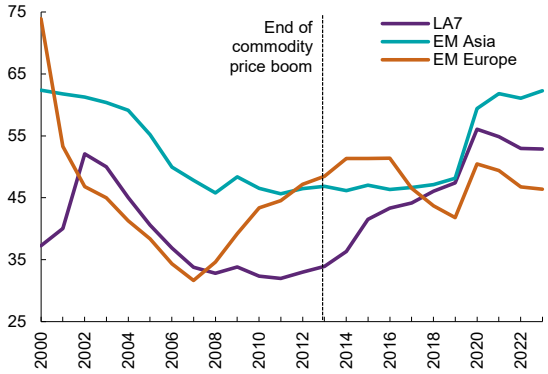
Public Debt Dynamics in Latin America: Time to Rebuild Buffers and Strengthen Fiscal Frameworks[1] (Background Paper 2)

Public debt soared globally during the past decade, and Latin America was no exception. Indebtedness in the region rose markedly following the end of the commodity price boom as fiscal discipline weakened despite the presence of fiscal rules. High financing costs also contributed to the debt buildup, although the shift toward longer maturities and domestic-currency financing helped mitigate vulnerabilities. Despite successfully weathering the pandemic, and ambitious fiscal consolidation plans, public debt in the region is projected to remain elevated over the medium term amid persistently high financing costs and slow growth. Greater fiscal efforts are needed to firmly put debt on a downward path and rebuild buffers. Strengthening fiscal frameworks and enhancing the effectiveness of fiscal rules will be key to deliver fiscal discipline. This, in turn, will strengthen credibility and reduce financing costs, helping to improve debt dynamics.

1. Introduction

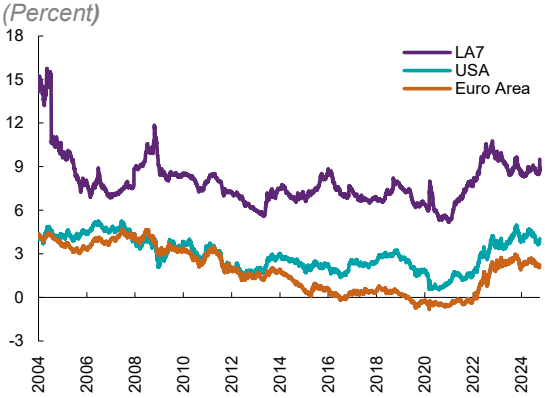
Public debt levels soared across the globe over the past decade. In seven large economies in Latin America (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, and Uruguay, henceforth LA7), after the steady decline that accompanied the commodity price boom in the early 2000s, public debt surged starting around 2013 (Figure 1). And, while the pandemic had a less-than-expected fiscal impact, debt levels remain elevated, especially in light of the region's prospects of low growth, high financing costs (Figure 2), and growing spending demands to address social needs. Moreover, prospects for debt dynamics in LA7—which may compete for global financing with advanced economies (AEs) and other emerging markets (EMs)—are clouded by a global environment of high uncertainty.

Figure 1. Gross Public Debt
(Percent of GDP)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Aggregates are simple averages. EM = emerging markets; EM Asia = India, Indonesia, Malaysia, Philippines, Thailand; EM Europe = Bosnia and Herzegovina, Bulgaria, Hungary, Poland, Romania, Serbia; LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

Figure 2. Nominal Ten-Year Local Currency Sovereign Bond Yields
(Percent)



Sources: Bloomberg Finance L.P.; Haver Analytics; and IMF staff calculations.
Note: LA7 is simple average. LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

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Against this backdrop, this paper explores the following questions:

- What lessons can be drawn from past debt dynamics in LA7 for assessing future debt sustainability risks? What were the main drivers of the debt buildup? Have these changed over time? How do they compare to those of other EMs?
- What role have fiscal frameworks and debt management strategies played in shaping debt dynamics and risks in LA7?
- What is the debt outlook for these economies? Are fiscal consolidation plans sufficient to tangibly put debt on a desirable downward path? Are fiscal frameworks sufficiently strong to deliver on these fiscal objectives?

2. The Evolution of Public Debt in LA7

This section provides an in-depth analysis of the drivers of public debt dynamics over the past 20 years, decomposing changes in debt-to-GDP ratios into five key drivers: primary balances (i.e., fiscal discipline), GDP growth, financing costs, exchange rate effects, and residuals.[2]

Debt Dynamics in Latin America

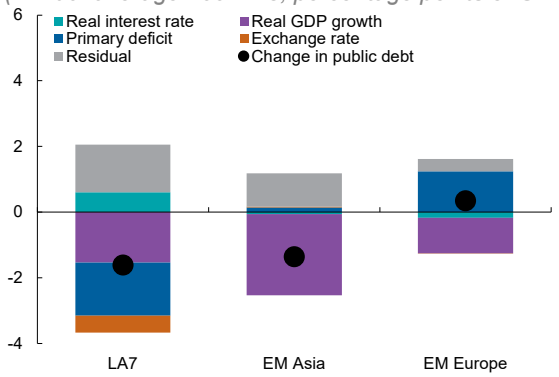
Public debt declined steadily during the commodity price boom. Between 2003 and 2013, the average public debt-to-GDP ratio in LA7 economies declined from 50 to 34 percent, supported by strong primary surpluses, solid growth, and appreciating domestic currencies (Figure 3), consistent with a usual response of economies to a positive terms-of-trade shock.[3] In contrast, real interest rates—reflecting financing costs in both domestic and foreign currency—and large residuals prevented a faster decline in public debt during this period. A comparison with peer economies in EM Asia and EM Europe highlights the strong fiscal performance in these economies during this period, although largely offset by their higher financing costs.

Progress made through 2013 was reversed in the years preceding the pandemic. The forces that previously contributed to the decline in debt reversed (Figure 4) following the end of the commodity price boom (IMF 2015), leading to a rise in public debt to about 47 percent of GDP by 2019. Primary surpluses turned into deficits, exchange rates depreciated, and growth slowed—reducing the contribution to debt reduction by half. The change in debt dynamics in the region was also characterized by a marked reduction of residuals (see discussion below). These developments contrast with both EM Asia and EM Europe, where primary balances pushed debt up in both periods (more so in EM Asia after 2014) amid a more stable contribution from growth over time, despite a shift in financing costs in EM Asia and the upward effect of currency depreciation in EM Europe.

[2] The analysis follows the methodology of the IMF Debt Sustainability Framework for Market Access Countries (MAC DSA), laid out in IMF (2021a), which decomposes changes in public debt (in percent of GDP) in terms of the contributions of real interest rates, exchange rates, growth, and primary balances. Changes in public debt that cannot be attributed to these drivers are defined as residuals, which comprise stock-flow adjustments arising (for example, from the materialization of contingent liabilities, interest revenue, institutional changes, asset purchases and sales), and other below-the-line operations (e.g., arrears clearance and statistical discrepancies) (IMF 2022). See Annex 1 for details.

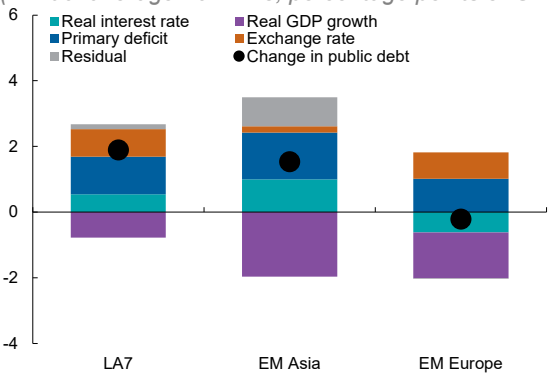
[3] See, for example, Mendoza's (1995) seminal contribution, and Cashin, Céspedes, and Sahay (2004), Schmitt-Grohé and Uribe (2018), Gruss and Kebhaj (2019), and Di Pace, Juvenal, and Petrella (2020), among others. See also Gruss, Nabar, and Poplawski-Ribeiro (2019), which studies the role of external conditions in growth accelerations.

Figure 3. Decomposition of Public Debt Changes During the Commodity Price Boom
(Annual average 2004–13; percentage points of GDP)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Aggregates are simple averages. EM = emerging markets; EM Asia = India, Indonesia, Malaysia, Philippines, Thailand; EM Europe = Bosnia and Herzegovina, Bulgaria, Hungary, Poland, Romania, Serbia; LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

Figure 4. Decomposition of Public Debt Changes After the Commodity Price Boom
(Annual average 2014–23; percentage points of GDP)

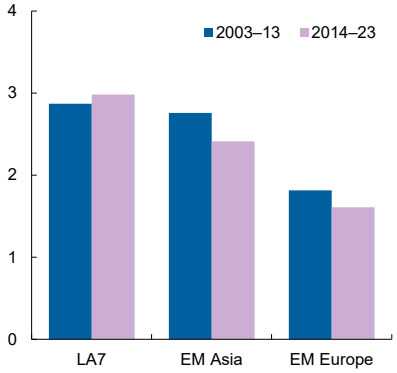


Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Aggregates are simple averages. EM = emerging markets; EM Asia = India, Indonesia, Malaysia, Philippines, Thailand; EM Europe = Bosnia and Herzegovina, Bulgaria, Hungary, Poland, Romania, Serbia; LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

Drivers of Financing Costs and the Interest-Growth Differential

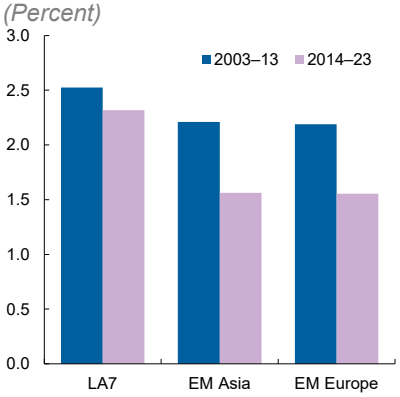
LA7 has faced high financing costs in both domestic and foreign currency. At about 3 percent of GDP, these economies have historically devoted a larger share of GDP to interest payments than other EMs (Figure 5)—in fact, that share has increased slightly since the end of the commodity price boom, while it has declined in other EMs. This is explained by higher average interest rates and, in some cases, higher debt levels. For example, these economies' marginal rate on US dollar financing—measured by the J.P. Morgan benchmark bond index EMBIG—has carried a spread over the risk-free rate of around 250 basis points on average, compared to around 150 basis points for other EMs (Figure 6). Similarly, for local currency financing, long-term real rates in LA7 have been consistently higher than those of other EMs (Figure 7), standing above 5 percent in 2024 compared to about 2¾ percent in EM Asia and ½ percent in EM Europe.

