b>	53,599	38,128	3,260	10,862	1,349

**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group.

**Note:** This table reports the number of bond issuances and issuing firms in the SDC Platinum sample (1990–2024), split by World Bank income groups (2005 classification) and currency.

<sup>55</sup> While coverage for the United States begins in the 1970s, data for most other markets become available from 1990 onward, and London Stock Exchange Group aims to cover the full universe of bond issuances over 1990–2024.

outside the issuer's home country. In practice, most international issuances occur in major financial centers such as the United States and the United Kingdom.

An important feature of the SDC is that it covers corporate bond issuance across a wide range of currencies, which makes it possible to study borrowing costs in local-currency corporate debt markets.<sup>56</sup> In many countries, especially LMICs, local-currency bond markets are central to firm financing, yet they have received less attention in cross-country studies of borrowing costs. This dataset allows a systematic analysis of these local-currency markets alongside hard-currency issuance.

The issuance coverage in the SDC database includes bonds issued by both nonfinancial and financial firms. **Table B.2** reports the breakdown of number issuances and issuers. The main analysis uses the full corporate sample so that cross-country comparisons reflect the overall composition of issuers in each market. **Appendix D** reports the spread between LMICs and HICs for financial and nonfinancial issuers separately. **Appendix I** reports the regression results for nonfinancial firms.

Bond features matter for borrowing costs because they shape both repayment risk and how easily the bond can be priced and traded. The observable characteristics in the SDC data set capture some of these differences. However,

TABLE B.2

### Breakdown by financial and nonfinancial firms

	Bond issuances	Issuing firms
<b>Nonfinancial firms</b>	135,949	32,568
<b>Financial firms</b>	202,127	21,031
<b>TOTAL</b>	338,076	53,599

**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group.

**Note:** This table reports the number of bond issuances and issuing firms in the SDC sample, split between nonfinancial and financial issuers. Issuers are classified using SIC codes, with firms whose SIC code begins with 6 treated as financial firms and all others treated as nonfinancial.

other contract terms are harder to measure consistently in large cross-country issuance datasets, including whether a bond is backed by collateral, callability and other options, covenant terms, sinking funds, guarantees, and seniority. When these terms vary systematically across markets or issuer types, estimates that rely only on the observable bond features may understate the role of contract design and attribute part of its effect to other variables, such as issuer type or country conditions. This is especially important for callable or convertible bonds, where the reported yield can be influenced by the value of the embedded option, not just compensation for credit risk. The results should therefore be interpreted as the pricing of the bond characteristics observed in the data, while recognizing that unobserved contract terms may still explain part of the remaining yield differences across settings.

<sup>56</sup> In practice, domestic issuance is predominantly in local currency, while international issuance is typically in hard currency.

To characterize firm-level attributes, the SDC dataset is merged with the Worldscope database from London Stock Exchange Group, which provides detailed annual financial statement data for public companies worldwide. Key firm characteristics include size (amount of assets), profitability (operating income over assets), leverage (total debt over assets) and tangibility (net property, plant, and equipment over total assets).<sup>57</sup>

Certain types of firms are also examined to assess whether they systematically face different borrowing costs. State-owned enterprises (SOEs) are identified using SDC variables on public status and government ownership. A firm is classified as an SOE if it is at least 50% owned by a government entity. Subsidiaries are defined as firms that are majority-owned ( $\geq 50\%$ ) by a parent company, whether public or private.

TABLE B.3

## Summary Statistics

Low- and middle-income countries	Mean	SD	Median	p25	p75	p90
<b>Global and country characteristics</b>						
Real GDP growth	4.5	3.47	5.03	3.09	6.9	8.15
Federal funds rate	1.9	2.08	1.01	0.13	3.82	5.33
Real GDP per capita	16.22	9.87	14.27	7.06	22.89	31.3
Domestic government yield	1.66	1.95	1.75	0.75	2.96	4.02
International government yield	2.94	2.66	2.98	1.44	4.44	6.25
<b>Firm characteristics</b>						
Private status	0.27	0.44	0	0	1	1
First bond issuance	0.21	0.41	0	0	0	1
Loan and bond market access	0.43	0.5	0	0	1	1
SOE	0.11	0.31	0	0	0	1
Subsidiary	0.39	0.49	0	0	1	1
Size	8.5	1.93	8.56	7.28	9.71	10.9
Profitability	4.4	5.12	3.45	1.78	6.53	10.34
Leverage	0.47	0.25	0.45	0.28	0.67	0.81
Tangibility	1.36	28.9	0.04	0.01	0.47	0.73
<b>Security characteristics</b>						
Amount issued	3.62	1.75	3.73	2.57	4.85	5.79
Maturity	5.94	5.16	5	3	7.08	10.17
Private placement	0.41	0.49	0	0	1	1

<sup>57</sup> This approach is consistent with previous studies such as Houston & James (1996), Denis & Mihov (2003), Adrian et al. (2013), and Hernando-Kaminsky (2025).

High-income countries	Mean	SD	Median	p25	p75	p90
<b>Global and country characteristics</b>						
Real GDP growth	2.38	2.41	2.58	1.4	3.52	4.79
Federal funds rate	2.49	2.29	1.75	0.16	5.08	5.51
Real GDP per capita	54.14	14.11	51.62	45.57	60.6	67.4
Domestic government yield	1.73	2.34	2.03	0.14	3.32	4.38
International government yield	1.6	2.89	1.69	-0.34	3.39	5.36
<b>Firm characteristics</b>						
Private status	0.23	0.42	0	0	0	1
First bond issuance	0.13	0.34	0	0	0	1
Loan and bond market access	0.41	0.49	0	0	1	1
SOE	0.05	0.21	0	0	0	0
Subsidiary	0.45	0.5	0	0	1	1
Size	9.77	2.57	9.8	8.27	11.54	13.13
Profitability	3.36	7.44	2.55	0.79	6.43	11.09
Leverage	0.41	2.97	0.36	0.23	0.51	0.67
Tangibility	0.73	17.83	0.19	0.01	0.54	0.83
<b>Security characteristics</b>						
Amount issued	4.5	1.72	4.66	3.3	5.83	6.61
Maturity	7.04	6.99	5	3	10	12.17
Private placement	0.32	0.47	0	0	1	1

**Source:** Calculations using issuance data from the Securities Data Company Platinum database and firm balance sheet data from Worldscope, both from London Stock Exchange Group (LSEG), inflation data from the International Monetary Fund's World Economic Outlook, GDP data from the World Bank's World Development Indicators, sovereign data from Bloomberg and federal funds rate data from the Federal Reserve Economic Data database.

**Note:** This table reports summary statistics for security-, firm-, country-, and global-level characteristics. Panel A shows low- and middle-income countries and Panel B shows high-income countries. Statistics reported are the mean, standard deviation, median, 25th percentile, 75th percentile, and 90th percentile. All indicator variables (Private status, First bond issuance, Loan and Bond market access, SOE, Subsidiary, and Private placement) are binary and equal to 1 if the condition holds for the issuer or security, and 0 otherwise; their means therefore report the share of observations equal to one. Real GDP growth, the federal funds rate, and domestic and international government yields are in percent. Real GDP per capita is in thousands of real U.S. dollars. Amount issued and firm size are in natural logs (real issue amount and real total assets, respectively). Maturity is in years. Profitability, leverage, and tangibility are accounting ratios.

These classifications allow us to study whether firms that benefit from government ownership or support (implicit or explicit), or operate under a parent company, enjoy systematically lower financing costs.

Data on GDP growth and real GDP per capita are drawn from the World Bank's World Development Indicators. Inflation data are taken from the International Monetary Fund's World Economic Outlook. The federal funds rate is

sourced from the Federal Reserve Economic Data database, and the U.S. Treasuries data are sourced from the U.S. Department of the Treasury. The global financial cycle measure is taken from Miranda-Agrippino and Rey (2020).

**Table B.3** presents summary statistics for the variables included in this report.

## Appendix C: LMIC Corporate Bond Yields Against Different Benchmarks

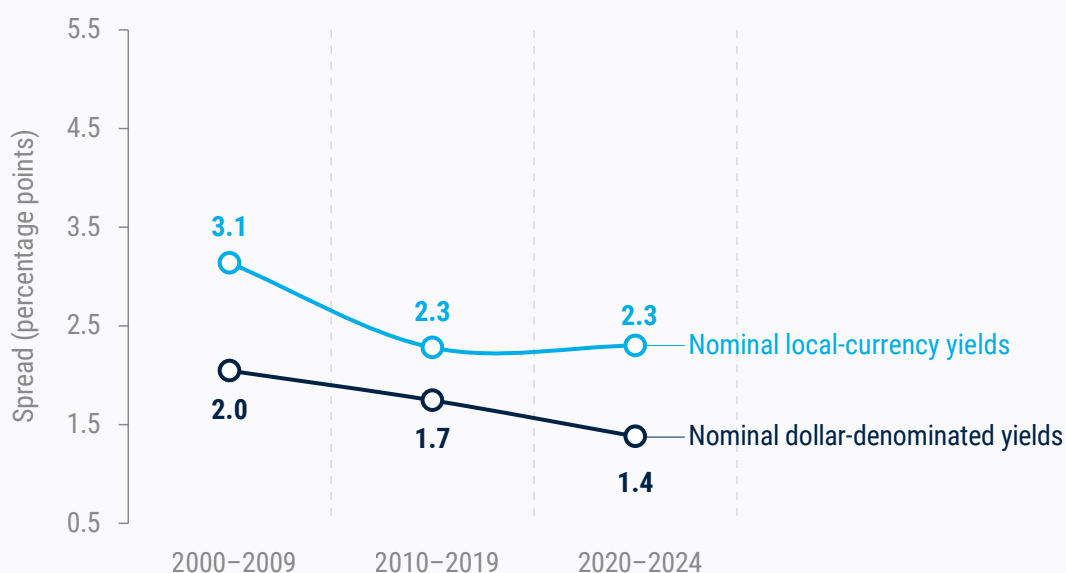
To complement the comparison with high-income country corporates presented in Chapter 1, this appendix reports yield differentials between corporate bonds issued by firms in low- and middle-income countries (LMIC) and those issued by U.S. firms. Results are first presented using nominal yields. The U.S. corporate bond market provides a useful benchmark given the large number of issuances available, which allows for a detailed characterization of yield distributions despite substantial dispersion

reflecting the variation in U.S. issuers. Overall, nominal yield spreads relative to U.S. corporates are similar to those obtained when using the broader set of high-income country (HIC) corporates as a benchmark, consistent with the fact that median U.S. corporate yields are close to median yields across HIC corporates more generally (**Figure C.1**).

The analysis is also replicated using real yields. Real yield differentials are generally smaller than nominal ones, suggesting that a proportion

FIGURE C.1

### Low- and Middle-Income Country Bond Yields Over U.S. Corporate Bond Yields, in Nominal Terms



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group.

**Note:** This figure reports decade averages of median nominal yield spreads between corporate bonds issued in LMICs and those issued in the United States. For each year, median yields are first calculated at the country level. These country-level medians are then aggregated to obtain the median yield for each group, and the yield gap between the two groups is calculated for that year. Income categories follow the World Bank's 2005 country income group definitions.

of the higher nominal borrowing costs faced by LMIC firms reflect higher inflation in some low- and middle-income economies. For local-currency bonds, however, the yield spread relative to U.S. corporates is slightly smaller than when using the full HIC corporate group (**Figure C.2**). This suggests that median U.S. corporate yields are not among the lowest within the HIC sample, implying that the broader benchmark includes relatively lower-yielding corporate issuers.

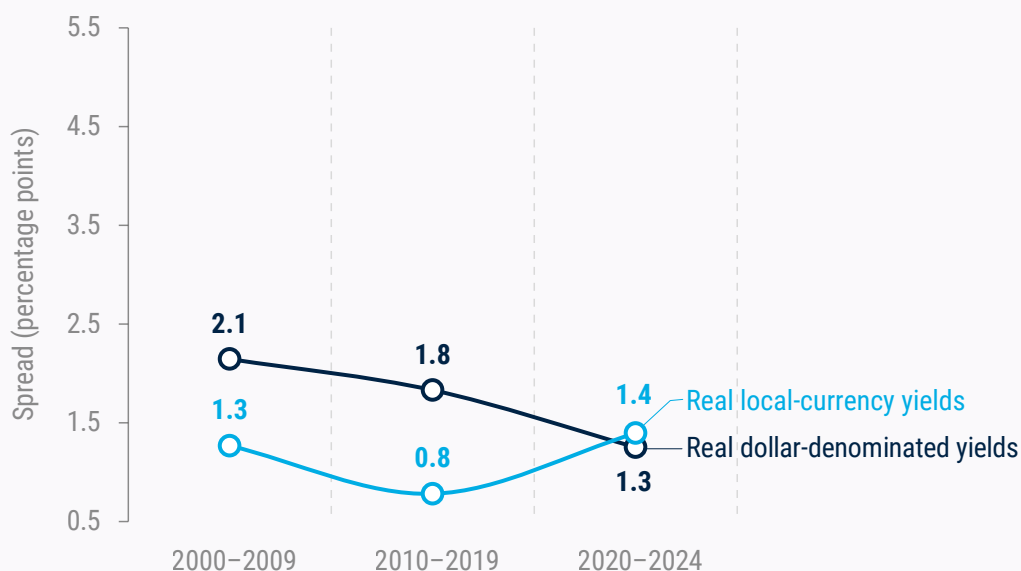
However, it is important to note that the emerging market finance literature typically

does not benchmark corporate borrowing costs against corporate yields in advanced economies. Instead, corporate yield spreads in emerging markets are most often measured relative to sovereign benchmarks, particularly U.S. Treasuries (Eichengreen & Mody, 1998, Dailami et al., 2008., Sy 2002). This approach reflects the role of Treasuries as the primary global risk-free reference rate and provides a consistent basis for interpreting credit risk and borrowing costs across countries and time.

For this reason, the remainder of this appendix focuses on spreads over U.S. Treasuries. These

FIGURE C.2

### Low- and Middle-Income Country Bond Yields Over U.S. Corporate Bond Yields, in Real Terms



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund's World Economic Outlook.

**Note:** This figure reports decade averages of median real yield spreads (adjusting for expected inflation) between corporate bonds issued in low- and middle-income countries and those issued in the United States for dollar-denominated and local-currency bonds. These country-level medians are then aggregated to obtain the median yield for each group, and the yield gap between the two groups is calculated for that year. Income categories follow the World Bank's 2005 country income group definitions.

spreads provide a standard measure of the risk premium faced by LMIC corporate issuers and allow a direct comparison with widely used secondary market indexes such as the JPMorgan Corporate Emerging Markets Bond Index (CEMBI). To ensure consistency with these market-based indicators, the analysis from this point onward is restricted to dollar bonds and is conducted in nominal terms.

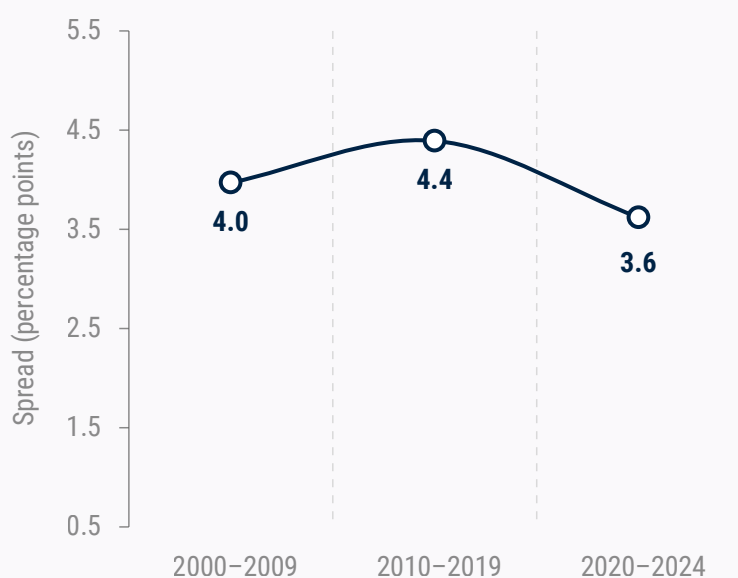
Since 2000, the average nominal yield spread between dollar bonds issued by firms in LMICs and U.S. Treasuries has been around 400 basis points (**Figure C.3**). Because U.S. Treasuries are typically considered the benchmark risk-

free rate, this spread reflects the additional compensation investors require for bearing credit risk, liquidity risk, and other emerging-market-specific sources of uncertainty.

This also helps explain why the spread relative to U.S. Treasuries is generally larger than the spread reported in Chapter 1 when comparing LMIC corporates to corporates in high-income countries. The latter comparison uses a riskier benchmark, as corporate yields in high-income countries already embed positive credit and liquidity premia.

FIGURE C.3

### Low- and Middle-Income Country Bond Yields Over U.S. Treasury Yields, in Nominal Terms



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and U.S. Treasuries data from the U.S. Department of the Treasury.

**Note:** This figure reports mean nominal spreads over U.S. Treasuries (UST) for firms in low- and middle-income countries, based on dollar-denominated bond issuances. For each year, the mean UST spread is first calculated at the country level. These country-year averages are then aggregated to obtain the annual mean spread for low- and middle-income countries. The figure reports decade averages of these spreads.

