Local Currency Debt and Sovereign Rollover Risk*

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Abstract

Using granular bond-level data on emerging-market sovereign debt, we construct country-specific maturity structures and document three novel stylized facts: (1) a negative relationship between average maturity and the share of local currency debt; (2) sustained declines in average local-currency debt maturity; and (3) increases in rollover requirements with substantial cross-country and time variation. We show that the effects of exogenous shocks to capital outflows on rollover risk are substantially amplified in countries with larger shares of short-term local-currency debt, as reflected in sharper increases in exchange rates, bond yields, and CDS spreads. Our results underscore the lasting effects of the "original sin."

KEYWORDS: local currency, maturity structure, rollover risk, sovereign debt.

JEL CLASSIFICATION: F34, G12, G15.

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1. Introduction

Historically, emerging-market sovereign debt was issued predominantly in reserve currencies such as the U.S. dollar. In recent years, however, an increasing share has been denominated in local currency (Du and Schreger, 2022; Onen, Shin, and Von Peter, 2023; Bertaut, Bruno, and Shin, 2025). This development may signal a partial erosion of the underlying causes of what Eichengreen and Hausmann (1999) famously termed the 'original sin': the long-standing inability of emerging markets to borrow in their own currency due to concerns over exchange rate instability.

This paper investigates the implications of this transformation, with a particular focus on a previously underexplored dimension: the relationship between local-currency issuance and the maturity structure of sovereign debt. Specifically, we ask whether the move toward local-currency borrowing entails a trade-off: greater reliance on shorter maturities that heightens rollover risk. In this sense, the 'penance' for overcoming original sin may be a new vulnerability, namely the increased exposure to capital flow reversals arising from more frequent refinancing needs.

Although sovereigns can, in principle, manage local-currency debt more easily by printing money, doing so would raise inflation expectations, depreciate the currency, and undermine investor confidence. As a result, markets still demand sizable credit spreads on local-currency sovereign bonds in emerging markets, as shown by Du and Schreger (2016), despite governments' theoretical ability to repay in domestic currency. This suggests that rollover risk in local-currency debt can be economically meaningful. In this paper, we examine sovereign debt rollover risk in emerging markets (EMs) compared with developed markets (DMs) and provide the first evidence on how shifts in the currency composition of sovereign debt interact with its maturity structure.[1] Our results

[1] Rollover risk is defined by the maturity structure of a country's sovereign bonds, such as the predetermined fraction of bonds maturing within the next year (Almeida, Campello, Laranjeira, and Weisbenner, 2011; Carvalho, 2015; Choi, Hackbarth, and Zechner, 2018)

show that the evolving maturity profile of EM sovereign debt has important implications for financial stability in foreign exchange and sovereign bond markets.

We demonstrate that local-currency sovereign bond rollover risk is associated with exchange rate depreciation, increases in CDS spreads, and increases in bond yields. The core of the paper examines how rollover risk affects EMs' exposure to exogenous shocks in international capital flows. We focus on three distinct sources of plausibly exogenous variation in cross-border capital flows: index-rebalancing-driven flows, changes in the Broad Dollar Index (BDI), and high-frequency monetary policy shocks.[2] We show that rollover risk is substantially amplified with capital outflows from countries with larger shares of short-term local-currency debt, as reflected in sharper increases in exchange rates, bond yields, and CDS spreads. Short-maturity bonds are particularly sensitive to these shocks, highlighting the potential risks faced by emerging market economies due to shortening debt maturities.

Our analysis builds on a novel, granular dataset of 7,243 local-currency sovereign bond issuances (LC bonds) across 23 EMs from 2013 to 2024. Using detailed information on issuance amounts, coupon payments, coupon frequency, issuance dates, and maturity dates we construct each country's sovereign debt maturity structure. From this, we derive four novel stylized facts.

First, we show that LC bonds have consistently shorter maturities than foreign-currency sovereign debt instruments. While LC debt as a share of GDP has risen sharply, this shift appears to involve trade-offs: a higher share of LC bonds is associated with lower average maturities. Second, we document a 22.96% decline in the average maturity of LC bonds between 2013 and 2024. Third, we find rising rollover risk with substantial cross-country and time variation. In Chile, for instance, average bond maturity fell from 12.74 years in 2013 to 9.88 years in 2024, while the share of bonds maturing within

[2]Index rebalancing shocks are based on the GBI-EM Global Diversified Index (Pandolfi and Williams, 2019). Broad Dollar Index (BDI) fluctuations capture the global dollar cycle, with appreciations linked to outflows from EMs (Jansen, Shin, and Von Peter, 2024). High-frequency U.S. monetary policy shocks are known to trigger global capital retrenchment (Miranda-Agrippino and Rey, 2020).

one year rose from 0.62% to 3.47%—a combination indicative of elevated rollover risk, especially under adverse market conditions. Fourth, we show that higher rollover risk is associated with wider CDS spreads and exchange rate depreciation, consistent with the notion that larger near-term refinancing needs raise required risk premia.

Our measure of rollover risk is based on the maturity structure of LC debt, reflecting the fact that LC debt constitutes a substantially larger share of total sovereign debt than foreign-currency (FC) debt. This approach is consistent with Du and Schreger (2016), who document the growing importance of LC debt in emerging market (EM) economies. Nonetheless, we extend our analysis to include the fraction of bonds maturing (FBM) in foreign currency as well. We find that while the FBM in LC debt is significantly associated with price effects, the FBM in FC debt shows no such relationship. This likely reflects two factors: first, FC debt represents a smaller share of total sovereign debt; and second, FC bonds tend to have longer maturities, resulting in a much lower FBM. Indeed, we show that the FBM in foreign currency is approximately four times smaller than in local currency—consistent with the fact that the average maturity of FC debt is 10.40 years, compared to 7.95 years for LC debt.

Our focus on the interaction between sovereign debt maturity structures and cross-border portfolio capital flows is motivated by the observation that capital flow shocks affect the valuation of sovereign financial assets through two distinct but interrelated channels. First, capital outflows can depress bond prices by altering the composition of the investor base. For example, outflows due to bond-index adjustments may shift holdings away from relatively inelastic, long-term passive investors toward more price-sensitive arbitrageurs, who are more likely to sell in response to adverse shocks.[3] Second, this investor composition shift generates feedback effects via a country's default risk. As bond prices fall and yields rise, the cost of rolling over

[3]This mechanism is consistent with the empirical evidence on downward-sloping demand curves for sovereign debt, as documented by Greenwood and Vayanos (2010), Vayanos and Woolley (2013), and Vayanos and Vila (2021)

maturing debt increases, placing greater strain on government budgets. This raises the likelihood of default, which further depresses prices and raises spreads, setting off a self-reinforcing cycle of rising risk premia and declining valuations.

Importantly, the strength of these mechanisms depends on the debt maturity structure. When a large share of debt must be refinanced in the near term, the transmission of yield increases into borrowing costs is immediate, heightening rollover risk. In contrast, countries with predominantly long-term debt are less vulnerable to short-term market pressures, as their refinancing needs are temporally distant. In such cases, sovereign solvency is more insulated from immediate capital flow shocks and more influenced by the evolution of macroeconomic fundamentals over the medium term.

A key empirical challenge in studying the relationship between capital flows and sovereign debt rollover risk is the endogeneity between capital flows and financial asset valuations. For example, improved macroeconomic fundamentals may simultaneously attract capital inflows and increase demand for sovereign bonds, making it difficult to isolate causal effects. As mentioned above, we address this issue by employing three complementary strategies to capture exogenous variation in cross-border capital flows and explicitly focus on the interaction between these exogenous capital flows and the predetermined fraction of bonds maturing within the next year.

First, we exploit mechanical rebalancing shocks from the GBI-EM Global Diversified Index, which generate exogenous shifts in demand for EM sovereign bonds. Second, we use fluctuations in the Broad Dollar Index (BDI), as dollar appreciations are systematically linked to portfolio outflows and reduced foreign holdings of LC bonds (Jansen, Shin, and Von Peter, 2024). Third, we draw on high-frequency U.S. monetary policy shocks, where contractionary surprises trigger global capital retrenchment and tighter EM financial conditions (Miranda-Agrippino and Rey, 2020).

We find that a one standard deviation increase in Flows Implied by the Rebalancings (FIR) leads to a 2.87% exchange rate appreciation over a quarter, with the effect rising

to 3.62% in high rollover-risk countries—an amplification of about 26%. CDS spreads show a similar pattern: they fall by 3.54% on average, with the decline roughly twice as large in high rollover-risk countries, highlighting their greater vulnerability. Results using the Broad Dollar Index (BDI) are consistent: the increase in CDS spreads is 2.2% in high-risk countries, while no effect is observed for other countries. Contractionary U.S. monetary policy shocks show similar dynamics, with a one-standard-deviation surprise raising CDS spreads by 2.23% in high rollover-risk countries within days of the announcement. The high-frequency nature of these monetary policy shocks lends further credibility to our identification strategy by mitigating concerns about reverse causality and anticipation effects. Taken together, these findings underscore how rollover risk amplifies the effects of external shocks on EM currencies, bond markets, and credit risk.

Given the significant impact of rollover risk documented in emerging markets, a natural question is whether advanced economies exhibit similar vulnerabilities. To address this, we construct a comprehensive bond-level dataset covering over 80% of total debt for nine advanced economies. In contrast to emerging markets, we find that the average local currency bond maturity in these countries has remained stable, or even increased over time. Moreover, we find no evidence of a significant amplification effect of rollover risk on CDS spreads in response to capital flow shocks (BDI and monetary policy shocks). These findings suggest that advanced economies are substantially less vulnerable to rollover risk. This relative resilience likely reflects their more stable maturity structures and stronger access to long-term financing, which together mitigate refinancing pressures even during periods of heightened market stress.

We conclude our analysis by investigating how capital flow shocks affect bond yields across the maturity spectrum. Our estimates show that short-term bond yields are significantly more sensitive to capital flow shocks than longer-term yields. Similarly, we find that 5-year CDS spreads respond more strongly to capital flows than 10-year CDS spreads, reinforcing the notion that short- to medium-term horizons are more

affected by shifts in external financing conditions. Collectively, these results suggest that the financial effects of capital flow shocks are concentrated at the short end of the maturity spectrum, where rollover risk is most salient. This underscores the importance of debt maturity composition in determining the sensitivity of sovereign financing conditions to global capital market dynamics.

The paper proceeds as follows. Section 2 reviews the literature. Section 3 describes the data and presents stylized facts. Sections 4 and 5 report the empirical results. Section 6 discusses the results for advanced economies. Section 7 concludes. Details on data construction, variable definitions, and robustness tests are provided in the Appendices.

2. Related Literature

This paper relates to several strands of literature. First, it contributes to the literature analyzing the currency composition of sovereign debt in emerging markets. Seminal contributions by Eichengreen and Hausmann (1999) and Eichengreen, Hausmann, and Panizza (2005) introduced the concept of *original sin*, referring to emerging markets' inability to issue bonds denominated in their domestic currencies. A growing body of recent work revisits this phenomenon using new datasets, including Aizenman, Jinjarak, Park, and Zheng (2021), Eichengreen, Hausmann, and Panizza (2023), Onen, Shin, and Von Peter (2023), Zheng (2023) and Bertaut, Bruno, and Shin (2025). These papers examine how domestic-currency bond issuance capacity is related to macro-economic variables and countries' institutional characteristics, such as currency mismatch, the volatility of output, managed exchange rates, securities-market regulation, monetary and fiscal institutions etc. Our contribution to this literature is twofold. First, we document the time-series of the fraction of local-currency denominated sovereign bonds, building on a granular set of bond issues. Second, and most notably, we analyze of the maturity structure of LC sovereign bonds and its dynamics compared to FC

denominated sovereign bonds. Our empirical analysis highlights how rollover risk in LC debt influences sovereign bond yields, default risk, and exchange rates—an aspect largely overlooked in prior studies focused solely on currency composition.

Second, our work is related to the literature on cross-border capital flows and financial asset valuations. Within this field, a number of studies have explored how benchmark indices affect mutual fund portfolio allocations across countries (Shleifer, 1986; Kaul, Mehrotra, and Morck, 2000; Greenwood, 2005; Vayanos and Woolley, 2013; Claessens and Yafeh, 2013; Raddatz, Schmukler, and Williams, 2017; Pandolfi and Williams, 2019; Beltran and He, 2024). While these studies emphasize the role of benchmark-induced capital flows, our focus is on the maturity structure of sovereign debt and its interaction with these shocks. We show that many emerging markets experience significant changes in their debt maturity structures over time, with substantial cross-country heterogeneity. Our analysis finds that the impact of exogenous capital flows on exchange rates, CDS spreads, and bond yields is significantly amplified when a large share of bonds matures following the shock period. Furthermore, we provide novel evidence that short-maturity bonds are more sensitive to these capital flow shocks, underscoring the short-run vulnerabilities associated with rollover risk in emerging markets.

This literature is also connected to work documenting how capital inflows affect credit markets and firm valuations. For example, Mendoza and Terrones (2012) find that credit booms tend to follow surges in capital inflows, productivity gains, and financial liberalization, especially under managed exchange rates. Williams (2018) shows that index rebalancing by J.P. Morgan led market-making banks to reduce sovereign bond holdings and expand credit supply. Broner, Martin, Pandolfi, and Williams (2021) exploit large sovereign debt inflow episodes and show that these episodes reduce yields, appreciate currencies, and have heterogeneous effects on equity valuations. Our paper contributes to this literature by providing a novel identification strategy to document how the effects of capital flows on asset prices depend on sovereign debt rollover risk.

Third, our analysis is linked to the literature on sovereign risk and sovereign debt markets (Du and Schreger, 2016; Bianchi, Hatchondo, and Martinez, 2018; Du and Schreger, 2022; Cole, Neuhann, and Ordonez, 2024; Barbosa-Alves, Bianchi, and Sosa-Padilla, 2024; Bianchi and Sosa-Padilla, 2024; Moretti, Pandolfi, Schmukler, Bauer, and Williams, 2024), as well as to recent theoretical work on sovereign bond pricing (Rebelo, Wang, and Yang, 2022; Jiang, Sargent, Wang, and Yang, 2024). While much of this research focuses on pricing sovereign risk or rare default events, we use granular bond-level data to establish new empirical facts about the maturity structure of sovereign debt in 23 emerging economies. We show that rollover risk in local-currency debt contributes to depreciating exchange rates, increasing sovereign CDS spreads, and increasing bond yields.

Finally, our study connects to the literature on corporate debt rollover risk (Almeida, Campello, Laranjeira, and Weisbenner, 2011; Carvalho, 2015; Kalemli-Ozcan, Laeven, and Moreno, 2015; Valenzuela, 2016; Choi, Hackbarth, and Zechner, 2018; Cortes and Rocha, 2021; Choi, Hackbarth, and Zechner, 2021; Jungherr, Meier, Reinelt, and Schott, 2022; Oliveira, Rafi, and Simon, 2024). For instance, Choi, Hackbarth, and Zechner (2018) show that maturity dispersion reflects firm characteristics and affects exposure to refinancing risk, which in turn shapes capital structure decisions. In contrast, we focus on sovereign debt, emphasizing how debt maturity profiles influence countries' exposure to external shocks and capital flow volatility.

3. Data and Stylized Facts

Our primary data source is Refinitiv Eikon, which provides detailed bond information, including coupon payments, maturity dates, issuance amounts, and coupon frequency. Our baseline sample includes 23 countries, covering the period from 2013 to 2024: Argentina, Brazil, Chile, China, Colombia, Czech Republic, Dominican Republic, Egypt, Hungary, Indonesia, Mexico, Malaysia, Nigeria, Peru, Philippines, Poland, Romania,

Russia, Serbia, South Africa, Thailand, Turkey, and Uruguay. In Table A.2 in the Appendix, we show that our bond-level dataset is highly comprehensive, covering, on average, 84% of each country's total debt. Table A.3 presents summary statistics for the basic characteristics of the countries in our sample.

Our granular bond-level dataset, comprising 7,243 LC sovereign bond issuances, allows us to construct two key variables: the average bond maturity and the amount of bonds maturing each month, quarter, and year. Using this dataset, we establish four empirical facts about the maturity structure of emerging market sovereign debt and its relationship to rollover risk. To the best of our knowledge, this is the first paper to document these facts.

3.1 Stylized Facts

An initial examination of the dataset reveals several novel and robust regularities, which we summarize in four stylized facts motivating the subsequent empirical analysis.

Fact 1: Local-Currency Debt Predominates but Has Shorter Maturities. We begin by examining local currency and foreign currency emerging markets debt maturities as well as their respective shares of GDP, taking averages both across time and across countries. We hereby construct the average bond maturity structure by taking the weighted average of years to maturity for each country. For example, if in a given year, country A has two bonds with outstanding amounts of 1,000 and 500 and maturity of 5 years and 10 years, respectively, the average maturity for that country would be ((1,000 * 5) + (500 * 10))/1500 = 6.67 years.

Figure 1 highlights two key observations. First, over the past decade, emerging market countries have borrowed predominantly in LC: the average LC debt-to-GDP ratio is 21.57%, compared with only 8.75% for FC debt. Thus, leverage in LC debt has been more than twice as high as that in FC debt. Second, the maturities differ systematically

across debt types. The average maturity of FC debt is 10.40 years, versus only 7.95 years for LC debt, a difference of 23.6% shorter maturity of LC debt compared to FC debt.

Figure 2, which reports country-level results, shows that these patterns are consistent across the sample. For 19 out of 23 emerging markets in our sample, LC bond debt exceeded FC debt. Also, for 19 of the 23 countries, the average LC bond maturity was shorter than that of FC bonds. Moreover, in the four countries where FC maturities were shorter, the outstanding amount of FC debt was negligible in three of them, namely Malaysia, South Africa and Thailand.

These findings motivate the hypothesis that a larger share of local currency debt is associated with lower average debt maturities. Consistent with this hypothesis, Table 1 shows that a higher share of local currency debt is indeed associated with lower total average debt maturities.[4] In this sense, although the rise of LC borrowing suggests that the "original sin", leading to the inability of emerging markets to borrow in LC, may have receded, the shift to LC borrowing may come with a cost: shorter maturities and thus greater rollover risk.

Figure 2 also shows that, while LC debt generally has shorter maturities than FC debt, LC maturities vary substantially across countries. To shed light on the drivers of this heterogeneity, we estimate a regression of local-currency average debt maturity on the LC debt/GDP, Term Spread, GDP growth, and Exchange Rate Volatility. Table 2 reports the results. We find that lower LC average maturities are significantly associated with a higher LC debt/GDP.

We further decompose LC debt over GDP into LC debt held by foreign investors and by domestic investors, following Arslanalp and Tsuda (2014). We find that higher levels of LC debt held by foreign investors relative to GDP are associated with shorter LC maturities. This suggests that although foreign investors have increasingly shifted

[4]Total average debt maturity is constructed using both FC and LC maturities.

to LC bonds, this shift has important consequences—namely, shortening the maturity of LC debt and thereby underscoring the heightened importance of rollover risk.

Overall, Stylized Fact 1 establishes that emerging markets' reliance on LC debt with shorter maturities increases their need to refinance frequently, increasing their exposure to adverse economic shocks such as sudden capital outflows. For instance, countries with significant short-term debt may struggle to meet repayment obligations during periods of capital flight, potentially triggering a sovereign debt crisis.

Fact 2: Local-Currency Debt Maturities Have Shortened Over Time. We next examine how LC debt maturities have evolved over time. Figure 3 shows a pronounced shortening of LC maturities: from 9.06 years in 2013 to 6.98 years in 2024, a decline of 22.96%. By contrast, FC maturities have remained broadly stable over the same period. It amounted to 9.16 years in 2013 and increased to 10.44 years by 2024. As a result, the maturity gap between FC bonds and LC bonds has widened substantially. Consequently, average sovereign bond maturities (across both LC and FC bonds) also declined from 9.04 years in 2013 to 8.72 years by 2024.

Fact 3: The Fraction of Bonds Maturing Within One Year Varies Substantially Across Countries and Time. We next investigate rollover risk directly by calculating, for each country and year, the fraction of outstanding bonds maturing within one year, scaled by GDP. Note that a shorter average debt maturity at issuance does not mechanically translate to a higher fraction of bonds maturing within one year. For example, countries could manage their rollover risk by refinancing bonds with shortening maturities before they expire, thereby mitigating the effects of shorter average maturities at issuance on rollover risk. Figure 5 reports country time-series averages for 2013–2024, while Figure 6 shows the time-series dynamics for each country.