Figure 5. Gross Interest Payments
(Percent of GDP)



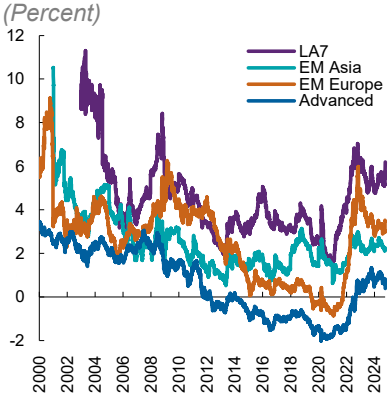
Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Aggregates are simple averages. EM Asia = India, Indonesia, Malaysia, Philippines, Thailand; EM Europe = Bosnia and Herzegovina, Bulgaria, Hungary, Poland, Romania, Serbia; LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

Figure 6. EMBIG Sovereign Spreads
(Percent)



Sources: JP Morgan Markets; and IMF staff calculations.
Note: Aggregates are simple averages. EM Asia = India, Indonesia, Malaysia, Philippines, Thailand; EM Europe = Bulgaria, Hungary, Poland, Romania, Serbia; LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

Figure 7. Real 10-Year Local Currency Sovereign Bond Yields
(Percent)



Sources: Bloomberg Finance L.P.; Haver Analytics; and IMF staff calculations.
Note: The real (ex-ante) 10-year local currency sovereign bond yields are measured by adjusting the nominal 10-year local currency sovereign bond yields by the midpoint inflation target for each country. Advanced = Germany, Japan, United Kingdom, United States; EM = emerging markets; EM Asia = India, Indonesia, Malaysia, Philippines, Thailand; EM Europe = Bulgaria, Hungary, Poland, Romania; LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

Domestic factors explain a large fraction of US dollar denominated bond spreads in LA7. To further understand the drivers of spreads, we estimate a panel data model (Annex 2) for EMBIG spreads as a function of domestic factors—including measures of debt levels (debt to GDP), the interest rate burden (interest payments to revenue), government effectiveness, real GDP growth, reserves to GDP, stress history—and global factors—such as the VIX and the US 10-year interest rate (Figure 8, panel 1).[4] Our analysis shows that, on average (2003–23), relatively higher spreads paid by LA7 countries reflect lower government effectiveness, lower levels of reserves, less favorable stress history, higher debt-to-GDP ratio, and unobserved heterogeneity. At the same time, higher interest to revenue explained higher spreads when compared to EM Europe, but lower spreads when compared to EM Asia (Figure 8, panel 2). Domestic factors explained approximately 65 percent of the level of spreads (Figure 8, panel 3). Overall, these results suggest that there is scope to reduce financing costs through strengthening fiscal frameworks and enhancing government effectiveness.

Local-currency financing costs reflect a significant term premium. We decompose local currency yields into a term premium and an expected average short rate component using a Gaussian dynamic term structure model following Joslin, Priebsch, and Singleton (2014) (Annex 3). For the 10-year bond, yield levels are explained by expected average short rates, while variations in yields are explained by movements in the term premium (Figure 8, panel 4).[5] The decomposition of 10-year yields also shows the surge in yields with the post-pandemic inflation spike in LA5 mostly reflected an increase in term premia. Current short rates, measured by the yield of short-maturity bonds (3-month yield), are mainly influenced by current inflation levels and US monetary policy rates, while the term premium of long-maturity bonds (5-year and 10-year) is primarily driven by inflation volatility (Figure 8, panel 5). By contrast, the expected average short-rate component moved much less over the same period thanks to better anchored inflation expectations. Therefore, low, and stable inflation rates, and monetary policy credibility, appear to be key to lowering local-currency financing costs.[6]

High financing costs amid low growth imply unfavorable debt dynamics in LA7. In line with other EMs in Asia and Europe, growth in these economies decelerated following the end of the commodity price boom. However, financing costs—including valuation effects—remained high relative to other EMs due to high interest rates and exchange rate depreciation. This implied a less favorable interest-growth differential (r-g) since 2014 compared to other EMs (Figure 8, panel 6).

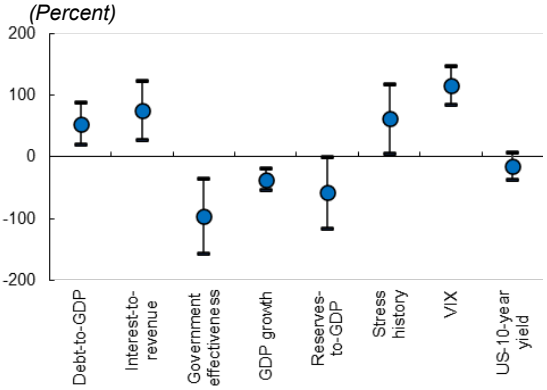
[4] IMF (2024a), using monthly data and focusing on changes on spreads, finds that global factors explain a large fraction of changes external currency spreads, but a much lower fraction of changes in local-currency yields for emerging market and developing economies. The qualitative results in Figure 1 Panels 1-3 are in line with findings in the empirical literature on sovereign spreads (Hilscher and Nosbusch 2010) and structural models of credit risk. See Annex 2 for a detailed discussion.

[5] The short rate refers to the 3-month treasury yield, which closely tracks the monetary policy rate. The term premium (usually positive) is the residual term of the treasury yield after subtracting the expected average short rate over a 10-year horizon. This reflects the premium from risks of holding fixed-rate long-term bonds instead of rolling over short-term bonds.

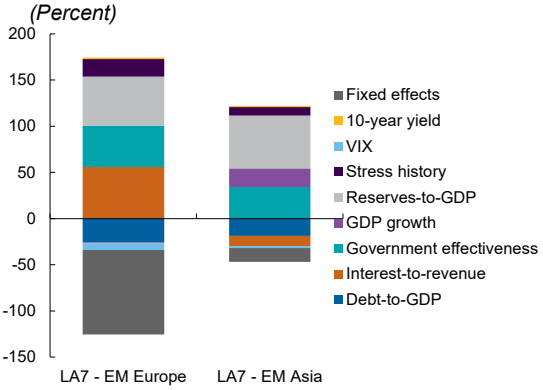
[6] The benefits of sound monetary policy on financing costs have been widely studied. See, for example, among many others, Clarida, Gali, and Gertler (2000), which shows the benefits of the Volcker Greenspan monetary regime in decreasing inflation, real rates, and output volatility; Wachter (2006), which shows how inflation volatility generates an increase in the term premium; Buraschi and Jiltsov (2005), which shows that the inflation risk premium has been substantial in the US, and peaked at the time of the inflation spike in the 1980s; Du, Pflueger, and Schreger (2020), which shows how the possibility of generating inflation ex-post precludes from government from borrowing in their own currencies.

Figure 8. Determinants of Financing Costs in LA7

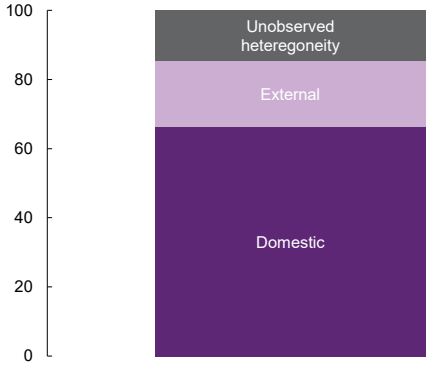
1. Response of EMBIG Sovereign Spreads to Domestic and Global Factors[1]
(Percent)



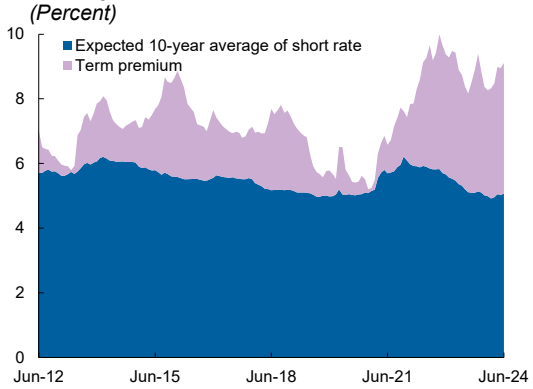
2. Decomposition of Difference in Spreads with Other Regions[2]
(Percent)



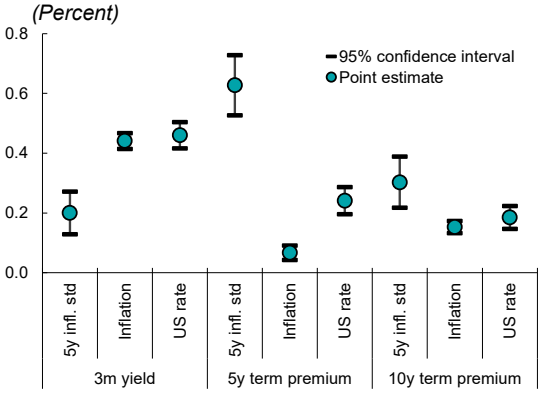
3. Common Drivers of Spreads[3]
(Percent)



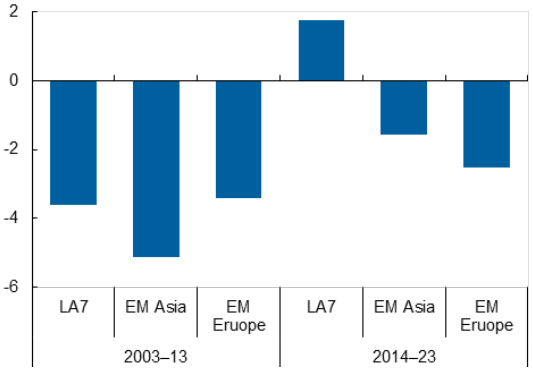
4. LA5: Ten-year Local Currency Government Bond Yield Decomposition[4]
(Percent)



5. Response of Short Rate and Term Premium to Inflation Uncertainty, Level, and US Rates[5]
(Percent)



6. Average Effective Interest-Growth Differential[6]
(Percentage points; local currency-denominated)



Sources: Haver Analytics; IMF, World Economic Outlook database; Reuters; Refinitiv Eikon; and IMF staff calculations.
Note: EM = emerging markets; EM Asia = India, Indonesia, Malaysia, Philippines, Thailand; EM Europe = Bosnia and Herzegovina, Bulgaria, Hungary, Poland, Romania, Serbia; LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).
[1]Estimated coefficients from a panel regression, at annual frequency, of the EMBI (independent variable) on Debt-to-GDP ratios, Interest-to-revenue, Government Effectiveness index, real GDP annual growth, Reserves-to-GDP, Stress History index, the VIX, and the 10-year yield. Country fixed effects are included. Sample is Latin America and the Caribbean (LAC): Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, Uruguay, and Venezuela. In Europe: Bulgaria, Hungary, Poland, Russia, Serbia, and Ukraine. In Asia: India, Indonesia, Jordan, Korea, Malaysia, Philippines, Qatar, Thailand, and Vietnam. In Africa and the Middle East: South Africa, Egypt, Jordan, and Qatar.
[2]Each component is the difference between the average for LA7 and for EM Asia and EM Europe, respectively for the period 2003–23.
[3]Decomposition between external and domestic factors is measured as the fraction of the R-squared in a regression of only domestic factors to the R-squared of a regression with both global and domestic factors.
[4]Gaussian dynamic term structure model with three latent factors and two macro factors, including inflation (year-over-year) and US three-month yield (Wu-Xia shadow rate before February 2022 to account for zero lower bound), estimated by country with monthly data. Short rate is defined as three-month yield. Decomposition is done for each country and simple average is taken.
[5]Short rate is defined as three-month yield. LA7 (excluding Paraguay and Uruguay) plus other EMs (Hungary, Poland, Indonesia, Malaysia, Thailand) panel with country fixed effect regression using decomposition from a Gaussian dynamic term structure model. Inflation uncertainty is proxied with rolling standard deviation of monthly inflation outturns over the last five years.
[6]Effective interest rate includes valuation effects due to changes in the exchange rate. Effective rates are total interest payments as a fraction of GDP. Aggregates are simple averages.

