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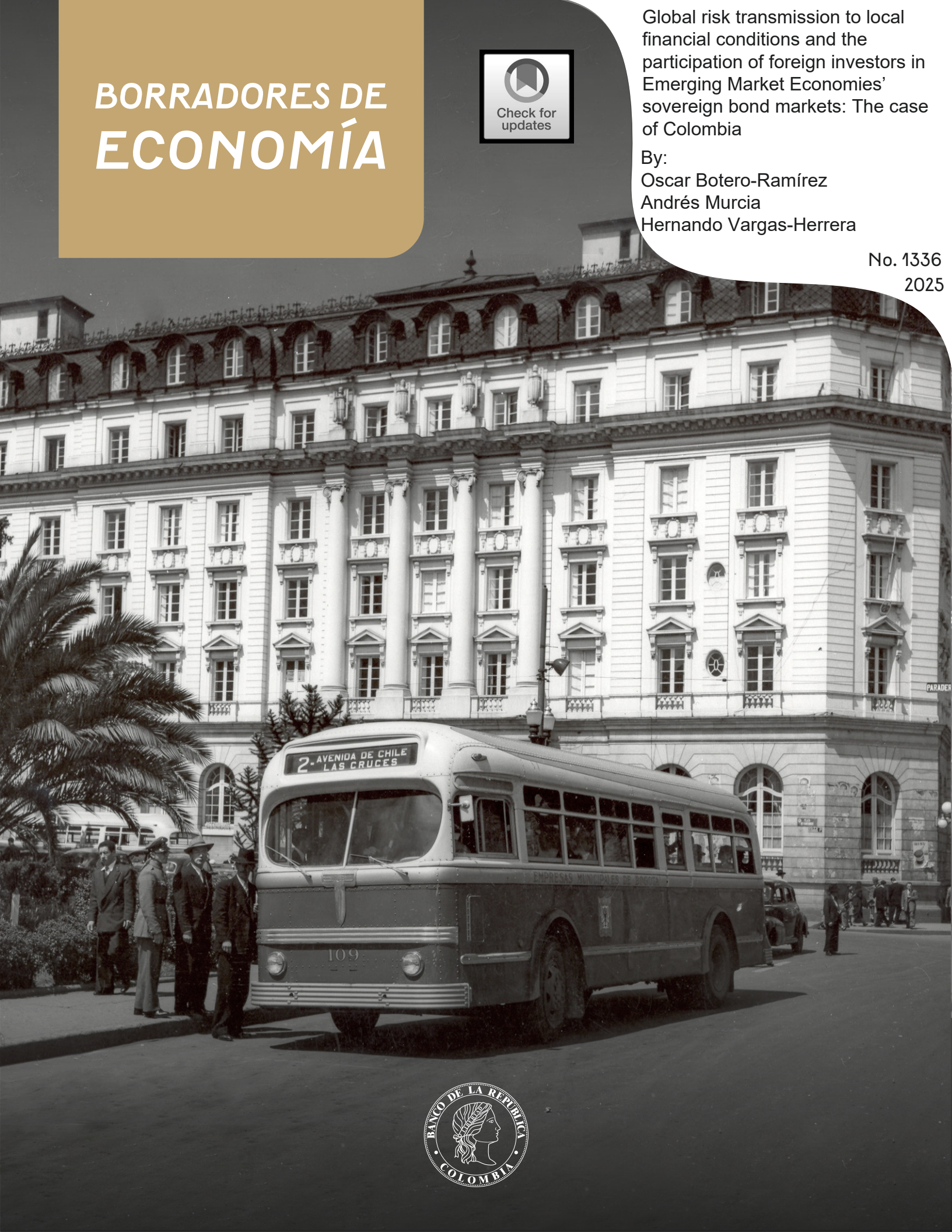

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Global risk transmission to local financial conditions and the participation of foreign investors in Emerging Market Economies' sovereign bond markets: The case of Colombia

Oscar Botero-Ramírez, Andrés Murcia and Hernando Vargas-Herrera[1]

Abstract

Foreign investor participation in Colombia's domestic sovereign bond market surged after 2014, lowering yields, and supporting local-currency debt issuance and local market liquidity. However, it also increased the market's sensitivity to global financial shocks. Empirical analysis suggests that during periods of high foreign participation in the local sovereign debt market (2014–2022), global risk factors had a stronger impact on domestic financial conditions, while the recent decline in foreign participation since 2023 has somewhat reduced this sensitivity. The Central Bank's flexible inflation-targeting regime, supported by a fully flexible exchange rate regime and robust external buffers, has helped manage these risks, as demonstrated during the Covid-19 pandemic. The evolving composition of foreign investors remains a key channel for the transmission of global shocks to Colombia's financial conditions.