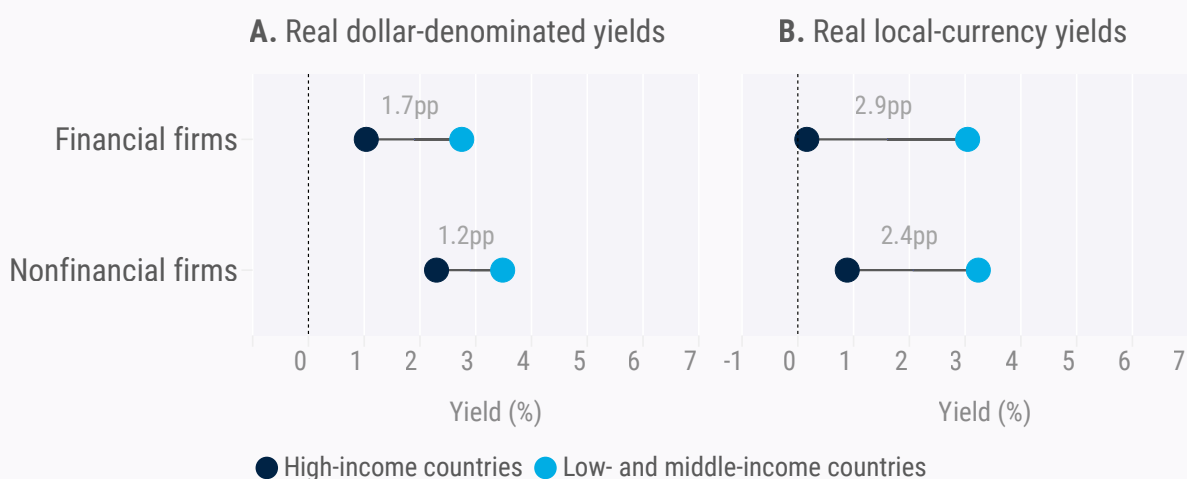
## Appendix D: *Financial versus Nonfinancial Firms*

Disaggregating by firm type confirms that the LMIC–HIC spread differential is robust, as LMIC issuers face higher yields than HIC issuers in both the financial and nonfinancial sectors. Spreads are broadly similar across financial and nonfinancial firms in both dollar-denominated and local-currency markets, although the LMIC–HIC gap is somewhat larger for financial firms in dollar-denominated bond issuances. The findings are still maintained when using realized inflation instead of expected inflation for the calculation of real yields, or using nominal yields.

In terms of yields, financial firms exhibit lower yields than nonfinancial firms in both dollar-denominated and local-currency bond markets. This may happen due to several structural factors. Banks and other financial institutions are subject to prudential regulation and ongoing supervisory oversight, which can reduce perceived default risk. They also tend to provide more frequent financial disclosures and are closely monitored by regulators and markets. In many countries, particularly in LMICs, financial institutions issuing bonds are also among the

FIGURE D.1

### Median Real Yields (Adjusted By Expected Inflation) by Financial and Nonfinancial Firms, 2015–2024



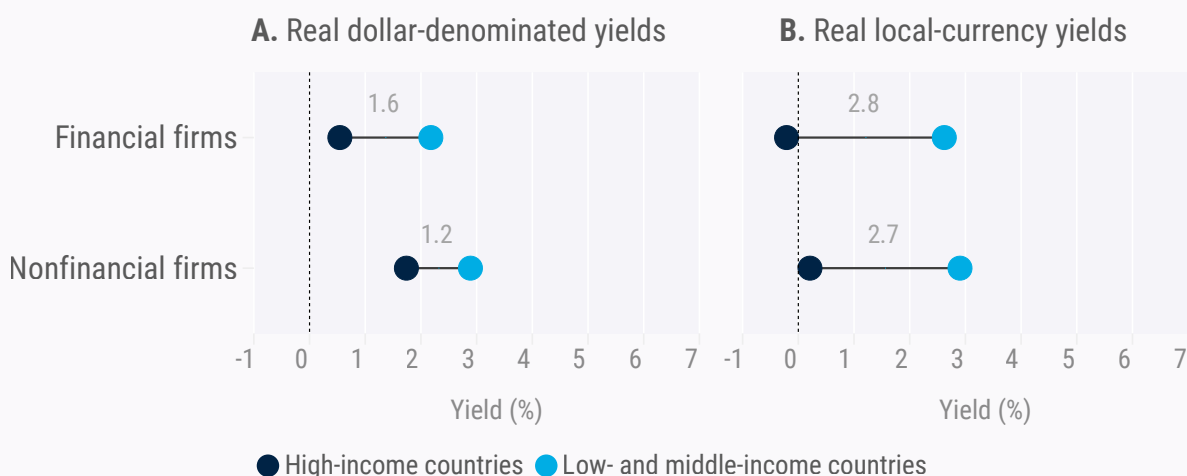
**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from International Monetary Fund's World Economic Outlook.

**Note:** This figure shows the median real yields (adjusting for expected inflation) of financial and nonfinancial firms in low- and middle-income countries and in high-income countries. Yield spreads between the income groups are annotated for both types of firms. Panel A shows dollar-denominated bonds, while panel B shows local-currency bonds. Income categories follow the World Bank's 2005 country income group definitions.

largest and most established domestic firms, with stronger market recognition and investor demand. In addition, investors may assign a lower risk premium to some financial institutions due to expectations of regulatory intervention or government support in the event of distress.

FIGURE D.2

### Median Real Yields (Adjusted by Realized Inflation) by Financial and Nonfinancial Firms, 2015–2024

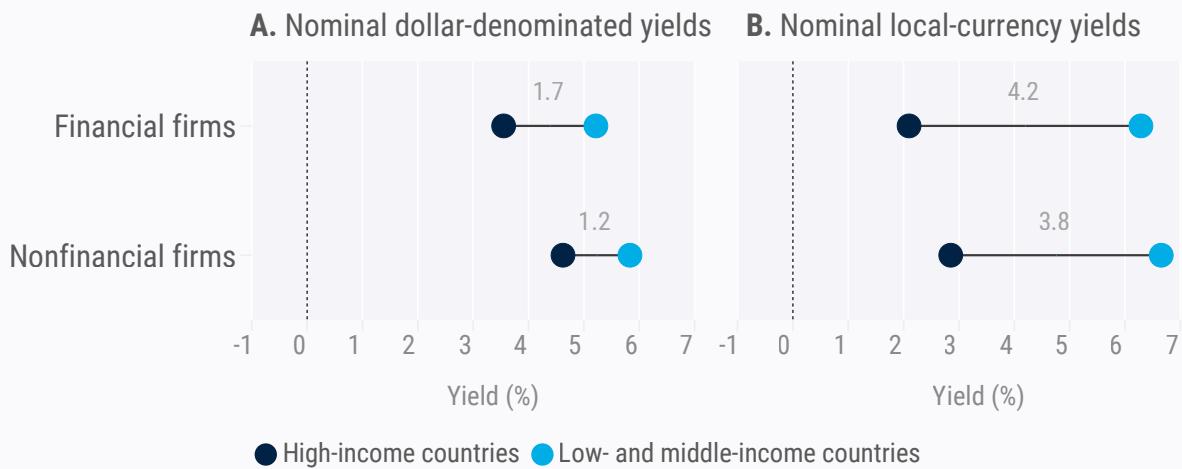


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund’s World Economic Outlook.

**Note:** This figure shows the median real yields (adjusting for realized inflation) of financial and nonfinancial firms in low- and middle-income countries and in high-income countries. Yield spreads between the income groups are annotated for both types of firms. Panel A shows dollar-denominated bonds, while panel B shows local-currency bonds. Income categories follow the World Bank’s 2005 country income group definitions.

FIGURE D.3

## Median Nominal Yields by Financial and Nonfinancial Firms, 2015–2024



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group.

**Note:** This figure shows the median nominal yields of financial and nonfinancial firms in low- and middle-income countries and in high-income countries. Yield spreads between the income groups are annotated for both types of firms. Panel A shows dollar-denominated bonds, while panel B shows local-currency bonds. Income categories follow the World Bank's 2005 country income group definitions.

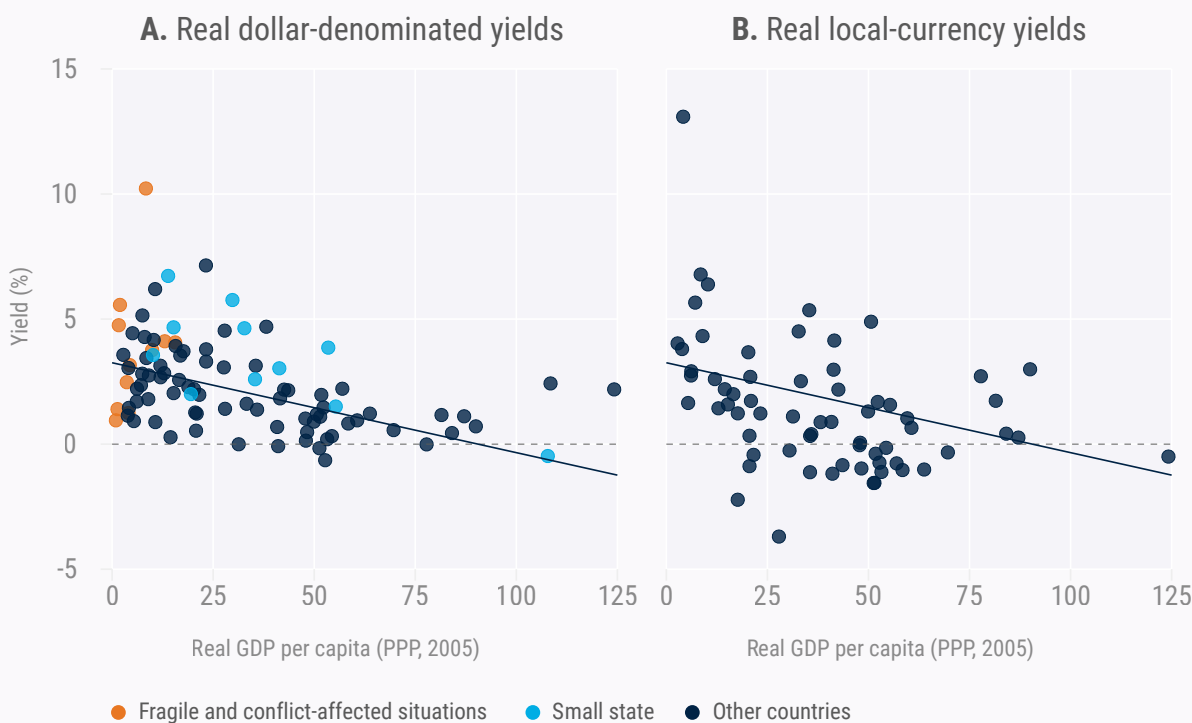
## Appendix E: Real Yields Using Realized Inflation

This appendix presents a robustness check to the baseline analysis by recalculating all figures in Chapter 1 using real yields constructed with realized inflation rather than expected inflation.

This approach aligns the real yield measure more closely with investors' actual financing costs since it accounts for unexpected inflation. The resulting figures closely mirror those in the main

FIGURE E.1

### Corporate Bond Real Yields Across Countries (Using Medians and Realized Inflation)



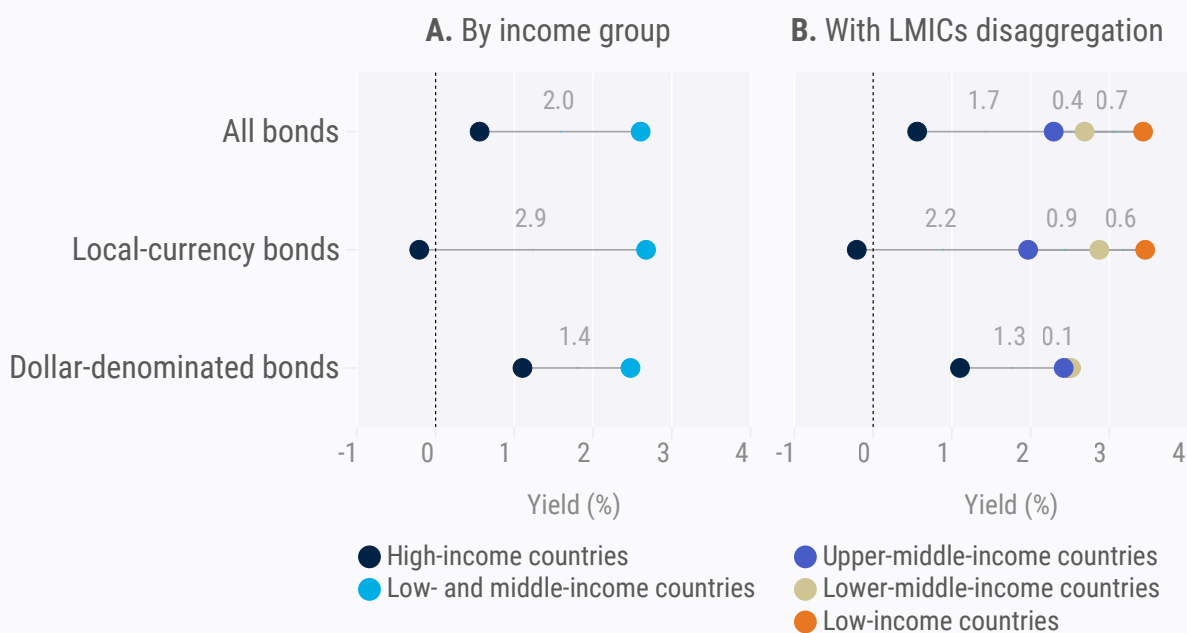
**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group, inflation data from the International Monetary Fund's World Economic Outlook and GDP data, Small States and Fragile and Conflict-Affected Situations (FCS) from the World Bank's World Development Indicators.

**Note:** This figure depicts real yields (adjusting for realized inflation) against real GDP per capita, with each point representing a country. For each country, the median yield is calculated by pooling all dollar-denominated bond issuances (panel A) or all local-currency bond issuances (panel B) between 2015 and 2024. In panel A, countries that are members of the Small States Forum (SSF) or classified as Fragile and Conflict-Affected Situations (FCS) are explicitly identified. A country is classified as FCS if it was designated as such at any point between 2015 and 2024. Due to limited data availability for local-currency bonds in these economies, small states and FCS countries are flagged only in the dollar-denominated bond sample. Real GDP per capita for 2005 is measured in purchasing-power-parity terms and expressed in thousands of constant 2021 dollars. Income categories follow the World Bank's 2005 country income group definitions. GDP = gross domestic product.

text: borrowing costs decline with income per capita, LMIC firms face persistently higher yields than HIC firms, and the relative patterns across currencies, time periods, and firm types are preserved. Differences relative to the baseline are primarily in levels, reflecting forecast errors in inflation, but the qualitative conclusions are unchanged. The findings still hold when using means instead of medians for realized inflation (see last set of figures in this appendix).

FIGURE E.2

### Corporate Bond Real Yield Spread Between Low- and Middle-Income Countries and High-Income Countries (Using Medians and Realized Inflation)

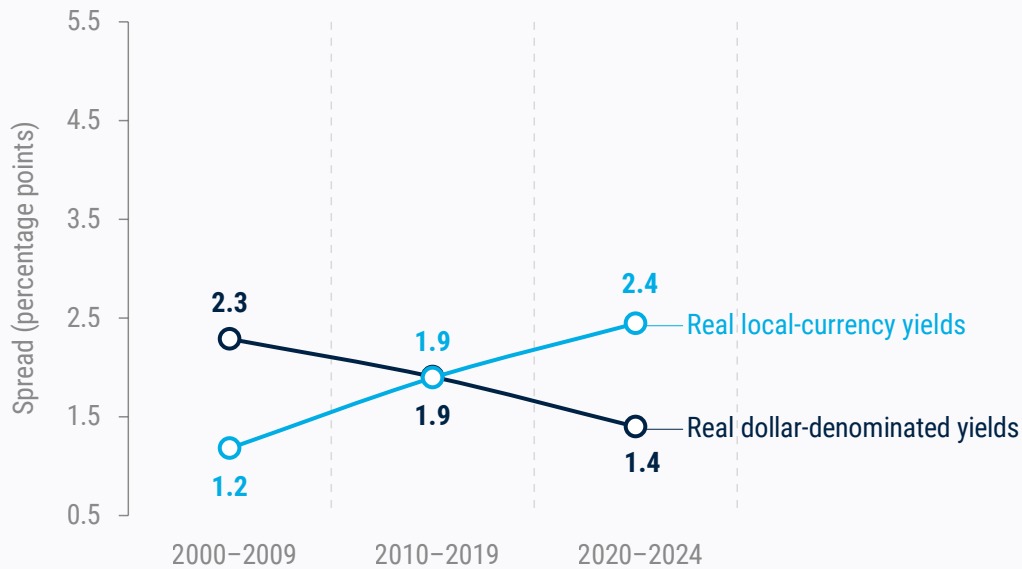


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund's World Economic Outlook.