The Role of Primary Balances

Weak fiscal discipline also played a role in the buildup of debt before the pandemic, despite the presence of fiscal rules. During the first years of the commodity price boom, primary revenues increased from around 20 percent of GDP in 2000 to about 25 percent in 2008 (Figure 9, panel 1), owing to rapid economic growth and related tax reforms in some countries. However, revenues flattened as the boom came to an end, while expenditures continued to rise—shifting from capital to social spending— leading to a deterioration of primary balances.[7] While fiscal rules—which were adopted in the region starting in the early 2000s—may have contained the deterioration of public finances, they did not prevent it. The increase in public debt took place while complying with rules (Figure 9, panel 2) as the operational targets were modified frequently and relaxed over time (Figure 9, panel 3).[8] For the most part, fiscal rules in the region combine budget balance and expenditure rules (Figure 9, panel 4), and only one country had introduced a debt rule by 2013. As of 2022, LA7 still lags in terms of the share of debt rules relative to both advanced economies (27 percent) and other EMs (37 percent) (Figure 9, panel 5). Given the frequent modification in the operational targets of fiscal rules, and the low adoption of debt rules in the region, there is scope for improvement in the design of fiscal rules to harmonize with ongoing practices among advanced economies (AEs), particularly through the introduction of debt rules. The advantage of this type of rules is that they guarantee debt sustainability, are simple and transparent, and provide needed flexibility to smooth negative shocks while maintaining accountability.[9]

Stock-Flow Adjustments

The role of residuals has diminished over time. As mentioned above, large residuals prevented a faster decline in public debt during the 2003–14 period in the region (Figure 3), reflecting country-specific developments. In Chile, for example, a rapid accumulation of financial assets took place between 2004 and 2008, and substantial spending in capitalization and policy lending in response to the global financial crisis. In Brazil, for instance, proactive portfolio management operations, bond issuances to the central bank for repo operations as part of the monetary policy management strategy, other transfers to the central bank, and the management of policy buffers. In Mexico, valuation effects to inflation-linked bonds (*Udibonos*), as well as subpar bond issuance. In Paraguay, statistical discrepancies associated with coverage (the non-financial public sector is larger than the General Government), and some capital injections to the country's electricity company. In Uruguay, a reprofiling of public debt in the early 2000's that included an increase in maturity and some haircuts. This was also the case in other EMs during that time, albeit of smaller magnitude, especially in Europe. Residuals had a smaller impact on debt dynamics in the LA7 countries during 2014–23 (Figure 4). This reduced impact was partly due to the use of policy buffers during the pandemic, which resulted in negative residuals that offset the positive, but lower, residuals observed during 2013–20.[10]

[7] IMF (2015) look at the impact of the end of the commodities boom on public finances in Latin America. In some countries (e.g., Colombia), contemporaneous non-discretionary spending is linked to past revenue performance, making budget cuts more challenging in years of large drops in revenues.

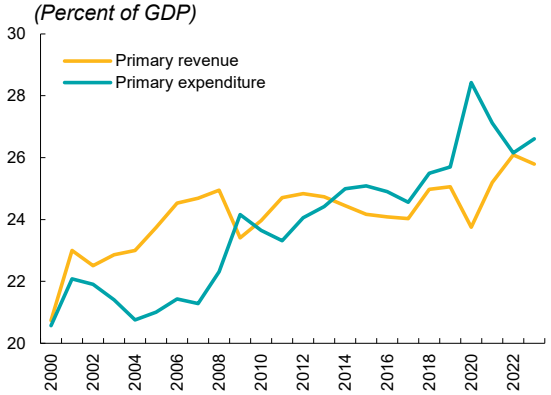
[8] Following Ardanaz, Ulloa-Suárez, and Valencia (2024), compliance is measured as the ratio of years of compliance with the rule and the number of years that the rule has been in place. The years during which escape clauses were invoked are excluded from the calculations.

[9] The introduction of debt anchors has been part of the reform discussions in Europe. See, for example, Blanchard, Leandro, and Zettelmeyer (2021), Benassy-Quere and others (2018), Beetsma and others (2018), Constancio (2020), and Feld and others (2018).

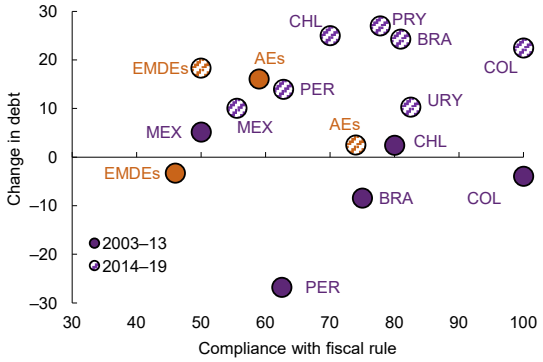
[10] The IMF 2024 Fiscal Monitor (IMF 2024a), "Putting a Lid on Debt", discusses the sources of stock-flow adjustments using a narrative approach based on the individual staff reports in a sample of EMDE's in the period 2010–23. The main source of stock-flow adjustments was the materialization of contingent liabilities (related to SOEs, loan guarantees, bank recapitalization, and natural disasters, among others), arrears, institutional changes, and statistical discrepancies. The chapter also discusses the role of fiscal rules and transparency in reducing stock-flow adjustments, the latter measured by the Fiscal Transparency Index from the Open Budget Survey Index.

Figure 9. Fiscal Rules and Compliance in LA7

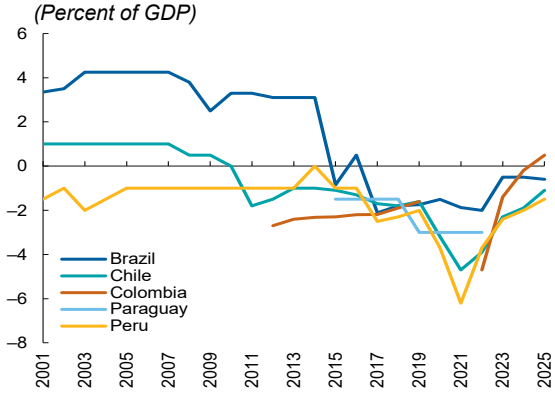
1. LA7: Primary Revenue and Primary Expenditure
(Percent of GDP)



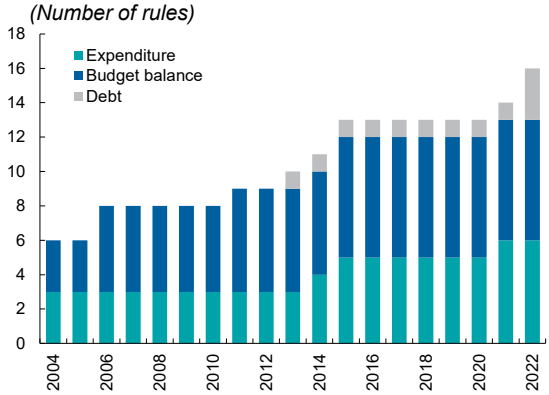
2. Changes in Debt and Compliance with Fiscal Rules[1]
(Percent of GDP)



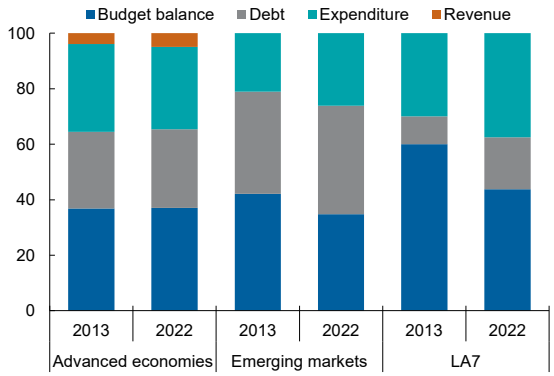
3. Fiscal Targets for Budget Balance Rules[2]
(Percent of GDP)



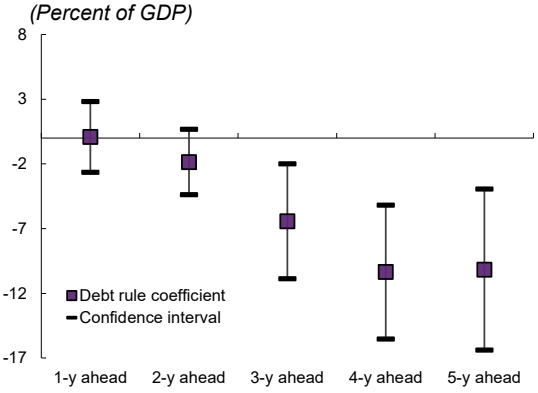
4. LA7: Evolution of Fiscal Rules[3]
(Number of rules)



5. Types of Fiscal Rules[4]
(Percent share)



6. LA7: Response of Stock-Flow Adjustment Surprises to the Presence of Debt Rules[5,6]
(Percent of GDP)



Sources: Davoodi and others (2022); IMF, World Economic Outlook database; Larch and others (2023); survey of IMF country teams; Ulloa-Suarez and Valencia (2022); and IMF staff calculations.
Note: Aggregates are simple averages unless otherwise indicated. LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).
[1]Compliance is measured as the average compliance across all fiscal rules during a given period (see Ulloa-Suarez and Valencia 2023), except for compliance for AEs and EMDEs, which is based on budget balance rules only (Davoodi and others, 2022). Debt increase is measured as the change in gross general government debt in percent of GDP between the last and first year of a period. Debt increase reflects the median.
[2]Chart reflects the fiscal target set at the beginning of each year. Brazil sets a primary balance fiscal target, Chile and Colombia a structural balance fiscal target, and Peru and Paraguay an overall balance target.
[3]Each bar denotes the number of countries in a region that has a particular fiscal rule (budget balance, debt, expenditure, revenue).
[4]For each year and each region, the number of a particular fiscal rule (budget balance, debt, expenditure, revenue) is computed as a fraction of the number of rules in the region. The number of rules in the region is the sum of rules by country and type of rule.
[5]The purple square depicts β_n, coefficient on debt rules, for each of the 1, 2, 3, 4, 5-year horizons. Regression includes country-horizon fixed effects. Control variables are elections, quality of governance, real growth of per capita GDP, inflation, public debt ratio, and primary balance.
[6]The increase in the difference over time reflects the cumulative effect of lower forecast error average over the projection horizon.

The adoption of debt rules partially helps explain the decline in the residuals in LA7. Regression analysis suggests that the adoption of debt rules contributed to reducing stock-flow adjustments (Figure 9 panel 6 and Annex 4).[11] Specifically, debt rules have reduced unanticipated stock-flow adjustments, captured by a negative and statistically significant coefficient for 3- to 5-year ahead forecasts. On average, stock-flow adjustment forecast errors in countries with a debt rule are 7 to 10 percentage points of GDP lower than in countries without a debt rule over the medium term. In contrast, budget balance rules do not seem to have an impact on the behavior of residuals. One potential mechanism relates to the implementation of other supporting policies that usually accompany the adoption of debt rules, including improvements in public financial management, public investment management, and fiscal transparency, as these help countries strengthen their control of public finances.[12] Moreover, the experience with budget balance rules in LA7 points to a considerable degree of flexibility on the adopted targets, as they have changed frequently, especially when there are risks of breaching the rule.

3. Debt Outlook, Vulnerabilities, and Risks

This section presents the outlook for public debt for 2024–29, remaining vulnerabilities, and stress scenarios to various types of shocks.