Both figures together reveal significant cross-country and within-country time-series variation in the fraction of bonds maturing within one year over the sample period from 2013 to 2024. For instance, in Chile the fraction rose from 0.62% in 2013 to

3.47% in 2023, indicating a strong within-country variation. Additionally, when comparing Chile with Brazil in 2023, the fraction of bonds maturing is 3.47% for the former and 7.96% for the latter, which suggest also a cross-country variation. Such variation suggests that cross-country differences in debt maturity structures is likely to affect their vulnerability to capital-flow shocks.

Fact 4: Many Countries Have Experienced an Increase in Rollover Risk. Combining Facts 1 and 3, we observe that several countries have experienced rising rollover risk: average bond maturities have declined and this has coincided with an increase in the fraction of bonds maturing. This pattern is evident in Chile, the Czech Republic, Egypt, Indonesia, Mexico, Peru, the Philippines, and South Africa. For example, in Chile the average bond maturities fell from 12.74 years in 2013 to 9.88 years in 2024, while the share of bonds maturing within one year rose from 0.62% to 3.47%. For these countries, the joint evolution of shorter maturities and higher near-term repayment obligations implies an increased exposure to refinancing difficulties, particularly during adverse economic conditions such as capital outflows that reduce liquidity.

4. Rollover Risk and Price Effects

The stylized facts presented above indicate that the maturities of LC debt are substantially shorter than those of FC debt and have decreased further in recent years, implying elevated debt rollover requirements. This raises the question of whether such risk creates fragility for emerging market economies. To address this, we begin our analysis by examining how LC debt rollover risk is associated with exchange rates and CDS spreads.

To do so, we construct the variable $FBM_{c,t}$, defined as the amount of bonds maturing within one year divided by GDP (see Section A.3 in the Appendix for details on its construction). This ratio captures the fraction of bonds maturing within one year. As a

result, higher values of this variable indicate higher rollover risk. We estimate the effect of higher $FBM_{c,t}$ on exchange rates and CDS spreads using the following specification:

$$\Delta y_{ct} = \theta_t + \theta_c + \beta_1 \Delta FBM_{c,t} + \text{Controls}_{c,t-1} + \epsilon_{ct} \tag{1}$$

where y_{ct} is the log of the exchange rate, or the log of the 5Y CDS at quarter t for country c. Exchange rates are measured in local currency per USD and, thus, an increase (decrease) represents a depreciation (appreciation) of the local currency.[5] In our main analysis, we use CDS spreads denominated in U.S. dollars due to their broader coverage. However, Table E.9 in the Appendix shows that our results are robust to using local currency CDS spreads. θ_c and θ_t are country and time fixed effects, respectively. $\text{Controls}_{c,t-1}$ is a vector of controls that includes the average bond maturity and total debt over GDP.

Panel (A) of Table 3 presents the main findings. From columns (1) and (2) it can be seen that a one standard deviation increase in rollover risk, as represented by Δ FBM, is associated with a depreciation of the country's exchange rate of 0.61%. This result is intuitive: when a country faces higher rollover risk, investors anticipate that the country may have difficulties to refinance its maturing debt. As a result, the country' currency is less attractive and the price of the U.S. dollar expressed in LC increases. The results for CDS spreads are consistent with the ones on exchange rates. Higher rollover risk is associated with an increase in CDS spreads, since the resulting debt rollover requirements lead to higher default probabilities. The magnitudes are also economically significant. A one standard deviation increase in rollover risk is associated with an increase of 1.96% in CDS spreads, suggesting higher credit risk.

Our measure of rollover risk, FBM, is based on the maturity structure of LC debt, reflecting the fact that LC debt constitutes a substantially larger share of total sovereign debt than foreign-currency (FC) debt. To see if rollover risk associated with FC debt is also related to countries' currency values and their CDS spreads, we extend our analysis

[5]None of the European countries in our sample use the euro as their official currency.

by constructing a similar rollover risk measure for FC debt, FBM_FC, and estimate Equation (1), considering both rollover risk in local and foreign currency.

Panel (B) of Table 3 shows the results. We find that, while FBM in LC is still significantly related to exchange rates and CDS spreads, there is no significant association with FBM_FC. This is consistent with the fact that FBM in foreign currency is much smaller, and the average debt maturity in foreign currency is longer. Indeed, Tables C.1 and C.2 in the Appendix, and Figure 7 show that FBM_FC is approximately four times smaller than the FBM in local currency, and that the average debt maturity in foreign currency is 10.40 years, compared to 7.95 years in local currency.

5. Rollover Risk and Capital Flows

Our previous findings in Section 4 indicate a strong association between rollover risk, exchange rates, and CDS spreads. These results, however, may be influenced by endogeneity. For example, asset price movements can themselves affect rollover risk by influencing investor sentiment and refinancing conditions. To address this concern and better identify the causal impact of rollover risk, we exploit the interaction between countries' predetermined sovereign debt maturity structures and plausibly exogenous cross-border portfolio capital flows. Specifically, we use differences in rollover risk, measured by the share of bonds maturing within 12 months, while controlling for average debt maturity and other country characteristics such as debt-to-GDP ratios and GDP growth. This approach allows us to analyze how the effects of capital flow shocks vary systematically with rollover risk.

Our focus on capital flow shocks is motivated by the observation that they can affect bond prices through two main channels. First, an outflow shock is likely to reallocate holdings from relatively inelastic, long-term investors to more price-sensitive arbitrageurs, who tend to sell more quickly in response to adverse shocks—consistent

with evidence on downward-sloping demand for sovereign debt. Second, falling bond prices raise yields, increasing the cost of rolling over debt and amplifying default risk, which can further depress prices in a self-reinforcing cycle. The magnitude of these effects depends critically on the debt maturity structure: countries with a high share of short-term debt face immediate increases in borrowing costs and heightened rollover risk, while those with longer maturities are more insulated from short-term pressures.

We employ three complementary approaches to capture exogenous variation in cross-border capital flows: flows implied by portfolio rebalancing, shifts in the Broad Dollar Index, and U.S. monetary policy shocks. In Appendix E, we also use uncertainty shocks proxied by changes in the VIX. To identify the effects of rollover risk, we focus on the interaction between these exogenous capital flows and each country's predetermined debt maturity structure to alleviate further endogeneity concerns.

We follow Carvalho (2015) and use the ex-ante maturity structure of sovereign debt to predict a country's financial position in a given year. We define countries as having their bonds largely maturing in a given year if they have a sufficiently high fraction of their bonds maturing within one year in the previous year. To do so, we sort countries each year into terciles based on the distribution of the one-year lag of $FBM_{c,t}$ and create the dummy $TopFBM_{c,t}$, which equals one if a country is in the top tercile of this distribution. The idea is that countries with a sufficiently higher fraction of bond maturing should face higher rollover risk, which could amplify the effect of capital flows. We use the dummy variable $TopFBM_{c,t}$ and not the variable $FBM_{c,t}$ in this analysis because we want to ensure that we are capturing countries with sufficiently high fraction of their bonds maturing in a given year.[6]

[6]Note that we use the ex-ante country maturity structure, which alleviates concerns about the endogenous determination of debt maturity. In the Appendix, we further assess the robustness of our bond maturity measure by constructing the FBM measure using DD2, which captures the amount of bonds maturing in two years.

5.1 Flows Implied by Index Rebalancings

Our first measure of cross-border capital flow shocks is the mechanical rebalancing shocks from the GBI-EM Global Diversified Index—the largest and most widely tracked local-currency government bond benchmark for emerging markets, with assets under management (AUM) of $222 billion as of December 2021. These index-driven reallocations generate predictable, exogenous shifts in currency-specific demand for sovereign bonds, independent of country-specific fundamentals.

We measure the Flows Implied by the Rebalancings (FIR) by multiplying the mechanical changes in index weights with the total assets under management benchmarked to the GBI-EM Global Diversified Index, normalized by the size of the sovereign debt market of each country (Pandolfi and Williams, 2019). Intuitively, this measure captures the implied dollar amounts that should enter or exit a given country at the time of each index rebalancing, expressed as a percentage of the country's sovereign bond market size.

We aggregate the FIR shocks to the quarterly level to merge them with bond maturity and macroeconomic variables data. This process is implemented by summing the FIR shocks that occur within a quarter (since rebalancing takes place at the end of each month, we observe three FIR shocks per quarter). A similar procedure is widely used in the monetary policy literature to aggregate shocks that occur around FOMC meetings to the quarterly level (see Ottonello and Winberry (2020) for details).

Table B.5 in the Appendix confirms that our aggregated FIR measure strongly affects exchange rates, and CDS spreads. In particular, in response to an increase in FIR, the exchange rate appreciates, and CDS spreads decrease. The magnitudes are economically significant. For example, in 2016 Q4, Chile's FIR was equal to -0.6947. Therefore, our estimates from Table B.5 would predict an exchange depreciation of (-0.6947)$\times$(-0.0101)= 0.70%, and an increase in CDS spreads of (-0.6947)$\times$(-0.0148) = 1.02% in response to these plausibly exogenous outflows.

To analyze the heterogeneous responses of countries facing high rollover risk to capital flows, we estimate the following regression:

$$\Delta y_{ct} = \theta_t + \theta_c + \beta_1 FIR_{ct} + \beta_2 TopFBM_{ct} + \beta_3 FIR_{ct} \times TopFBM_{ct} + \gamma' \text{Controls}_{c,t-1} + \epsilon_{ct} \tag{2}$$

where y_{ct} is the log of the exchange rate, or the log of the 5Y CDS at quarter t for country c. We control for average bond maturity, total debt over GDP, GDP growth, interest rates, and the interaction of these variables with FIR. The main coefficient of interest is β_3, which captures the differential effect of capital flow shocks on countries with a higher fraction of bonds maturing, i.e. countries facing higher rollover risk. We expect a negative coefficient for exchange rates and CDS, as the effects of capital inflows should be significantly amplified when countries face high sovereign debt rollover risk. That is, a capital inflow shock should lead to an appreciation of the local currency, expressed as a drop in the price of the U.S. dollar expressed in local currency units. Similarly, a capital inflow shock should decrease the country's CDS spread. Both effects should be amplified by rollover risk, implying a negative sign for β_3.

Table 4 presents the findings. The first column displays the effects of capital flow shocks on exchange rates. We find that exchange rates are significantly affected by bond index rebalancings, FIR. Notably, this effect is amplified significantly for countries with a high fraction of bonds maturing shortly after the time of the shock. In response to a one standard deviation increase in FIR, exchange rates appreciate by 2.87%. The exchange rate of countries with a higher fraction of maturing bonds appreciates by 3.62%. This represents an amplification effect of approximately 26.13% relative to the baseline appreciation of 2.87%.

We next focus on the impact of capital flow shocks on CDS spreads. Table 4 reveals that the impact of capital flows on CDS spreads is concentrated in countries facing high rollover risk. In response to a one standard deviation increase in FIR, CDS spreads

decrease by 3.54%, but this effect is not statistically significant. However, this effect is significantly amplified for countries with a high fraction of maturing bonds. In response to the same increase in FIR, the CDS spreads of these countries decrease by 7.6%, which is twice as large as the impact observed in other countries. These findings are important because they suggest that negative capital flow shocks increase credit risk and, consequently, the probability of sovereign default, for countries with high rollover risk.

5.2 Flows Implied by Shifts in the Broad Dollar Index (BDI)

As our second measure of capital flow shocks, we use changes in the BDI. Prior research shows that dollar appreciations are systematically associated with portfolio outflows and reductions in foreign investor holdings of local-currency sovereign bonds across emerging markets (Jansen, Shin, and Von Peter, 2024).

We estimate the following regression:

$$\begin{aligned}\Delta y_{ct} = \theta_c + \beta_1 \Delta \log BDI_t + \beta_2 TopFBM_{ct} + \beta_3 \Delta \log BDI_t \times TopFBM_{ct} \\ + \gamma' \text{Controls}_{c,t-1} + \epsilon_{ct}\end{aligned} \tag{3}$$

where y_{ct} is the outcome variable of country c at day t, defined as in Equation (2), but without considering exchange rates, to avoid confounding effects. The broad dollar index (BDI) is a weighted average of the foreign exchange value of the US dollar against the currencies of a broad group of major US trading partners; an increase represents a stronger US dollar.[7] The vector of controls is the same as in Equation (2).

Table 4 presents the results. Consistent with our hypothesis, we find that rollover risk significantly amplifies the effects of BDI shocks, and the economic magnitudes are substantial. In response to a one–standard-deviation increase in the BDI index,

[7]The BDI is composed of the following countries: Euro Area, Canada, Japan, Mexico, China, United Kingdom, Taiwan, Korea, Singapore, Hong Kong, Malaysia, Brazil, Switzerland, Thailand, Philippines, Australia, Indonesia, India, Israel, Saudi Arabia, Russia, Sweden, Argentina, Venezuela, Chile, and Colombia.

the CDS of countries with high rollover risk increases by 2.19%, corresponding to approximately 13% of one standard deviation of CDS changes, while no effect is observed for other countries. Overall, these results highlight the importance of rollover risk, which can affect countries even in non-crisis periods.

5.3 Flows Implied by U.S. Monetary Policy Shocks (MPS)

Following Miranda-Agrippino and Rey (2020), we also utilize U.S. monetary policy shocks identified from movements in federal funds futures around Federal Open Market Committee (FOMC) announcements for identification. Contractionary surprises are well documented to trigger global capital retrenchment and tighten financial conditions in emerging markets, thereby offering another plausibly exogenous source of variation in capital flows.

Specifically, we measure monetary policy shocks as in Bauer and Swanson (2023), who construct them from changes in the first four quarterly Eurodollar futures contracts within a 30-minute window around FOMC announcements. These measures capture unexpected shifts in interest rate expectations and are widely used as a proxy for U.S. monetary policy shocks.

We estimate the following specification:

$$\Delta y_{c,t} = \theta_{cy} + \beta_1 MPS_t + \beta_2 TopFBM_{ct} + \beta_3 MPS_t \times TopFBM_{ct} + \gamma' Controls_{c,t-1} + \epsilon_{ct} \quad (4)$$

where $y_{c,t}$ is the outcome variable from country c at time t (the outcome variables are the same as in Equation (2)). $\Delta y_{c,t}$, defined as $y_{c,d+z} - y_{c,d-1}$, is the cumulative change over an interval from one day prior to the FOMC date, d, to z days after it. In the baseline results, we use z=$\{0,1,2,3\}$. θ_{cy} represents Country $\times$ Year fixed effects. MPS_t is the monetary policy shock from Bauer and Swanson (2023) described above. The vector of controls is the same as in Equation (2).

Table 5 shows the results for CDS spreads. We find that rollover risk significantly amplifies the effects of U.S. contractionary monetary policy shocks, and the magnitudes are again economically meaningful. For example, a one–standard-deviation contractionary shock increases the CDS of countries with high rollover risk by 2.23% three days after the FOMC announcement, corresponding to about 26% of one standard deviation of CDS changes, which highlights that the effect is substantial in relative terms. We also analyze the impact on exchange rates in Table 5. We find that contractionary shocks lead to a depreciation of exchange rates in EM economies, and rollover risk amplifies these effects, but the magnitudes are not statistically significant.

5.4 Term Structure Effects

To better understand the mechanisms underlying our results, we analyze how capital flow shocks affect the valuation of bonds with different maturities. This question is motivated by fundamental insights from capital structure models, such as Merton (1974), which imply that a shock to the value of a bond issuer's assets affects the credit spreads of bonds with different maturities to varying degrees. This theoretical framework aligns closely with our setting, as we find that capital flow shocks lead to de facto increases in countries' leverage, manifested through currency depreciation and related macroeconomic adjustments.

Merton (1974) argues that a decline in the value of the underlying assets has a larger effect on short-term bonds than on long-term bonds. Guided by this theoretical prediction, we investigate whether a similar maturity-dependent response exists for sovereign debt, specifically, whether short-maturity bond spreads react more strongly to capital flow shocks than long-maturity bonds. To examine this, we again employ three distinct measures of capital flow shocks: FIR shocks, BDI shocks, and monetary policy shocks.

5.4.1 Bond Yield

We collect daily yield data for all government bonds in the JP Morgan index from Bloomberg and estimate specifications similar to those in Section 5. The outcome variable is y_{imct}, the yield of bond i, in maturity group $m \in st, mt, lt$, from country c at time t. Short-term bonds (st) have maturities of 1-5 years, medium-term bonds (mt) 5-10 years, and long-term bonds (lt) more than 10 years.

Panel (A) of Table 6 reports the findings for bond yields using FIR shocks. Short-term bond yields are the most sensitive to capital flow shocks: a one-standard-deviation capital flow shock reduces short-term bond yields by 0.62 percentage points on average and decline by an additional 0.17 percentage points in countries with a high fraction of bonds maturing within a given year, corresponding to a rollover-risk amplification effect of 28%. By contrast, long-term bond yields show no statistically significant average response. Panels (A) of Table 7 and Table 8 present consistent results for BDI and monetary policy shocks, with effects concentrated in short- and medium-term maturities. For instance, rollover risk amplifies the impact of BDI shocks on short-term bond yields by 20%, while no amplification is detected for long-term yields.

Our findings indicate that capital flow shocks primarily generate short-term financial effects, with the strongest impact on the yields of short-term bonds. This is intuitive, as short-term bonds are more sensitive to financial conditions in emerging economies. The results highlight the adverse consequences for an emerging economy that needs to refinance a large fraction of its debt. Of course the average fraction of debt maturing will be positively related to the average maturity of bonds that a country has outstanding. However, countries which tend to issue longer-term bonds may also approach "maturity towers", when some of these initially long-maturity bonds need to be rolled over.

5.4.2 Credit Default Swaps (CDS)

We next examine how capital flow shocks affect sovereign CDS spreads across different maturities. Unlike bond yields, CDS spreads provide a direct market-based measure of sovereign credit risk. If rollover risk is a key mechanism, we would expect short-maturity CDS contracts (5-year maturity) to respond more strongly to capital flow shocks than longer-maturity contracts (10-year maturity), since they insure against near-term default risk.[8] Consistent with our bond yield evidence, a sharper response of short-maturity CDS spreads and a stronger amplification in countries with greater near-term refinancing needs would provide additional support for the rollover-risk channel.

Panel (B) of Table 6 reports the effects of FIR shocks on five- and ten-year CDS spreads. A one-standard-deviation capital flow shock leads to a significant decline in five-year spreads in countries with high rollover risk, while the impact on ten-year spreads is statistically insignificant and roughly one-third as large. Panels (B) of Tables 7 and 8 show qualitatively similar patterns for BDI and monetary policy shocks. Overall, the evidence highlights that rollover risk amplifies the effects of capital flow shocks on financial assets much more strongly at shorter maturities.

6. Advanced Economies

This final section examines whether the debt structures of advanced economies exhibit dynamics similar to those of emerging markets. In particular, we ask whether average debt maturities in advanced economies also show a sustained decline. To investigate this, we follow the same procedure as in Section 3 and construct the maturity structure of nine advanced economies: Australia, Austria, Denmark, France, Italy, South Korea, Spain, Sweden, and Switzerland. Our bond-level dataset for these countries is comprehensive, covering more than 80% of each country's total debt. Figure 8 plots the average

[8] We do not use CDS spreads with shorter maturities due to data limitations for many countries in our sample.

bond maturity for advanced economies, and presents a comparison between advanced and emerging markets. The results show that while emerging markets experience a gradual reduction in the average maturity of local-currency bonds, advanced economies display an increase followed by relative stability over time.[9]

We next examine the role of sovereign debt rollover risk in amplifying capital flow shocks in advanced economies. For each country in our sample, we construct the fraction of bonds maturing within a given year and estimate the impact of BDI and monetary policy shocks on CDS spreads using Equations (3) and (4), restricting the analysis to advanced economies. FIR shocks are excluded, as the J.P. Morgan GBI-EM index covers only emerging markets.

Table 9 presents the results for BDI shocks. We find no statistically significant amplification effect of rollover risk on CDS spreads: the coefficient on the interaction between BDI and rollover risk is insignificant. Results for monetary policy shocks are qualitatively similar, likewise showing no amplification. Overall, these findings suggest that advanced economies are less vulnerable to rollover risk, as short-term debt does not significantly increase sovereign credit risk during external shocks. This relative resilience likely reflects their more stable maturity profiles and stronger access to long-term financing, which reduce refinancing risks even in periods of market stress.

7. Conclusion

This paper provides novel evidence on how shifts in the currency composition of sovereign debt interact with its maturity profile, and the implications this has for financial stability in developing economies. We construct a novel bond-level dataset and document: (1) a sustained decline in average debt maturity, concentrated in local currency

[9]The Appendix reports country-level average maturities of local currency bond maturities and bonds maturing within one year as a percentage of GDP.

debt; (2) a negative relationship between average maturity and the share of local currency debt; and (3) a rise in rollover risk, with considerable cross-country and time variation.