**Note:** This figure displays the median real yields (adjusting for realized inflation) for dollar-denominated bonds, local-currency bonds, and the full bond sample by income group, along with the corresponding yield spreads. In panel A, countries are classified into two groups: high-income and low- and middle-income countries. In panel B, countries are divided into four groups: high-income, upper-middle-income, lower-middle-income and low-income countries. For each year, the median yield is first calculated for the distribution of all issuances by firms of a given country. These country-year medians are then aggregated to obtain the median yield for each income category across all years. Yield spreads between the groups are annotated in both panels. For both panels, income classifications are based on 2005 GDP = gross domestic product.

FIGURE E.3

### Yield Spread Between Low- and Middle-Income Countries and High-Income Countries Over Time (Using Medians and Realized Inflation)

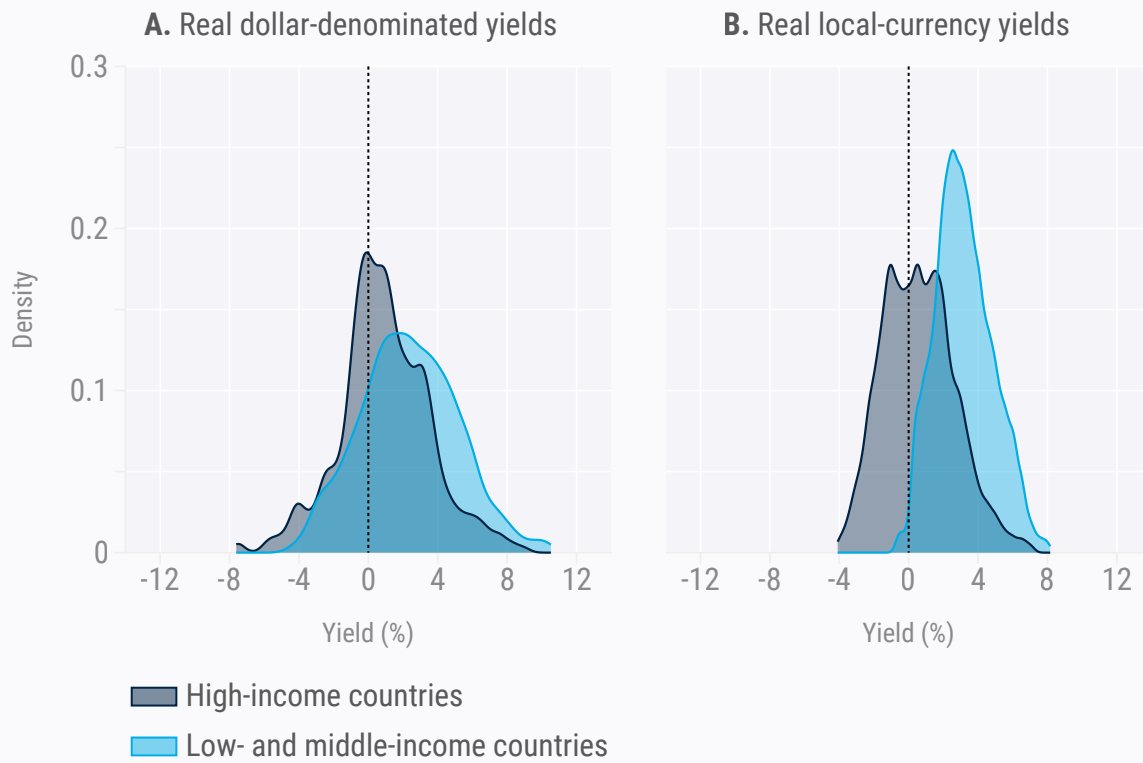


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund's World Economic Outlook.

**Note:** This figure presents the median real yield spreads (adjusting for realized inflation) between LMICs and HICs. For each year, the median yield is first calculated for each country. These country-level medians are then aggregated to obtain the median yield for each income category. Finally, the yield gap between the two income groups is calculated for that year. The figure reports decade averages of these spreads. Income categories follow the World Bank's 2005 country income group definitions.

FIGURE E.4

### Distribution of Yields in High-Income and Low- and Medium Income Countries (Using Realized Inflation)

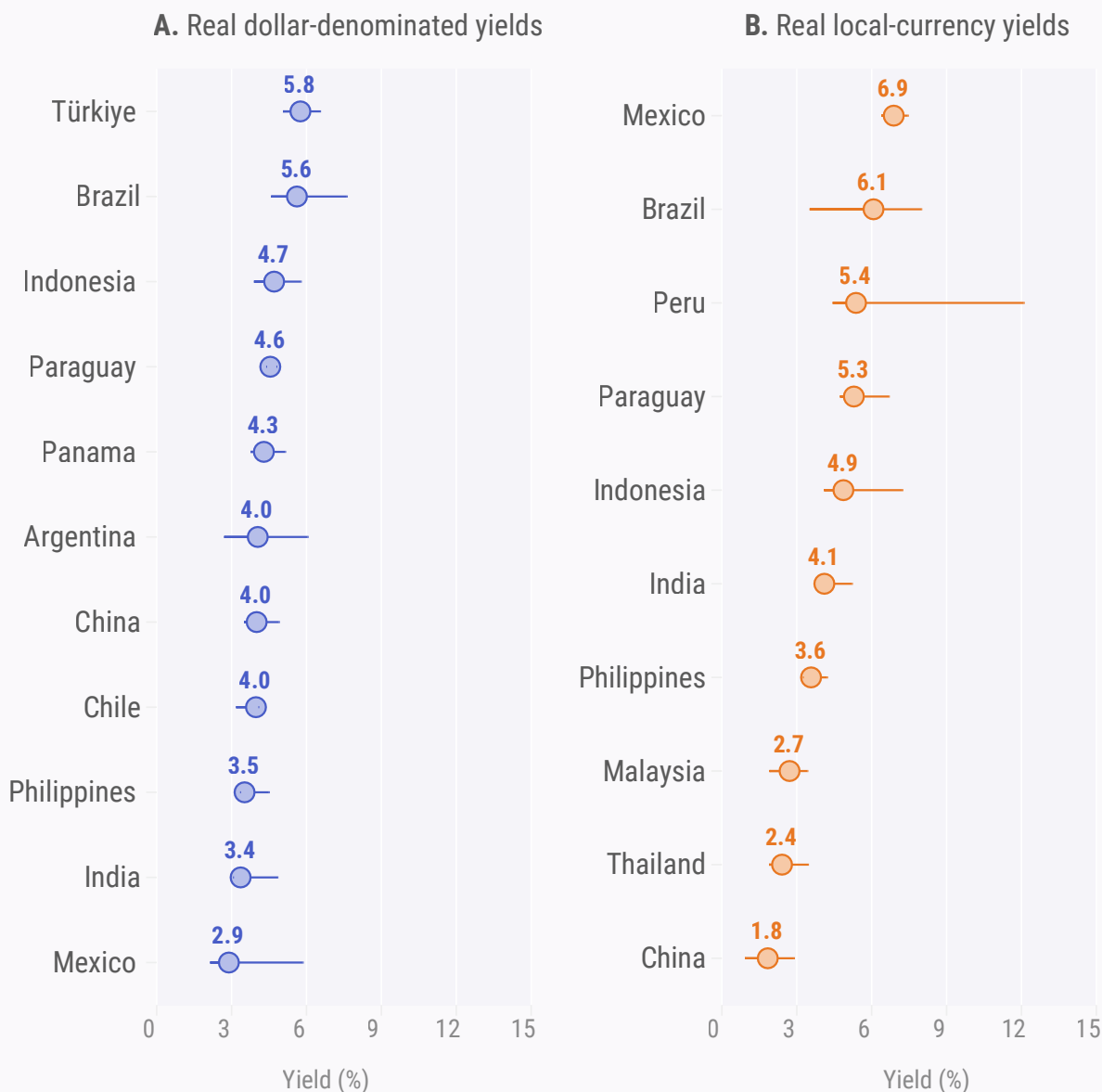


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund's World Economic Outlook.

**Note:** This figure presents the distribution of real yields (adjusting for realized inflation) for all issuances, grouping separately high income countries and low- and middle-income countries. Panel A shows dollar-denominated bonds, while panel B shows local-currency bonds. To improve clarity, the lowest and highest 1% of yields within each income category are excluded from the figure. Income categories follow the World Bank's 2005 country income group definitions.

FIGURE E.5

### Yield Dispersion in Low- and Middle-Income Countries (Using Realized Inflation)

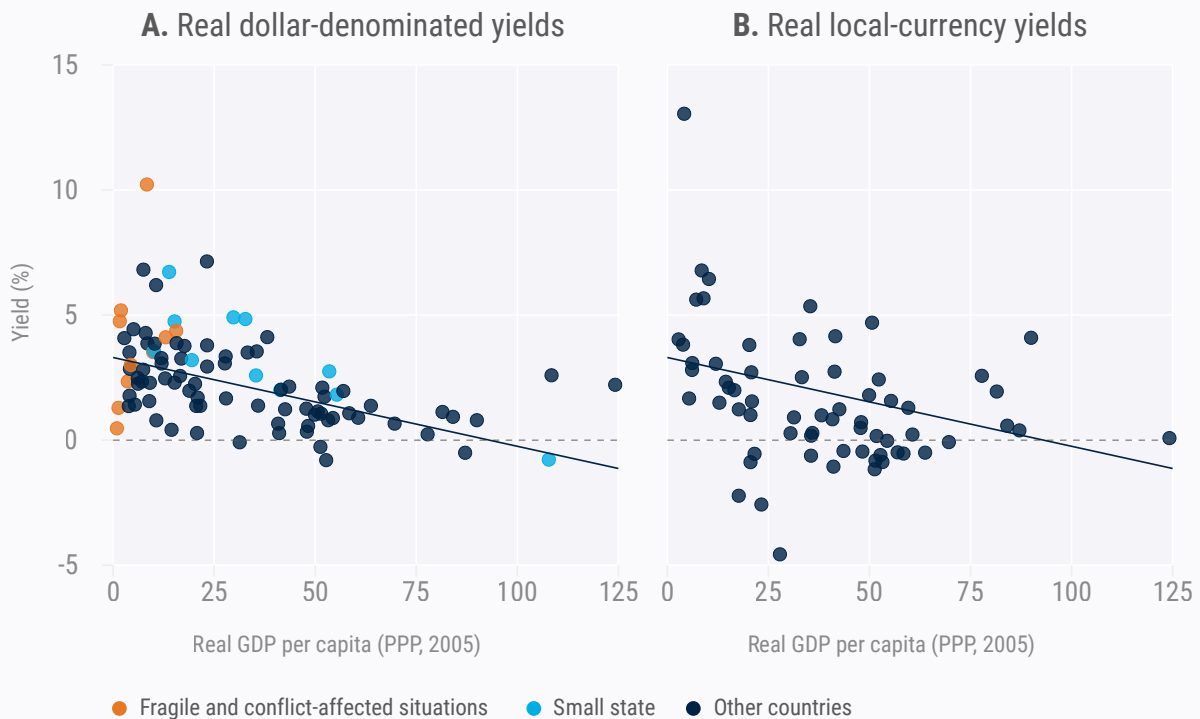


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund’s World Economic Outlook.

**Note:** This figure reports the median real corporate bond yield and the interquartile range (25th–75th percentiles), adjusting for realized inflation, for low- and middle-income countries. Panel A shows dollar-denominated bonds, while panel B shows local-currency bonds. Countries are included only if they have at least eight corporate bond issuances over the period 2023–2024. Income categories follow the World Bank’s 2005 country income group definitions.

FIGURE E.6

## Corporate Bond Real Yields Across Countries (Using Means and Realized Inflation)

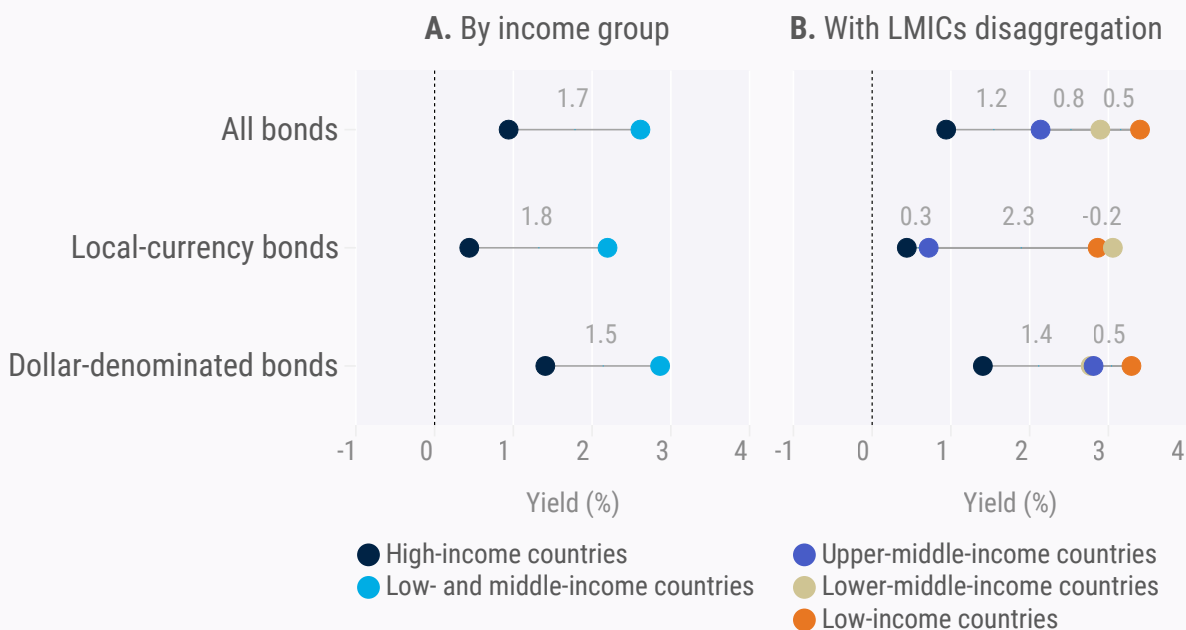


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group, inflation data from the International Monetary Fund's World Economic Outlook and GDP data, Small States and Fragile and Conflict-Affected Situations from the World Bank's World Development Indicators.

**Note:** This figure depicts real yields (adjusting for realized inflation) against real GDP per capita, with each point representing a country. For each country, the mean yield is calculated by pooling observations from all years between 2015 and 2024. Panel A shows dollar-denominated bonds, while panel B shows local-currency bonds. In panel A, countries that are members of the Small States Forum or classified as Fragile and Conflict-Affected Situations (FCS) are explicitly identified. A country is classified as FCS if it was designated as such at any point between 2015 and 2024. Due to limited data availability for local-currency bonds in these economies, small states and FCS countries are flagged only in the dollar-denominated bond sample. Real GDP per capita for 2005 is measured in purchasing-power-parity terms and expressed in thousands of constant 2021 dollars. Income categories follow the World Bank's 2005 country income group definitions. GDP = gross domestic product.

FIGURE E.7

### Corporate Bond Real Yield Spread Between Low- and Middle-Income Countries and High-Income Countries (Using Means and Realized Inflation)

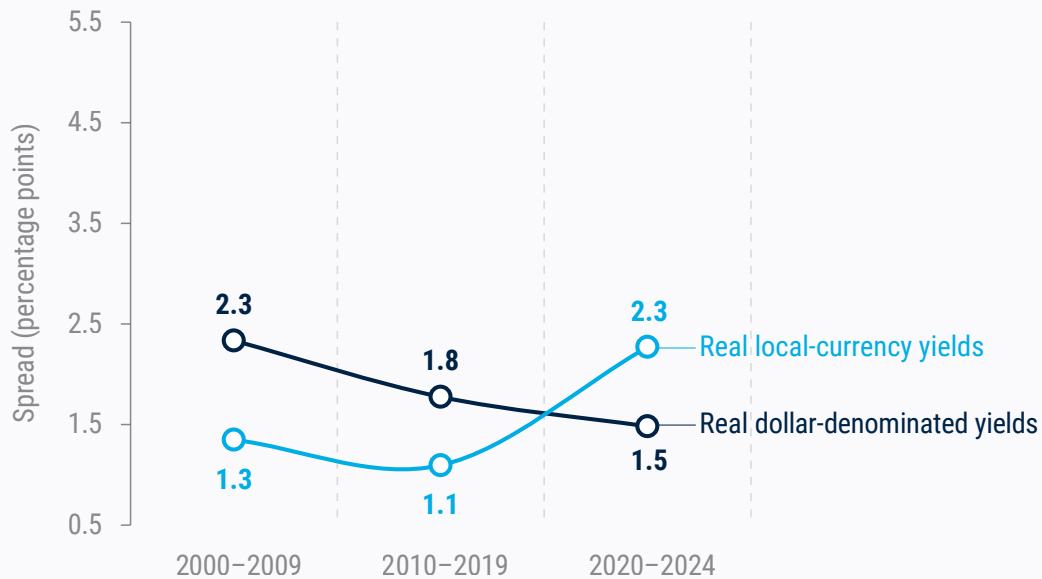


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund’s World Economic Outlook.