Debt Outlook for LA7

Public debt in LA7 is projected to remain broadly unchanged over the medium term. Under the assumption that the projected strengthening of fiscal balances materializes, the group's public debt is projected to stabilize around 55 percent of GDP in 2024–29, middle-ground relative to other EMs in Asia and Europe (Figure 10). Key to this outcome is the expected strengthening of primary balances (Figure 11), which contrasts with other EMs, where primary balances are projected to contribute to increasing debt (Figure 12). Meanwhile, financing costs in LA7 are projected to play a larger role than in the past—largely because of higher average debt levels and higher servicing costs over the projection horizon—while their contribution in other EMs is projected to be smaller, effectively resulting in a more favorable r-g.[13] The larger role of financing costs offsets the expected contribution from growth, which in turn is projected to remain close to its low historical average, reflecting long-standing challenges including from low investment and productivity growth, as well as shifting demographics (IMF 2024b, 2024c).

Financing costs are expected to moderate but remain high relative to peers. Following the sharp increase during the pandemic, foreign currency sovereign yields are projected to decline gradually in LA7 and other EMs (Figure 13). This reflects the effects of external factors, including a decline in long-term rates, and expectations of debt stabilization. High sovereign yields relative to peers are driven by domestic factors including governance indicators and other country-specific drivers.[14] Local currency yields are also projected to moderate substantially at the short end (3-month) of the government bond yield curve, and to a lesser extent at the long end (10-year), mainly supported by the expectation that inflation will continue to decline toward (or stay close to) the established targets (Figure 14).

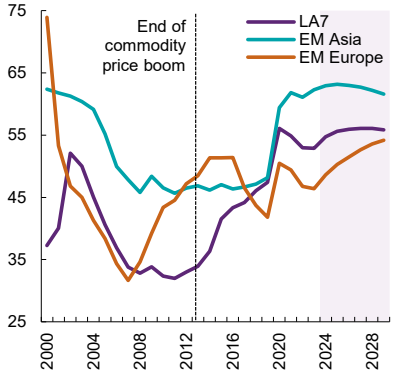
[11] The exercise estimates the effect of debt rules and budget balance rules on stock-flow adjustment forecast errors over the medium term (Perrelli and others 2024). The regression includes controls on macroeconomic variables (per capita real GDP growth, inflation), trading partners' growth surprises and inflation surprises, dummies for election years, governance indicators (corruption, government effectiveness), debt-to-GDP and primary balance-to-GDP ratios at the year of the WEO submission (initial conditions), per capita purchasing power parity (PPP dollars), age dependency ratios, terms of trade, and sovereign credit rating indices. The results hold for a larger set of AEs and EMs.

[12] See, among others, IMF (2016) and IMF (2021b), which discuss, respectively, best practices on fiscal risk management, and the assessment of fiscal risks from state-owned enterprises.

[13] The projected positive contribution from residuals reflects anticipated debt management operations, transfers to central banks, and management of policy buffers in some countries.

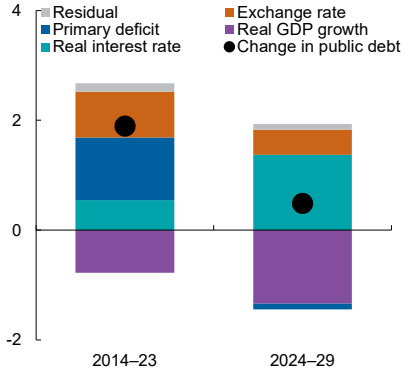
[14] The focus on sovereign yields, rather than spreads, reflects that yields are more relevant for the assessment of debt sustainability.

Figure 10. EMs: Gross Public Debt
(Percent of GDP)



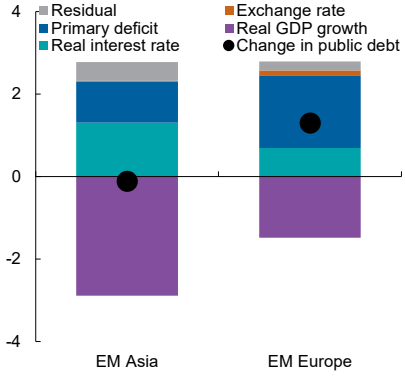
Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Aggregates are simple averages. EM = emerging markets; EM Asia = India, Indonesia, Malaysia, Philippines, Thailand; EM Europe = Bosnia and Herzegovina, Bulgaria, Hungary, Poland, Romania, Serbia; LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

Figure 11. LA7: Decomposition of Public Debt Changes
(Annual average; percent of GDP)



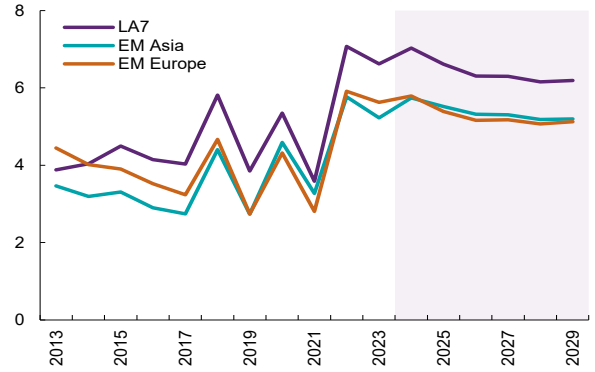
Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Aggregates are simple averages. LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

Figure 12. EMs: Decomposition of Public Debt Changes, 2024–29
(Annual average; percent of GDP)



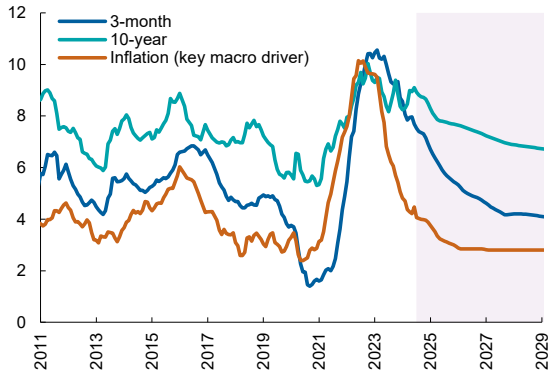
Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Aggregates are simple averages. EM = emerging markets; EM Asia = India, Indonesia, Malaysia, Philippines, Thailand; EM Europe = Bosnia and Herzegovina, Bulgaria, Hungary, Poland, Romania, Serbia.

Figure 13. Foreign Currency Sovereign Yields in Selected EMs
(Percent)



Sources: Haver Analytics; IMF, World Economic Outlook database; Reuters; and IMF staff calculations.
Note: Dynamic forecast of a panel regression of the EMBIG (independent variable) on Debt-to-GDP ratios, Interest-to-revenue, Government Effectiveness index, GDP growth, Reserves-to-GDP, the Stress History index, the VIX, and the US 10-year yield. Country fixed effects are included. We add the US 10-year rate to the spreads to obtain the level of yields. Aggregates are simple averages. EM = emerging markets; EM Asia = India, Indonesia, Malaysia, Philippines, Thailand; EM Europe = Bosnia and Herzegovina, Bulgaria, Hungary, Poland, Romania, Serbia; LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

Figure 14. LA5: Local Currency Sovereign Yields
(Mean; percent)



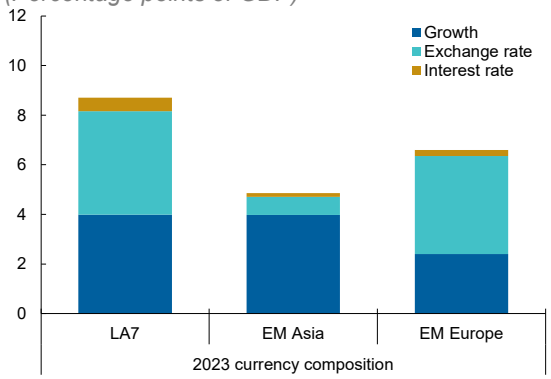
Sources: Haver Analytics; IMF, World Economic Outlook database; Reuters; and IMF staff calculations.
Note: Gaussian dynamic term structure model with three latent factors and two macro factors, including inflation (year-over-year) and US 3-month yield (Wu-Xia shadow rate before Feb 2022 to account for zero lower bound), estimated by country with monthly data. Decomposition is done for each country and simple average is taken.

Risks to the Debt Outlook

Public finances remain vulnerable to adverse shocks. These include sudden changes in financing conditions and risk appetite, which could affect growth, the exchange rate, and financing costs for these economies. A stress-test analysis for these scenarios indicate that an external shock affecting growth, interest rates, and the exchange rate could lead to an increase in public debt by about 8.5 percentage points of GDP relative to baseline by 2029 in LA7, compared to about 5.8 percent in EM Asia and 6.5 percent in EM Europe (Figure 15 and Annex 5). A commodity price shock that induces a 30-percent change in domestic prices of fuel and non-fuel commodities could increase public debt by about 9 percentage points of GDP cumulatively over the next 5 years in LA7 (Figure 16 and Annex 5). Similarly, a natural disaster could increase public debt by almost 6 percentage points of GDP over the same horizon (Annex 5). The upside risks to debt reflect a global phenomenon—using a novel methodology, *Debt at Risk*, IMF

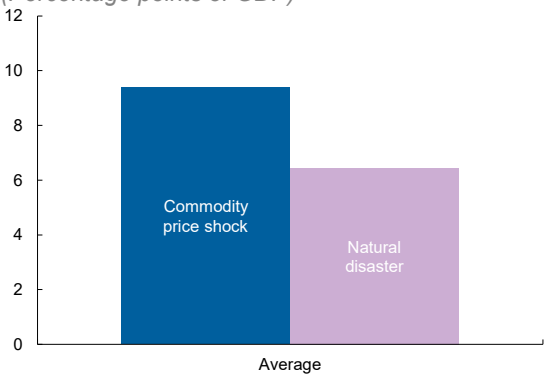
(2024a) shows that the probability of an increase in global debt of at least 20 percent of GDP by 2026 is 5 percent. In addition, it also shows that optimistic macroeconomic forecast constitutes an important risk for the debt outlook.

Figure 15. Cumulative Change in Debt between 2024 and 2029 Given Shocks
(Percentage points of GDP)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Growth, one-standard deviation shock, 0.88 pp, that lasts for five years (2024–28); Interest rate, one-standard deviation shock, 0.31 pp to domestic rates, 0.87 pp to foreign rates, that lasts for five years (2024–28); real exchange rate, one-standard deviation shock, 10.95 pp, that lasts for two years (2024–25). Standard deviations computed for years 2013–19. Shocks do not include interactions among variables.

Figure 16. LA7: Cumulative Change in Debt Between 2024 and 2029 Given Shocks
(Percentage points of GDP)



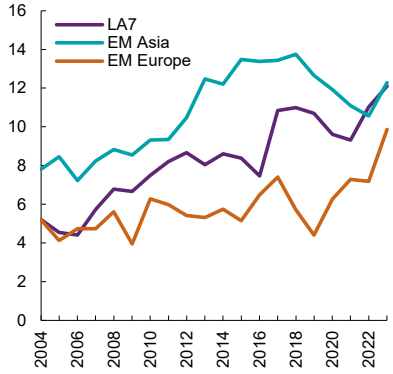
Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: The commodity price shock corresponds to a one standard deviation change in the prices of fuel and non-fuel commodities that translates into a 30 percent change in the country-specific commodity price average. It includes interaction effects with real GDP growth, fiscal revenues to GDP, inflation, expenditures to GDP and interest rate premiums. The natural disasters shock considers a one-off shock of 4.5 percentage points of GDP to public debt-to-GDP ratio (direct impact), and a reduction of real GDP growth (interaction effect), with no subsequent rebound, both in the second year of the projection period. For further details, see Annex 5, IMF (2022), and references therein.