Motivated by these facts, we show that rollover risk creates fragility for emerging market economies. Using countries' ex-ante maturity structure and three distinct approaches to capture exogenous variation in cross-border capital flows—flows implied by portfolio rebalancing, changes in the Broad Dollar Index (BDI), and high-frequency monetary policy shocks, we find that the effects of such plausibly exogenous capital flows on exchange rates, CDS spreads, and bond yields are significantly amplified when countries face high rollover risk. Short-maturity bonds are particularly sensitive to these shocks, underscoring the risks posed by the shortening of debt maturities in emerging markets.

Taken together, our findings suggest that the penance for overcoming original sin may be a new form of vulnerability: increased exposure to capital flow shocks driven by frequent refinancing needs. These results underscore the macro-financial importance of local currency sovereign debt rollover risk in emerging markets, with implications for currency stability, bond pricing, and sovereign creditworthiness.

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Figures and Tables

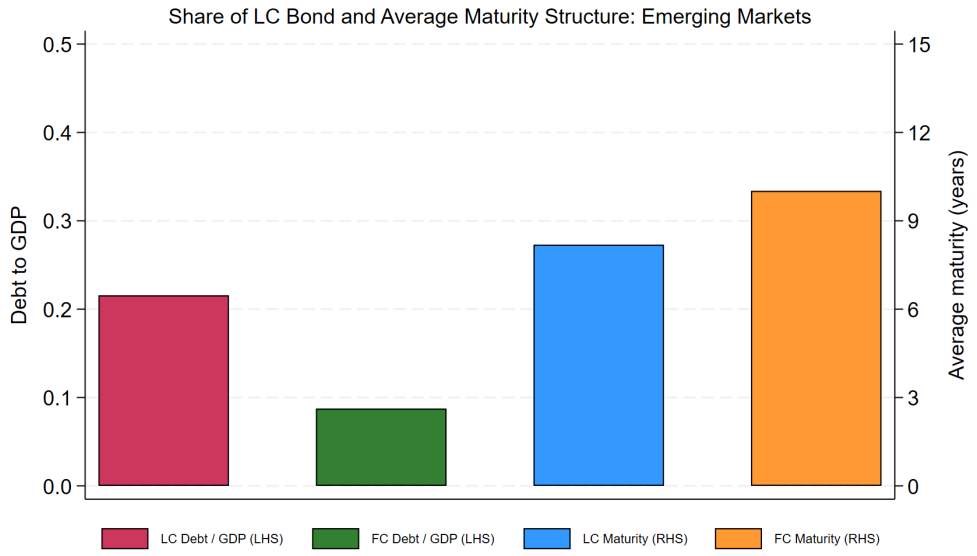
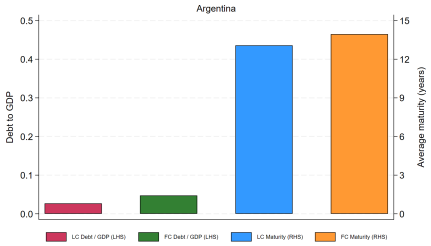


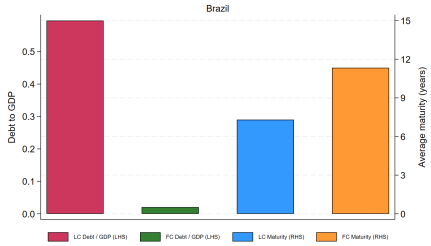
Figure 1. This figure reports the average local currency (LC) Debt/GDP ratio (cranberry bars), foreign currency (FC) Debt/GDP ratio (dark green bars), LC average bond maturity (blue bars), and FC average bond maturity (orange bars) for all emerging market economies in our sample, 2013–2024. For each country, we compute the annual time series of LC (FC) Debt/GDP, average across years, and then take the cross-country average of these country-level means. Similarly, LC (FC) maturity is defined as the cross-country average of country-level weighted average maturities. For each country, we compute the annual time series of LC (FC) maturities, average across years, and then take the average across countries. Source: Refinitiv Eikon, BIS, IMF.

Average Maturity Structure and Debt to GDP: Country Breakdown

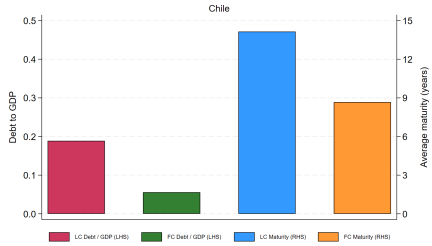
(A) Argentina



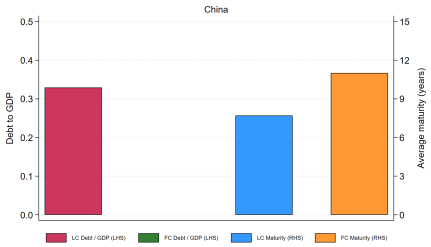
(B) Brazil



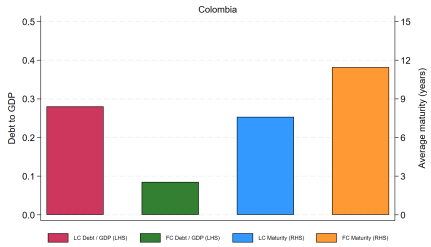
(C) Chile



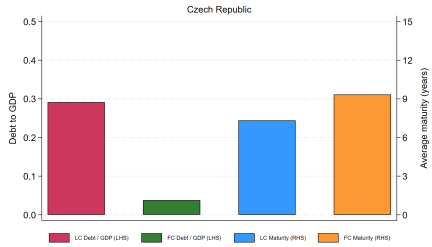
(D) China



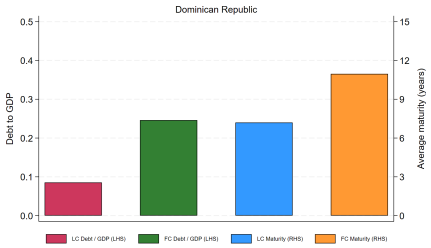
(E) Colombia



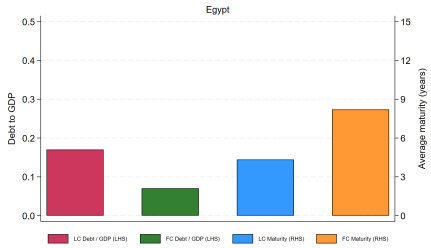
(F) Czech Republic



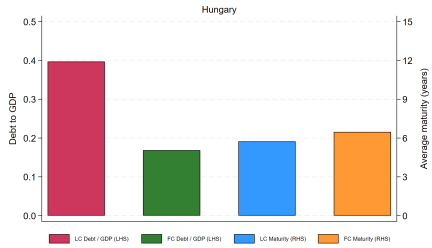
(G) Dominican Republic



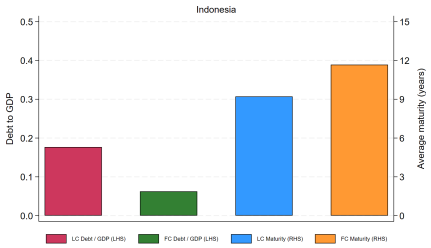
(H) Egypt



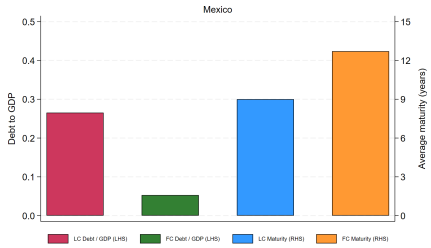
(I) Hungary



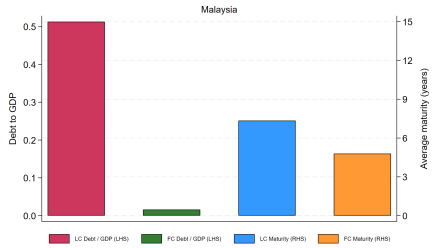
(J) Indonesia

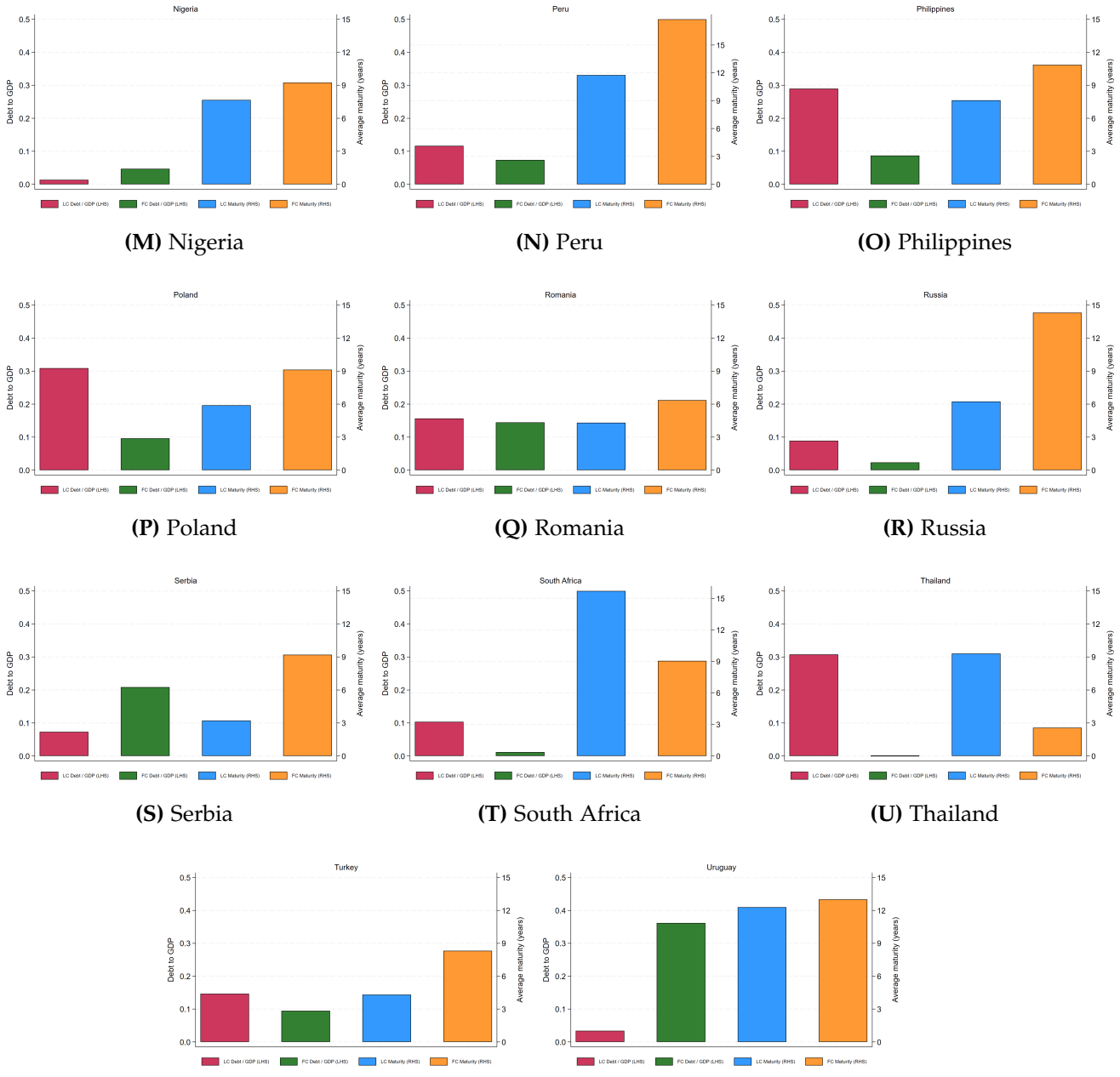


(K) Mexico



(L) Malaysia





(M) Nigeria **(N)** Peru **(O)** Philippines

(P) Poland **(Q)** Romania **(R)** Russia

(S) Serbia **(T)** South Africa **(U)** Thailand

(V) Turkey **(W)** Uruguay

Figure 2. This figure reports LC Debt/GDP (cranberry), FC Debt/GDP (dark green), LC average maturity (mid blue), and FC average maturity (orange) by country. LC Debt/GDP and FC Debt/GDP use the left y-axis; LC and FC average maturities use the right y-axis (years). To construct Debt/GDP ratios, for each country and year t, we compute LC (FC) Debt/GDP as total LC (FC) public debt in USD divided by annual GDP in USD. We then take the simple (unweighted) average of these annual ratios over 2013–2024 to obtain each country's LC (FC) average Debt/GDP. To construct average maturities, for each country and year t, we compute the weighted-average maturity of outstanding LC (FC) debt at the country level, and then take the simple average of these annual maturities over 2013–2024 to obtain each country's LC (FC) average maturity. Local- and foreign-currency debt data are from the Bank for International Settlements (BIS), except for the Dominican Republic, Egypt, Nigeria, Serbia, and Uruguay (Refinitiv Eikon). Sources: BIS; Refinitiv Eikon; IMF.

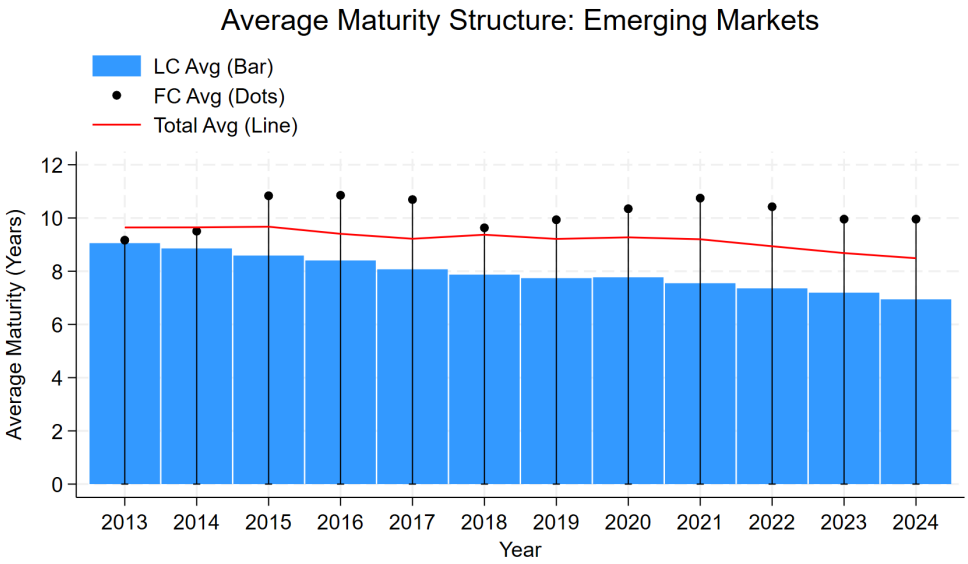
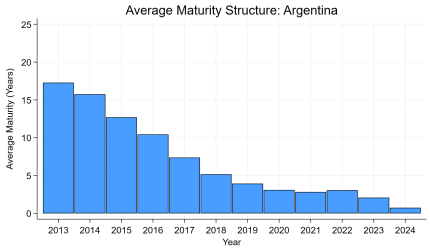


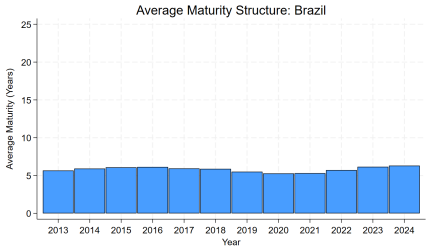
Figure 3. This figure reports the local-currency (LC) average bond maturity (blue bars), the foreign-currency (FC) average bond maturity (black dots), and the total average bond maturity (red line) for all emerging-market countries in our sample from 2013–2024. For each country and year, we compute the weighted average years to maturity of LC and FC debt at the country level. The total average bond maturity is calculated as the weighted average of LC and FC maturities. We then take the simple (unweighted) average across countries in a given year to obtain each data point in the figure. Source: Refinitiv Eikon.

Local Currency Average Bond Maturity per Country.