**Note:** This figure displays the mean real yields (adjusting for realized inflation) for dollar-denominated bonds, local-currency bonds, and the full bond sample by income group, along with the corresponding yield spreads. In panel A, countries are classified into two groups: high-income and low- and middle-income countries. In panel B, countries are divided into four groups: high-income, upper-middle-income, lower-middle-income and low-income countries. For each year, the mean yield is first calculated at the country level. These country-year means are then aggregated to obtain the mean yield for each income category across all years. Yield spreads between the groups are annotated in both panels. For both panels, income classifications are based on 2005. GDP = gross domestic product.

FIGURE E.8

### Yield Spread Between Low- and Middle-Income Countries and High-Income Countries Over Time (Using Means and Realized Inflation)



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund's World Economic Outlook.

**Note:** This figure presents the mean real yield spreads (adjusting for realized inflation) between LMICs and HICs. For each year, the mean yield is first calculated for each country. These country-level means are then aggregated to obtain the mean yield for each income category. Finally, the yield gap between the two income groups is calculated for that year. The figure reports decade averages of these spreads. Income categories follow the World Bank's 2005 country income group definitions.

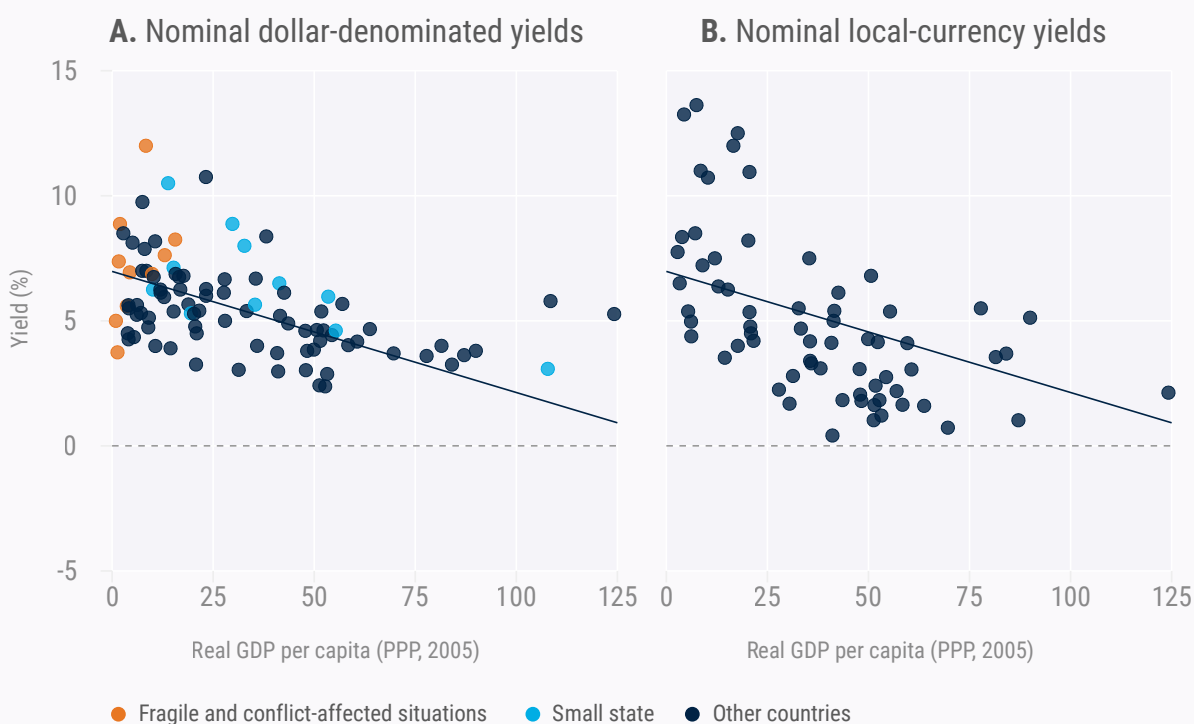
## Appendix F: Nominal Yields

This appendix reports the same set of figures as in Chapter 1 using nominal yields instead of real yields. Presenting nominal yields illustrates how differences in inflation environments across

countries translate into observed borrowing costs before inflation adjustment and provides a complementary perspective that reflects quoted market rates. As expected, nominal yields are

FIGURE F.1

### Corporate Bond Nominal Yields Across Countries (Using Medians)



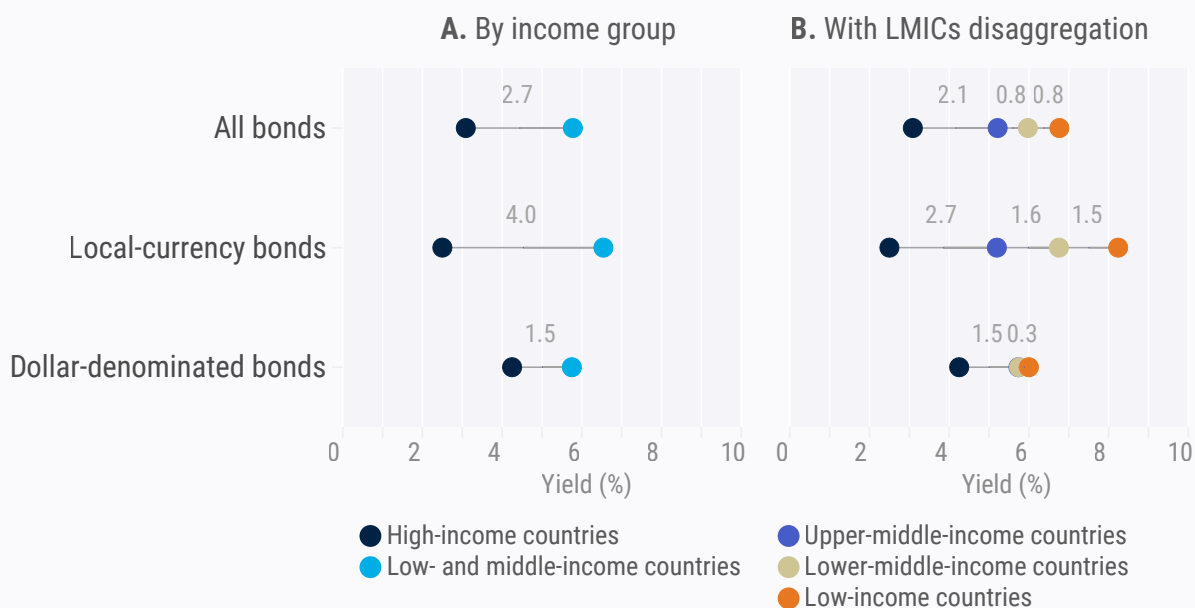
**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and GDP data, Small States and Fragile and Conflict-Affected Situations from the World Bank’s World Development Indicators.

**Note:** This figure depicts nominal yields against real GDP per capita, with each point representing a country. For each country, the median yield is calculated by pooling observations from all years between 2015 and 2024. Panel A shows dollar-denominated bonds, while panel B shows local-currency bonds. In panel A, countries that are members of the Small States Forum or classified as Fragile and Conflict-Affected Situations (FCS) are explicitly identified. A country is classified as FCS if it was designated as such at any point between 2015 and 2024. Due to limited data availability for local-currency bonds in these economies, small states and FCS countries are flagged only in the dollar-denominated bond sample. Real GDP per capita for 2005 is measured in purchasing-power-parity terms and expressed in thousands of constant 2021 dollars. Income categories follow the World Bank’s 2005 country income group definitions. GDP = gross domestic product.

higher—especially in higher-inflation LMICs— but the cross-country and cross-group patterns remain qualitatively similar to those based on real yields. The findings also hold using means instead of medians (see last set of figures in this appendix).

FIGURE F.2

### Corporate Bond Nominal Yield Spread Between Low- and Middle-Income Countries and High-Income Countries (Using Medians)

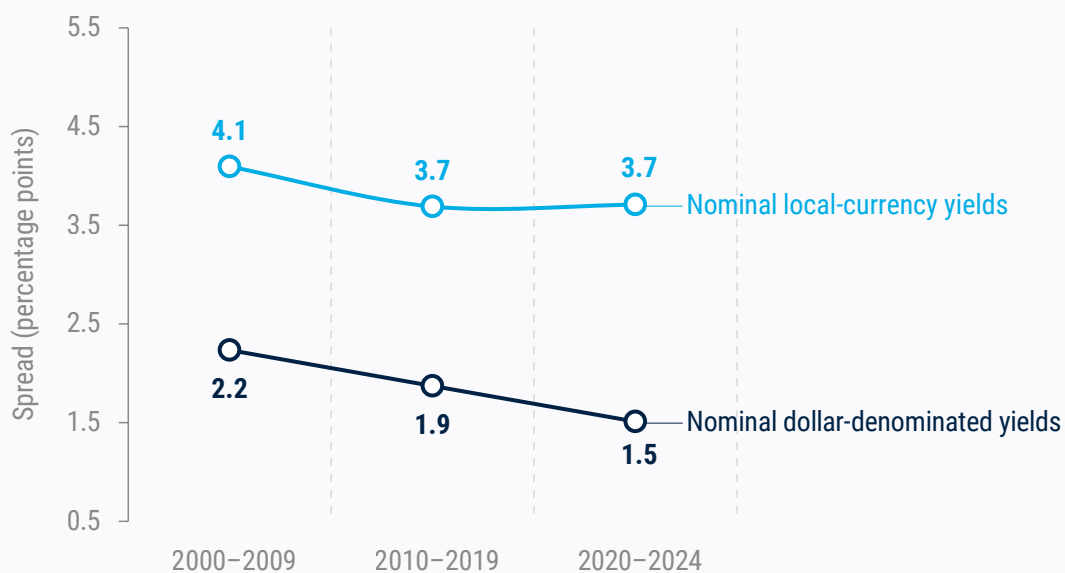


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group.

**Note:** This figure displays the median nominal yields for dollar-denominated bonds, local-currency bonds, and the full bond sample by income group, along with the corresponding yield spreads. In panel A, countries are classified into two groups: high-income and low- and middle-income countries. In panel B, countries are divided into four groups: high-income, upper-middle-income, lower-middle-income and low-income countries. For each year, the median yield is first calculated at the country level. These country-year medians are then aggregated to obtain the median yield for each income category across all years. Yield spreads between the groups are annotated in both panels. For both panels, income classifications are based on 2005 GDP = gross domestic product.

FIGURE F.3

### Nominal Yield Spread Between Low- and Middle-Income Countries and High-Income Countries Over Time (Using Medians)

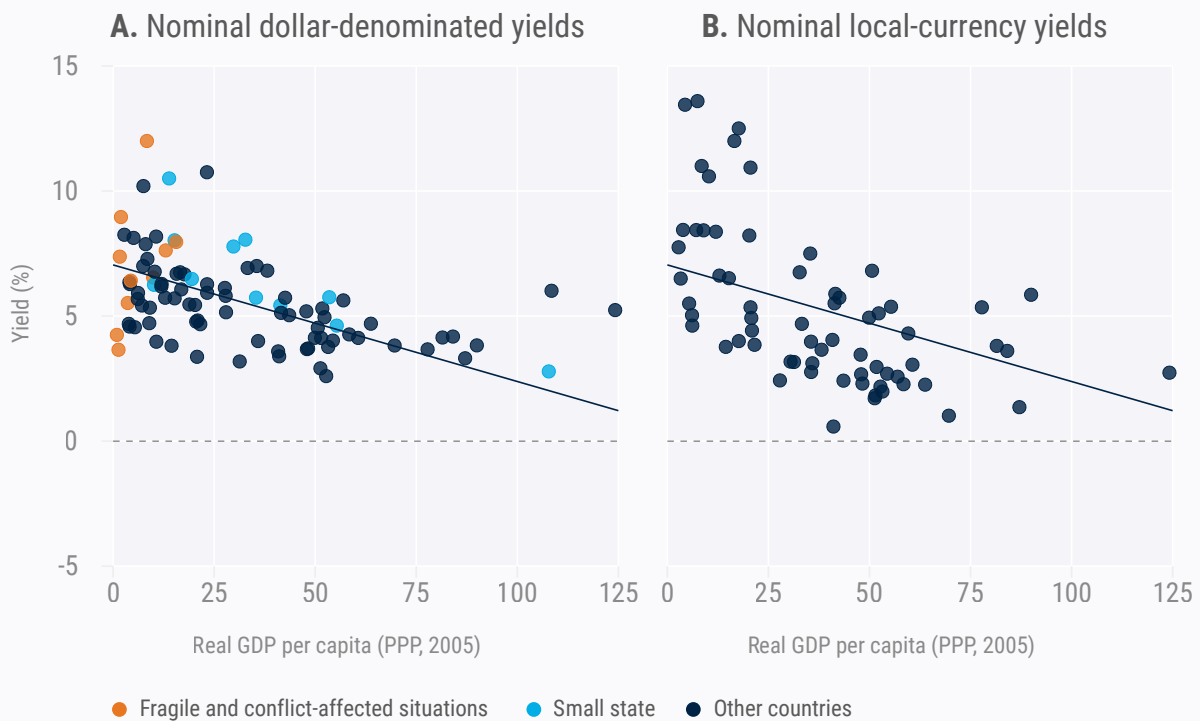


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group.

**Note:** This figure presents the median nominal yield spreads between low- and middle-income countries and high income countries. For each year, the median yield is first calculated for each country. These country-level medians are then aggregated to obtain the median yield for each income category. Finally, the yield gap between the two income groups is calculated for that year. The figure reports decade averages of these spreads. Income categories follow the World Bank's 2005 country income group definitions.

FIGURE F.4

## Corporate Bond Nominal Yields Across Countries (Using Means)

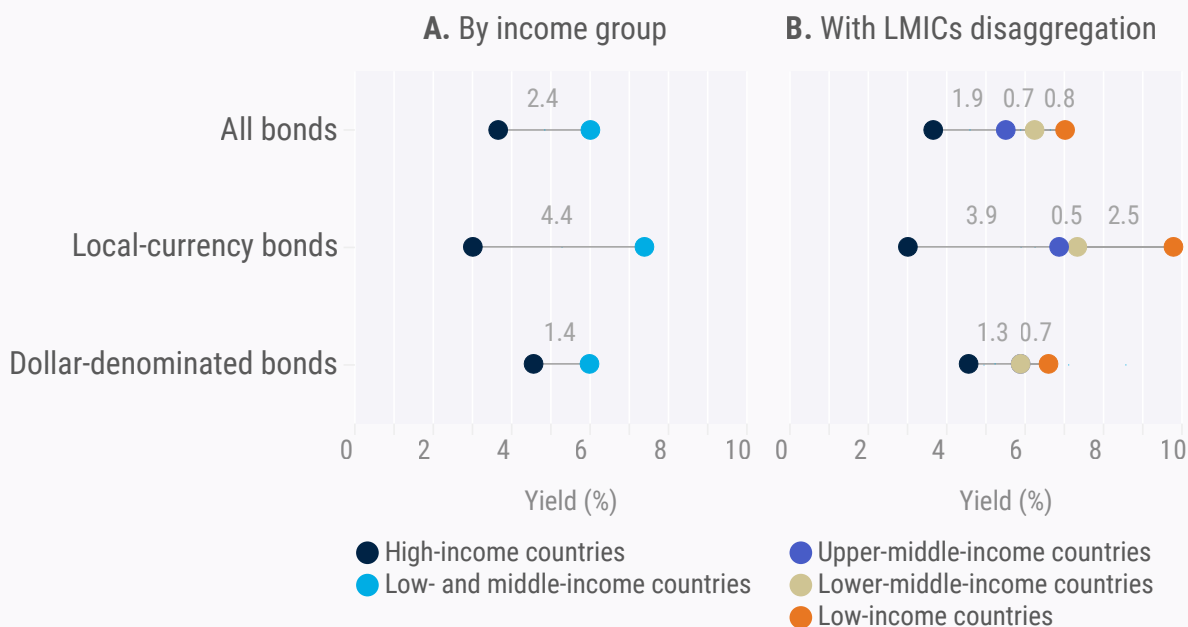


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and GDP data, Small States and Fragile and Conflict-Affected Situations from the World Bank's World Development Indicators.

**Note:** This figure depicts nominal yields against real GDP per capita, with each point representing a country. For each country, the mean yield is calculated by pooling observations from all years between 2015 and 2024. Panel A shows dollar-denominated bonds, while panel B shows local-currency bonds. In panel A, countries that are members of the Small States Forum or classified as Fragile and Conflict-Affected Situations (FCS) are explicitly identified. A country is classified as FCS if it was designated as such at any point between 2015 and 2024. Due to limited data availability for local-currency bonds in these economies, small states and FCS countries are flagged only in the dollar-denominated bond sample. Real GDP per capita for 2005 is measured in purchasing-power-parity terms and expressed in thousands of constant 2021 dollars. Income categories follow the World Bank's 2005 country income group definitions. GDP = gross domestic product.