Factors Mitigating Debt Vulnerabilities to Shocks

Changes in the structure of debt in LA7 contribute to mitigating the vulnerability to shocks. Countries in the region have made strides in mitigating vulnerabilities associated with the composition of public debt in two dimensions. First, the average maturity has increased from about 5 years in 2004 to about 14 years in 2023, a much larger increase relative to other EMs (Figure 17). This has helped to improve cash flow management and mitigate refinancing risks. Second, the share of public debt in foreign currency has also declined more in these economies relative to other EMs between 2000 and 2023, from almost 80 percent to around 45 percent (Figure 18), helping mitigate exchange rate valuation change effects. This can be illustrated by estimating the impact of an exchange rate shock under two different scenarios for currency composition. Assuming the currency composition of 2005, an exchange rate shock could increase debt by more than 6 percentage points of GDP, higher than EM Europe and well above EM Asia (Figure 19). Assuming the 2023 currency composition, the same exchange rate shock would increase debt by about 4 percentage points of GDP, still higher than in EM Asia, but comparable to the impact in EM Europe.[15]

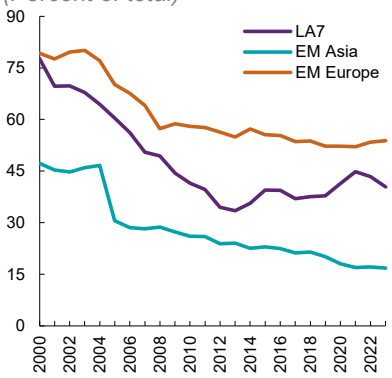
[15] There are also costs associated with higher domestic debt. First, if it ends up in the balance sheet of domestic banks, which increases vulnerabilities in the event of a debt crisis (e.g., Brunnermeier and others 2016). Second, it can crowd out private investment (e.g., Cao, Gaspar, and peralta 2024). Third, if domestic debt is held by banks, the costs of restructuring can be high, potentially offsetting the gains from the reduction of other vulnerabilities. Fourth, while longer maturity debt in domestic currency can reduce rollover risks for the issuing country, the increase in duration risk for the lender (the sensitivity of bond prices to changes in interest rates—higher for longer maturity bonds) could potentially increase debt vulnerabilities (e.g., Bertaut, Bruno, and Shin 2023).

Figure 17. Average Maturity of Public Debt
(Years)



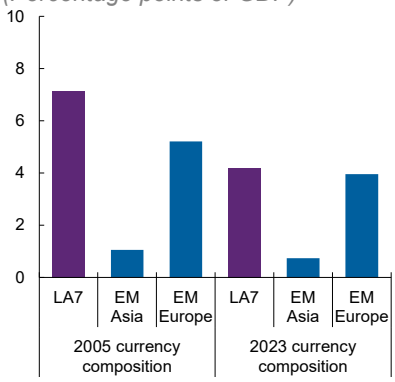
Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Aggregates are simple averages. EM Asia = India, Indonesia, Malaysia, Philippines, Thailand; EM Europe = Bosnia and Herzegovina, Bulgaria, Hungary, Poland, Romania, Serbia; LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

Figure 18. Share of Foreign Currency Denominated Public Debt
(Percent of total)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Aggregates are simple averages. EM Asia = India, Indonesia, Malaysia, Philippines, Thailand; EM Europe = Bosnia and Herzegovina, Bulgaria, Hungary, Poland, Romania, Serbia; LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

Figure 19. Change in Public Debt in 2024–29 due to an Exchange Rate Shock
(Percentage points of GDP)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Aggregates are simple averages. Real exchange rate, one-standard deviation shock, 10.95 pp, that lasts for two years (2024–25). EM Asia = India, Indonesia, Malaysia, Philippines, Thailand; EM Europe = Bosnia and Herzegovina, Bulgaria, Hungary, Poland, Romania, Serbia; LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

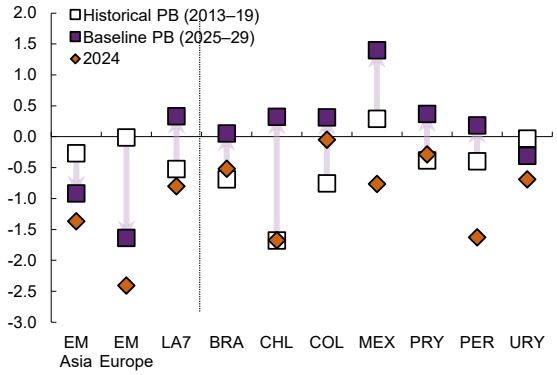
4. Policies for Debt Sustainability

This section discusses the importance of fiscal consolidation and strong fiscal frameworks for improving debt dynamics, which is paramount for debt sustainability.

The Need for Fiscal Consolidation

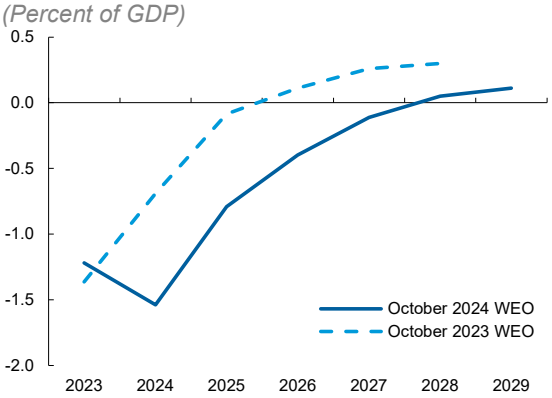
Ambitious fiscal consolidation is needed to stabilize public debt around the 2024 level. On average, the projected fiscal adjustment amounts to some ¾ of a percentage point of GDP relative to 2024 and requires running average primary balances of about ⅓ percent of GDP, a figure substantially higher than the average historical primary balance of about -½ percent of GDP (Figure 20). Moreover, the feasibility of fiscal plans is under question as plans have been repeatedly delayed in the recent past—and some deterioration of public finances is expected before the consolidation takes place (Figure 21). Adding to the challenge, the projected adjustment still requires identifying specific policy measures. In the near term, addressing spending inefficiencies could help in implementing the consolidation. But to be successful in having a high probability of durably reducing debt ratios, the consolidation should be adequately timed and accompanied by growth-friendly revenue mobilization (IMF 2023b, IMF 2024b). With debt remaining high, most countries face the challenge of putting debt firmly on a downward path—except for Peru, where the envisaged consolidation allows for a gradual reduction in the debt ratio (IMF 2024d), and Chile, where debt stabilization is appropriate (IMF 2024e). This calls for an assessment of the likelihood of distress episodes in the future since the risk of such an episode might call for further fiscal adjustment (Box 1).

Figure 20. General Government Primary Balance
(Percent of GDP)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Aggregates are simple averages. EM Asia = India, Indonesia, Malaysia, Philippines, Thailand; EM Europe = Bosnia and Herzegovina, Bulgaria, Hungary, Poland, Romania, Serbia; LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

Figure 21. LA7: General Government Structural Primary Balance
(Percent of GDP)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Aggregates are simple averages. LA7 = Latin America 7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay).

The Importance of Further Strengthening Fiscal Frameworks

The debt buildup in the years preceding the pandemic call for further strengthening fiscal frameworks.[16] By setting long-lasting constraints on fiscal policy, fiscal rules contribute to limiting the deficit bias and reducing uncertainty through constraining the policy choices of the public sector. For those constraints to be effective and ensure long-term debt sustainability, fiscal rules need to effectively shape macroeconomic outcomes, including fiscal deficits, financing costs, and debt dynamics.[17] The effectiveness of fiscal rules is especially important at the current juncture of high debt levels, since the costs from policy slippages could be high, underscoring the need for credible and well-communicated fiscal frameworks.

While LA7 countries have fiscal frameworks in place since the early 2000's, efforts to improve them continue.[18] For example, Paraguay submitted to Congress a bill to introduce a debt anchor and better define the escape clause in 2020; Uruguay added a budget balance and a spending rule to its fiscal framework in 2021; Chile and Colombia introduced debt anchors in 2022—in the former multiyear annual targets became binding in 2024, while in the latter the permanent rule is expected to be operationalized in 2026; and Brazil redefined its spending rule in 2023 (Table 1).

[16] A multiyear fiscal framework can be defined as a set of institutional arrangements, planning strategies, and policy tools that provide a medium-term perspective on fiscal policy (at least two to four years beyond the budget year), including targets and rules that ensure consistency and predictability, and enhance transparency and accountability. IMF (2018) provides a comprehensive discussion on the design and implementation of multiyear fiscal frameworks. Fiscal frameworks should also support opportunities arising from new challenges such as the global transition to a low-carbon economy, the impact of rapidly evolving digital technologies, and potential consequences of economic fragmentation (IMF 2023a). These changes could affect countries' terms of trade and underscore the importance of strengthening public financial management (PFM), including green PFM (IMF 2022), to create fiscal space that supports growth while safeguarding social spending, including strengthening safety nets and social assistance.

[17] Empirically, the effect of fiscal rules on lowering budget deficits and taming debt accumulation has been widely documented, see Poterba (1994), Caselli and Reynaud (2019), Grembi, Nannicini, and Troiano (2016), and Potrafke (2024) for a recent review. Kolerus and Pereira (2023) also provide a summary of the empirical evidence on how different rules help enforce different aspects of budgetary discipline. From a theoretical point of view, fiscal rules that constrain debt levels (i.e., debt brakes) have been shown to reduce sovereign spreads and default frequencies (Alfaro and Kanczuk 2017). See also Hatchondo, Martinez, and Roch (2022) for a proposal of fiscal rules based on sovereign spreads rather than debt levels, where the welfare gains from adopting spreads, rules are substantial for economies that are constrained by debt brakes.

[18] Cardenas and others (2021).