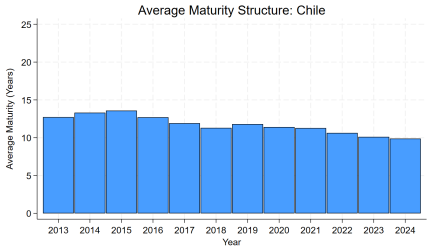
(A) Argentina



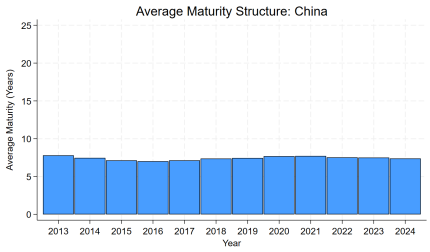
(B) Brazil



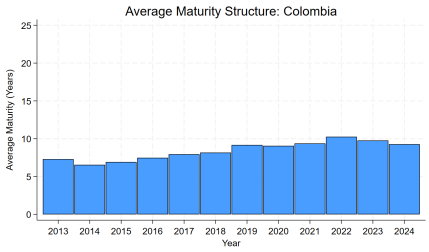
(C) Chile



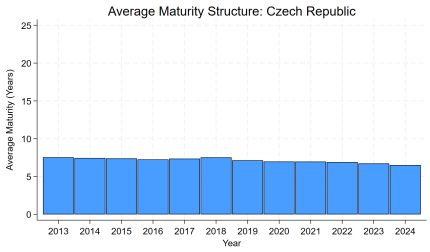
(D) China



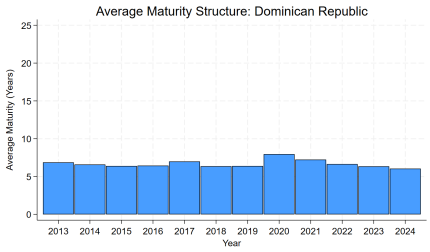
(E) Colombia



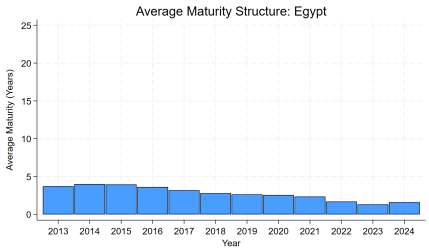
(F) Czech Republic



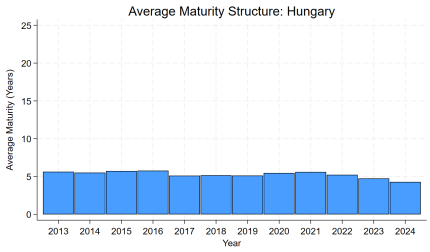
(G) Dominican Republic



(H) Egypt



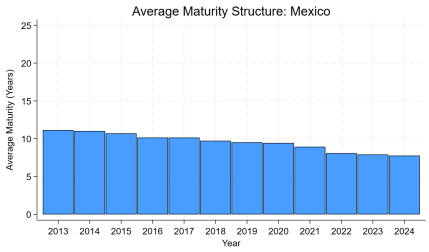
(I) Hungary



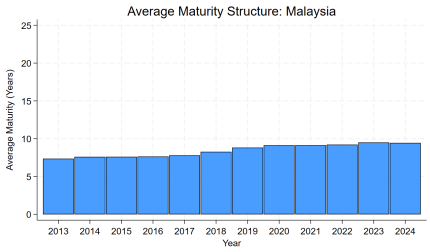
(J) Indonesia

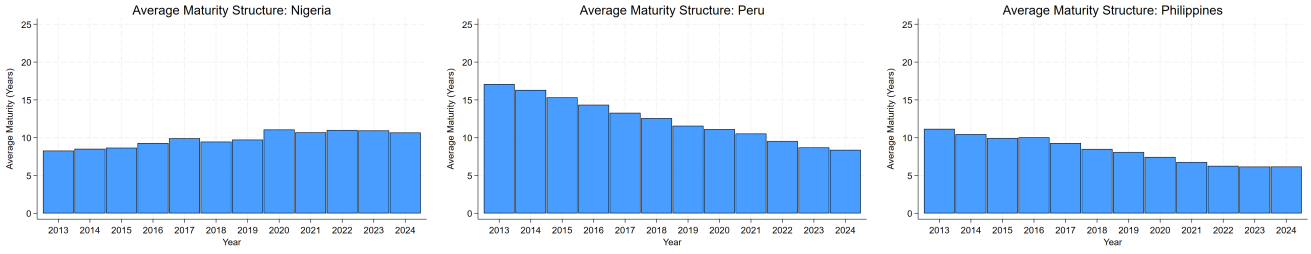


(K) Mexico

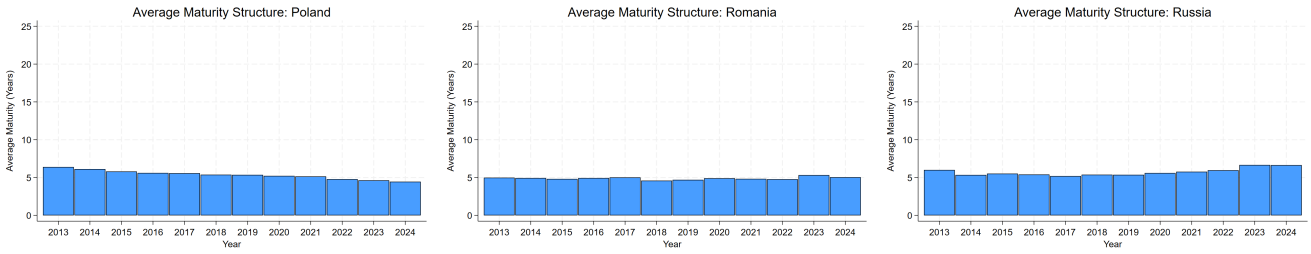


(L) Malaysia

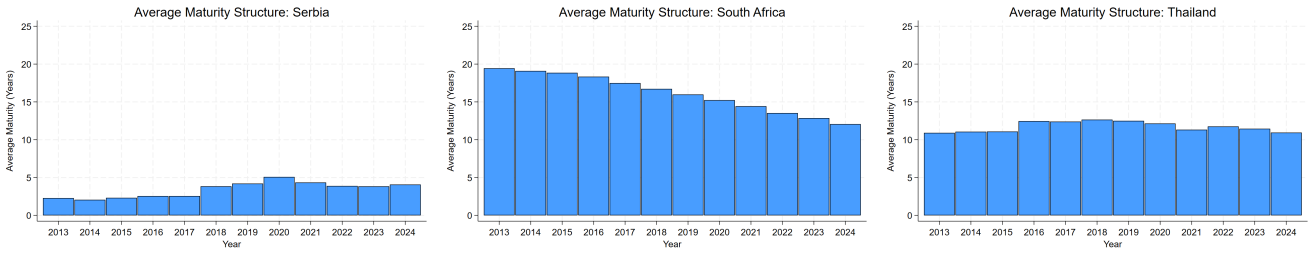




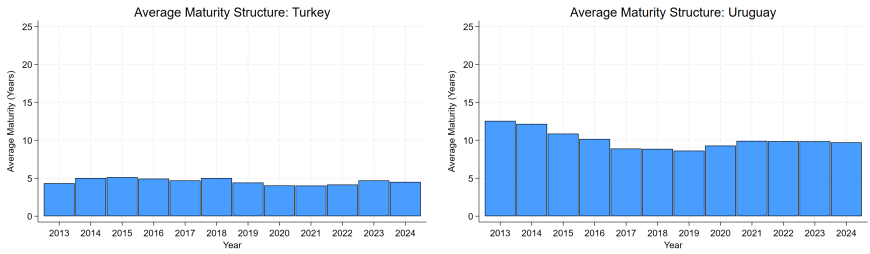
(M) Nigeria **(N)** Peru **(O)** Philippines



(P) Poland **(Q)** Romania **(R)** Russia

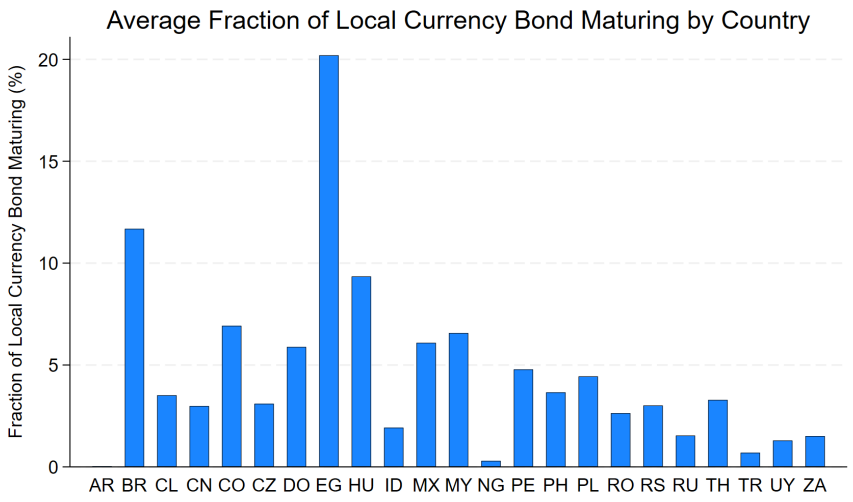


(S) Serbia **(T)** South Africa **(U)** Thailand

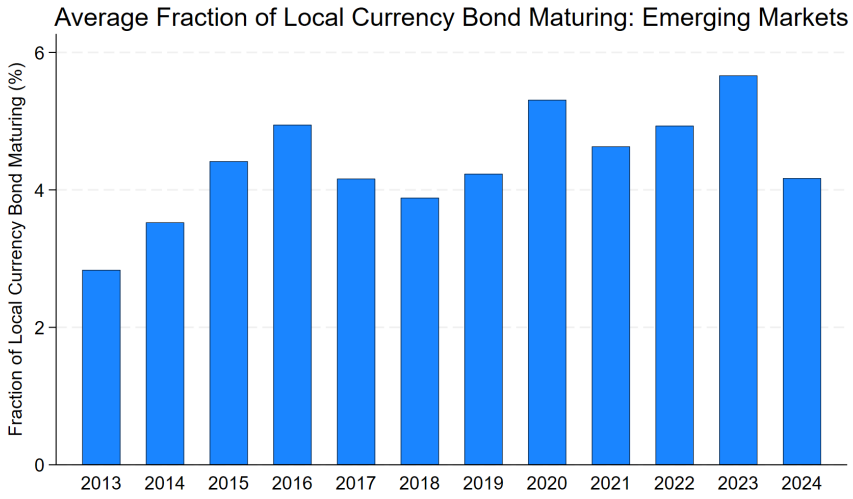


(V) Turkey **(W)** Uruguay

Figure 4. This figure reports the local currency (LC) average bond maturity per country from 2013–2024. We construct the LC average maturity by computing the weighted average years to maturity of LC debt at the country level in each year. Source: Refinitiv Eikon.



Panel A: By country (average, 2013–2024)

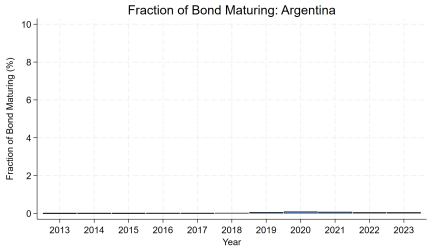


Panel B: By year (cross-country average)

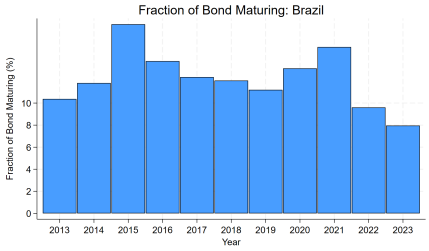
Figure 5. This figure reports the amount of bonds maturing within one year as a percentage of GDP for emerging-market countries in our sample from 2013–2024. The fraction of local-currency bonds maturing is computed by dividing the value of outstanding bonds maturing within one year by GDP. Panel A reports the average fraction of bonds maturing by country over 2013–2024. Panel B reports the cross-country average of the fraction of bonds maturing by year. Source: Refinitiv Eikon.

Fraction of Local-Currency Bonds Maturing by Country.

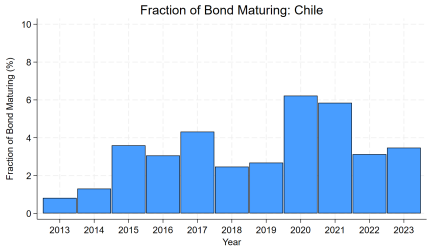
(A) Argentina



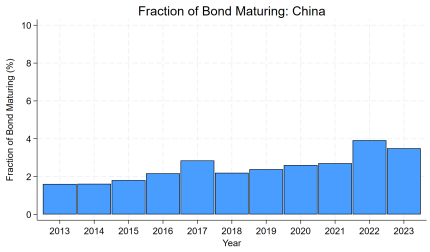
(B) Brazil



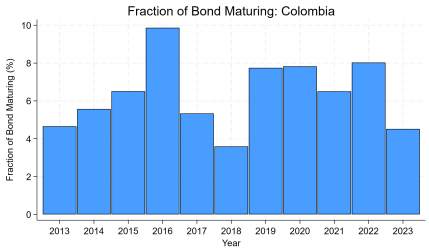
(C) Chile



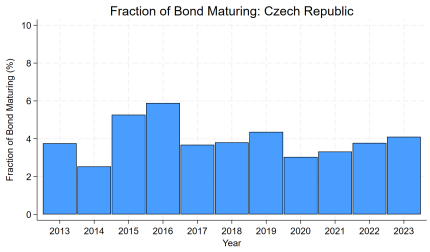
(D) China



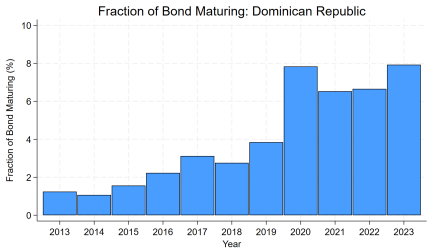
(E) Colombia



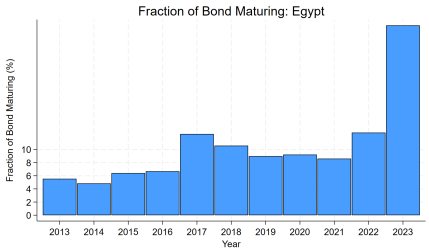
(F) Czech Republic



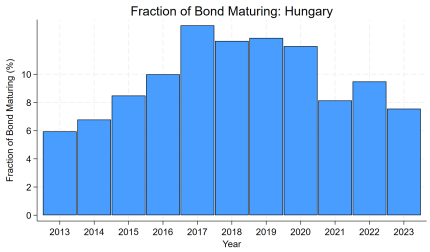
(G) Dominican Republic



(H) Egypt



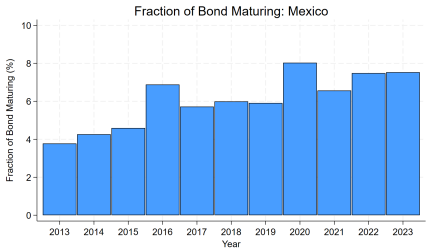
(I) Hungary



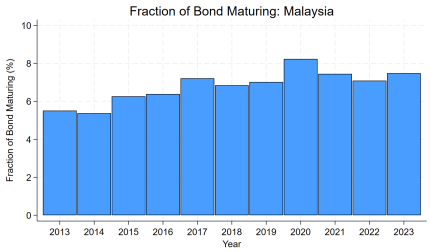
(J) Indonesia

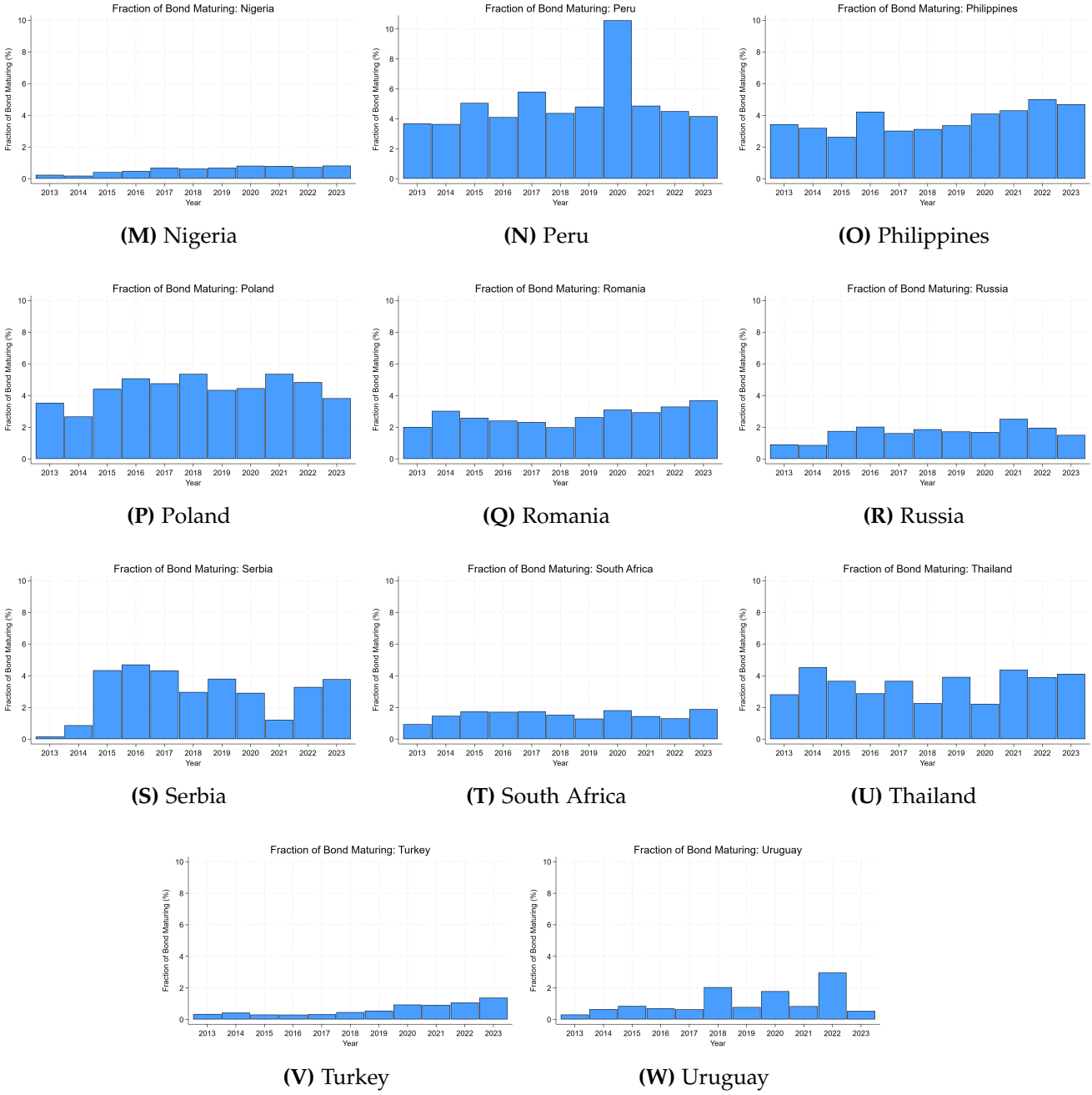


(K) Mexico



(L) Malaysia





(M) Nigeria **(N)** Peru **(O)** Philippines

(P) Poland **(Q)** Romania **(R)** Russia

(S) Serbia **(T)** South Africa **(U)** Thailand

(V) Turkey **(W)** Uruguay

Figure 6. This figure reports the amount of bonds maturing within one year as a percentage of GDP for each country in our sample from 2013 to 2024. The fraction of local-currency bonds maturing is computed by dividing the value of outstanding bonds maturing within one year by GDP. Source: Refinitiv Eikon.

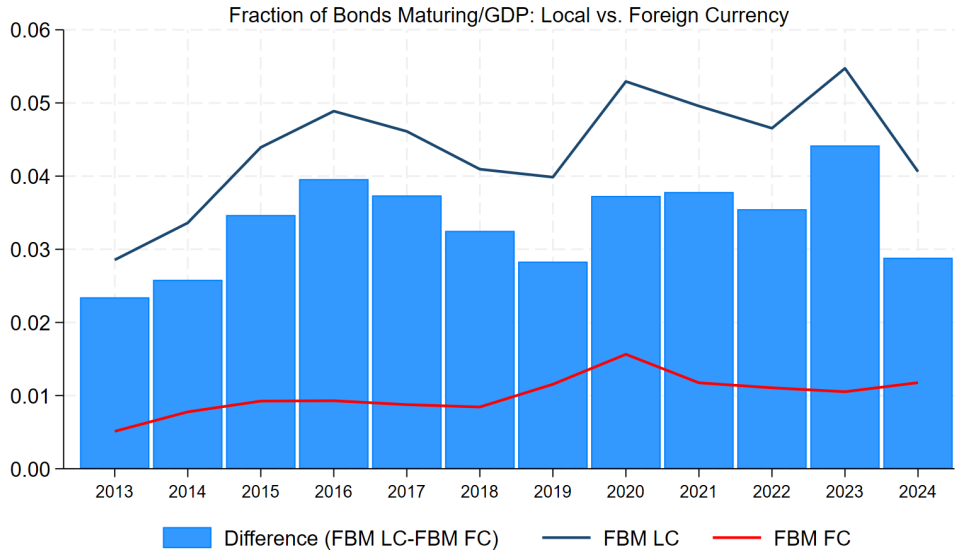
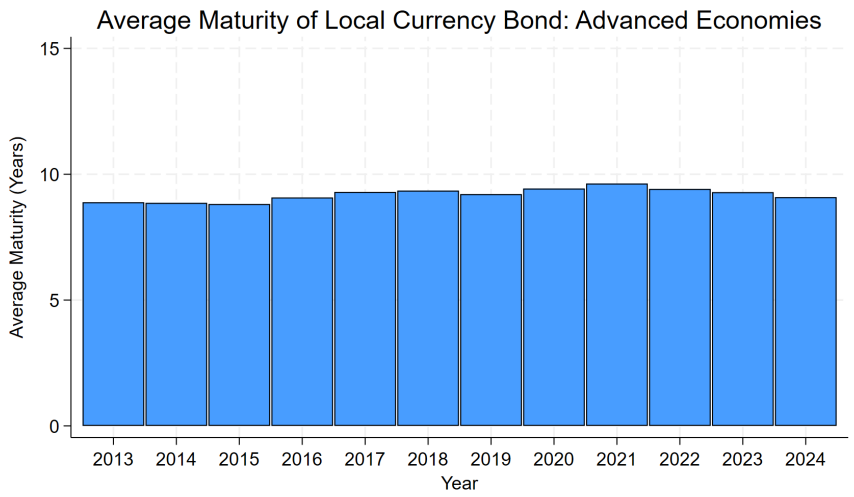
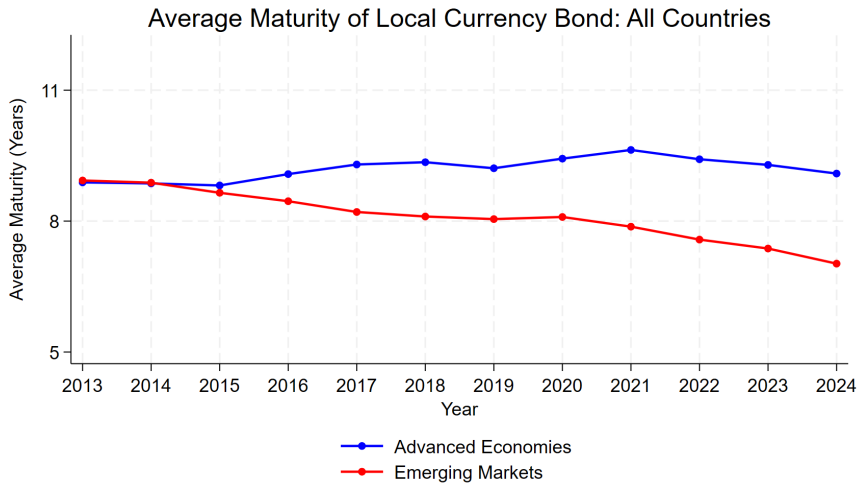


Figure 7. This figure reports the annual average share of bonds maturing within one year, expressed as a percentage of GDP. For each year, we compute the cross-country averages of FBM LC and FBM FC. FBM LC is the fraction of local-currency bonds maturing within one year (see Equation 6), while FBM FC is the fraction of foreign-currency bonds maturing within one year. FBM (LC–FC) is defined as the difference between FBM LC and FBM FC. Source: Refinitiv Eikon.