FIGURE F.5

### Corporate Bond Nominal Yield Spread Between Low- and Middle-Income Countries and High-Income Countries (Using Means)

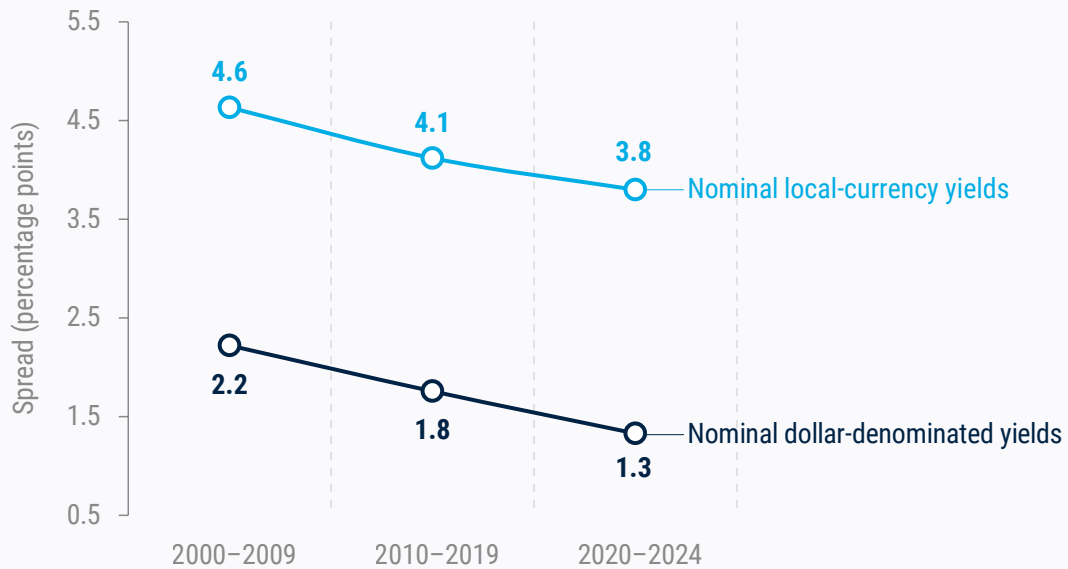


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and JPMorgan EMBI data from Bloomberg.

**Note:** This figure displays the mean nominal yields for dollar-denominated bonds, local-currency bonds, and the full bond sample by income group, along with the corresponding yield spreads. In panel A, countries are classified into two groups: high-income and low- and middle-income countries. In panel B, countries are divided into four groups: high-income, upper-middle-income, lower-middle-income and low-income countries. For each year, the mean yield is first calculated at the country level. These country-year means are then aggregated to obtain the mean yield for each income category across all years. Yield spreads between the groups are annotated in both panels. For both panels, income classifications are based on 2005. GDP = gross domestic product.

FIGURE F.6

### Nominal Yield Spread Between Low- and Middle-Income Countries and High-Income Countries Over Time (Using Means)

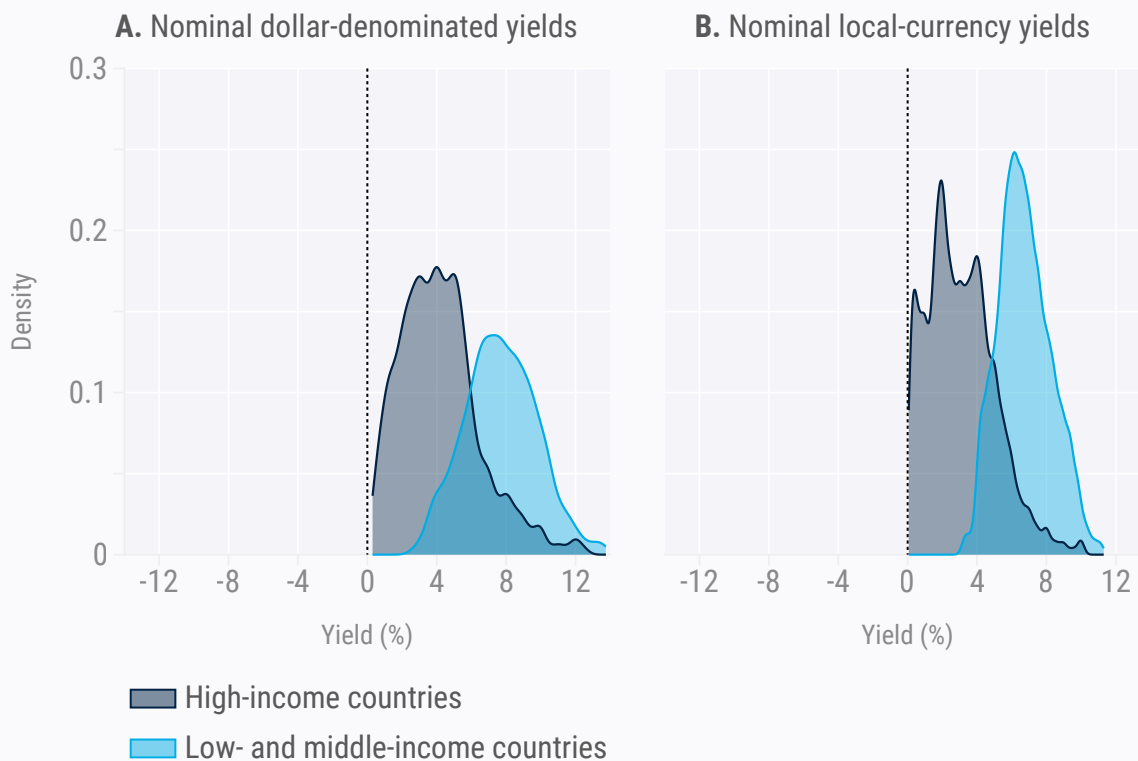


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group.

**Note:** This figure presents the mean nominal yield spreads between LMICs and HICs. For each year, the mean yield is first calculated for each country. These country-level means are then aggregated to obtain the mean yield for each income category. Finally, the yield gap between the two income groups is calculated for that year. The figure reports decade averages of these spreads. Income categories follow the World Bank's 2005 country income group definitions.

FIGURE F.7

### Distribution of Nominal Yields in High-Income and Low- and Middle-Income Countries

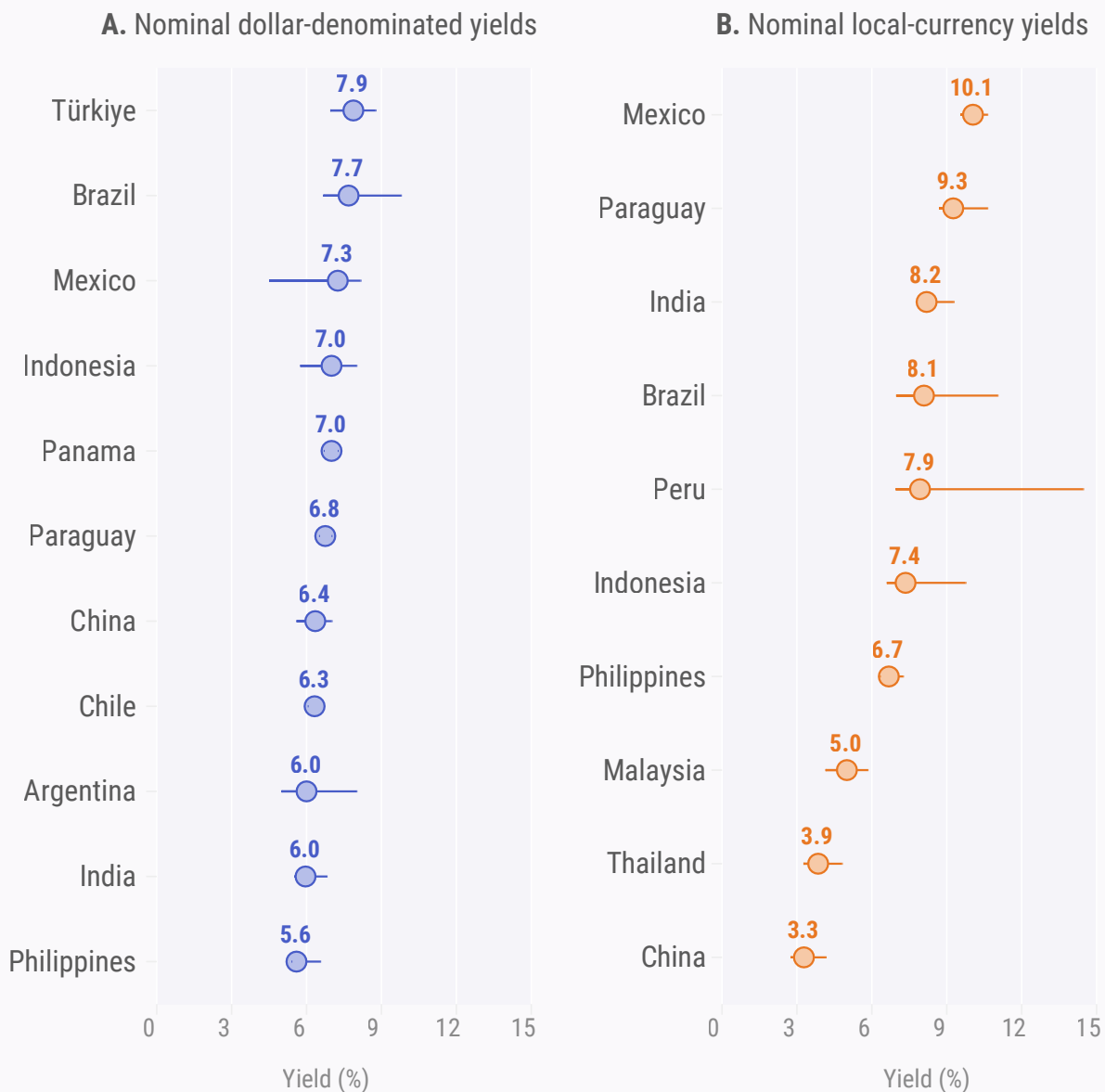


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group.

**Note:** This figure presents the distribution of nominal yields for low- and middle-income countries and high income countries. Panel A shows dollar-denominated bonds, while panel B shows local-currency bonds. To improve clarity, the lowest and highest 1% of yields within each income category are excluded from the figure. Income categories follow the World Bank's 2005 country income group definitions.

FIGURE F.8

## Nominal Yield Dispersion in Low- and Middle-Income Countries



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group.

**Note:** This figure reports the median nominal corporate bond yield and the interquartile range (25th–75th percentiles), for LMICs. Panel A shows dollar-denominated bonds, while panel B shows local-currency bonds. Countries are included only if they have at least 8 corporate bond issuances over the period 2023–2024. Income categories follow the World Bank's 2005 country income group definitions.

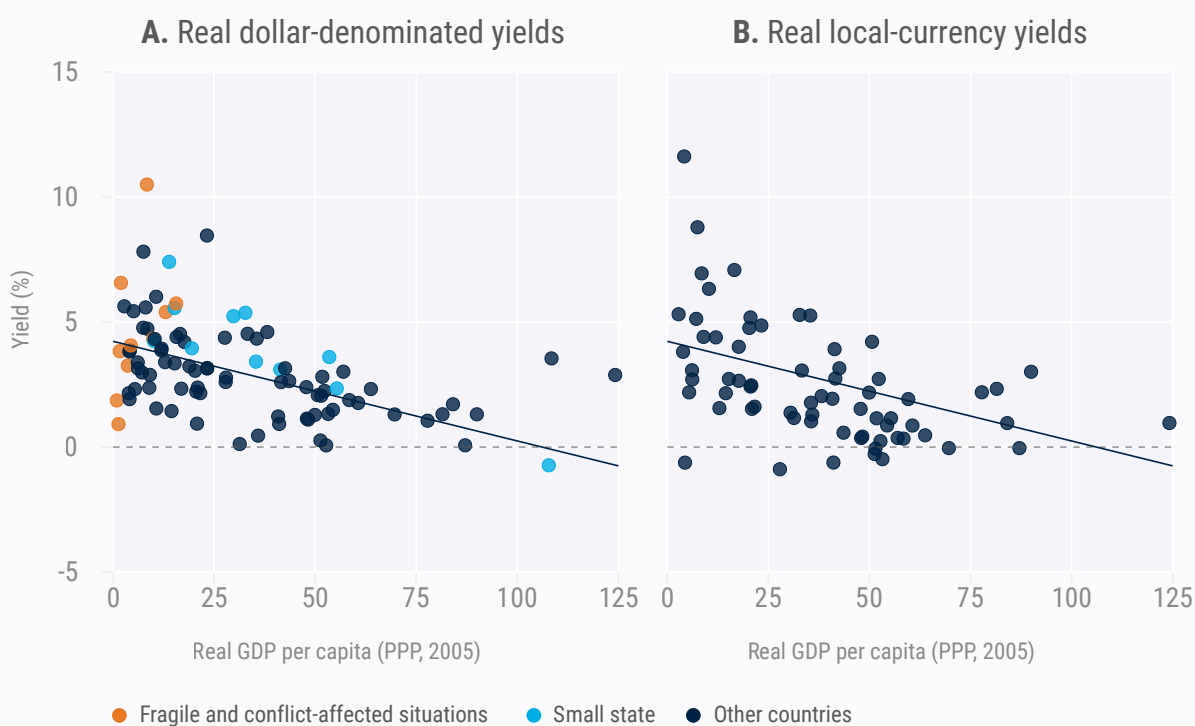
## Appendix G: *Using Mean Real Yields Instead of Medians*

This appendix assesses the sensitivity of the results to the choice of summary statistic by reporting mean real yields—using expected inflation—rather than medians, as used in the

main text. Means place greater weight on the tails of the yield distribution and are therefore more sensitive to outliers and episodes of financial stress, which are more prevalent in

FIGURE G.1

### Corporate Bond Yields Across Countries (Using Means and Expected Inflation)



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group, inflation data from the International Monetary Fund's World Economic Outlook and GDP data, Small States and Fragile and Conflict-Affected Situations from the World Bank's World Development Indicators.

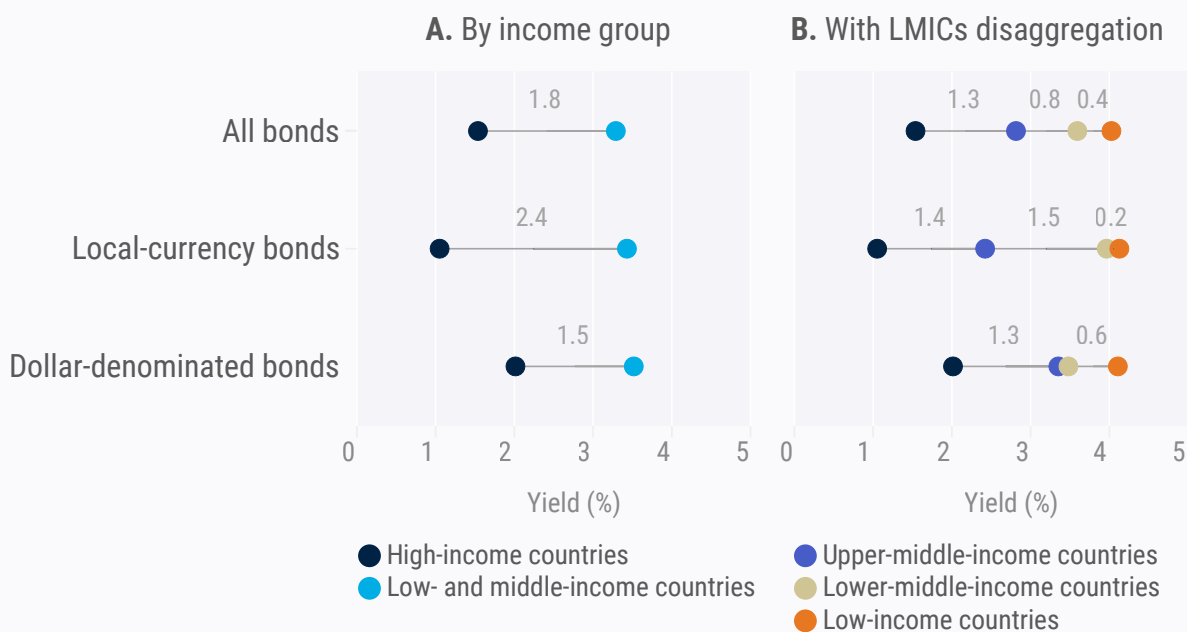
**Note:** This figure depicts real yields (adjusting for expected inflation from the World Economic Outlook) against real GDP per capita, with each point representing a country. For each country, the mean yield is calculated by pooling observations from all years between 2015 and 2024. Panel A shows dollar-denominated bonds, while panel B shows local-currency bonds. In panel A, countries that are members of the Small States Forum or classified as Fragile and Conflict-Affected Situations (FCS) are explicitly identified. A country is classified as FCS if it was designated as such at any point between 2015 and 2024. Due to limited data availability for local-currency bonds in these economies, small states and FCS countries are flagged only in the dollar-denominated bond sample. Real GDP per capita for 2005 is measured in purchasing-power-parity terms and expressed in thousands of constant 2021 dollars. Income categories follow the World Bank's 2005 country income group definitions. GDP = gross domestic product.

LMICs. Despite higher average levels, the figures show the same qualitative patterns as the baseline analysis. Borrowing costs decline with income per capita, the LMIC–HIC gap remains large and persistent, and relative differences across currencies, time, and firm types are

unchanged. The similarity between mean- and median-based results underscores how the main findings are not driven by distributional asymmetries or extreme observations.