Table 1. Fiscal Rules in LA7

	Types of Fiscal Rules				Flexibility and Enforcement					Other Supporting Elements	
	Budget Balance Target	Expenditure Rule	Debt Anchor	Perimeter	Target Change	Loopholes/ Exclusions	Formal Enforcement	Escape Clause	Correction Mechanism	Link to MTFF	IFI
Brazil	Golden rule (1998) Yearly CG primary balance target (2000)	0.6–2.5 percent (2016, 2023)		CG plus Subnational Rules (96 percent)	Law, congress approval	Golden rule (too broad definition of capital expenditure). Primary balance target: frequent changes in the past; exclusion of expenditure items; payments of judicial claims due (*precatorios*)	✓ (1998)				✓ (2016)
Chile	Multiyear structural balance subject to debt anchor (2001, 2022)		45 percent of GDP (2022)	CG (57 percent)	Presiden-tial decree	Below-the-line operations before 2022.	✓ (2024)	✓ (2024)		✓ (2000)	✓ (2014, 2019)
Colombia	Net structural primary balance, a function of deviation from debt anchor (2011, 2022)		55/71 percent of GDP (debt anchor/limit) (2022)	Net CG debt (95 percent)	Law, congress approval	One-off transactions defined by the Superior Council of Fiscal Policy (COFINS)	✓ (2011, 2022)	✓ (2011)	✓ (2026e)	✓ (2011)	✓ (2022)
Mexico	Overall balance (2006)	2 percent (potential growth) (2014)	Public sector borrowing requirement (2014)	NFPS exc. local governments (100 percent)	Law, congress approval		✓ (2014)	✓ (2014)			✓ (1998)
Paraguay	Overall balance (2015)	4 percent (potential growth) (2015)		Central Administration exc. extra-budgetary and social security funds (1.5 percent)	Law, congress approval			✓ (2015)			✓ (2016)
Peru	Overall balance (2000)	Historical and projected average of GDP growth (2000)	30/38 percent of GDP (debt anchor/limit) (2013)	NFPS (100 percent)	Law, congress approval		✓ (2000)	✓ (2000)		✓ (2003)	✓ (2015)
Uruguay	Structural balance indicative target, subject to stabilizing net debt (2006, 2020)	2.8 percent (potential growth, indicative target for 2024) 2.5 percent indicative target for 2025 (2020)	Ceiling for net annual debt issuance in U.S. dollars	CG + SS (90 percent)	Law			✓ (2021,2 023)			✓ (2021)

Sources: IMF staff; and Davoodi and others (2022).
Note: The table summarizes the main features of the current fiscal rules in LA7 (Latin America 7 = Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay). The years in parentheses indicate the time of implementation and of major modifications to the corresponding feature. The check mark indicates that the corresponding feature is in operation. Perimeter denotes the coverage of the rule: CG = central government; NFPS = nonfinancial public sector; SS = social security, where the number in parenthesis indicates the share of public debt in percent of NFPS debt. MTFF = medium-term fiscal framework; IFI = independent fiscal institutions. Information as of September 2024.

However, some fiscal frameworks have become overly complex at the expense of transparency and accountability. Brazil's fiscal framework, for instance, comprises a set of rules and norms that could be internally inconsistent (e.g., spending limits while mandatory spending continues to grow) or not connected to one another (e.g., a golden rule establishing that borrowing cannot exceed capital expenditures versus spending limits).[19] In Chile, the calculation of the structural balance is complex, requiring knowledge of many different variables, some of which are not publicly available. These aspects hinder the monitoring of compliance, potentially weighing on credibility and enforceability.

An assessment of fiscal rules in LA7 points to some areas for further improvement. Rules are assessed in three dimensions (Figure 22, Annex 7, and Table 2):[20]

- *Efficacy* relates to whether numerical targets currently in place would put debt on a downward path and considers the presence of an explicit debt anchor within a multiyear fiscal framework. A key area for improvement in this dimension is setting rules that are consistent with a firm downward path for debt (except for Peru, where the rule is consistent with declining debt, and Chile, where debt stabilization is deemed as appropriate). Also, while rules are embedded in a multiyear fiscal framework in most countries, some (Brazil, Mexico, Paraguay, Uruguay) would benefit from establishing clearer links between multiyear operational targets and a medium-term debt anchor.
- *Commitment* refers to the stringency of changing targets (including whether this requires Congress approval or Presidential decree) and the presence of escape clauses with clear triggers and associated correction mechanisms. In this dimension, while escape clauses have become prevalent in the region (Chile introduced it most recently in 2024), most countries would benefit from better defining triggers and associated correction mechanisms that are credible and promptly bring debt back to a sustainable path.
- *Enforcement* captures whether the consequences of missing targets are established in the law, the presence of correction mechanisms when the targets are breached, whether the framework identifies risks, and if it is robust to managing them. In this dimension, Chile, Colombia, Mexico, and Uruguay, for example, would benefit from setting clearer sanctions and correction mechanisms in case of breaching the rule. In several countries, strengthening fiscal institutions, particularly fiscal councils, is also of key importance.

Figure 22. Assessment of Fiscal Rules in LA7

Source: IMF staff calculations.
Note: See Annex 7 for details.

[19] Kolerus and Pereira (2023).

[20] The simplicity considerations discussed, and the assessment of the *Commitment* and *Enforcement* dimensions encompass the properties of effective fiscal rules described in Eyraud, Debrun, and others (2018).

Table 2. Key Areas for Improvement of Fiscal Rules and Frameworks in LA7

Brazil	Ensuring consistency of the spending rule and the primary balance targets. Introducing a debt anchor that puts debt on a firmly declining path and embeds a medium-term perspective. Institutionalizing the escape clause.
Chile	Setting clear procedures and sanctions in case of deviations from the rule. Improving the specification of triggers and correction mechanisms of escape clauses. Providing more resources and broadening the mandate of the autonomous fiscal council.
Colombia	Setting clear procedures and sanctions in case of deviations from the rule.
Mexico	Setting a well-calibrated debt anchor. Clarifying escape clauses and limiting them to specified exceptional circumstances. Setting clear correction mechanisms in case of breaches of the rule.
Paraguay	Establishing a debt ceiling. Setting a transition period after the escape clause is invoked. Defining escape clause triggering events more clearly.
Peru	Introducing more effective and timely communication that enhances the credibility of needed adjustments to the rule. Clarifying the definition of escape clauses and associated correction mechanisms. Improving the operational independence of the fiscal council.
Uruguay	Extending the time horizon of the fiscal rule. Establishing corrective procedures or actions in case of slippages. Setting more specific targets that better anchor the objective of debt sustainability. Increasing the operational autonomy of the Advisory Fiscal Council

Sources: IMF staff; Kolerus and Pereira (2023); IMF (2024d), IMF (2024f), and IMF (2024g).

5. Conclusion

The drivers of public debt in LA7 have changed over time, and the progress made in lowering debt during the commodity price boom was reversed in the years preceding the pandemic. Going forward, public debt in the region is projected to stabilize around current levels over the medium term. However, this hinges on strengthening public finances, which requires ambitious fiscal consolidation efforts—both historically and relative to peers—as financing costs are expected to remain high and growth lackluster—implying an unfavorable interest rate-growth differential. Fiscal frameworks are supportive of ongoing consolidation efforts but need to be further strengthened to enhance credibility, ensure fiscal discipline, and help reduce financing costs.

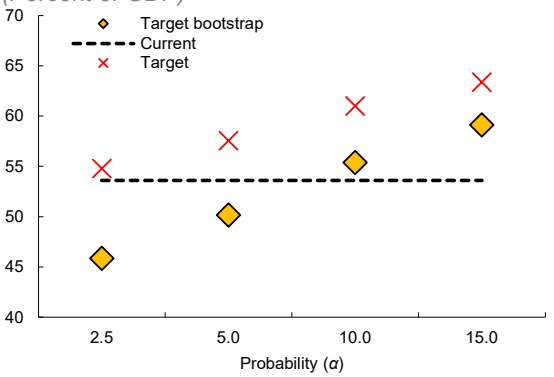
Box 1. An Assessment of Public Debt Distress

An important question is whether current debt levels could trigger an episode of distress in the future. This could inform the extent to which the projected fiscal adjustment is sufficient or more consolidation is needed to ensure debt stability. Following the methodology of Eyraud, Baum, and others (2018), this question is addressed in three steps (see Annex 6 for details):

- First, exploring which level of debt could trigger an episode of distress, dubbed as the debt "Limit." This depends on the maximum attainable primary balance, the real interest rate when debt approaches the distress limit, and the real GDP growth rate during times of stress.
- Second, constructing simulated paths for debt over the 2024–29 projection period based on historical data of debt drivers in LA7 and using the evolution of debt dynamics in IMF (2022).
- Third, identifying the simulated paths that reach the "Limit" by 2029 with 2.5, 5, 10, and 15 percent probabilities (denoted by α), and comparing their corresponding initial levels, dubbed as "Target," with those observed in 2024.

Box Figure 1.1. LA7: Debt Targets and Distress Probability

(Percent of GDP)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: "Current" represents the PPP GDP-weighted LA7 average debt in 2024. "Target" and "Target Bootstrap" represent the debt level for 2024 that could reach the debt limit by 2029 with probability α (2.5, 5, 10, and 15 on the horizontal axis) using two simulation methodologies (see Annex 6 for technical details).

If the debt levels observed in 2024 are above "Target" for a given probability, then more fiscal consolidation is needed to ensure debt stability. Conversely, if the debt levels are below "Target" for a given probability, then there is some fiscal space.

Further consolidation efforts might be needed to attain a low probability of distress in the future. On average, debt "Targets" for LA7 are close to current debt levels, suggesting that fiscal space is limited (Box Figure 1.1). For instance, for a probability of distress in 2029 of 2.5 percent, the "Target" for 2024 is about 55 percent of GDP, which is marginally higher than the current debt level of about 54 percent, indicating no fiscal space. An alternative method for simulating the debt paths that assigns a higher weight to the tails of the distribution of the determinants of debt, yields a lower debt target, dubbed as "Target bootstrap," of about 46 percent of GDP, indicating that further fiscal consolidation is needed to secure debt stability. Even for a probability of 10 percent, the "Target bootstrap" points to very limited fiscal space. These results provide a framework to analyze the likelihood of debt distress arising from sustainability considerations and the implications for fiscal policy. A proper assessment of the levels of debt that can trigger distress episodes, and the "acceptable" probabilities around them, require judgment on the specific characteristics underlying each outcome—that is, the capacity to attain a primary surplus and its level, the behavior of financing costs as debt approaches the "Limit," the growth rate that prevails under stress, and other considerations about the structure of the economies in the region—and, as such, should be taken with caution. Overall, the findings in (Box Figure 1.1) complement those of IMF (2024a), which computes the probability that debt stabilizes at a future horizon (following IMF 2022) and finds that, globally and on average, an additional medium-term cumulative adjustment of 3.0–4.5 percent of the GDP will be needed to stabilize debt with sufficiently high probability.

The authors of this box are Juan Passadore and Juan Treviño.

Annex 1. Drivers of Debt Dynamics

Methodology. We perform debt decompositions using the MAC DSA specification using the toolbox developed in Acosta Ormaechea Martinez (2021). Recall that the MAC DSA decomposition established that changes in debt to GDP are given by:

$$d_t - d_{t-1} = \frac{i_t - (1+g_t)\pi_t}{(1+g_t)(1+\pi_t)} d_{t-1} + \frac{\epsilon_t^{eop} + i_t^f \left[(1+\epsilon_t^{eop}) \left(\frac{e_t^{avg}}{e_t^{eop}} \right) \right]}{(1+g_t)(1+\pi_t)} \alpha_{t-1} d_{t-1} - \frac{g_t}{(1+g_t)(1+\pi_t)} d_{t-1}$$

$$-pb_t + of_t + sf_t^{ier},$$

where $i_t = \alpha_{t-1}\left(1 + i_t^f\right) + (1 - \alpha_{t-1})(1 + i_t^d) - 1$ denotes the nominal weighted average effective interest rate without the exchange rate valuation effects; g_t is real GDP growth; d_t is debt to GDP; π_t is the growth rate of the GDP deflator; pb_t is the primary balance; of_t are other flows; and sf_t^{ier} are stock flow adjustments. α_{t-1} denotes the fraction of debt that is in foreign currency.

Data. At a yearly frequency for EM Asia (India, Indonesia, Malaysia, Philippines, Thailand), EM Europe (Bulgaria, Hungary, Poland, Romania, Serbia), and LA7 (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay), we obtain data from World Economic Outlook database for growth, GDP deflator, primary balances, fraction of debt in foreign currency, and exchange rate average for the and end of period. In addition, we construct interest rates as a fraction of interest payments to GDP, for both domestic and external debt. We final construct regional averages using simple averages and we perform the decomposition on these regional averages.