Panel A: Advanced Economies Average Maturity



Panel B: Average Maturity by country group

Figure 8. This figure reports the average local currency bond maturity for advanced economies (blue bars and blue line) and emerging markets (red line) from 2013 - 2024. For each country, we compute the yearly weighted average years to maturity of LC debt at the country level. We then take the simple average across country group in a given year to obtain each data point in the graph. The advanced economies in our sample are: Australia, Austria, Denmark, France, Italy, South Korea, Spain, Sweden, and Switzerland. The emerging market countries are: Argentina, Brazil, Chile, China, Colombia, Czech Republic, Dominican Republic, Egypt, Hungary, Indonesia, Mexico, Malaysia, Nigeria, Peru, Philippines, Poland, Romania, Russia, Serbia, South Africa, Thailand, Turkey, and Uruguay. Source: Refinitiv Eikon.

Table 1. Total Average Bond Maturity and Share of Local Currency Debt

	Debt Maturity	**Debt Maturity**	**Debt Maturity**
Share LC	-7.467***	-2.439***	-7.426***
	(0.470)	(0.252)	(0.471)
Observations	1,077	1,077	1,077
Country FE	Yes	No	Yes
Time FE	No	Yes	Yes
R-squared	0.8849	0.056	0.8934

This table reports the estimated coefficients of the share of local currency debt (Share LC) on total average debt maturity. The share of local currency debt is the ratio of local currency debt to total debt (local currency debt + foreign currency debt). The total average bond maturity is calculated as the weighted average of LC and FC maturities. Robust standard errors clustered at the time level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Table 2. Local Currency Average Bond Maturity and Share of Local Currency Debt

	Debt Maturity	**Debt Maturity**	**Debt Maturity**	**Debt Maturity**
LC Debt/GDP	-1.290**			
	(0.609)			
LC Debt Held LI/GDP		-0.694		-0.902
		(0.752)		(0.685)
LC Debt Held FI/GDP			-3.354**	-3.595**
			(1.433)	(1.436)
Term Spread	-0.038	-0.040	-0.040	-0.038
	(0.025)	(0.026)	(0.026)	(0.025)
GDP Growth	-0.211	-0.201	-0.212	-0.219
	(0.707)	(0.720)	(0.731)	(0.713)
Exchange Rate Volatility	-1.784	-1.753	-1.770	-1.798
	(2.070)	(2.066)	(2.121)	(2.103)
Observations	676	676	676	676
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
R-squared	0.92	0.91	0.92	0.92

This table reports the estimated coefficients of LC Debt/GDP, Term Spread, GDP growth and Exchange Rate Volatility on local-currency average debt maturity. LC Debt/GDP is defined as local currency debt over GDP. LC Debt held by FI and DI refers to local currency government debt held by foreign and domestic investors, respectively, as reported by Arslanalp and Tsuda (2014). Term Spread is the country 10Y treasury rate minus the country 1Y treasury rate. We use the 2Y or 3Y rates when the 1Y rate is missing. Exchange Rate Volatility is measured as the rolling standard deviation of quarterly log changes in the bilateral exchange rate over the past four quarters. GDP growth is the change in local currency GDP. Observations are at the country-quarter level. Robust standard errors clustered at the time level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Table 3. Rollover Risk and Price Effects

	Exchange Rate		Credit Default Swaps	
	(1)	(2)	(3)	(4)
Panel A: Baseline Specification				
ΔFBM	0.0062**	0.0061**	0.0202**	0.0196**
	(0.0024)	(0.0023)	(0.0073)	(0.0069)
Average Maturity		-0.0003		-0.0026
		(0.0010)		(0.0036)
Debt/GDP		-0.0301***		-0.0348
		(0.0104)		(0.0253)
Observations	711	707	650	650
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
R-squared	0.4984	0.5089	0.5722	0.5737
Panel B: LC vs. FC Fraction of Bonds Maturing				
ΔFBM	0.0062**	0.0061**	0.0200**	0.0189**
	(0.0024)	(0.0023)	(0.0074)	(0.0070)
ΔFBM_FC	0.0005	0.0002	-0.0042	-0.0040
	(0.0011)	(0.0010)	(0.0046)	(0.0045)
Average Maturity LC		-0.0006		-0.0036
		(0.0010)		(0.0040)
Average Maturity FC		-0.0023*		-0.0054**
		(0.0012)		(0.0020)
Debt/GDP		-0.0341***		-0.0456*
		(0.0110)		(0.0256)
Observations	711	703	650	646
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
R-squared	0.4985	0.5104	0.5726	0.5775

This table reports the estimated coefficients of $\Delta FBM_{c,t}$ in Panel A and, in Panel B, $\Delta FBM_FC_{c,t}$ on changes in log exchange rates, and log CDS spreads. $\Delta FBM_{c,t}$ is the change in the fraction of local currency bonds maturing within one year. $\Delta FBM_FC_{c,t}$ is the change in the fraction of foreign currency bonds maturing within one year. Observations are at the country-quarter level. Controls include average bond maturity and total debt over GDP. Robust standard errors clustered at the country level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 4. Capital Flows and Rollover Risk: Flows Implied by the Rebalancing (FIR) and Broad Dollar Index (BDI)

Panel A: Flows Implied by the Rebalancing (FIR)

	Exchange Rate	Credit Default Swaps
FIR	-0.0287**	-0.0354
	(0.0121)	(0.0283)
FIR × TopFBM	-0.0075**	-0.0406***
	(0.0031)	(0.0120)
Observations	673	639
Country FE	Yes	Yes
Time FE	Yes	Yes
Controls	Yes	Yes
R-squared	0.5500	0.5633

Panel B: Broad Dollar Index (BDI)

	Credit Default Swaps	Credit Default Swaps
$\Delta \log$ BDI	-0.0073	
	(0.0280)	
$\Delta \log$ BDI × TopFBM	0.0292***	0.0365***
	(0.0070)	(0.0072)
Observations	879	879
Country FE	Yes	Yes
Time FE	No	Yes
Controls	Yes	Yes
R-squared	0.1761	0.2935

Panel A of this table reports the estimated coefficients of FIR and FIR× TopFBM on the changes in the log of the exchange rate, and the log of CDS spreads. Observations are at the country-quarter level. The main independent variable is the measure of standardized flows implied by the rebalancings accumulated to the quarterly-level interacted with $TopFBM$. $TopFBM$ is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_{c,t}$ variable. Panel B of this table reports the estimated coefficients of $\Delta \log BDI$ and $\Delta \log BDI\times$ TopFBM on the changes in the log of CDS spreads. Observations are at the country-month level. The main independent variable is the broad dollar index (BDI), which is a weighted average of the foreign exchange value of the US dollar against the currencies of a broad group of major US trading partner interacted with $TopFBM$. All regressions control for average bond maturity, total debt over GDP, GDP growth, interest rates, and the interaction of these variables with FIR or $\Delta \log BDI$. Robust standard errors clustered at the country and time levels are reported in parentheses in Panels A and B, respectively. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Table 5. Capital Flows and Rollover Risk: Monetary Policy Shocks (MPS)

Panel A: Credit Default Swaps	[d]	[d+1]	[d+2]	[d+3]
MPS	0.0973	-0.0063	0.2554	0.2723
	(0.3052)	(0.3765)	(0.4732)	(0.4674)
$MPS \times TopFBM$	0.1387*	0.1653	0.3058**	0.3072**
	(0.0737)	(0.0994)	(0.1465)	(0.1466)
Observations	1,237	1,237	1,237	1,222
Country x Year	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.1838	0.0831	0.1209	0.1212
Panel B: Exchange Rates	[d]	[d+1]	[d+2]	[d+3]
MPS	0.2404	0.2606	0.2326	0.2442
	(0.1803)	(0.1827)	(0.1972)	(0.2011)
$MPS \times TopFBM$	0.0358	0.0330	0.0169	0.0173
	(0.0311)	(0.0352)	(0.0431)	(0.0437)
Observations	1,416	1,416	1,416	1,399
Country x Year	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.2424	0.2468	0.2280	0.2417

Panel A reports the estimated coefficients of MPS and $MPS \times TopFBM$ on changes in the log of CDS over a four-day window around the FOMC announcement date (d). Panel B reports the estimated coefficients of MPS and $MPS \times TopFBM$ on changes in the log of exchange rates over the same window. MPS is the monetary policy shock from Bauer and Swanson (2023). TopFBM is an indicator equal to one if a country is in the top tercile of the $FBM_{c,t}$ distribution. All regressions control for average bond maturity, total debt over GDP, GDP growth, interest rates, and their interactions with MPS. Robust standard errors clustered at the time level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 6. Flows Implied by the Rebalancing (FIR) and Term Structure Effects

Panel A: Impact on Bond Yields by Maturity

	Bond Yields (1–5Y)	Bond Yields (5–10Y)	Bond Yields (10Y+)
FIR	-0.6218***	-0.2837	-0.0592
	(0.2346)	(0.1806)	(0.0984)
FIR × TopFBM	-0.1745**	0.0429	0.0713**
	(0.0782)	(0.0672)	(0.0331)
Observations	4,547	3,290	2,859
Bond FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
R-squared	0.2604	0.3175	0.5116

Panel B: Impact on CDS Spreads by Maturity

	CDS (5Y)	CDS (10Y)
FIR	-0.0353	0.0271
	(0.0284)	(0.0583)
FIR × TopFBM	-0.0399***	-0.0119
	(0.0119)	(0.0144)
Observations	642	324
Country FE	Yes	Yes
Time FE	Yes	Yes
Controls	Yes	Yes
R-squared	0.5657	0.6158

Panel A of this table reports the estimated coefficients of FIR and $FIR\times$ TopFBM on changes in bond yields across maturity buckets. Observations are at the bond-quarter level. Panel B reports the estimated coefficients of FIR and $FIR\times$ TopFBM on changes in the log of CDS spreads with 5-year and 10-year maturities. The main independent variable is the measure of standardized flows implied by the rebalancings accumulated to the quarterly-level interacted with $TopFBM$. $TopFBM$ is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_{c,t}$ variable. All regressions include controls for average bond maturity, total debt over GDP, GDP growth, interest rates, and their interactions with FIR. Robust standard errors, clustered at the bond level for the bond-yield regressions and at the country level for the CDS regressions, are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Table 7. Broad Dollar Index (BDI) Shocks and Term Structure Effects

Panel A: Impact on Bond Yields by Maturity

	Bond Yields (1–5Y)	Bond Yields (5–10Y)	Bond Yields (10Y+)
$\Delta \log BDI$	-0.2608***	-0.3128**	0.0005
	(0.0803)	(0.1388)	(0.0375)
$\Delta \log BDI \times$ TopFBM	-0.0523***	-0.0495**	0.0087
	(0.0159)	(0.0185)	(0.0133)
Observations	13,727	9,922	8,620
Bond $\times$ Year FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
R-squared	0.1790	0.2348	0.2501

Panel B: Impact on CDS Spreads by Maturity

	CDS (5Y)	CDS (10Y)
$\Delta \log BDI$	0.0006	0.0568***
	(0.0221)	(0.0172)
$\Delta \log BDI \times$ TopFBM	0.0209***	0.0437***
	(0.0078)	(0.0109)
Observations	2,075	892
Country $\times$ Year FE	Yes	Yes
Controls	Yes	Yes
R-squared	0.1784	0.3692

Panel A of this table reports the estimated coefficients of $\Delta \log BDI$ and $\Delta \log BDI \times$ TopFBM on changes in bond yields across maturity buckets. Observations are at the country-month level. Panel B reports the estimated coefficients of $\Delta \log BDI$ and $\Delta \log BDI \times$ TopFBM on changes in the log of CDS spreads with 5-year and 10-year maturities. The main independent variable is the broad dollar index (BDI), a weighted average of the foreign exchange value of the U.S. dollar against the currencies of a broad group of major U.S. trading partners, interacted with $TopFBM$. $TopFBM$ is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_{c,t}$ variable. All regressions include controls for average bond maturity, total debt over GDP, GDP growth, interest rates, and their interactions with $\Delta \log BDI$. Robust standard errors, clustered at the bond level for the bond-yield regressions and at the time level for the CDS regressions, are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Table 8. Monetary Policy Shocks (MPS) and Term Structure Effects

	Bond Yields			
	[d]	[d+1]	[d+2]	[d+3]
Panel A: 1–5 Years Maturity				
MPS	0.1502	0.1581	-0.4402	-0.4258
	(0.2055)	(0.3983)	(0.4495)	(0.4472)
MPS× TopFBM	0.2276***	0.2288**	0.0843	0.0812
	(0.0779)	(0.0980)	(0.1247)	(0.1245)
Observations	8,179	8,179	8,179	8,179
Bond × Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.1695	0.1873	0.2150	0.2095
Panel B: 5–10 Years Maturity				
MPS	0.4091**	0.6407*	-0.0981	-0.0797
	(0.2061)	(0.3344)	(0.3396)	(0.3349)
MPS× TopFBM	0.1508*	0.1200	0.0140	0.0128
	(0.0868)	(0.1013)	(0.1326)	(0.1325)
Observations	5,859	5,859	5,859	5,859
Bond × Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.1480	0.1980	0.2191	0.2052
Panel C: Over 10 Years Maturity				
MPS	0.5532**	0.2153	-0.1198	-0.1259
	(0.2270)	(0.3116)	(0.3130)	(0.3134)
MPS× TopFBM	0.1473**	0.1374	0.1594	0.1579
	(0.0702)	(0.0936)	(0.1157)	(0.1158)
Observations	5,138	5,138	5,138	5,138
Bond × Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.1801	0.2306	0.2189	0.2188

	Credit Default Swaps			
	[d]	[d+1]	[d+2]	[d+3]
Panel D: 5-Year CDS				
MPS	0.096	-0.013	0.254	0.271
	(0.305)	(0.376)	(0.473)	(0.467)
MPS× TopFBM	0.134*	0.159	0.300**	0.302**
	(0.074)	(0.100)	(0.146)	(0.146)
Observations	1,245	1,245	1,245	1,229
Country × Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.184	0.083	0.121	0.121
Panel E: 10-Year CDS				
MPS	0.198	0.275	0.439	0.439
	(0.220)	(0.348)	(0.455)	(0.455)
MPS× TopFBM	0.118	0.161	0.247	0.243
	(0.079)	(0.120)	(0.176)	(0.176)
Observations	537	537	537	531
Country × Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.177	0.166	0.205	0.197

Panels A–C of this table report the estimated coefficients of *MPS* and its interaction with *TopFBM* on changes in bond yields across maturity buckets (1–5 years, 5–10 years, and over 10 years). Panels D and E report the effects on the log of CDS spreads with 5-year and 10-year tenors. *d* denotes the FOMC day. MPS is the monetary policy shock from Bauer and Swanson (2023). All regressions include controls for average bond maturity, total debt over GDP, GDP growth, interest rates, and their interactions with MPS. Robust standard errors, clustered at the bond level for the bond-yield regressions and at the time level for the CDS regressions, are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Table 9. Capital Flows, Rollover Risk, and Advanced Economies

Panel A: Broad Dollar Index (BDI)

	Credit Default Swaps	Credit Default Swaps
$\Delta \log BDI$	-0.0307**	
	(0.0148)	
$\Delta \log BDI \times$ TopFBM	-0.0172	-0.0159
	(0.0156)	(0.0144)
Observations	416	416
Country FE	Yes	Yes
Time FE	No	Yes
Controls	Yes	Yes
R-squared	0.1659	0.3862

Panel B: Monetary Policy Shocks (MPS)

	Credit Default Swaps			
	[d]	[d+1]	[d+2]	[d+3]
MPS	-0.0254	0.0294	-0.9440	-0.9454
	(0.1275)	(0.2178)	(0.9734)	(0.9731)
$MPS \times TopFBM$	-0.1139*	0.0330	-0.3324	-0.3308
	(0.0672)	(0.1577)	(0.3064)	(0.3074)
Observations	584	584	584	584
Country $\times$ Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.1393	0.1411	0.1294	0.1295

Panel A of this table reports the estimated coefficients of $\Delta \log BDI$ and $\Delta \log BDI \times$ TopFBM on the changes in the log of CDS spreads. Observations are at the country-month level. The main independent variable is the broad dollar index (BDI), which is a weighted average of the foreign exchange value of the US dollar against the currencies of a broad group of major US trading partner interacted with $TopFBM$. $TopFBM$ is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_{c,t}$ variable. Panel B reports the estimated coefficients of monetary policy shocks (MPS) and their interaction with TopFBM on changes in the log of CDS around the FOMC announcement day (d). The main independent variable is the MPS from Bauer and Swanson (2023), interacted with TopFBM. All regressions include controls for average bond maturity, total debt over GDP, GDP growth, interest rates, and their interactions with MPS or $\log \Delta BDI$. Robust standard errors clustered at the time level are reported in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Online Appendix for "Local Currency Debt and Sovereign Rollover Risk" by Jaewon Choi, Sebastiao Oliveira, Jay Rafi and Josef Zechner

A. Data Construction and Coverage

A.1 Variables Sources

This section provides information on the sources of the variables in our sample. Table A.1 reports the variables used in our analysis, along with their sources, frequencies, and ranges.

Appendix Table A.1. Appendix Table A.1: Variable Description

Variable	Source	Frequency	Range
Local Currency Bond Data	Refinitiv Eikon	Monthly	2013–2024
Foreign Currency Bond Data	Refinitiv Eikon	Monthly	2013–2024
Debt to GDP Ratio	CEIC	Quarterly	2013–2024
Exchange Rates	Compustat	Daily	2013–2024
CDS Spreads US Dollar (5Y, 10Y)	Bloomberg	Daily	2013–2024
CDS Spreads Local Currency (3Y, 4Y, 5Y)	Markit	Daily	2013–2024
Bond Prices	Bloomberg	Daily	2013–2024
Bond Yields	Bloomberg	Daily	2013–2024
Interest Rates (Policy Rates)	IMF	Quarterly	2013–2024
Debt Held by Foreign and Domestic Investors	Arslanalp and Tsuda (2014)	Quarterly	2013–2024
FIR (Flows Implied by Rebalancing)	JP Morgan / Authors' calc.	Monthly	2013–2024
Broad Dollar Index (BDI)	St. Louis FRED	Daily	2013–2024
Monetary Policy Shocks	Bauer and Swanson (2023)	Event-based	2013–2024
GDP Growth	IMF, Economist Intelligence Unit	Quarterly	2013–2024
Credit Ratings	Moody's	Monthly	2013–2024
Term Spread	Bloomberg	Monthly	2013–2024
Credit Spread (vs. US)	Bloomberg	Monthly	2013–2024
Exchange Rate	Compustat	Quarterly	2013–2024

This table reports the variables used in our analysis, their sources, frequencies, and ranges.

A.2 Coverage

This section provides information on the data coverage of our sample. Table A.2 shows the country-level distribution of Eikon local and foreign currency bond

coverage as a share of total government debt reported by CEIC. The coverage spans the period 2013–2024.

Appendix Table A.2. Eikon Coverage of Local and Foreign Currency Debt as Share of CEIC Total Debt

Country	Mean	Std. Dev.	Max	Min
Argentina	0.9456	0.0611	1.0000	0.7970
Brazil	0.6317	0.2278	0.9993	0.3010
Chile	0.9907	0.0322	1.0000	0.8886
China	0.9478	0.0414	0.9998	0.8595
Colombia	0.9037	0.0607	1.0000	0.7926
Czech Republic	0.9737	0.0373	1.0000	0.9073
Egypt	0.5357	0.1924	0.8574	0.2592
Hungary	0.9186	0.1157	1.0000	0.6220
Indonesia	0.7873	0.0498	0.8764	0.7302
Mexico	0.9693	0.0642	1.0000	0.8324
Malaysia	0.9851	0.0339	1.0000	0.9083
Nigeria	0.3517	0.1455	0.4962	0.1492
Peru	0.9939	0.0145	1.0000	0.9560
Philippines	0.8830	0.0927	0.9791	0.7445
Poland	0.8914	0.1268	1.0000	0.6365
Romania	0.9500	0.1167	1.0000	0.6385
Russia	0.9937	0.0217	1.0000	0.9248
Serbia	0.7770	0.0892	0.8874	0.5766
Thailand	0.9397	0.0623	1.0000	0.8279
Turkey	0.4458	0.1430	0.6784	0.2495
Uruguay	0.6926	0.1094	0.8550	0.5179
South Africa	1.0000	0.0000	1.0000	1.0000

This table reports the country-level distribution of Eikon local- and foreign-currency bond coverage as a share of total government debt reported by CEIC. The coverage spans 2013–2024.