FIGURE G.2

### Corporate Bond Yield Spread Between Low- and Middle-Income Countries and High-Income Countries (Using Means and Expected Inflation)

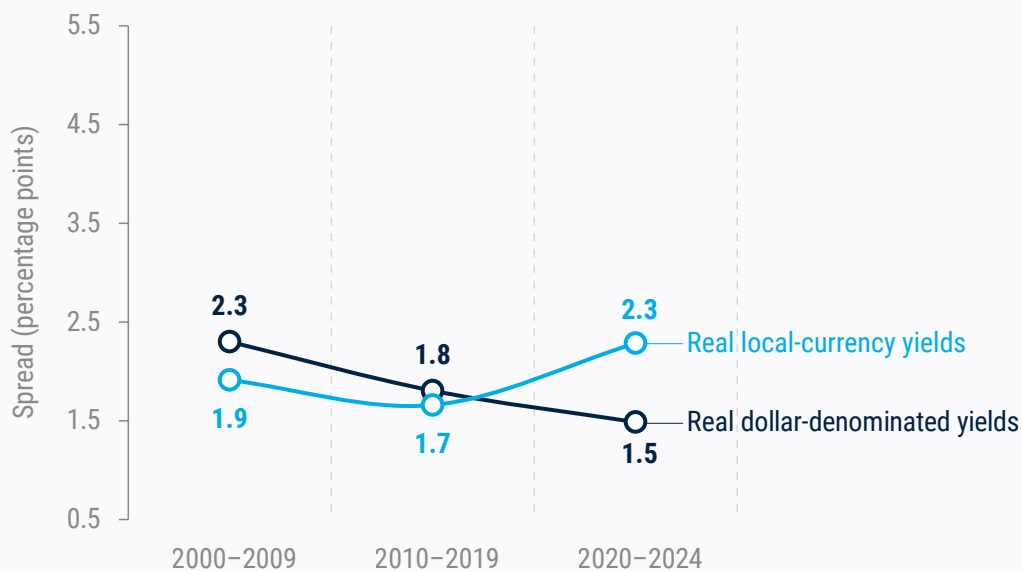


**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund's World Economic Outlook.

**Note:** This figure displays the mean real yields (adjusting for expected inflation) for dollar-denominated bonds, local-currency bonds, and the full bond sample by income group, along with the corresponding yield spreads. In panel A, countries are classified into two groups: high-income and low- and middle-income countries. In panel B, countries are divided into four groups: high-income, upper-middle-income, lower-middle-income and low-income countries. For each year, the mean yield is first calculated at the country level. These country-year means are then aggregated to obtain the mean yield for each income category across all years. Yield spreads between the groups are annotated in both panels. For both panels, income classifications are based on 2005. GDP = gross domestic product.

FIGURE G.3

### Yield Spread Between Low- and Middle-Income Countries and High-Income Countries Over Time (Using Means and Expected Inflation)



**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from the International Monetary Fund's World Economic Outlook.

**Note:** This figure presents the mean real yield spreads (adjusting for expected inflation) between low- and middle-income countries and high income countries. For each year, the mean yield is first calculated for each country. These country-level means are then aggregated to obtain the mean yield for each income category. Finally, the yield gap between the two income groups is calculated for that year. The figure reports decade averages of these spreads. Income categories follow the World Bank's 2005 country income group definitions.

## Appendix H: *Regression Tables Using Realized and Expected Real Yields*

This appendix reports the full set of regression tables using both realized and expected real yields. The realized real yield subtracts realized inflation over the bond's life for the full 1990–2024 sample. The expected real yield instead uses the International Monetary Fund's inflation projections available at the time of issuance and

is estimated on the 1999–2024 sample, when those projections become available. Results are similar across the two measures, suggesting that the findings are not sensitive to whether real yields are constructed using realized inflation or inflation projections.

TABLE H.1

### Regression Estimates of Global and Country Factors (Real Yields)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
<b>Real GDP growth</b>	-0.26*** (-16.57)	0.00 (0.13)	-0.06*** (-9.38)	-0.09*** (-9.12)	-0.12*** (-18.74)	-0.08*** (-8.88)
<b>Real GDP per capita</b>	-0.09*** (-3.33)	0.03*** (3.17)	0.00 (1.63)	0.02*** (9.39)	0.01*** (3.60)	0.02*** (10.75)
<b>Domestic government yield</b>	0.76*** (40.05)		0.75*** (65.07)		0.71*** (66.46)	
<b>International government yield</b>	0.46*** (9.57)		0.55*** (46.72)		0.53*** (45.82)	
<b>Federal funds rate</b>	0.10*** (2.79)	0.47*** (2.13)	0.25*** (15.09)	0.28*** (10.32)	0.23*** (14.35)	0.30*** (10.71)
<b>Real GDP growth x LMIC</b>					-0.09*** (-10.90)	0.08*** (5.23)
<b>Real GDP per capita x LMIC</b>					-0.10*** (-8.19)	-0.03*** (-5.41)
<b>Federal funds rate x LMIC</b>					-0.05*** (-4.33)	0.13*** (3.24)
<b>Domestic government yield x LMIC</b>					0.15*** (8.09)	
<b>International government yield x LMIC</b>					0.07** (2.50)	

TABLE H.1 (CONTINUED)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
N	11,234	1,402	45,025	24,088	56,262	25,492
R-squared	0.74	0.65	0.69	0.49	0.68	0.49
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes
Security and firm controls	Yes	Yes	Yes	Yes	Yes	Yes

*t* statistics in parentheses

\*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$

**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group, inflation data from the International Monetary Fund's World Economic Outlook, GDP data from the World Bank's World Development Indicators, sovereign data from Bloomberg and federal funds rate data from the Federal Reserve Economic Data database.

**Note:** This table presents regression estimates where the dependent variable is the realized real yield to maturity at issuance, expressed in percentage points (1.0 = 1 percentage point = 100 basis points). Real yields are constructed by subtracting annualized inflation realized over the bond's life using International Monetary Fund's World Economic Outlook data, matched to the currency of denomination. Specifications are estimated separately by income group (LMICs, HICs, and pooled) and by market segment (domestic and international). All regressions use heteroskedasticity-robust standard errors. FE = fixed effects.

TABLE H.2

## Regression Estimates of Global and Country Factors (Expected Real Yields)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
<b>Real GDP growth</b>	-0.18*** (-11.96)	-0.02 (-0.85)	-0.02** (-1.99)	-0.05*** (-4.71)	-0.09*** (-11.43)	-0.05*** (-5.13)
<b>Real GDP per capita</b>	-0.08*** (-3.17)	0.03*** (3.68)	-0.00 (-1.13)	0.01*** (3.9)	-0.00 (-0.59)	0.00*** (2.92)
<b>Domestic government yield</b>	0.15*** (8.96)		0.35*** (30.39)		0.40*** (38.32)	
<b>International government yield</b>		0.29*** (6.33)		0.09*** (6.62)		0.10*** (6.92)
<b>Federal funds rate</b>	0.04 (1.14)	0.35 (1.50)	0.22*** (12.10)	0.22*** (6.73)	0.16*** (9.09)	0.23*** (6.98)
<b>Real GDP growth x LMIC</b>					-0.06*** (-8.04)	0.02 (1.24)
<b>Real GDP per capita x LMIC</b>					-0.01 (-0.91)	-0.01 (-1.40)
<b>Federal funds rate x LMIC</b>					0.21*** (16.64)	0.09** (2.37)
<b>Domestic government yield x LMIC</b>					-0.17*** (-9.97)	
<b>International government yield x LMIC</b>						0.21*** (7.80)
N	11,234	1,387	33,938	19,422	45,175	20,811

TABLE H.2 (CONTINUED)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
R-squared	0.53	0.59	0.6	0.39	0.56	0.4
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes
Security and firm controls	Yes	Yes	Yes	Yes	Yes	Yes

*t* statistics in parentheses

\*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$

**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group, inflation data from the International Monetary Fund's World Economic Outlook, GDP data from the World Bank's World Development Indicators, sovereign data from Bloomberg and federal funds rate data from the Federal Reserve Economic Data database.

**Note:** This table presents regression estimates where the dependent variable is the expected real yield to maturity at issuance, expressed in percentage points (1.0 = 1 percentage point = 100 basis points). Real yields are constructed by subtracting annualized inflation expectations formed at issuance using International Monetary Fund's World Economic Outlook projections, matched to the currency of denomination. Specifications are estimated separately by income group (LMICs, HICs, and pooled) and by market segment (domestic and international). All regressions use heteroskedasticity-robust standard errors. FE = fixed effects.

TABLE H.3

## Regression Estimates of Firm Factors (Real Yields)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
<b>Private status</b>	0.22* (1.68)	0.84*** (2.70)	0.28*** (5.07)	-0.14* (-1.88)	0.28*** (5.11)	-0.14* (-1.83)
<b>First bond issuance</b>	0.06 (1.10)	-0.57*** (-3.24)	0.00 (0.15)	-0.01 (-0.15)	0.01 (0.19)	-0.01 (-0.11)
<b>Loan and bond market access</b>	-0.23*** (-6.26)	-0.31* (-1.81)	0.12*** (6.83)	-0.03 (-0.85)	0.12*** (6.5)	-0.02 (-0.80)
<b>SOE</b>	-0.50*** (-9.77)	-0.37** (-2.20)	-0.38*** (-8.91)	-0.26*** (-3.85)	-0.39*** (-9.25)	-0.26*** (-3.85)
<b>Subsidiary (domestic parent)</b>	-0.00 (-0.04)	0.08 (0.57)	-0.29*** (-13.80)	0.02 (0.37)	-0.28*** (-13.45)	0.02 (0.34)
<b>Subsidiary (international parent)</b>	-0.31*** (-4.13)	0.24 (1.29)	-0.33*** (-4.42)	0.02 (0.19)	-0.32*** (-4.23)	0.02 (0.28)
<b>Size</b>	-0.32*** (-19.23)	-0.23*** (-4.12)	-0.17*** (-38.40)	-0.24*** (-29.37)	-0.17*** (-39.81)	-0.24*** (-29.01)
<b>Profitability</b>	-0.02*** (-4.39)	-0.05*** (-3.92)	-0.03*** (-20.47)	-0.04*** (-12.48)	-0.03*** (-21.14)	-0.03*** (-12.36)
<b>Leverage</b>	0.06 (0.79)	1.38*** (3.70)	1.18*** (28.30)	1.26*** (14.73)	1.19*** (28.39)	1.26*** (14.64)
<b>Tangibility</b>	0.08 (1.45)	0.06 (0.27)	0.00 (0.14)	0.10*** (3.41)	-0.00 (-0.24)	0.10*** (3.45)
<b>Private status x LMIC</b>					-0.18* (-1.75)	0.97*** (3.61)
<b>First bond issuance x LMIC</b>					0.10* (1.70)	-0.99*** (-5.31)

TABLE H.3 (CONTINUED)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
<b>Loan and bond market access x LMIC</b>					-0.25*** (-7.22)	-0.82*** (-5.92)
<b>SOE x LMIC</b>					0.09 (1.47)	0.29* (1.72)
<b>Subsidiary (domestic parent) x LMIC</b>					0.27*** (6.87)	0.61*** (4.44)
<b>Subsidiary (international parent) x LMIC</b>					0.08 (0.76)	0.14 (0.74)
<b>Size x LMIC</b>					-0.06*** (-5.16)	-0.03 (-0.76)
<b>Profitability x LMIC</b>					0.01*** (3.92)	0.00 (0.07)
<b>Leverage x LMIC</b>					-1.23*** (-15.14)	1.41*** (3.78)
<b>Tangibility x LMIC</b>					0.05 (0.99)	-1.15*** (-6.02)
N	12,126	1,692	57,422	25,683	73,038	28,490
R-squared	0.77	0.75	0.7	0.65	0.71	0.64
Country x year FE	Yes	Yes	Yes	Yes	Yes	Yes
Currency x year FE	Yes	Yes	Yes	Yes	Yes	Yes
Security characteristics	Yes	Yes	Yes	Yes	Yes	Yes

*t statistics in parentheses*

\*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$

**Source:** Calculations using issuance data from the Securities Data Company Platinum database and firm balance sheet data from Worldscope, both from London Stock Exchange Group, and inflation data from the International Monetary Fund's World Economic Outlook.

**Note:** This table presents regression estimates where the dependent variable is the realized real yield to maturity at issuance, expressed in percentage points (1.0 = 1 percentage point = 100 basis points). Real yields are constructed by subtracting annualized inflation realized over the bond's life using International Monetary Fund's World Economic Outlook data, matched to the currency of denomination. Specifications are estimated separately by income group (LMICs, HICs, and pooled) and by market segment (domestic and international). All regressions use heteroskedasticity-robust standard errors. FE = fixed effects.

TABLE H.4

## Regression Estimates of Firm Factors (Expected Real Yields)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
<b>Private status</b>	0.14 (1.13)	0.97*** (2.66)	0.24*** (3.02)	-0.24*** (-2.63)	0.24*** (3.06)	-0.24*** (-2.63)
<b>First bond issuance</b>	0.10* (1.89)	-0.58*** (-3.10)	0.01 (0.3)	0.01 (0.21)	0.01 (0.32)	0.01 (0.2)
<b>Loan and bond market access</b>	-0.29*** (-8.37)	-0.32* (-1.81)	0.12*** (5.9)	-0.07** (-2.17)	0.11*** (5.39)	-0.07** (-2.22)
<b>SOE</b>	-0.45*** (-9.80)	-0.42** (-2.55)	-0.54*** (-13.49)	-0.23*** (-3.10)	-0.57*** (-14.10)	-0.24*** (-3.14)
<b>Subsidiary (domestic parent)</b>	-0.01 (-0.25)	0.07 (0.46)	-0.29*** (-13.13)	0.12** (2.05)	-0.29*** (-12.89)	0.11* (1.96)
<b>Subsidiary (international parent)</b>	-0.23*** (-3.38)	0.10 (0.49)	-0.22** (-2.47)	0.01 (0.11)	-0.20** (-2.31)	0.02 (0.21)
<b>Size</b>	-0.35*** (-21.39)	-0.27*** (-4.80)	-0.17*** (-35.67)	-0.25*** (-29.23)	-0.18*** (-37.58)	-0.25*** (-29.00)
<b>Profitability</b>	-0.02*** (-4.35)	-0.05*** (-4.50)	-0.03*** (-18.63)	-0.03*** (-11.26)	-0.03*** (-19.57)	-0.03*** (-11.13)
<b>Leverage</b>	0.03 (0.40)	1.32*** (3.50)	1.04*** (22.32)	1.10*** (11.34)	1.05*** (22.5)	1.10*** (11.26)
<b>Tangibility</b>	0.08 (1.58)	0.05 (0.22)	0.09*** (4.13)	0.29*** (6.69)	0.07*** (2.86)	0.29*** (6.69)
<b>Private status x LMIC</b>					-0.23** (-2.01)	0.93*** (2.84)
<b>First bond issuance x LMIC</b>					0.13** (2.19)	-1.07*** (-5.28)
<b>Loan and bond market access x LMIC</b>					-0.28*** (-7.84)	-0.81*** (-5.59)
<b>SOE x LMIC</b>					0.43*** (7.24)	0.22 (1.27)
<b>Subsidiary (domestic parent) x LMIC</b>					0.29*** (7.40)	0.58*** (4.18)
<b>Subsidiary (international parent) x LMIC</b>					0.02 (0.15)	0.15 (0.76)
<b>Size x LMIC</b>					-0.06*** (-5.16)	-0.05 (-1.17)
<b>Profitability x LMIC</b>					0.01*** (3.82)	-0.00 (-0.38)
<b>Leverage x LMIC</b>					-1.16*** (-14.05)	1.78*** (4.64)
<b>Tangibility x LMIC</b>					0.04 (0.70)	-1.50*** (-7.34)
N	12,095	1,571	48,412	21,512	64,005	24,179
R-squared	0.67	0.73	0.62	0.56	0.63	0.58

TABLE H.4 (CONTINUED)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
Country x year FE	Yes	Yes	Yes	Yes	Yes	Yes
Currency x year FE	Yes	Yes	Yes	Yes	Yes	Yes
Security characteristics	Yes	Yes	Yes	Yes	Yes	Yes

*t* statistics in parentheses

\*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$

**Source:** Calculations using issuance data from the Securities Data Company Platinum database and firm balance sheet data from Worldscope, both from London Stock Exchange Group, and inflation data from the International Monetary Fund's World Economic Outlook.

**Note:** This table presents regression estimates where the dependent variable is the expected real yield to maturity at issuance, expressed in percentage points (1.0 = 1 percentage point = 100 basis points). Real yields are constructed by subtracting annualized inflation expectations formed at issuance using International Monetary Fund's World Economic Outlook projections, matched to the currency of denomination. Specifications are estimated separately by income group (LMICs, HICs, and pooled) and by market segment (domestic and international). All regressions use heteroskedasticity-robust standard errors. FE = fixed effects.