Figures. The plots in Figures 3 and 4 are given by the five terms defined in this decomposition of debt dynamics. The first term is the term is “real interest rate;” the second term is “Exchange rate;” the third term is “Real GDP growth;” the fourth term is “Primary Balance;” the combination of other flows and stock flow adjustments constitute the residuals.

Annex 2. External Spreads

Data. Un balanced panel at annual frequency (unless otherwise specified) on:

- EMBIG Spreads from JP Morgan (end of period). We use all available years for each country (ranging from 1996 to 2022).
- From IMF WEO database, debt to GDP, interest to revenue, reserves to GDP, real GDP growth.
- From Kaufmann and Kraay (2023), Government Effectiveness Index.[1]
- VIX and 10-year rate constant maturity (end of period).
- Stress history (IMF staff calculations), which takes a value of 1 if there is a: large IMF-supported programs and exceptional financing from other IFIs and donors; default; debt Restructuring; chronic excessive inflation; loss of market access; financial repression. This variable summarizes the track record of stress episodes in a country, with recent events indicating a higher probability of renewed stress. If a country is not under stress, its stress history decays by 10 percent yearly.[2]

For the baseline results country data includes for Latin America and the Caribbean, Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, Uruguay, and Venezuela; for Europe, Bulgaria, Hungary, Poland, Russia, Serbia, and Ukraine; for Asia, India, Indonesia, Jordan, Korea, Malaysia, Philippines, Qatar, Thailand, and Vietnam; for Africa South Africa, and Egypt.

Methodology. We estimate the following Panel Specification:

$$EMBI_{c,t} = \alpha_c + \delta_c^G \Delta Global_t + \delta_c^L \Delta Local_t + \varepsilon_{c,t}.$$

where α_c are country fixed effects; $\mathrm{Global_t}$ includes VIX, United States Treasury 10 Year yield, and $\mathrm{Domestic_{c,t}}$ includes debt burden (debt to GDP), interest burden (interest to Revenue), government effectiveness, stress history, reserves as a fraction of GDP, and real GDP growth.

Robustness checks. The baseline results are robust to alternative data periods (post 2003); a larger sample of EMs and LICs (all countries with available EMBI data); first differencing of the data; dropping countries with debt higher to 100 percent of the GDP; clustering standard errors at the country level; robust standard errors; and the inclusion of time fixed effects. In the baseline, we drop observations when the EMBIG is higher than 2000, due to limited market access, and we perform robustness checks at 2500, 3000 and 3500.

Discussion of results. The qualitative results, presented in Figure 8, panel 1, are in line with findings in the empirical literature on sovereign spreads (see, for example, Hilscher and Nosbusch 2010) and structural models of credit risk. Specifically, the role of most of the variables included in the regression have been explored by the quantitative literature on sovereign debt: debt to GDP and growth (Arellano 2008; Aguiar and Gopinath 2006); reserves (Bianchi, Hatchondo, and Martinez 2018); reputation (Amador and Phelan 2021; Morelli and Moretti 2023). From a theoretical point of view, the expected sign-on 10-year rate on spreads is ambiguous. On the one hand, lower 10-year rates should decrease default probabilities due to lower financing costs. However, lower 10-year rates might occur at moments of stress, in which the market price or risk increases, and there is a flight to quality (see for example, He and Krishnamurthy 2012).

[1] This indicator is compiled from a variety of inputs from various sources, including Transparency International Global Corruption Barometer Survey, Political Risk Services International Country Risk Guide, and Varieties of Democracy Project. As such, it may capture subjective perceptions and expectations and should be interpreted with caution.

[2] For details on the construction of the variable, see Table 2 in IMF (2022).

Using quarterly data and focusing on changes of spreads (which map to returns on debt when multiplied by the duration of the debt instrument) rather than levels, robustness checks suggest a larger role for external factors (more than 60 percent), in line with Longstaff and others (2011) and Gonzalez Rozada and Levy-Yeyati (2008). These results also align with IMF (2024a), which uses monthly data and focuses on changes in spreads and finds that global factors explain a large fraction of changes in external currency spreads but a much lower fraction of changes in local currency yields for emerging markets and developing economies. In addition, the results using annual data, and spreads in levels, and using interactive fixed effects (e.g., Bai 2009) which account for the heterogenous exposure to global factors, suggest that global factors can have a larger role. Finally, when estimating separately the baseline regression for LAC and other EMs, the results are qualitatively similar; the results of including an interaction term to account for this heterogeneity suggest that, quantitatively, the differences are not statistically significant.

Annex 3. Local Currency Yields

Methodology. To decompose the yields to expected average short rates and term premium, we construct a Gaussian Dynamic Term Structure Model with un-spanned macro factors following Joslin, Priebsch, and Singleton (2014). The model relies on three latent factors and two macro factors: inflation and the U.S. 3-month treasury yield. Generically, observable yields are determined by factors whereas the factors (latent or observable) evolve according to an AR(1) process. In particular:

$$y_{t,\tau} = b_\tau X_t + \Sigma_Y u_t,$$

$$X_t - \mu = \Phi(X_{t-1} - \mu) + \Sigma_X e_t,$$

where $y_{t,\tau}$ is τ month yield at t, X_t is a vector of factors, and b_τ is the loading. We allow three latent factors with two un-spanned macro factors so $X_t = \left(r_t, X_{2,t}, X_{3,t}, \pi_t, r_t^{US}\right)$. The macro factors are inflation and US 3-month treasury yield (Wu-Xia shadow rate before Feb 2022 to account for zero lower bound). No arbitrage and un-spanning assumptions implies parsimonious parameterization b_τ that is given by:

$$b_\tau = \left(1,\ 1 - \frac{1-\gamma^\tau}{(1-\gamma)\tau},\ -\gamma^{\tau-1} + \frac{1-\gamma^\tau}{(1-\gamma)\tau},\ 0, 0\right).$$

Given this parametrization, the analytical solution for expectation components and term premium is equal to:

$$y_{t,\tau}^{rf} = \frac{1}{\tau}\mathbf{E}_t \Sigma_{j=1}^{\tau-1} r_{t+j} = \frac{1}{\tau}\left(X_t'\iota + \left((\tau-1)\mu + \frac{\Phi^\tau - \Phi}{\Phi - \mathrm{I}}(X_t - \mu)\right)\iota\right),$$

$$y_{t,\tau}^{tp} = y_{t,\tau} - y_{t,\tau}^{rf},$$

where ι is a vector of appropriate dimension with first element being 1 and rest 0, and I is identity matrix.

The model is estimated for each country with following steps: 1, regress $Y_t = (y_{t,3m}, y_{t,1y}, y_{t,2y}, \dots, y_{t,10y})'$ on $B = (b_{3m}, b_{t,1y}, b_{t,2y}, \dots, b_{t,10y})'$ to get X_t for each γ in a grid; 2, choose the γ that minimize the sum squared error; 3, regress X_t (demeaned, first 3 components from step 2, including macro factors) to estimate Φ; 4, calculate expectation components and term premium. Simple average is taken when reporting results for country group. To forecast yields, the estimated model is iterated forward with macro factors replaced by those forecasted in WEO.

To study the drivers of short rate and term premium, a panel fixed effect model is applied to the decomposition obtained from the Gaussian Dynamic Term Structure Model following Wright (2011). In particular:

$$r_{c,t} = y_{c,t,3m} = \alpha_c + \beta_V V_{c,t}^\pi + \beta_\pi \pi_{c,t} + \beta_r r_t^{US} + \varepsilon_{c,t},$$

$$y_{c,t,\tau}^{tp} = \alpha_c + \beta_V V_{c,t}^\pi + \beta_\pi \pi_{c,t} + \beta_r r_t^{US} + \varepsilon_{c,t}.$$

The independent variables are inflation uncertainty, inflation level and US 3-month treasury yield (Wu-Xia shadow rate before Feb 2022 to account for zero lower bound). Inflation uncertainty is proxied by the standard deviation of inflation in the last 5 years, and as a robustness check, by the 1-year ahead standard deviation of CPI inflation from professional forecasters.

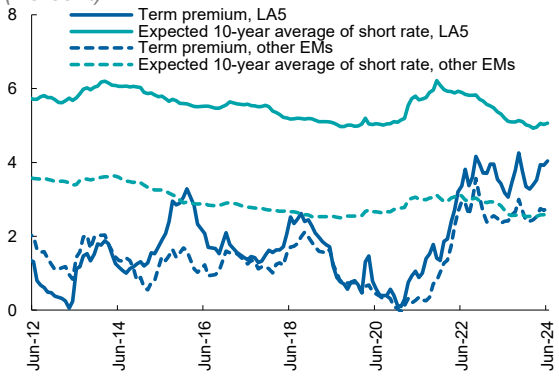
Data. We use (A) 3m, 1y, 2y, … , 10y local currency sovereign yield compiled by Refinitiv Eikon (zero yield close) with Nelson-Siegel or Svensson-Soderlind method to interpolate missing observations; (B) CPI, US 3 month treasury yield and Wu-Xia shadow rate from Haver; (C) 1-year ahead standard deviation of CPI inflation from professional forecasters from Consensus, all from 2010m10-2024m6, and unless otherwise stated, for LA5 (Brazil, Chile,

Colombia, Mexico, Peru) and other EMs (Hungary, Poland, Indonesia, Malaysia, and Thailand). In addition, we interpolate quarterly WEO forecast for inflation and US short rate to monthly 2024m7-2029m6 (piecewise cubic Hermite interpolating polynomial).

Additional results. LA5 countries pay much higher expected short rate, largely due to higher inflation, and slightly higher term premium, comparing to selected other EMs (Annex Figure 3.1). If we use survey dispersion of inflation expectations as a proxy of inflation uncertainty, we get similar result: short rates are mainly influenced by inflation levels and U.S. rates, while the term premium is mainly driven by inflation volatility (Annex Figure 3.2).

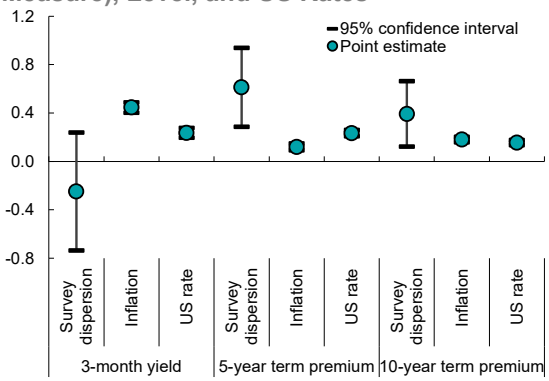
Annex Figure 3.1. LA5 versus Other EMs Local Currency Yield Decomposition

(Percent)



Sources: Haver Analytics; IMF, World Economic Outlook database, Refinitiv Eikon, and IMF staff calculations.
Note: From a Gaussian dynamic term structure model with three latent factors and two macro factors, including inflation (year-over-year) and US three-month yield (Wu-Xia shadow rate before February 2022 to account for zero lower bound), estimated by country with monthly data. Short rate is defined as three-month yield. Decomposition is done for each country and simple average is taken. Other EMs (emerging markets) include Hungary, Poland, Indonesia, Malaysia, and Thailand.