A.3 Measuring the Fraction of Bonds Maturing

The EIKON database provides comprehensive information on government bonds, including the amount issued, coupon payments, coupon frequency, issuance date, and maturity date. This data allows us to construct the maturity structure for each country in our sample and determine the amount of debt maturing each month, quarter, and year. However, this process is not straightforward. First, we exclude bonds from the analysis if they are missing the amount issued or coupon rate. Second, we calculate the interest payments for each active bond by multiplying the annual coupon rate by the outstanding amount and adjusting the payment based on the frequency of the coupon payment. For example, if the payments are semi-annual, we divide the annual coupon payment by two and assign the payment to the corresponding quarter. If a bond is issued in Q1 2020, the coupon payments would occur in Q3 2020, Q1 2021, and so on. Finally, after calculating the interest payments, we combine them with the principal amount of maturing bonds for each quarter. For example, in Mexico in Q2 2021, the interest payment was 134 million USD, and the amount of bonds maturing was 1.12 billion USD, which makes the total maturing bonds based on our definition to be 1.25 billion USD.

Motivated by previous literature (Almeida, Campello, Laranjeira, and Weisbenner, 2011; Choi, Hackbarth, and Zechner, 2018), we define the amount of bonds maturing within one year in a quarter t as:

$$DD1_{c,t} = \sum_{j=0}^{3} (\text{maturing bonds})_{c,t+j} \tag{5}$$

where $\text{maturing bonds}_{c,t}$ represents the amount of local currency bonds maturing (in USD) in quarter t. We calculate $\text{maturing bonds}_{c,t}$ by including both the principal and the coupon, as this provides a measure of total cash outflows at maturity (the total amount of money that the government needs to pay to bondholders at a given time).[10]

[10] We show that our results remain similar when considering only the principal in constructing $\text{maturing bonds}_{c,t}$. Results are available upon request.

We then define our rollover risk measure for quarter t as follows:

$$FBM_{c,t} = \frac{DD1_{c,t}}{\text{GDP}_{c,t}} \tag{6}$$

where GDP is the nominal annualized GDP in USD from EIU (Economist intelligence unit). Note that we use data at the quarterly level because although we have the amount of bond that matures at the monthly frequency, the nominal GDP in USD is only available at the quarterly frequency. The average of $FBM_{c,t}$ is approximately 4.59%, the standard deviation is 3.47%, and the max and min are 16.35% and 0, respectively.

Table A.3 presents the characteristics of countries with a high fraction of bonds maturing relative to the rest of the sample.[11] We identify significant differences in the fraction of bonds maturing (FBM), underscoring the importance of rollover risk as a critical factor shaping the financial stability of emerging economies. Countries with a high fraction of bonds maturing tend to have lower GDP growth, slower debt growth, and a higher debt-to-GDP ratio. For example, high-rollover-risk countries have an average debt-to-GDP ratio of 59.64%, compared to 45.44% in other countries. In addition, these countries exhibit higher long-term yields and a higher interest-to-exports ratio relative to the rest of the sample.

[11] All data are reported at an annual frequency because more variables are available for comparison at this level.

Appendix Table A.3. Country-Level Summary Statistics: Low vs. High Rollover Risk

Variable	All			Low Rollover Risk			High Rollover Risk		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
GDP growth (%)	1.21	0.95	0.018	1.30	0.71	0.01	1.10	0.71	0.03
Debt growth (%)	1.74	1.78	0.027	1.90	1.94	0.03	1.30	1.43	0.02
CA/GDP (%)	-1.04	-1.69	3.43	-1.03	-1.83	3.60	-1.06	-1.23	3.09
Debt/GDP (%)	50.01	44.24	25.07	45.44	42.24	18.03	59.64	47.92	35.89
Interest / Export (%)	4.87	4.44	3.15	4.75	4.28	3.28	5.11	4.70	2.84
CDS Spread	152.42	118.64	112.05	155.81	112.99	128.73	144.28	146.95	63.09
LT Yield (%)	6.17	5.62	3.39	6.07	5.53	3.52	6.39	5.92	3.09
Inflation rate (%)	5.39	3.75	6.44	6.00	4.01	7.00	5.00	3.44	5.00
FBM (%)	4.45	3.67	2.54	2.57	2.52	1.52	8.51	7.48	3.92
Observations		199			136			63	

This table reports the summary statistics of country characteristics. Debt growth is defined as the year-over-year change in government debt. CA/GDP represents the ratio of the current account to GDP. Debt/GDP is the ratio of government debt to GDP. CDS spread is the annual cost, expressed in basis points, that an investor pays to insure against the default of a borrower's debt. IR Spread refers to the interest rate spread within a country, defined as the difference between the rate charged by banks on loans to prime customers and the rate paid by commercial or similar banks on demand, time, or savings deposits. LT yield is the yield on 10-year Treasury bonds. Interest due/export is the ratio of government interest due in a particular year to the country's total exports. FBM represents the fraction of bonds maturing as a proportion of GDP. Countries are classified as high rollover risk if they are in the top tercile in terms of the FBM measure, while countries classified as low rollover risk are those in the middle and bottom terciles of the FBM distribution.

B. Flows Implied by the Rebalancing

This appendix provides additional information on the construction of the Flows Implied by the Rebalancing (FIR). Section B.1 describes the Government Bond–Emerging Market Index (GBI-EM) series from JP Morgan and the rebalancing mechanism, and Section B.2 details how we measure the Flows Implied by the Rebalancing (FIR).

B.1 J.P. Morgan GBI-EM global diversified

The Government Bond–Emerging Market Index (GBI-EM) series, launched in June 2005, was the most frequently followed benchmarks in the EM local currency denominated government bond space, tracked by an estimated $247 billion AUM as of December 2021. In this paper, we use the GBI-EM Global Diversified, which is the largest local-currency government bond index for emerging countries. It is also the most widely followed benchmark in its class with AUM of $222 billion as of December 2021.

According to J.P. Morgan, a country qualifies for index inclusion if its Gross National Income (GNI) per capita remains below the Index Income Ceiling (IIC) for three consecutive years. The IIC is adjusted annually based on the global GNI per capita growth rate, as reported by the World Bank. In 2024, the IIC level is $23,287. J.P. Morgan determines which securities from each country are included in each index. Bonds entering the GBI-EM Global Diversified must meet quantitative criteria (a minimum face amount outstanding of $1 billion and at least 2.5 years to maturity) and qualitative criteria regarding overall market liquidity and tradability. Specifically, bonds must have both bid and ask prices available. Moreover, the index is denominated entirely in USD, with bond and country weights determined by converting all local-currency debt into USD.

Countries with explicit capital controls are excluded from the index. That is, countries with capital controls—either de jure or de facto—that limit the ability of international investors to repatriate proceeds from the domestic currency (e.g., re-

strictions on selling local currency and receiving USD, EUR, etc.) or restrict the free trade of the official currency (e.g., limits on transaction size or the existence of multiple exchange rates) are deemed ineligible. Historically, such situations have led to the exclusion of countries like Egypt (removed in 2024), Nigeria (removed in 2015), and Argentina (removed in 2019), following the imposition of capital controls that impaired investors' ability to adequately replicate exposure.

The index's diversification methodology imposes a 10% weight cap at the country level, with any residual weight redistributed accordingly. No tactical adjustments are made based on recent asset performance. As a result, larger markets such as Indonesia, China, and Mexico, which have significant index-eligible debt stock, will routinely reach the 10% country cap, while smaller markets with limited issuance will have lower weights in the index. As countries cannot have a benchmark weight higher than 10%, the GBI-EM global diversified is rebalanced monthly on the last weekday of the month. Since the mechanical rebalancings by the GBI-EM Global Diversified index are, in principle, informationless and unrelated to any new information about the economic conditions of a country, this generates exogenous capital flows.

Consider the following example. Suppose that before the rebalancing, Indonesia's weight is 12%, Chile's weight is 7% and Argentina's weight is 1%. For simplicity, assume there are 11 countries in the index, and the other 8 countries are fixed at the 10% cap. The rebalancing mechanism (cap-driven rebalancing) implies that Indonesia's weight is reduced to 10%, Chile's weight is increased to 8.75%, and Argentina's weight is increased to 1.25%. Mutual funds have to sell local-currency sovereign bonds of Indonesia and buy local-currency sovereign bonds of Chile and Argentina. As a result, Chile and Argentina will experience capital inflows that are uncorrelated with macroeconomic conditions.

B.2 Measuring Flows Implied by the Rebalancing

We follow Pandolfi and Williams (2019) to construct flows implied by the rebalancings or capital flow shocks (FIR). As discussed above, a significant source of variation in FIR stems from the fund's practice of imposing a 10% cap on the bond weight of each emerging economy within the index. When a country surpasses this 10% cap, the fund divests its ownership of the excess bond holdings to reduce its weight to the stipulated 10%. The remaining holdings are then redistributed proportionally to their market value across the other countries included in the index.

We sum across bonds i and normalize by market size to obtain FIR for country c at time t as follows:

$$FIR_{ct} = \sum_i FIR_{ict} = \sum_i (w_{ict} - w_{ict}^{BH}) \frac{AUM_t}{MV_{ict-1}} \tag{7}$$

where w_{ct} is the weight of a country at time t, $w_{ct}^{BH} = w_{ct-1} \times \left(\frac{R_{ct}}{R_t}\right)$, R_{ct} is the country-level bond's return in month t at the country level, and R_t is the J.P. Morgan GBI-EM Global Diversified Index return in month t. Intuitively, w_{ct}^{BH} is the buy-and-hold weight, i.e., it is the weight a bond would have if the only changes affecting it were due to price movements. AUM_t is Asset under management (in USD) that tracks the J.P. Morgan GBI-EM Global Diversified, and MV_{ct-1} the previous period USD market value of government debt securities.

Table B.1 presents the summary statistics of the components that build the FIR. Table B.2 shows country-wise breakdown of the components that build the FIR, in line with Table B.1. Table B.3 collects the frequency distribution of countries in our sample. Note that the frequency distribution of countries reported is not the same due to different inclusion dates. For instance, China was included in January 2020, Argentina was included from January 2017 to January 2020, the Czech Republic was included

after January 2017, Egypt was included after January 2022, Nigeria was included from January 2013 to January 2016, and Russia was dropped in May 2022.

Table B.4 shows that a higher FIR is associated with lower CDS spreads and lower exchange rates around rebalancing dates. Notably, we find no evidence of pre-trends: in the days prior to the rebalancing, the relationship between FIR and CDS is close to zero and becomes statistically significant only after the rebalancing dates. The impact on exchange rates is qualitatively similar. Although we observe an effect three days before the rebalancing (statistically significant at the 10% level), the effects are much stronger afterward. For example, the effect of FIR on exchange rates is 4.5 times greater when comparing three days before the rebalancing with three days after it.

Table B.5 documents the estimated coefficients of FIR on changes in the log of the exchange rate and the log of CDS when FIR shocks are aggregated to the quarterly level, and the results are qualitatively similar. Collectively, these tables show a strong impact of FIR on both exchange rates and CDS spreads.

Appendix Table B.1. Aggregate Level Summary Statistics

	Obs	Mean	Std Dev	Min	Max
Panel (A): FIR components					
FIR (%)	1,792	0.016	1.046	-3.195	5.222
Country Market Value (MV)	1,798	60,112	47,726	644	255,998
Weight in the index (w_{ct})	1,798	0.056	0.037	0.001	0.100
Buy-hold Weight in the index (w_{ct}^{bh})	1,792	0.056	0.037	0.001	0.107
Asset Under Management (AUM_t)	1,798	204,263	11,639	178,716	223,129
Index Return (%)	1,798	0.076	0.032	-0.070	0.091
Bond Return (%)	1,792	-0.139	0.025	-0.455	0.194
Panel (B): Monetary Policy Shocks					
MPS	348	0.000	0.053	-0.240	0.160
Panel (C): Broad Dollar Index					
BDI	4,828	105.445	12.230	85.469	130.214

Panel (A) of this table reports the summary statistics of components that build the flows implied by the index rebalancing (FIR) variables, constructed from the JP Morgan Government Bond Index - Emerging Markets Global Diversified (GBI-EM Global Diversified). The components include country market value in million USD (MV), weight in the index (w_{ct}), buy-hold weight in the index (w_{ct}^{bh}), asset under management in million USD (AUM_t), index return, and bond return. w_{ct}, w_{ct}^{bh}, and returns are expressed in decimal points. FIR is reported in percentage. We exclude months with substantial rebalancing events in the JP Morgan GBI-EM Index due to the upgrade or downgrade of the credit rating of countries in our sample during the analysis period (Jan 2013 - March 2024). Panel (B) presents the summary statistics of monetary policy shocks from Bauer and Swanson (2023) from 1988 to 2023. MPS is the orthogonalized monetary policy surprise (MPS_ORTH) measure, computed as the residuals from regressing MPS raw on macro and financial variables (see Bauer and Swanson (2023) for details). MPS raw is the unadjusted monetary policy computed as the first principal component of the changes in ED1-ED4, scaled so that the impact on ED4 is unity. Panel (C) shows the summary statistics of the the broad dollar index (BDI), which is a weighted average of the foreign exchange value of the US dollar against the currencies of a broad group of major US trading partner from 2006 to 2025.

Appendix Table B.2. Summary Statistics by Country

	FIR (%)	MV	w_{ct}	w_{ct}^{bh}	Return
Argentina	-0.654	6,144	0.007	0.007	0.971
Brazil	-0.003	129,904	0.097	0.097	1.000
Chile	0.068	18,723	0.016	0.016	0.999
China	0.665	125,746	0.091	0.092	1.000
Colombia	0.032	56,528	0.057	0.057	0.998
Czech Republic	0.306	57,670	0.047	0.046	0.998
Dominican Republic	-0.028	1,888	0.002	0.001	1.005
Egypt	-0.204	14,960	0.011	0.012	0.996
Hungary	-0.020	40,940	0.043	0.043	0.998
Indonesia	0.068	97,366	0.095	0.095	0.999
Mexico	0.051	121,325	0.099	0.099	0.998
Malaysia	-0.040	86,718	0.085	0.085	1.000
Nigeria	-0.019	11,671	0.018	0.018	0.989
Peru	0.069	25,015	0.024	0.024	0.998
Philippines	-0.281	2,320	0.003	0.003	0.999
Poland	0.009	93,398	0.088	0.088	0.999
Romania	0.218	30,985	0.029	0.029	1.000
Serbia	0.148	4,263	0.003	0.003	1.000
Russia	-0.033	67,679	0.073	0.073	0.997
Thailand	0.084	89,430	0.086	0.086	1.001
Turkey	-0.234	41,520	0.052	0.052	0.998
Uruguay	-0.109	2,036	0.002	0.002	1.003
South Africa	0.029	92,242	0.090	0.090	0.997

This table reports a country-wise breakdown of the summary statistics for the components that constitute the flows implied by the index rebalancing (FIR) variables. FIR is in percentage, Market Value is in millions of US Dollar, w_{ct}, w_{ct}^{bh}, and Return are in decimal points. The methodology used to calculate these statistics is consistent with that described for Table B.1.

Appendix Table B.3. Frequency Distribution of Countries

Country	Obs	Percent	Cum.
Argentina	21	1.13	1.13
Brazil	100	5.57	6.70
Chile	100	5.57	12.27
China	43	2.36	14.63
Colombia	100	5.57	20.20
Czech Republic	65	3.66	23.86
Dominican Republic	59	3.32	27.18
Egypt	20	1.07	28.25
Hungary	100	5.57	33.82
Indonesia	100	5.57	39.39
Mexico	100	5.57	44.96
Malaysia	100	5.57	50.53
Nigeria	21	1.13	51.66
Peru	100	5.57	57.23
Philippines	97	5.40	62.63
Poland	100	5.57	68.20
Romania	99	5.57	73.78
Serbia	30	1.63	75.41
Russia	78	4.33	79.74
Thailand	100	5.57	85.31
Turkey	100	5.57	90.88
Uruguay	64	3.55	94.43
South Africa	100	5.57	100.00
Total	1,798	100.00	

This table reports the frequency distribution of countries over the analysis period (January 2013–March 2024). Obs denotes the number of observations for each country during this period. We exclude months with substantial rebalancing events in the JP Morgan GBI-EM Index resulting from credit rating upgrades or downgrades of countries in our sample.

Appendix Table B.4. Pretrend and Post-Rebalancing Analysis

Panel (A): CDS									
	[d-4]	[d-3]	[d-2]	[d-1]	[d]	[d+1]	[d+2]	[d+3]	[d+4]
FIR_{ct}	-0.047	-0.050	-0.101	-0.134	-0.205	-0.256**	-0.224*	-0.294**	-0.332**
	(0.0597)	(0.0561)	(0.0572)	(0.0588)	(0.0737)	(0.1384)	(0.1392)	(0.1535)	(0.1780)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,571	1,571	1,571	1,571	1,571	1,571	1,571	1,571	1,555
Number of countries	18	18	18	18	18	18	18	18	18
R^2	0.355	0.350	0.418	0.469	0.489	0.490	0.498	0.499	0.471
Panel (B): Exchange Rates									
	[d-4]	[d-3]	[d-2]	[d-1]	[d]	[d+1]	[d+2]	[d+3]	[d+4]
FIR_{ct}	-0.058	-0.069*	-0.133***	-0.190***	-0.288***	-0.283***	-0.294***	-0.311***	-0.292***
	(0.0379)	(0.0367)	(0.0415)	(0.0458)	(0.0652)	(0.0703)	(0.0706)	(0.0747)	(0.0811)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,756	1,756	1,756	1,756	1,756	1,756	1,756	1,756	1,736
Number of countries	23	23	23	23	23	23	23	23	23
R^2	0.2137	0.2522	0.2682	0.3165	0.3212	0.3184	0.3246	0.3475	0.3111

This table reports the estimated coefficients of FIR on CDS spreads (Panel A), and exchange rates (Panel B). FIR is the measure of standardized flows implied by the rebalancings (see Section 3). The cumulative log change is measured over an interval from four days prior to the rebalancing date (d) to four days after. All regressions include time and country fixed effects. Robust standard errors clustered at the country level are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Appendix Table B.5. The Average Impact of FIR

	Exchange Rate	Credit Default Swaps
FIR	-0.0101***	-0.0148***
	(0.0031)	(0.0041)
Observations	695	658
Country FE	Yes	Yes
Time FE	Yes	Yes
Controls	Yes	Yes
R-squared	0.5249	0.5650

This table reports the estimated coefficients of FIR on the changes in the log of the exchange rate and the log of CDS. Observations are at the country-quarter level. The main independent variable is the measure of standardized flows implied by the rebalancings accumulated to the quarterly-level. We control for average bond maturity, FBM, total debt over GDP, GDP growth, and interest rates. Robust standard errors clustered at the country level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

C. Local Currency versus Foreign Currency Debt

This appendix provides summary statistics on countries' debt maturity structures. Table C.1 reports local- and foreign-currency debt as a share of GDP, the average maturity of local- and foreign-currency debt, and the fraction of bonds maturing for both. Tables C.3 and C.2 present a country-level breakdown of these statistics.

Appendix Table C.1. Summary Statistics: Local vs. Foreign Currency

	Obs	Mean	Median	p25	p75	Std.Dev
LC/GDP	178	0.2765	0.2635	0.1525	0.3505	0.1559
FC/GDP	178	0.0704	0.0569	0.0223	0.1064	0.0598
Diff (LC - FC)	178	0.2079	0.1909	0.0810	0.2890	0.1808
Debt Maturity in LC	1,104	7.950	7.452	5.312	10.189	3.519
Debt Maturity in FC	1,079	10.406	10.581	6.859	12.810	5.200
Debt Maturity (LC-FC)	1,079	-2.490	-2.433	-5.692	0.230	5.689
$FBM_{c,t}$	734	0.045	0.038	0.019	0.061	0.034
$FBM_FC_{c,t}$	734	0.010	0.007	0.002	0.014	0.011
FBM (LC-FC)	734	0.035	0.028	0.011	0.051	0.035

This table reports the summary statistics of a country maturity structure. LC/GDP is the outstanding local currency bonds over GDP, and FC/GDP is the outstanding foreign currency bonds over GDP. Diff (LC-FC) is the difference between LC/GDP and FC/GDP. Debt Maturity in LC is the local currency average bond maturity structure constructed by taking the weighted average of years to maturity on a country level. Debt Maturity in FC is the foreign currency average bond maturity structure constructed by taking the weighted average of years to maturity on a country level. $FBM_{c,t}$ is the fraction of local currency bonds maturing within one year (see Equation 6), and $FBM_FC_{c,t}$ is the fraction of foreign currency bonds maturing within one year. Debt Maturity (LC-FC) is the difference between debt maturity in LC and debt maturity in FC. FBM (LC-FC) is the difference between $FBM_{c,t}$ and $FBM_FC_{c,t}$.