TABLE H.5

## Regression Estimates of Security Factors (Real Yields)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
<b>Amount issued</b>	0.02 (1.54)	0.16*** (4.28)	-0.00 (-0.63)	-0.08*** (-10.65)	-0.00 (-0.61)	-0.08*** (-10.70)
<b>Maturity</b>	0.14*** (44.45)	0.10*** (8.79)	0.09*** (84.98)	0.08*** (31.99)	0.09*** (84.9)	0.08*** (31.88)
<b>Private placement</b>	-0.05* (-1.90)	0.12* (1.7)	-0.04* (-1.89)	0.11*** (5.00)	-0.05* (-1.95)	0.11*** (4.97)
<b>Amount issued x LMIC</b>					0.02* (1.68)	0.21*** (6.42)
<b>Maturity x LMIC</b>					0.06*** (16.58)	0.02** (2.34)
<b>Private placement x LMIC</b>					-0.00 (-0.13)	-0.03 (-0.41)
N	26,806	2,541	120,593	70,264	147,423	72,894
R-squared	0.91	0.95	0.93	0.85	0.93	0.86
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes
Security and firm controls	Yes	Yes	Yes	Yes	Yes	Yes

*t* statistics in parentheses

\*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$

**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from International Monetary Fund's World Economic Outlook.

**Note:** This table presents regression estimates where the dependent variable is the realized real yield to maturity at issuance, expressed in percentage points (1.0 = 1 percentage point = 100 basis points). Real yields are constructed by subtracting annualized inflation realized over the bond's life using International Monetary Fund's World Economic Outlook data, matched to the currency of denomination. Specifications are estimated separately by income group (LMICs, HICs, and pooled) and by market segment (domestic and international). All regressions use heteroskedasticity-robust standard errors. FE = fixed effects.

TABLE H.6

## Regression Estimates of Security Factors (Expected Real Yields)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
<b>Amount issued</b>	0.01 (1.28)	0.19*** (4.9)	0.00 (0.76)	-0.08*** (-11.14)	0.00 (0.81)	-0.09*** (-11.22)
<b>Maturity</b>	0.14*** (48.6)	0.08*** (15.93)	0.07*** (115.19)	0.06*** (37.98)	0.07*** (115.15)	0.06*** (37.77)
<b>Private placement</b>	-0.04* (-1.67)	0.12 (1.46)	-0.03 (-1.47)	0.11*** (5.01)	-0.04 (-1.55)	0.11*** (4.97)
<b>Amount issued x LMIC</b>					0.01 (0.95)	0.29*** (7.68)
<b>Maturity x LMIC</b>					0.07*** (24.37)	0.01* (1.85)
<b>Private placement x LMIC</b>					-0.01 (-0.15)	-0.01 (-0.17)
N	26,670	1,973	101,683	57,601	128,371	59,640
R-squared	0.89	0.95	0.92	0.79	0.91	0.80
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes
Security and firm controls	Yes	Yes	Yes	Yes	Yes	Yes

*t* statistics in parentheses

\*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$

**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from International Monetary Fund's World Economic Outlook.

**Note:** This table presents regression estimates where the dependent variable is the expected real yield to maturity at issuance, expressed in percentage points (1.0 = 1 percentage point = 100 basis points). Real yields are constructed by subtracting annualized inflation expectations formed at issuance using International Monetary Fund's World Economic Outlook projections, matched to the currency of denomination. Specifications are estimated separately by income group (LMICs, HICs, and pooled) and by market segment (domestic and international). All regressions use heteroskedasticity-robust standard errors. FE = fixed effects.

## Appendix I: Regression Results When Considering Only Nonfinancial Firms

This appendix reports the regression tables estimated on a sample restricted to nonfinancial firms. Issuers are classified using their SIC codes, treating any firm with an SIC code that begins with 6 as a financial firm and excluding those observations from the regressions. The

results are broadly similar to those in the full sample, suggesting that the main findings are not being driven by banks and other financial intermediaries.

TABLE I.1

### Regression Estimates of Global and Country Factors for Nonfinancial Firms (Real Yields)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
<b>Real GDP growth</b>	-0.19*** (-8.64)	-0.03 (-0.71)	-0.07*** (-7.38)	-0.02 (-1.30)	-0.11*** (-12.59)	-0.02 (-1.53)
<b>Real GDP per capita</b>	-0.11*** (-2.82)	0.00 (0.3)	0.00* (1.77)	0.01*** (5.57)	0.01*** (3.04)	0.01*** (6.97)
<b>Domestic government yield</b>	0.65*** (20.72)		0.77*** (45.53)		0.75*** (46.87)	
<b>International government yield</b>		0.49*** (8.57)		0.57*** (29.32)		0.54*** (28.81)
<b>Federal funds rate</b>	0.03 (0.63)	0.48 (1.09)	0.17*** (7.54)	0.15*** (3.09)	0.16*** (7.70)	0.17*** (3.53)
<b>Real GDP growth x LMIC</b>					-0.06*** (-5.09)	0.05** (2.26)
<b>Real GDP per capita x LMIC</b>					-0.08*** (-4.90)	-0.02*** (-3.03)
<b>Federal funds rate x LMIC</b>					-0.03 (-1.50)	0.13*** (2.61)
<b>Domestic government yield x LMIC</b>					-0.05 (-1.63)	
<b>International government yield x LMIC</b>						0.03 (0.83)

TABLE I.1 (CONTINUED)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
N	4,665	648	28,473	11,444	33,140	12,097
R-squared	0.60	0.63	0.66	0.51	0.65	0.51
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes
Security and firm controls	Yes	Yes	Yes	Yes	Yes	Yes

*t* statistics in parentheses

\*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$

**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group, inflation data from the International Monetary Fund's World Economic Outlook, GDP data from the World Bank's World Development Indicators, sovereign data from Bloomberg and federal funds rate data from the Federal Reserve Economic Data database.

**Note:** This table presents regression estimates where the dependent variable is the realized real yield to maturity at issuance, expressed in percentage points (1.0 = 1 percentage point = 100 basis points). Real yields are constructed by subtracting annualized inflation realized over the bond's life using International Monetary Fund's World Economic Outlook data, matched to the currency of denomination. Specifications are estimated separately by income group (LMICs, HICs, and pooled) and by market segment (domestic and international). All regressions use heteroskedasticity-robust standard errors. FE = fixed effects.

TABLE I.2

## Regression Estimates of Firm Factors for Nonfinancial Firms (Real Yields)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
<b>Private status</b>	0.05 (0.32)	0.94** (2.42)	0.54*** (5.37)	0.46*** (4.06)	0.55*** (5.4)	0.46*** (3.97)
<b>First bond issuance</b>	0.16** (2.23)	-0.50** (-2.15)	-0.06 (-1.49)	-0.07 (-1.27)	-0.06 (-1.43)	-0.07 (-1.28)
<b>Loan and bond market access</b>	-0.08 (-1.35)	-0.23 (-0.98)	0.10*** (3.63)	0.09 (1.44)	0.10*** (3.69)	0.09 (1.4)
<b>SOE</b>	-0.37*** (-4.54)	-0.65** (-2.02)	-0.78*** (-9.89)	-0.43*** (-4.82)	-0.79*** (-9.99)	-0.46*** (-5.03)
<b>Subsidiary (domestic parent)</b>	-0.00 (-0.04)	0.19 (0.79)	0.06* (1.78)	0.14* (1.77)	0.05* (1.69)	0.14* (1.8)
<b>Subsidiary (international parent)</b>	-0.18* (-1.82)	0.12 (0.33)	0.25* (1.88)	0.16 (1.43)	0.26** (1.97)	0.16 (1.36)
<b>Size</b>	-0.17*** (-6.74)	-0.09 (-1.01)	-0.11*** (-14.51)	-0.21*** (-12.67)	-0.11*** (-14.31)	-0.20*** (-12.32)
<b>Profitability</b>	-0.01** (-2.23)	-0.04*** (-2.61)	-0.03*** (-15.89)	-0.04*** (-13.22)	-0.03*** (-15.86)	-0.04*** (-12.98)

TABLE I.2 (CONTINUED)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
<b>Leverage</b>	0.87*** (4.81)	1.73** (2.48)	1.83*** (28.63)	2.16*** (16.73)	1.83*** (28.56)	2.17*** (16.69)
<b>Tangibility</b>	-0.11 (-1.33)	0.16 (0.43)	0.15*** (4.77)	0.25** (2.5)	0.14*** (4.62)	0.25** (2.51)
<b>Private status x LMIC</b>					-0.51*** (-3.35)	0.61* (1.73)
<b>First bond issuance x LMIC</b>					0.23*** (3.43)	-0.66*** (-2.87)
<b>Loan and bond market access x LMIC</b>					-0.08 (-1.41)	0.13 (0.63)
<b>SOE x LMIC</b>					0.55*** (5.08)	0.50* (1.71)
<b>Subsidiary (domestic parent) x LMIC</b>					-0.12** (-2.15)	0.39* (1.82)
<b>Subsidiary (international parent) x LMIC</b>					-0.43*** (-2.62)	0.63* (1.74)
<b>Size x LMIC</b>					-0.07*** (-3.85)	-0.02 (-0.33)
<b>Profitability x LMIC</b>					0.02*** (3.42)	0.01 (0.53)
<b>Leverage x LMIC</b>					-0.77*** (-5.05)	0.10 (0.18)
<b>Tangibility x LMIC</b>					-0.36*** (-4.73)	-0.60** (-2.01)
N	5,169	819	37,275	11,941	44,630	13,163
R-squared	0.69	0.72	0.68	0.66	0.68	0.66
Country x year FE	Yes	Yes	Yes	Yes	Yes	Yes
Currency x year FE	Yes	Yes	Yes	Yes	Yes	Yes
Security characteristics	Yes	Yes	Yes	Yes	Yes	Yes

*t* statistics in parentheses

\*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$

**Source:** Calculations using issuance data from the Securities Data Company Platinum database and firm balance sheet data from Worldscope, both from London Stock Exchange Group, and inflation data from the International Monetary Fund's World Economic Outlook.

**Note:** This table presents regression estimates where the dependent variable is the realized real yield to maturity at issuance, expressed in percentage points (1.0 = 1 percentage point = 100 basis points). Real yields are constructed by subtracting annualized inflation expressed over the bond's life using International Monetary Fund's World Economic Outlook data, matched to the currency of denomination. Specifications are estimated separately by income group (LMICs, HICs, and pooled) and by market segment (domestic and international). All regressions use heteroskedasticity-robust standard errors. FE = fixed effects.

TABLE I.3

## Regression Estimates of Security Factors for Nonfinancial Firms (Real Yields)

	LMICs		HICs		All	
	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET	DOMESTIC MARKET	INTNL. MARKET
<b>Amount issued</b>	-0.04** (-2.06)	0.28*** (3.06)	0.01 (1.4)	0.04*** (2.74)	0.01 (1.41)	0.04*** (2.7)
<b>Maturity</b>	0.14*** (26.42)	0.07*** (5.38)	0.07*** (60.38)	0.08*** (26.25)	0.07*** (60.66)	0.08*** (26.21)
<b>Private placement</b>	-0.11* (-1.71)	0.12 (0.84)	-0.02 (-0.40)	0.21*** (3.86)	-0.02 (-0.40)	0.21*** (3.83)
<b>Amount issued x LMIC</b>					-0.05** (-2.33)	0.25*** (3.1)
<b>Maturity x LMIC</b>					0.07*** (13.25)	-0.01 (-1.11)
<b>Private placement x LMIC</b>					-0.09 (-1.23)	-0.07 (-0.56)
N	9,212	909	42,567	15,307	51,789	16,258
R-squared	0.91	0.95	0.95	0.94	0.95	0.94
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes
Security and firm controls	Yes	Yes	Yes	Yes	Yes	Yes

*t* statistics in parentheses

\*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$

**Source:** Calculations using issuance data from the Securities Data Company Platinum database from London Stock Exchange Group and inflation data from International Monetary Fund's World Economic Outlook.

**Note:** This table presents regression estimates where the dependent variable is the realized real yield to maturity at issuance, expressed in percentage points (1.0 = 1 percentage point = 100 basis points). Real yields are constructed by subtracting annualized inflation realized over the bond's life using International Monetary Fund's World Economic Outlook data, matched to the currency of denomination. Specifications are estimated separately by income group (LMICs, HICs, and pooled) and by market segment (domestic and international). All regressions use heteroskedasticity-robust standard errors. FE = fixed effects.

## Appendix J: How Much of The LMIC-HIC Yield Spread is Accounted for by Firm-Level Observables (Domestic and International Markets)?

This appendix reports the same sequential controls exercise as in the main text but estimated separately for domestic and international bond markets. As in the main results, adding controls explains about one-third of the baseline spread, leaving a residual spread.

The sources of the explained component differ across markets. In domestic markets, the largest reduction comes from security characteristics, while in international markets it comes primarily from firm characteristics, with country controls playing a more modest role in both cases.

TABLE J.1

### Low- and Middle-Income to High-Income Country Spread in Real Issuance Yields with Sequential Controls (Domestic Markets)

	(1)	(2)	(3)	(4)
<b>Low- and middle-income countries</b>	<b>1.396<sup>***</sup></b>	<b>1.037<sup>***</sup></b>	<b>1.135<sup>***</sup></b>	<b>0.922<sup>***</sup></b>
	<b>(37.00)</b>	<b>(25.43)</b>	<b>(26.72)</b>	<b>(14.77)</b>
N	56,268	56,268	56,268	56,268
R-squared	0.30	0.34	0.37	0.38
Year FE	Yes	Yes	Yes	Yes
Security factors	No	Yes	Yes	Yes
Firm factors	No	No	Yes	Yes
Real GDP growth	No	No	No	Yes
Sample	Common	Common	Common	Common
Years	1990-2024	1990-2024	1990-2024	1990-2024

*t* statistics in parentheses

\*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$

**Source:** Calculations using issuance data from the Securities Data Company (SDC) Platinum database and firm balance sheet data from Worldscope, both from London Stock Exchange Group, inflation data from the International Monetary Fund's World Economic Outlook, and GDP data from the World Bank's World Development Indicators.

**Note:** The dependent variable is the real yield to maturity at issuance for all firms. Results are shown for domestic markets only. Columns (1)-(4) report pooled regressions that sequentially add controls. Column (1) includes only an indicator for LMICs. Column (2) adds security characteristics: amount issued, maturity, and private placement. Column (3) additionally includes firm characteristics: private status, first bond issuance, loan and bond market access, SOE, subsidiary, size, profitability, leverage, and tangibility. Column (4) further adds real GDP growth. All regressions include year fixed effects and use heteroskedasticity-robust standard errors. Specifications in columns (1)-(4) are estimated on a common sample, so the set of observations is identical across columns. The spread in Column (1) is not directly comparable to the spread shown in Chapter 1 because Chapter 1 reports results for 2015–2024, whereas these regressions use the full period 1990–2024. The estimation sample is also smaller than in the SDC-only analysis because merging SDC with Worldscope reduces coverage, as Worldscope primarily covers publicly listed firms and firm-level variables are not uniformly populated for all issuers. FE = fixed effects.

TABLE J.2

### Low- and Middle-Income to High-Income Country Spread in Real Issuance Yields With Sequential Controls (International Markets)

	(1)	(2)	(3)	(4)
<b>Low- and middle-income countries</b>	<b>1.300***</b> <b>(18.34)</b>	<b>1.322***</b> <b>(18.83)</b>	<b>0.905***</b> <b>(13.06)</b>	<b>0.928***</b> <b>(12.72)</b>
N	25,501	25,501	25,501	25,501
R-squared	0.26	0.30	0.36	0.36
Year FE	Yes	Yes	Yes	Yes
Security factors	No	Yes	Yes	Yes
Firm factors	No	No	Yes	Yes
Real GDP growth	No	No	No	Yes
Sample	Common	Common	Common	Common
Years	1990-2024	1990-2024	1990-2024	1990-2024

*t* statistics in parentheses

\*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$

**Source:** Calculations using issuance data from the Securities Data Company (SDC) Platinum database and firm balance sheet data from Worldscope, both from London Stock Exchange Group, inflation data from the International Monetary Fund's World Economic Outlook, and GDP data from the World Bank's World Development Indicators.

**Note:** The dependent variable is the real yield to maturity at issuance for all firms. Results are shown for international markets only. Columns (1)-(4) report pooled regressions that sequentially add controls. Column (1) includes only an indicator for LMICs. Column (2) adds security characteristics: amount issued, maturity, and private placement. Column (3) additionally includes firm characteristics: private status, first bond issuance, loan and bond market access, SOE, subsidiary, size, profitability, leverage, and tangibility. Column (4) further adds real GDP growth. All regressions include year fixed effects and use heteroskedasticity-robust standard errors. Specifications in columns (1)-(4) are estimated on a common sample, so the set of observations is identical across columns. The spread in Column (1) is not directly comparable to the spread shown in Chapter 1 because Chapter 1 reports results for 2015-2024, whereas these regressions use the full period 1990-2024. The estimation sample is also smaller than in the SDC-only analysis because merging SDC with Worldscope reduces coverage, as Worldscope primarily covers publicly listed firms and firm-level variables are not uniformly populated for all issuers. FE = fixed effects.

## Appendix K: *Machine-Learning Model for Predicting the Cost of Debt*

To complement the econometric analysis presented in the main body of the report, an advanced machine-learning model has been developed to predict the cost of debt using the same comprehensive dataset of transactional bond-level information. The model incorporates the broad set of explanatory variables discussed throughout the chapter, including global financial indicators, country-level macroeconomic conditions, firm-specific characteristics, and issuance-specific features.