Annex Figure 3.2. Response of Short Rate and Term Premium to Inflation Uncertainty (Alternative Measure), Level, and US Rates



Sources: Haver Analytics; IMF, World Economic Outlook database, Refinitiv Eikon, and IMF staff calculations.
Note: Short rate is defined as three-month yield. LA5 (Brazil, Chile, Colombia, Mexico, Peru) plus other emerging market economies (Hungary, Poland, Indonesia, Malaysia, Thailand) panel with country fixed effect regression using decomposition from a Gaussian dynamic term structure model. Inflation uncertainty is proxied with survey dispersion of inflation expectations (1-year ahead standard deviation of CPI inflation from professional forecasters).

Annex 4. Fiscal Rules and Surprises in Stock-Flow Adjustments

We examine whether fiscal rules have helped to mitigate debt surprises. Specifically, we test the hypothesis of whether having a fiscal rule reduces the forecast errors on stock-flow adjustments (henceforth called SFAs).

Methodology. Our dependent variable is the absolute value of the forecast error on the SFA for each year of the forecast horizon (from T+1 to T+5), which we denote by:

$$\Delta_{t,n,i}(SFA) = SFA_{t,i} - \mathbf{E}_{t-n}\left(SFA_{t,i}\right),$$

where $SFA_{t,i}$ denotes the stock flow adjustment realized in year t and country i; $\mathbf{E}_{t-n}$ is the expectation at year $t-n$; thus, $\mathbf{E}_{t-n}\left(SFA_{t,i}\right)$ denotes the projection at year $t-n$ of stock flow adjustments in year t and country i.[1] The focus on this variable and not on the level of SFA's is because Our main explanatory variables are dummies for the presence of a budget balance rule and/or a debt rule at the time the projections were made (denoted by $Rules_{i,t}$). We run a panel data regression with the fiscal rule dummies as well as country-fixed effects and time-fixed effects. In addition, the panel data regression includes controls on macroeconomic variables (per capita real GDP growth, inflation), trading partners' growth surprises and inflation surprises, dummy for election years, governance indicators (corruption, government effectiveness), debt-to-GDP and primary balance-to-GDP at the year of the WEO submission (initial conditions), per capita purchasing power parity (PPP dollars), age dependency ratio, terms of trade, and sovereign credit rating index (all denoted as $X_{i,t}$). Our specification is as follows:

$$\Delta_{t,n,i}(SFA) = \beta_n Rules_{i,t} + \alpha_n X_{i,t} + \phi_{i,n} + \varepsilon_{t,n,i},$$

where $\phi_{i,n}$ are country-horizon fixed effects. Standard errors are robust (VCE clustered by country and WEO vintage).

Data. We measure SFAs as the changes in debt stocks not explained by traditional macroeconomic drivers of debt changes in the debt decomposition formula Escolano (2010), namely: primary balances, growth, inflation, and interest rates. In addition, we remove from SFAs the debt changes resulting from exchange rate movements in FX-denominated debt. As a result, our SFAs are purely below-the-line transactions not directly related to valuation effects. Our sample comprises annual data on the LA7 countries (Brazil, Chile, Colombia, Mexico, Paraguay, Peru, and Uruguay) for the period from 2002 through 2019. For each October WEO of year T, we record the actual SFA for year T and the SFA projections for years T+1, T+2, T+3, T+4, and T+5. These five projection years correspond to the forecast horizon in our hypothesis test. Next, we compute the SFAs forecast errors as the difference between the actual SFA and the projected SFAs for each respective year in the forecast horizon. To avoid bias from revisions to historical data and re-basing, we compute the forecast error for each projection year using the actual data from the WEO vintage published in the immediately subsequent year (i.e., adjacent to it).

[1] Note that the level of SFA's does not reflect fiscal risks. For example, SFA's because of asset accumulation policies or SFA that each year authorities include to account for losses from SOEs or from servicing inflation-linked instruments if not properly accounted as part of the deficits. Therefore, we focus on surprises in stock-flow adjustments, which are more directly related to fiscal risks, and can be influenced by fiscal rules.

Annex 5. Stress Tests

External Shock to Growth, Interest Rates, and the Exchange Rate

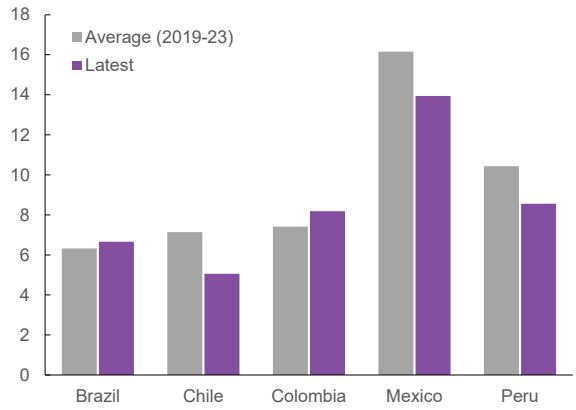
This scenario corresponds to a one standard deviation shock (0.88 percentage points) to growth over the projection period (five years), a one standard deviation shock (0.31 and 0.87 percentage points, respectively) to domestic and foreign interest rates over the projection period, and a one standard deviation shock (10.95 percentage points) to the real exchange rate, over the next two years, where the standard deviations are computed for the 2013–19 period. The scenario does not include interactions among variables.

Commodity Price Shock

This scenario corresponds to a one standard deviation change in the prices of fuel and non-fuel commodities, where commodity exports and imports are shocked by a commodity price gap in the second year of projection closing over five years. It includes interaction effects with real GDP growth, fiscal revenues to GDP, inflation (measured by the GDP deflator), expenditures to GDP and interest rate premiums (IMF 2022). The calibration translates into a 30 percent fall in the country-specific commodity price average (larger than the typical 10 percent found in the literature for LA7—see for example Bertrand (2014), Magud and Sosa (2015), and Chapter 3 of the April 2015 WHDREO; OECD (2017 Latin America Outlook). The main reason is that the elasticities of growth, the primary balance, and financing costs embedded in the exercise are consistent with those in the literature for a broader set of countries beyond EMs. The calibration yields a cumulative fall in the primary balance of 5.3 percentage points of GDP in 5 years and includes a permanent increase in financing costs (of about 130 basis points). In addition, the stress testing tool does not provide a quantitative probability of the shocks materializing. Also, while it provides criteria to trigger these shocks (automatically)—in terms of the share of commodity exports to total exports or they are subject to risks from fuel subsidies—the test can be performed even if the shock is deemed by the user as a low probability event. Therefore, the outcome should be taken as an upper bound for the countries considered in an extreme (tail-risk) scenario. Also, commodity dependence of fiscal revenue as a share of total revenue varies widely across countries, from 5 percent in Chile to about 14 percent in Mexico (Annex Figure 5.1).

Annex Figure 5.1. Commodity-Related Revenue to Total Revenue

(Percent)



Source: IMF, World Economic Outlook database; and IMF staff calculations.

Natural Disaster

This scenario corresponds to a one-off shock of 4.5 percentage points of GDP to the public debt-to-GDP ratio (direct impact), and a 1.3 percentage point reduction of real GDP growth (interaction effect), with no subsequent rebound, both in the second year of the projection period (IMF 2022). The exercise considers a sample of 160 AE and EM jurisdictions with annual data from 1980 to 2021. The calibration is based on a broad set of events beyond those associated with climate (e.g., droughts, wildfires), including geophysical (e.g., earthquakes including tsunamis, volcanic activity), hydrological (e.g., floods, landslides), meteorological (e.g., storms, extreme cold and heatwaves), biological (e.g., epidemics), and other using information from the International Disaster Database (EM-DAT) since 1980. The calibration considers a one-off shock of 4.5 percentage points of GDP to public debt-to-GDP ratio (direct impact), and a reduction of real GDP growth (interaction effect), with no subsequent rebound, both in the second year of the projection period.

Annex 6. Debt Targets

We compute debt targets following the methodology in Eyraud, Baum, and others (2018). Our procedure consists of three steps.

Step 1: Debt limits. Specify a limit at which a country faces debt distress $\bar{d}$. This limit is based on a combination of cross-country IMF implementation of Jiang, Sargent, Wang, and Yang (2024); team's inputs; and previous implementation of fiscal targets calibration. The debt distress limit in Jiang, Sargent, Wang, and Yang (2024) is equal to maximum debt stabilizing primary balance that a country can achieve and is equal to:

$$\bar{d} = \frac{\overline{pb}}{r - g},$$

where $\overline{pb}$ is a maximal primary balance; r is the real interest rate when debt reaches this value $\bar{d}$; and g is the growth rate under this stress scenario of high debt.

Step 2. Simulation. Using historical data on debt drivers we generate a simulated path for d_{2029}. We implement two alternative methodologies. First, using the MAC DSA decomposition of debt dynamics, we simulate future paths of debt by fitting a multivariate normal for the debt drivers using 20 years of historical annual data. Second, using the SRDSF decomposition of debt dynamics we generate paths of debt drivers using bootstrap. The advantage of bootstrap is that it nonparametrically recovers the joint distribution of debt drivers, and better captures the asymmetry and the fat tails in the distribution of shocks.

Step 3. Debt Target. Compute a debt target d_{2024} as the level of debt such that the probability of reaching $d_{2029} = \bar{d}$ is equal to α, given by:

$$P\left(d_{2029} = \bar{d} \mid d_{2024}\right) = \alpha.$$

We do this exercise for both simulation methods: MAC DSA and SRDSF, which are, respectively, the yellow square and the red cross in Box Figure 1.1.

Annex 7. Assessment of Fiscal Rules

The assessment of current fiscal rules (as of end-2023) is based on a survey to country economists at the IMF. The survey considers several features of current fiscal rules that are grouped into three categories: *Efficacy*, *Commitment*, and *Enforcement*. Each feature or component of the rule within a category is mapped into a scalar that takes the values of -1, 0, or 1, and the value for each category corresponds to the simple average of its components.

- *Efficacy* is defined as the strength to achieve a desired outcome. This category reflects whether it is sufficient to stabilize debt over the projection horizon—in any given country under baseline assumptions—or more needs to be done to put debt on a downward path. It also considers the presence of an explicit debt anchor and whether the rule is embedded in a multiyear fiscal framework.[1]
- *Commitment* is defined as the pledge to achieve a desired outcome. This category considers the ease of changing targets, and the presence of well-defined escape clauses, corresponding triggers, and associated correction mechanisms.
- *Enforcement* is defined as the capacity to carry out the commitment. It considers aspects of accountability and the presence of correction mechanisms when a rule is breached. It also considers the framework's ability to manage identified risks and ensure adherence to fiscal targets.

A robustness check was done by regrouping the features into the categories used in Davoodi and others (2022) and Ulloa-Suarez and Valencia (2022). Qualitatively, the results using these methodologies are broadly in line with the calculations described. The observed differences reflect two observations: first, the sample periods are different (the assessment presented here is based on the stance of rules as of 2024, whereas other papers refer to the information as of 2021), and, as noted in Section 4 of the chapter, several changes took place in the past few years that may not be fully captured by the alternative methodologies; and second, the methodologies used in those papers do not consider the assessment of the rules to deliver a possible need for additional fiscal effort to put debt on a downward path.

[1] Since baseline projections are consistent with debt stabilization and it is assumed that countries comply with the established rules, the base score equals zero for all countries. Then, the value of one is added or subtracted based on the presence or absence of other considerations. In this sense, this category incorporates a broader measure than that of Strength in Davoodi and others (2022) and Ulloa-Suarez and Valencia (2022), which focus on the presence or absence of other features, but do not assess the “sufficiency” of the rule in terms of the debt path.

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