Appendix Table C.2. Summary Statistics: Local vs. Foreign Currency by Country

	Debt Maturity in LC	Debt Maturity in FC	Debt Maturity (LC-FC)	$FBM_{c,t}$	$FBM_FC_{c,t}$	FBM (LC-FC)
Argentina	7.036	12.612	-5.576	0.0005	0.014	-0.014
Brazil	5.827	8.432	-2.605	0.122	0.005	0.116
Chile	11.725	12.215	-0.490	0.035	0.002	0.032
China	7.437	16.227	-8.789	0.032	0.0001	0.032
Colombia	8.442	14.116	-5.675	0.066	0.007	0.058
Czech Republic	7.151	3.730	3.421	0.036	0.005	0.030
Dominican Republic	6.694	13.093	-6.399	0.064	0.041	0.023
Egypt	2.789	10.161	-7.372	0.153	0.017	0.135
Hungary	5.285	7.198	-1.913	0.100	0.023	0.076
Indonesia	9.811	12.238	-2.428	0.0167	0.008	0.008
Mexico	9.548	12.846	-3.298	0.062	0.014	0.047
Malaysia	8.464	5.395	3.314	0.068	0.0002	0.068
Nigeria	9.867	9.721	0.147	0.0023	0.0005	0.001
Peru	12.411	16.849	-4.438	0.051	0.009	0.0428
Philippines	8.367	10.685	-2.318	0.037	0.011	0.025
Poland	5.375	6.102	-0.727	0.0459	0.015	0.030
Romania	4.905	9.198	-4.293	0.0283	0.0198	0.008
Serbia	3.422	5.314	-1.892	0.0347	0.021	0.013
Russia	5.738	11.441	-5.704	0.0162	0.0058	0.010
Thailand	11.725	2.148	9.672	0.0350	0.00003	0.0349
Turkey	4.589	9.227	-4.639	0.006	0.012	-0.005
Uruguay	10.070	15.772	-5.702	0.0152	0.024	-0.009
South Africa	16.174	11.271	4.903	0.0155	0.0011	0.0143

This table reports a country-level breakdown of summary statistics on maturity structure. Debt Maturity (LC) is the mean local-currency average bond maturity, constructed as the weighted average years to maturity at the country level. Debt Maturity (FC) is the mean foreign-currency average bond maturity, constructed analogously. $FBM_{c,t}$ is the mean fraction of local-currency bonds maturing within one year (see Equation 6), and $FBM_FC_{c,t}$ is the mean fraction of foreign-currency bonds maturing within one year. Debt Maturity (LC–FC) is the mean difference between local- and foreign-currency debt maturities. FBM (LC–FC) is the mean difference between $FBM_{c,t}$ and $FBM_FC_{c,t}$.

Appendix Table C.3. Summary Statistics: Local vs. Foreign Currency Debt Share by Country

	LC/GDP	FC/GDP	Diff (LC - FC)
Argentina	0.1096	0.1929	-0.0833
Brazil	0.5958	0.0205	0.5753
Chile	0.1889	0.0556	0.1332
China	0.3293	0.0000	0.3293
Colombia	0.2804	0.0849	0.1955
Czech Republic	0.2914	0.0378	0.2536
Hungary	0.3973	0.1686	0.2286
Indonesia	0.1768	0.0626	0.1142
Mexico	0.2655	0.0529	0.2126
Malaysia	0.5133	0.0159	0.4973
Peru	0.1164	0.0736	0.0428
Philippines	0.2898	0.0871	0.2027
Poland	0.3089	0.0964	0.2126
Romania	0.1565	0.1446	0.0119
Russia	0.0890	0.0232	0.0582
Thailand	0.3075	0.0000	0.3075
Turkey	0.1467	0.0947	0.0520
South Africa	0.4153	0.0470	0.3683

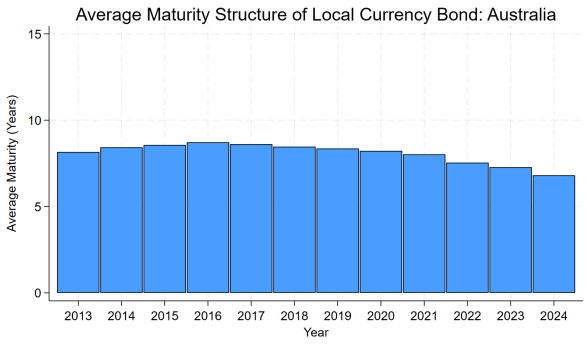
This table reports a country-wise breakdown of the summary statistics on each country's currency composition. LC/GDP is the mean of outstanding local currency bonds over GDP, and FC/GDP is the mean of outstanding foreign currency bonds over GDP. Diff (LC-FC) is the difference between LC/GDP and FC/GDP.

D. Maturity Structure: Advanced Economies

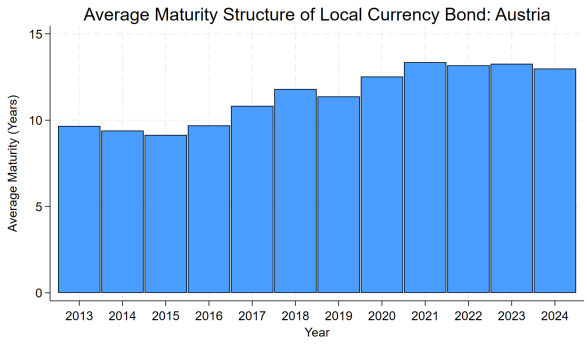
This appendix presents the maturity structure for advanced-economy countries: Australia, Austria, Denmark, France, Italy, South Korea, Spain, Sweden, and Switzerland. Figures D.1 and D.2 show the average local-currency bond maturity by country. Figures D.3, D.4, and D.5 plot the amount of bonds maturing within one year as a percentage of GDP for each country.

Appendix Figure D.1. Local Currency Average Bond Maturity per Country: Advanced Economies.

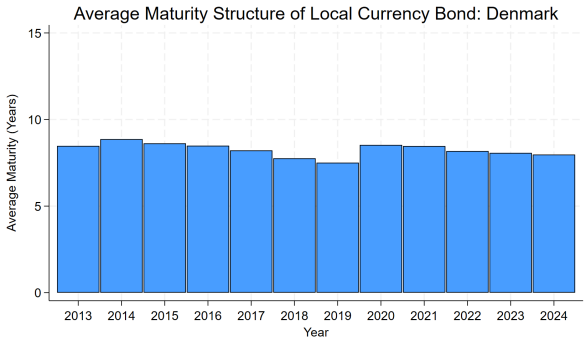
(A) Australia



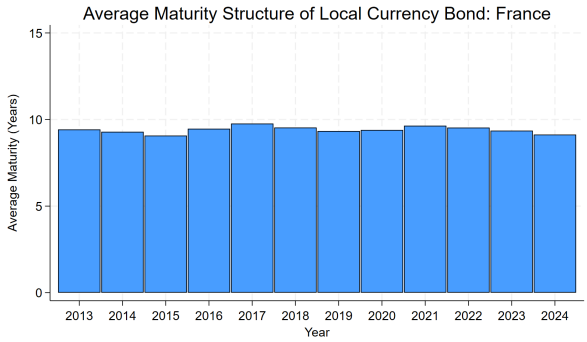
(B) Austria



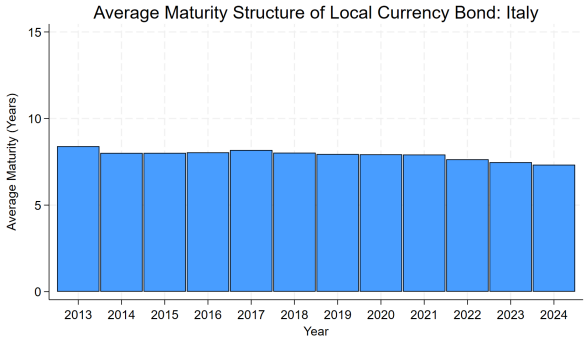
(C) Denmark



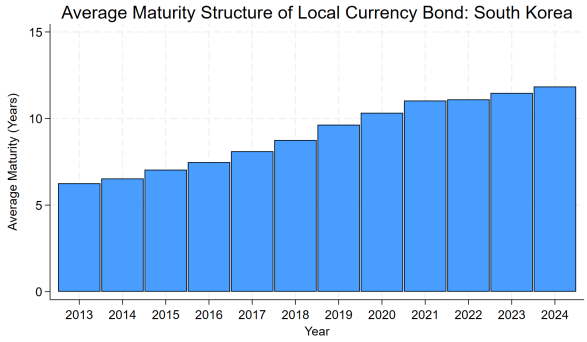
(D) France



(E) Italy



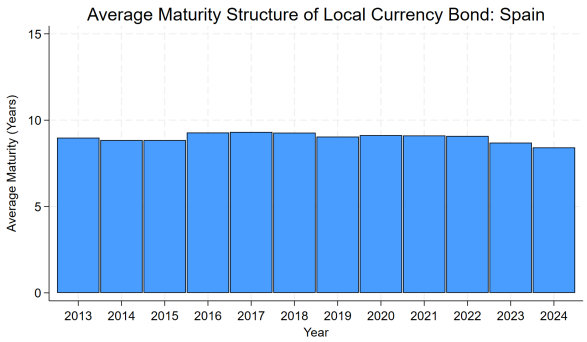
(F) South Korea



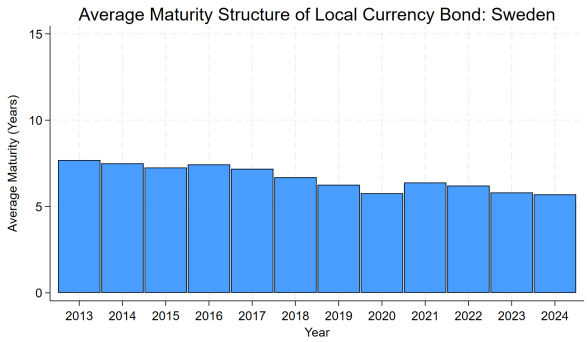
This figure reports the local currency (LC) average bond maturity per country from 2013–2024. We construct the LC average maturity by computing the weighted average years to maturity of LC debt at the country level in each year. Panels (A), (B), (C), (D), (E), and (F) plot the average bond maturity for Australia, Austria, Denmark, France, Italy, and South Korea, respectively. Source: Refinitiv Eikon.

Appendix Figure D.2. Local Currency Average Bond Maturity per Country: Advanced Economies

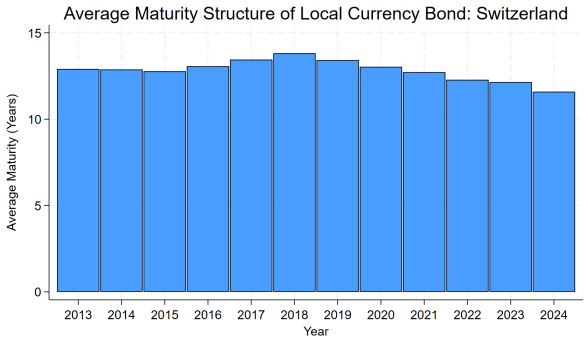
(A) Spain



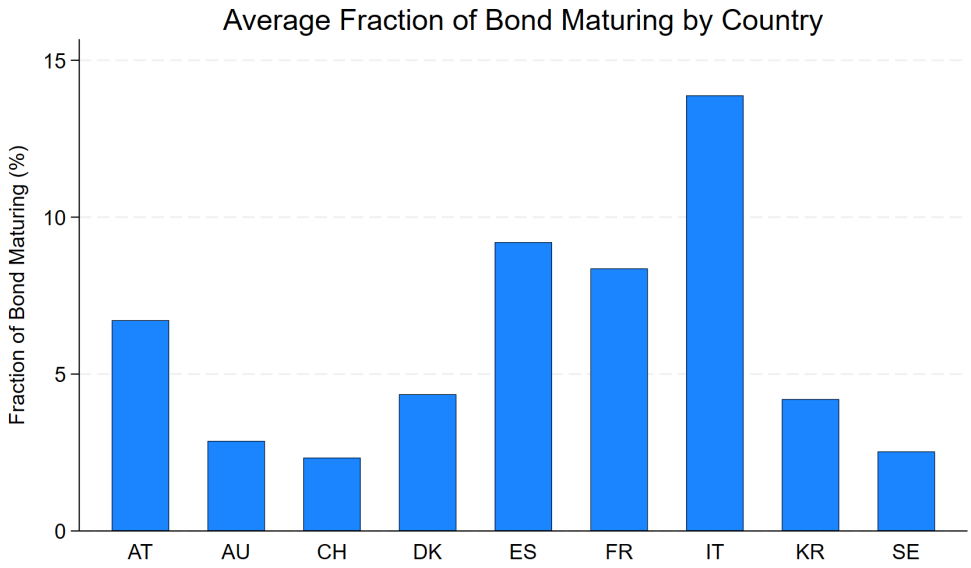
(B) Sweden



(C) Switzerland



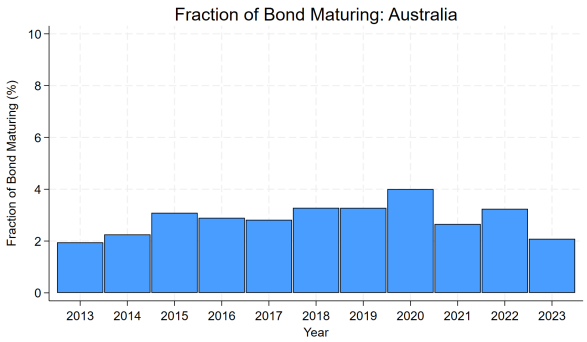
This figure reports the local currency (LC) average bond maturity per country from 2013–2024. We construct the LC average maturity by computing the weighted average years to maturity of LC debt at the country level in each year. Panels (A), (B) and (C) plot the local currency average bond maturity for Spain, Sweden, and Switzerland, respectively. Source: Refinitiv Eikon.



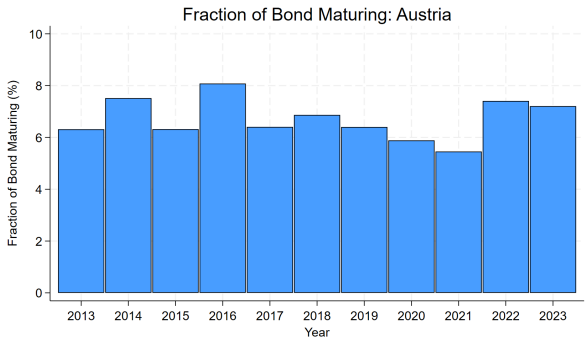
Appendix Figure D.3. This figure reports the amount of bonds maturing within one year as a percentage of GDP for each advanced-economy country in our sample from 2013–2024. The fraction of local-currency bonds maturing is computed by dividing the value of outstanding bonds maturing within one year by GDP. AT, AU, CH, DK, ES, FR, IT, KR, and SE refer to Austria, Australia, Switzerland, Denmark, Spain, France, Italy, South Korea, and Sweden, respectively. Source: Refinitiv Eikon.

Appendix Figure D.4. Fraction of Local-Currency Bonds Maturing by Country.

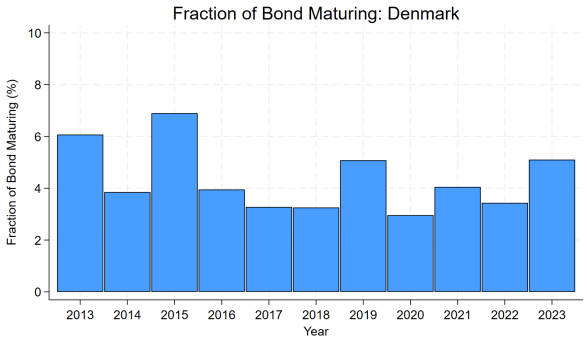
(A) Australia



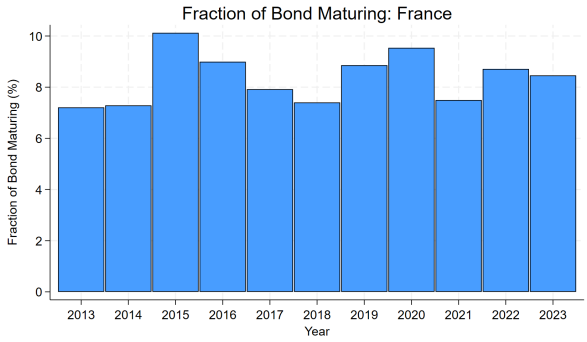
(B) Austria



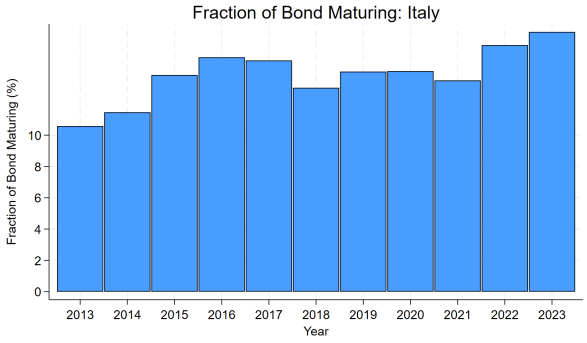
(C) Denmark



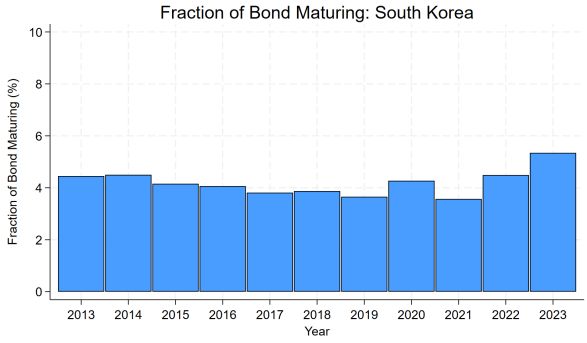
(D) France



(E) Italy



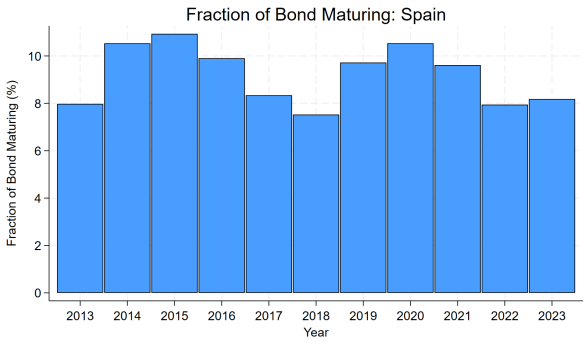
(F) South Korea



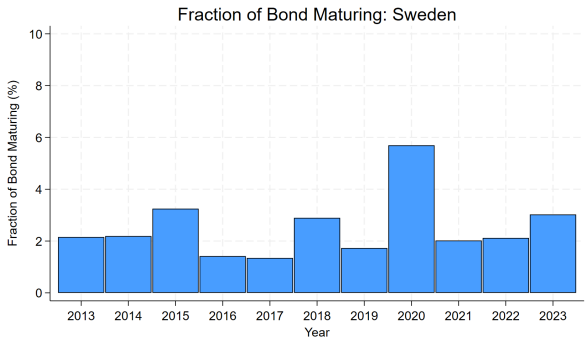
This figure reports the amount of bonds maturing within one year as a percentage of GDP for each country in our sample from 2013 to 2024. The fraction of local-currency bonds maturing is computed by dividing the value of outstanding bonds maturing within one year by GDP. Panels (A), (B), (C), (D), (E), and (F) plot the fraction of bond maturing for Australia, Austria, Denmark, France, Italy, and South Korea, respectively. Source: Refinitiv Eikon.

Appendix Figure D.5. Fraction of Local-Currency Bonds Maturing by Country.

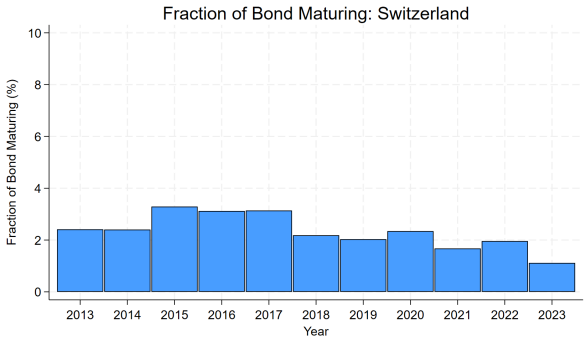
(A) Spain



(B) Sweden



(C) Switzerland



This figure reports the amount of bonds maturing within one year as a percentage of GDP for each country in our sample from 2013 to 2024. The fraction of local-currency bonds maturing is computed by dividing the value of outstanding bonds maturing within one year by GDP. Panels (A), (B), and (C) plot the fraction of bond maturing for Spain, Sweden, and Switzerland, respectively. Source: Refinitiv Eikon.