Unlike linear econometric specifications, which rely on predefined functional forms and interaction terms, the machine-learning framework offers a flexible, data-driven approach. In particular, tree-based ensemble methods can capture non-linear relationships and higher-order interactions among predictors. This flexibility allows the model to uncover complex patterns that may be difficult to represent with additive linear techniques, complementing the insights provided by traditional econometric models.

Tree-based ensemble methods are widely used in predictive analytics due to their ability to flexibly approximate complex functional forms and interaction effects, typically exhibiting strong generalization performance when applied to previously unseen data (Breiman, 2001; Friedman, 2001). However, this predictive flexibility entails a trade-off. Compared to standard regression models, machine-learning algorithms generally provide lower interpretability, especially in terms of deriving

marginal effects for individual explanatory variables. This tension between predictive accuracy and interpretability has been widely discussed in the literature integrating machine learning into econometric analysis (Varian, 2014; Mullainathan & Spiess, 2017).

In this context, the machine-learning model serves as a predictive robustness and validation tool. The convergence of results between the econometric models and the machine-learning predictions reinforces confidence in the empirical findings.

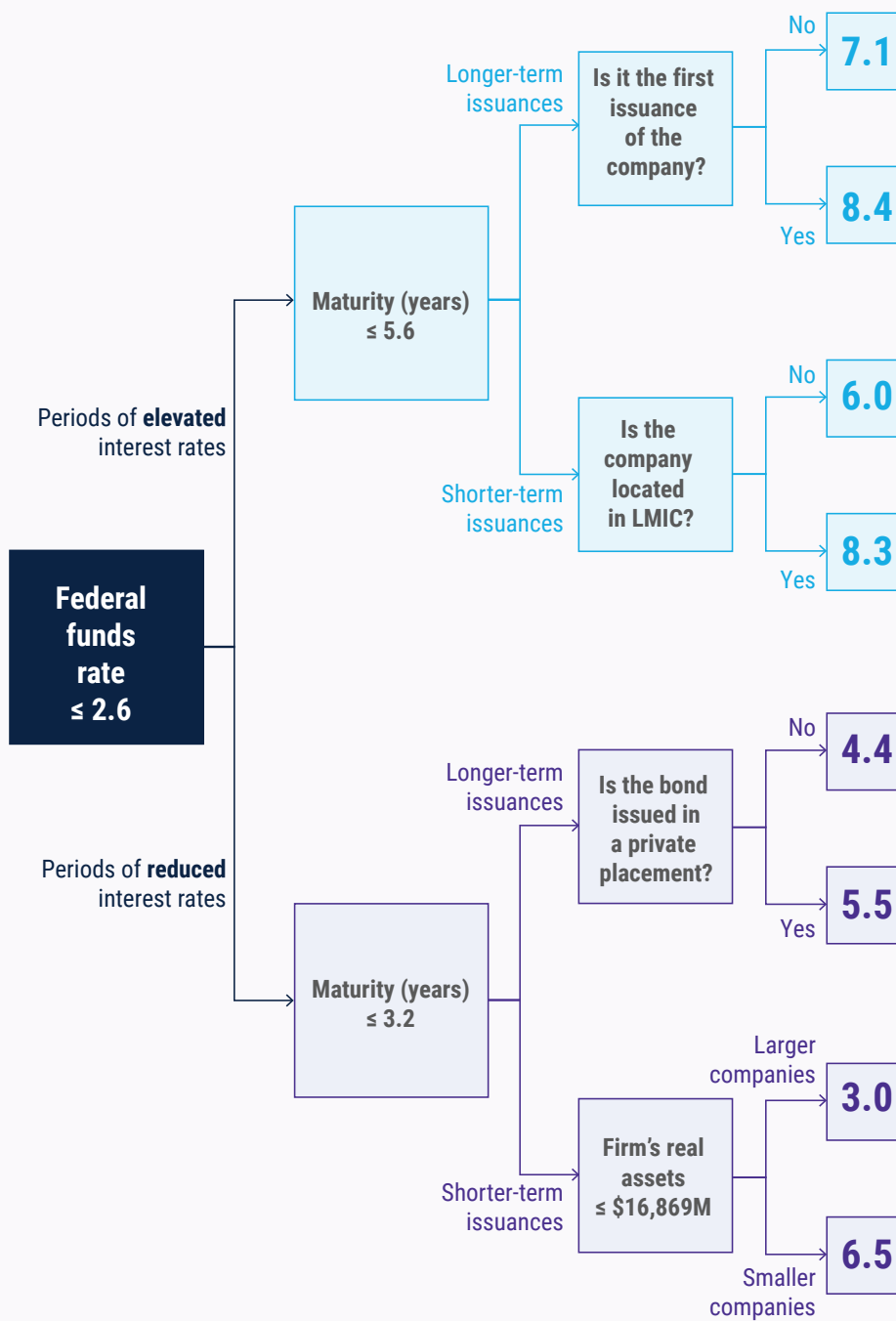
To illustrate the logic underlying tree-based models, **Figure K.1** presents a simplified decision tree with a maximum depth of three for dollar-denominated bonds. At each node, the algorithm selects the variable that yields the greatest reduction in the variance of the cost of debt across observations.

In the first split, the model identifies the prevailing federal funds rate as the most informative predictor. Bonds issued during periods of higher policy rates are associated with a higher average cost of capital relative to issuances occurring in lower-rate environments. This result is economically intuitive, as tighter monetary conditions generally translate into higher borrowing costs.

The model then evaluates the two resulting subgroups separately. For both groups, maturity emerges as the next most relevant feature. As the tree expands, additional patterns become evident. For example, firms with larger real

FIGURE K.1

### Decision Tree Machine-Learning Model for Dollar-Denominated Bonds



**Source:** Calculations using issuance data from the Securities Data Company Platinum database and firm balance sheet data from Worldscope, both from London Stock Exchange Group, GDP data from the World Bank's World Development Indicators and federal funds rate data from the Federal Reserve Economic Data database.

**Note:** This figure presents a regression tree model with a maximum depth of three, used to estimate the nominal yields of dollar-denominated bond issuances.

asset bases and issuers operating in wealthier economies tend to face lower borrowing costs. In addition, first-time bond issuers are associated with higher yields, reflecting the absence of an established market track record and the greater uncertainty perceived by investors. These findings are consistent with the econometric evidence presented earlier in the report.

At each stage, the algorithm partitions the data into two subgroups that maximize differences in the average cost of capital. Once the decision tree is trained using the training dataset, its predictive performance is evaluated on a separate test dataset. Each bond issuance in the test set is allocated to a terminal leaf according to its observable characteristics. The predicted cost of debt corresponds to the average yield observed among training observations assigned to the same leaf -namely, issuances sharing similar values of the most predictive features.

To improve predictive accuracy and granularity, the final specification extends beyond a single tree. The model allows for deeper trees and employs an ensemble approach combining multiple trees rather than relying on a single partitioning structure. Structural hyperparameters -such as maximum tree depth and the number of trees- are optimized through cross-validation procedures.

The model is implemented using the XGBoost algorithm, in which each successive tree is trained to correct the residual errors of the preceding ensemble (Chen & Guestrin, 2016). This iterative process incrementally improves predictive performance. The learning rate -i.e., the parameter controlling the contribution

of each additional tree- is also tuned during training to balance convergence speed and generalization performance.

To ensure robustness, the model is trained and fine-tuned on a dedicated training dataset. Its predictive accuracy and generalization capacity are subsequently assessed on a separate test set, providing an objective evaluation of performance on unseen data and mitigating the risk of overfitting.

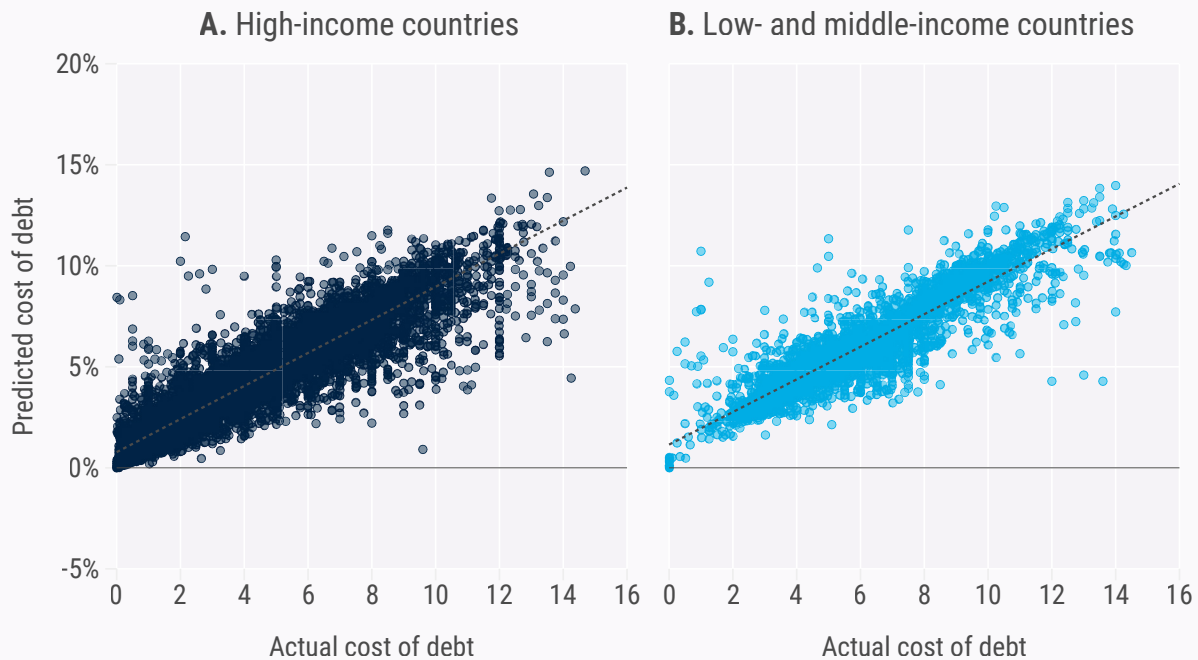
Within the training phase, each tree is constructed using a slightly different subset of observations and predictors. This controlled randomness enhances diversity across trees while preserving the underlying structure of the data, thereby strengthening overall predictive stability. The model's predictive accuracy is evaluated using the hold-out test dataset, which contains bond issuances not used during training. **Figure K.2** shows that the ensemble approach delivers strong predictive capability across both income categories.

Predictive performance, disaggregated by issuance currency, suggests that the model maintains reliable predictive performance across major currencies, with variations reflecting differences in market depth, liquidity conditions, macro-financial environments, and bond issuance characteristics. Overall, the machine-learning model exhibits robust out-of-sample performance, confirming its suitability as a complementary tool to the econometric analysis presented in this report (**Table K.1**).

FIGURE K.2

## Predictive Performance of the Machine Learning Model by Income Category

*Actual and predicted cost of debt on test set*



**Source:** Calculations using issuance data from the Securities Data Company Platinum database and firm balance sheet data from Worldscope, both from London Stock Exchange Group, GDP data from the World Bank's World Development Indicators and federal funds rate data from the Federal Reserve Economic Data database.

**Note:** This figure displays the actual and predicted yields from the machine learning model, disaggregated by income category. Each point corresponds to an individual corporate bond issuance, with darker shades indicating greater number of issuances. The 45° line denotes perfect prediction. Income categories reflect the classification at the time of issuance, since the analysis focuses on predictive performance at that point.

TABLE K.1

## Predictive Performance of the Machine Learning Model by Currency

Currency	Description	Predictive Performance
TWD	New Taiwan Dollar	98.7%
JPY	Japanese Yen	88.8%
CHF	Swiss Franc	88.3%
PHP	Philippine Peso	87.1%
KRW	South Korean Won	85.7%
IDR	Indonesian Rupiah	84.9%
THB	Thai Baht	84.2%
AUD	Australian Dollar	83.0%
HKD	Hong Kong Dollar	82.7%
NZD	New Zealand Dollar	82.6%
TRY	Turkish Lira	81.4%
GBP	British Pound	80.8%
USD	U.S. Dollar	80.4%
CAD	Canadian Dollar	79.8%
NOK	Norwegian Krone	79.2%
ZAR	South African Rand	77.5%
INR	Indian Rupee	76.3%
DKK	Danish Krone	75.6%
MYR	Malaysian Ringgit	74.7%
EUR	Euro	73.9%
RUB	Russian Ruble	69.9%
CNY	Chinese Yuan	68.0%

**Source:** Calculations using issuance data from the Securities Data Company Platinum database and firm balance sheet data from Worldscope, both from London Stock Exchange Group, GDP data from the World Bank's World Development Indicators and federal funds rate data from the Federal Reserve Economic Data database.

**Note:** This table presents the predictive performance of the machine learning model by issuance currency, measured using the out-of-sample  $R^2$ . This metric indicates the proportion of variation in observed yields that can be explained by the model when applied to issuances that were not used in model development. Higher values indicate stronger predictive performance.

## Appendix L: *Estimated Interest Payment Savings—An Illustration*

The objective of this exercise is to provide an illustrative estimate of the potential interest-payment savings from reforms that broaden the investor base in LMICs. The estimates are not intended to capture the full gains from financial-sector reform. Instead, they apply the yield effects estimated in the paper to groups of countries that appear to have clear remaining scope for similar reforms.

We construct two country lists. The first identifies LMICs with room to develop domestic institutional investors through pension reform, focusing on countries that have not introduced reforms based on private accounts or where private pension markets remain small. The second identifies LMICs with room to further liberalize the capital account, based on their current level of financial openness. Because the exercise excludes countries that may still benefit from additional, intensive-margin reforms, the resulting estimates should be interpreted as conservative illustrations of the broader potential gains from expanding the investor base.

### **Pension Reforms Sample**

We exclude countries that have already introduced pension reforms based on private accounts, leaving 46 countries. For the remaining countries, we classify the private-pension industry as significant, partial or emerging, or negligible, using international pension databases, country pension profiles, national regulatory reports, and industry sources. We retain countries where the private-pension

industry is negligible, or where it is emerging, but assets remain below roughly 10 percent of GDP. This leaves a final sample of 34 LMICs.

The sample includes six countries with partial or emerging private-pension markets below this threshold: Czech Republic, Indonesia, Kiribati, Tanzania, Thailand, and Zimbabwe. It also includes 28 countries with negligible private-pension industries: Argentina, Azerbaijan, Bangladesh, Cambodia, Ecuador, Egypt, Equatorial Guinea, Guatemala, Iran, Lao PDR, Lebanon, Liberia, Libya, Madagascar, Marshall Islands, Mongolia, Mozambique, Myanmar, Nicaragua, Oman, Pakistan, Paraguay, Senegal, Serbia, Sri Lanka, Syria, Togo, and Ukraine.

### **Capital Account Liberalization Sample**

We use the latest available Chinn-Ito Financial Openness Index, available for 115 LMICs in 2023. We retain countries whose index values are at least one standard deviation below the maximum observed value among LMICs, which broadly excludes the most financially open quartile of the distribution. This restriction keeps the calculation focused on countries with sufficient remaining scope for the liberalization margin estimated in the report. This gives a final sample of 47 LMICs.

The sample comprises Albania, Argentina, Azerbaijan, Bangladesh, Belarus, Bolivia, Brazil, Burundi, the Central African Republic, China, Colombia, Egypt, Equatorial Guinea, Gabon, Ghana, Honduras, India, Indonesia, Iran, Jamaica, Kazakhstan, Lao PDR, Lebanon, Libya,

Madagascar, Malaysia, Maldives, Morocco, Mozambique, Myanmar, Nigeria, Pakistan, Paraguay, the Philippines, Saint Lucia, Senegal, South Africa, Sri Lanka, Sudan, Syria, Tanzania, Thailand, Togo, Türkiye, Ukraine, Uzbekistan, and Zimbabwe.

This exercise estimates the interest-payment savings that could have resulted from lower borrowing costs on qualifying bonds issued between 2015 and 2024. For each bond, savings equal the issuance amount multiplied by the estimated reduction in borrowing costs and by the number of years for which the bond is issued. For savings accrued through 2024, this number is capped at the number of years between the issuance year and 2024. The calculation is summarized as follows:

$$Savings_{2015-2024} = \sum_{b \in B} Issuance_b \times r \times Years_b$$

Here,  $B$  denotes the set of qualifying bonds  $b$  issued between 2015 and 2024,  $Years_b$  denotes the number of years for which bond  $b$  is issued,  $r = 0.015$  for pension reform, and  $r = 0.012$  for financial liberalization. The pension reform calculation applies to domestic bonds issued by countries without a private pension sector, while the financial liberalization calculation applies to international bonds issued by countries with room to liberalize. Based on this calculation, estimated savings are \$78 billion for financial liberalization and \$25 billion for pension reforms.



**The material in this work is copyrighted.**

Copying and/or transmitting portions or all of this work without permission may be a violation of applicable law. IFC does not guarantee the accuracy, reliability or completeness of the content included in this work, or for the conclusions or judgments described herein, and accepts no responsibility or liability for any omissions or errors (including, without limitation, typographical errors and technical errors) in the content whatsoever or for reliance thereon.

The findings, interpretations, views, and conclusions expressed herein are those of the authors and do not necessarily reflect the views of the Executive Directors of the International Finance Corporation or of the International Bank for Reconstruction and Development (the World Bank) or the governments they represent.