E. Additional Results and Robustness

This appendix presents additional results and robustness tests to which we subject our baseline findings.

E.1 Importance of Debt/GDP

We examine whether a country's Debt/GDP ratio implies a differential response to capital flow shocks and compare its importance to rollover risk. Each quarter, we sort countries into terciles based on the distribution of Debt/GDP and create the dummy variable $TopDebt_{c,t}$, which equals one if a country is in the top tercile of this distribution. We then estimate Equations (2), (3), and (4), including $TopDebt_{c,t}$ and its interaction with the capital flow shock, while keeping the same control variables.

Table E.1 reports the results for the FIR shock. First, the coefficient associated with FIR $\times$ TopFBM remains virtually unchanged relative to our baseline findings. Second, rollover risk appears to play a more important role than "leverage" (Debt/GDP) in explaining a country's differential response to exogenous capital flows. Results using the BDI and monetary policy shocks are reported in Tables E.2 and E.3 and show qualitatively similar patterns. These findings underscore the unique role of rollover risk in amplifying the effects of capital flows in emerging markets.

E.2 Additional Controls

In this section, we test the robustness of our results to alternative specifications and additional controls. First, we re-estimate our baseline results including the interaction of TopFBM with GDP growth in the set of controls to ensure that the heterogeneous effects of capital flows are not driven by differences in cyclicality (see Jungherr, Meier, Reinelt, and Schott (2022) and others). Tables E.4, E.5, and E.6 show that our findings remain unchanged. Second, Beltran and He (2024) show that flows implied by rebalancing

have persistent effects on exchange rates. To address this concern, we re-estimate our baseline results including the lag of FIR as an additional control. Table E.7 shows that our results are qualitatively the same. Overall, these findings suggest that there is little to no confounding effect and that adding controls does not alter the regression results.

E.3 Countries at the 10% threshold

One concern with our results is that, when measuring the flows implied by the rebalancing (FIR), we also use data from countries at the 10% country-weight cap, and the flows from these countries may be correlated with macroeconomic fundamentals. For instance, if Brazil's country weight is rebalanced from 12% to 10%, the resulting outflows from Brazil could be driven by its economic performance, which might also be correlated with broader macroeconomic conditions that affect our outcome variables.

To address this concern, we construct a FIR measure that excludes flows from countries potentially correlated with macroeconomic conditions. The procedure is identical to that described in Subsection B.2, but we exclude countries at the 10% threshold. The idea is that when Brazil's weight is rebalanced from 12% to 10%, it results in an increase in the weight of a smaller country, such as Chile. In this case, the capital flows experienced by Chile's local-currency bonds would be unrelated to its own economic conditions and would instead reflect the reallocation caused by the larger country reaching the 10% cap. As a result, in this analysis, we exclude the outflows from Brazil and consider only the inflows to Chile.

We then estimate our main results using the FIR measure described above. Table E.8 presents our findings. We consistently find that the impact of FIR on exchange rates, and CDS spreads is significantly amplified for countries facing high rollover risk. Notably, the magnitudes are also very similar to those in our baseline analysis, which does not exclude countries in the top 10%. This is important as it suggests that the flows implied by the rebalancing are plausibly exogenous. These results highlight

the robustness of our identification strategy and further underscore the important role of rollover risk in the transmission of capital flow shocks.

E.4 Local Currency CDS Spreads

In our main analysis, we use CDS spreads denominated in U.S. dollars due to their broader coverage. Table E.9 shows that our results are robust to using local currency CDS spreads. In fact, we find that higher rollover risk is associated with higher local currency CDS spreads for maturities of 3Y, 4Y, and 5Y.

E.5 Pre-determined Maturity

As previously discussed, asset price movements can themselves affect rollover risk by influencing investor sentiment and refinancing conditions. To address this concern and better identify the causal impact of rollover risk, our baseline approach uses the ex-ante country maturity structure, which helps alleviate these concerns. Specifically, we define TopFBM using the distribution of the one-year lag of FBM, which represents the amount of bonds maturing in a given year as predicted from the previous year.

In this section, we conduct an additional robustness analysis of our bond maturity measure by constructing the FBM measure in a manner similar to Section 3, but using DD2, which captures the amount of bonds maturing in two years. This approach further ensures that the country's maturity structure is predetermined. Tables E.10–E.12 report qualitatively similar findings when using this alternative measure of rollover risk.

E.6 Uncertainty Shocks

Akinci, Kalemli-Özcan, and Queralto (2022) show that when U.S. uncertainty rises, the foreign country's exchange rate vis-à-vis the dollar depreciates and capital flows out of the country. Motivated by this evidence, we examine how changes in the VIX affect

exchange rates and CDS spreads, and whether these impacts are amplified by rollover risk. To do so, we re-estimate our baseline specification, replacing BDI shocks with uncertainty shocks while keeping the same set of control variables.

Table E.13 presents the results. In response to a one–standard-deviation increase in the VIX, exchange rates depreciate by 6.45%. Rollover risk amplifies this impact by 38.44%. The findings for CDS spreads are even stronger: a one–standard-deviation increase in the VIX leads to a 6.83% rise in CDS spreads. This effect is approximately 1.1 times larger for countries facing rollover risk. Overall, our findings suggest that global uncertainty shocks are transmitted more strongly to countries with greater rollover risk

Appendix Table E.1. FIR and Rollover Risk: The importance of Debt/GDP

	Exchange Rate	Credit Default Swaps
FIR	-0.0240	-0.0209
	(0.0168)	(0.0278)
FIR $\times$ *TopFBM*	-0.0078**	-0.0421***
	(0.0036)	(0.0138)
FIR $\times$ *TopDebt*	0.0078	0.0262
	(0.0091)	(0.0192)
Observations	672	638
Country FE	Yes	Yes
Time FE	Yes	Yes
Controls	Yes	Yes
R-squared	0.5541	0.5657

This table reports the estimated coefficients of FIR, FIR$\times$ TopFBM, and FIR$\times$ TopDebt on the changes in the log of the exchange rate and the log of CDS. Observations are at the country-quarter level. The main independent variable is the measure of standardized flows implied by the rebalancings accumulated to the quarterly-level interacted with *TopFBM*. *TopFBM* is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_{c,t}$ variable (see Section 5.1). $TopDebt_{c,t}$ is an indicator variable that equals one if a country is in the top tercile of the distribution of Debt/GDP (sorted by quarter). We control for average bond maturity, total debt over GDP, GDP growth, interest rates, and the interaction of these variables with FIR. Robust standard errors clustered at the country level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Appendix Table E.2. BDI and Rollover Risk: The importance of Debt/GDP

	Credit Default Swaps	Credit Default Swaps
$\Delta \log BDI$	0.0024	
	(0.0289)	
$\Delta \log BDI \times$ TopFBM	0.0268***	0.0318***
	(0.0074)	(0.0076)
$\Delta \log BDI \times$ TopDebt	0.0199*	0.0395***
	(0.0111)	(0.0108)
Observations	878	878
Country FE	Yes	Yes
Time FE	No	Yes
Controls	Yes	Yes
R-squared	0.1778	0.2973

This table reports the estimated coefficients of $\Delta \log BDI$, $\Delta \log BDI \times$ TopFBM, and $\Delta \log BDI \times$ TopDebt on the changes in the log of CDS. Observations are at the country-month level. The main independent variable is the broad dollar index (BDI), which is a weighted average of the foreign exchange value of the US dollar against the currencies of a broad group of major US trading partner interacted with $TopFBM$. $TopFBM$ is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_{c,t}$ variable (see Section 5.1). $TopDebt_{c,t}$ is an indicator variable that equals one if a country is in the top tercile of the distribution of Debt/GDP (sorted by quarter). We control for average bond maturity, total debt over GDP, GDP growth, interest rates, and the interaction of these variables with $\Delta \log BDI$. Robust standard errors clustered at the time level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Appendix Table E.3. MPS and Rollover Risk: The importance of Debt/GDP

	Credit Default Swaps			
	[d]	[d+1]	[d+2]	[d+3]
MPS	0.1035	0.0187	0.3228	0.3331
	(0.3278)	(0.4065)	(0.5130)	(0.5050)
$MPS \times TopFBM$	0.1363*	0.1586	0.2893**	0.2921**
	(0.0761)	(0.1000)	(0.1423)	(0.1423)
$MPS \times TopDebt$	0.0122	0.0475	0.1268	0.1145
	(0.0894)	(0.1127)	(0.1348)	(0.1295)
Observations	1,235	1,235	1,235	1,220
Country $\times$ Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.1838	0.0831	0.1211	0.1213

This table reports the estimated coefficients of MPS, $MPS\times$ TopFBM, and $MPS\times$ TopDebt on the changes in the log of CDS, where d is the day of the FOMC. The main independent variable is the monetary policy shock from Bauer and Swanson (2023) interacted with $TopFBM$. $TopFBM$ is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_{c,t}$ variable (see Section 5.1). $TopDebt_{c,t}$ is an indicator variable that equals one if a country is in the top tercile of the distribution of Debt/GDP (sorted by quarter). We control for average bond maturity, total debt over GDP, GDP growth, interest rates, and the interaction of these variables with MPS. Robust standard errors clustered at the time level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Appendix Table E.4. FIR and Rollover Risk: Cyclicality

	Exchange Rate	Credit Default Swaps
FIR	-0.0285**	-0.0353
	(0.0123)	(0.0283)
FIR $\times$ $TopFBM$	-0.0074**	-0.0402***
	(0.0033)	(0.0123)
$TopFBM \times$ GDP Growth	0.0307	0.0580
	(0.0400)	(0.1539)
Observations	673	639
Country FE	Yes	Yes
Time FE	Yes	Yes
Controls	Yes	Yes
R-squared	0.5503	0.5634

This table reports the estimated coefficients of FIR and FIR$\times$ TopFBM on the changes in the log of the exchange rate and the log of CDS. Observations are at the country-quarter level. The main independent variable is the measure of standardized flows implied by the rebalancings accumulated to the quarterly-level interacted with $TopFBM$. $TopFBM$ is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_{c,t}$ variable (see Section 5.1). We control for average bond maturity, total debt over GDP, GDP growth, interest rates, and the interaction of these variables with FIR. We also control for cyclicality, measured by the interaction of TopFBM with GDP growth. Robust standard errors clustered at the country level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Appendix Table E.5. BDI and Rollover Risk: Cyclicality

	Credit Default Swaps	Credit Default Swaps
$\Delta \log BDI$	-0.0068	
	(0.0279)	
$\Delta \log BDI \times$ TopFBM	0.0288***	0.0358***
	(0.0071)	(0.0073)
$TopFBM \times$ GDP Growth	0.0511	0.0844
	(0.0857)	(0.0873)
Observations	879	879
Country FE	Yes	Yes
Time FE	No	Yes
Controls	Yes	Yes
R-squared	0.1762	0.2938

This table reports the estimated coefficients of $\Delta \log BDI$ and $\Delta \log BDI \times$ TopFBM on the changes in the log of CDS. Observations are at the country-month level. The main independent variable is the broad dollar index (BDI), which is a weighted average of the foreign exchange value of the US dollar against the currencies of a broad group of major US trading partner interacted with $TopFBM$. $TopFBM$ is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_{c,t}$ variable (see Section 5.1). We control for average bond maturity, total debt over GDP, GDP growth, interest rates, and the interaction of these variables with $\log \Delta BDI$. We also control for cyclicality, measured by the interaction of TopFBM with GDP growth. Robust standard errors clustered at the time level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Appendix Table E.6. MPS and Rollover Risk: Cyclicality

	Credit Default Swaps			
	[d]	[d+1]	[d+2]	[d+3]
MPS	0.0981	-0.0035	0.2555	0.2758
	(0.3078)	(0.3775)	(0.4746)	(0.4686)
$MPS \times TopFBM$	0.1382*	0.1634	0.3058**	0.3048**
	(0.0743)	(0.1004)	(0.1475)	(0.1483)
$TopFBM \times$ GDP Growth	0.0039	0.0137	0.0004	0.0171
	(0.0323)	(0.0394)	(0.0503)	(0.0481)
Observations	1,237	1,237	1,237	1,222
Country $\times$ Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.1838	0.0831	0.1209	0.1213

This table reports the estimated coefficients of MPS and $MPS\times$ TopFBM on the changes in the log of CDS, where d is the day of the FOMC. The main independent variable is the monetary policy shock from Bauer and Swanson (2023) interacted with $TopFBM$. $TopFBM$ is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_{c,t}$ variable (see Section 5.1). We control for average bond maturity, total debt over GDP, GDP growth, interest rates, and the interaction of these variables with MPS. We also control for cyclicality, measured by the interaction of TopFBM with GDP growth. Robust standard errors clustered at the time level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Appendix Table E.7. FIR and Rollover Risk: Persistence

	Exchange Rate	Credit Default Swaps
FIR	-0.0248**	-0.0317
	(0.0101)	(0.0293)
FIR $\times$ $TopFBM$	-0.0059**	-0.0391***
	(0.0027)	(0.0119)
Lag of FIR	-0.0062*	-0.0068
	(0.0032)	(0.0064)
Observations	673	639
Country FE	Yes	Yes
Time FE	Yes	Yes
Controls	Yes	Yes
R-squared	0.5583	0.5643

This table reports the estimated coefficients of FIR and FIR$\times$ TopFBM on the changes in the log of the exchange rate and the log of CDS. Observations are at the country-quarter level. The main independent variable is the measure of standardized flows implied by the rebalancings accumulated to the quarterly-level interacted with $TopFBM$. $TopFBM$ is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_{c,t}$ variable (see Section 5.1). We control for average bond maturity, total debt over GDP, GDP growth, interest rates, and the interaction of these variables with FIR. We also add one lag of FIR to control for persistence. Robust standard errors clustered at the country level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Appendix Table E.8. FIR and Rollover Risk: Excluding countries at 10% threshold

	Exchange Rate	Credit Default Swaps
FIR	-0.0318**	-0.0348
	(0.0122)	(0.0330)
FIR $\times$ $TopFBM$	-0.0066*	-0.0346***
	(0.0034)	(0.0113)
Observations	525	491
Country FE	Yes	Yes
Time FE	Yes	Yes
Controls	Yes	Yes
R-squared	0.5792	0.5299

This table reports the estimated coefficients of FIR and FIR$\times$ TopFBM on the changes in the log of the exchange rate and the log of CDS. Observations are at the country-quarter level. The main independent variable is the measure of standardized flows implied by the rebalancings accumulated to the quarterly-level interacted with $TopFBM$. $TopFBM$ is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_{c,t}$ variable (see Section 5.1). We control for average bond maturity, total debt over GDP, GDP growth, interest rates, and the interaction of these variables with FIR. We exclude countries at the 10% threshold when constructing the FIR measure. Robust standard errors clustered at the country level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Appendix Table E.9. Rollover Risk and Price Effects: Local Currency CDS Spreads

	CDS LC 3Y		CDS LC 4Y		CDS LC 5Y	
	(1)	(2)	(3)	(4)	(5)	(6)
ΔFBM	0.0168*	0.0157*	0.0149**	0.0141**	0.0104*	0.0098
	(0.0083)	(0.0083)	(0.0066)	(0.0064)	(0.0062)	(0.0061)
Average Maturity LC		0.0113		0.0104		0.0100
		(0.0071)		(0.0067)		(0.0061)
Debt/GDP		-0.1027***		-0.0811***		-0.0652***
		(0.0262)		(0.0230)		(0.0206)
Observations	423	423	423	423	423	423
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes
R-squared	0.6198	0.6256	0.6176	0.6231	0.6051	0.6105

This table reports the estimated coefficients of $\Delta FBM_{c,t}$ on the log of local currency CDS spreads with maturities of 3Y, 4Y, and 5Y. $\Delta FBM_{c,t}$ is the change in the fraction of local currency bonds maturing within one year. Observations are at the country-quarter level. We control for average bond maturity and total debt over GDP. Robust standard errors clustered at the country level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Appendix Table E.10. Capital Flows and Rollover Risk: FIR Shocks

	Exchange Rate	Credit Default Swaps
FIR	-0.0419**	-0.0398
	(0.0196)	(0.0347)
FIR × *TopFBM_DD2*	-0.0090**	-0.0331**
	(0.0042)	(0.0150)
Observations	626	598
Country FE	Yes	Yes
Time FE	Yes	Yes
Controls	Yes	Yes
R-squared	0.5591	0.5610

This table reports the estimated coefficients of FIR and FIR× TopFBM_DD2 on the changes in the log of the exchange rate, and the log of CDS. Observations are at the country-quarter level. The main independent variable is the measure of standardized flows implied by the rebalancings accumulated to the quarterly-level interacted with *TopFBM_DD2*. *TopFBM_DD2* is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_DD2_{c,t}$ variable ($FBM_DD2_{c,t} = \frac{DD2_{c,t}}{\text{GDP}_{c,t}}$), where DD2 is the amount of debt due in two years. We control for average bond maturity, total debt over GDP, GDP growth, interest rates, and the interaction of these variables with FIR. Robust standard errors clustered at the country level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Appendix Table E.11. Capital Flows and Rollover Risk: BDI Shocks

	Credit Default Swaps	Credit Default Swaps
$\Delta \log BDI$	-0.0134	
	(0.0285)	
$\Delta \log BDI \times TopFBM_DD2$	0.0172*	0.0215**
	(0.0087)	(0.0082)
Observations	799	799
Country FE	Yes	Yes
Time FE	No	Yes
Controls	Yes	Yes
R-squared	0.1685	0.2841

This table reports the estimated coefficients of $\Delta \log BDI$ and $\Delta \log BDI \times TopFBM_DD2$ on the changes in the log of CDS. Observations are at the country-month level. The main independent variable is the broad dollar index (BDI), which is a weighted average of the foreign exchange value of the US dollar against the currencies of a broad group of major US trading partner interacted with $TopFBM_DD2$. $TopFBM_DD2$ is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_DD2_{c,t}$ variable ($FBM_DD2_{c,t} = \frac{DD2_{c,t}}{\text{GDP}_{c,t}}$), where DD2 is the amount of debt due in two years. We control for average bond maturity, total debt over GDP, GDP growth, interest rates, and the interaction of these variables with $\log \Delta BDI$. Robust standard errors clustered at the time level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Appendix Table E.12. Capital Flows and Rollover Risk: Monetary Policy Shocks

	Credit Default Swaps			
	[d]	[d+1]	[d+2]	[d+3]
MPS	0.0588	-0.0984	0.0969	0.1130
	(0.3070)	(0.3790)	(0.4587)	(0.4531)
$MPS \times TopFBM_DD2$	0.0999	0.1213	0.2115	0.2120
	(0.0675)	(0.0963)	(0.1324)	(0.1326)
Observations	1,141	1,141	1,141	1,126
Country $\times$ Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.1957	0.1047	0.1590	0.1599

This table reports the estimated coefficients of MPS and $MPS \times TopFBM_DD2$ on the changes in the log of CDS, where d is the day of the FOMC. The main independent variable is the monetary policy shock from Bauer and Swanson (2023) interacted with $TopFBM_DD2$. $TopFBM_DD2$ is an indicator variable that equals one if the country is in the top tercile in terms of the $FBM_DD2_{c,t}$ variable ($FBM_DD2_{c,t} = \frac{DD2_{c,t}}{\text{GDP}_{c,t}}$), where DD2 is the amount of debt due in two years. We control for average bond maturity, total debt over GDP, GDP growth, interest rates, and the interaction of these variables with MPS. Robust standard errors clustered at the time level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

Appendix Table E.13. VIX and Rollover Risk

	Exchange Rate	Exchange Rate	Credit Default Swaps	Credit Default Swaps
VIX	0.0645***		0.0683***	
	(0.0101)		(0.0243)	
VIX × TopFBM		0.0248*		0.0740**
		(0.0137)		(0.0333)
Observations	673	673	639	639
Country FE	Yes	Yes	Yes	Yes
Time FE	No	Yes	No	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.99	0.99	0.82	0.88

This table reports the estimated coefficients of VIX and $VIX \times TopFBM$ on the log of exchange rates and CDS spreads. Observations are at the country-quarter level. The main independent variable is the VIX interacted with $TopFBM$. $TopFBM$ is an indicator variable that equals one if the country is in the top tercile in terms of the FBM_c,t variable. We control for average bond maturity, total debt over GDP, GDP growth, interest rates, and the interaction of these variables with VIX. Robust standard errors clustered at the time level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.