JEL classification: E44, E52, F30, F32, F34, F31, F38, G12, G15, G18

Keywords: *sovereign bond markets, foreign investors, benchmark-driven investors, global risk transmission, financial conditions, original sin, inflation-targeting, exchange-rate flexibility, central banking, Colombia*

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Transmisión del riesgo global a las condiciones financieras locales y la participación de inversionistas extranjeros en los mercados de deuda soberana de economías emergentes: el caso de Colombia

Oscar Botero-Ramírez, Andrés Murcia and Hernando Vargas-Herrera

Resumen

La participación de inversionistas extranjeros en el mercado local de deuda soberana de Colombia aumentó significativamente después de 2014, reduciendo los rendimientos y apoyando la emisión de deuda en moneda local y la liquidez del mercado. Sin embargo, esto también incrementó la sensibilidad del mercado a los choques financieros globales. El análisis empírico sugiere que, durante los periodos de alta participación extranjera en el mercado local de deuda soberana (2014–2022), los factores de riesgo global tuvieron un impacto más fuerte sobre las condiciones financieras internas, mientras que la reciente disminución en la participación extranjera desde 2023 ha reducido parcialmente esta sensibilidad. El régimen de metas de inflación flexible del Banco Central, respaldado por un régimen cambiario totalmente flexible y sólidos colchones externos, ha ayudado a gestionar estos riesgos, como se demostró durante la pandemia del Covid-19. La composición cambiante de los inversionistas extranjeros sigue siendo un canal clave para la transmisión de choques globales a las condiciones financieras de Colombia.

Códigos JEL: E44, E52, F30, F32, F34, F31, F38, G12, G15, G18

Palabras clave: *mercados de deuda soberana, inversionistas extranjeros, inversionistas indexados, transmisión del riesgo global, condiciones financieras, pecado original, metas de inflación, flexibilidad cambiaria, banca central, Colombia*

1. Introduction

Foreign participation in Colombia's sovereign bond market has become a channel for global risk transmission to local financial conditions. Market-deepening reforms in the early 2010s enabled a sharp rise in foreign portfolio investment after Colombia's reweighting in the J.P. Morgan GBI-EM index in 2014. These inflows reduced sovereign yields, expanded the local-currency investor base, strengthened liquidity, and lowered financing costs. However, higher foreign ownership also increased sensitivity to global financial conditions.

In this note, we first describe the main episodes of foreign investor entry and retrenchment. We then review some documented effects of increased foreign participation in the local bond market, both in Colombia and in other emerging economies, including its influence on the domestic transmission of changes in external financial conditions. This review further explores the evolving composition of foreign investors as a key channel for the transmission of global shocks. Next, we present a financial conditions index calculated at Banco de la República (IDOAM) and its relationship to domestic absorption. Finally, based on IDOAM, we discuss some econometric results that capture the changing sensitivity of local financial conditions to global factors, and conclude with a description of the features of the monetary and FX policy framework in Colombia that are relevant for the management of shifts in external financial conditions.

2. EMEs' exposure to global financial conditions and gross capital flows

The prominent role of foreign investors in Colombia's sovereign bond (TES) market followed a surge in inflows after Colombia's inclusion in the GBI-EM index in 2014. Significant foreign selloffs have been observed since 2023, as a consequence of fiscal deterioration and the downgrade of Colombian public debt. In 2014, J.P. Morgan announced a sharp increase in Colombia's weight in the GBI-EM index (Graph A.1)—from roughly 4% to 8% over a four-month period (Romero et al., 2021; Botero, Murcia and Villamizar, 2025). This reweighting triggered foreign inflows of USD 8–9 billion, making 2014 the year with the largest public-bond portfolio inflows on record in the country. Subsequent research exploits this episode as a quasi-natural experiment and shows that the arrival of foreign investors relaxed domestic funding constraints, reduced financial repression, and fostered bank credit expansion (Williams, 2017; López et al., 2020). These results are consistent with broader evidence that the growing importance of benchmark-driven investment in EM local-currency indices has mechanically increased domestic markets' sensitivity to index changes and global risk conditions (Broner, 2013; Arslanalp et al., 2020).

Regulatory reforms implemented between 2010 and 2013 enhanced the attractiveness of Colombian TES for global investors. According to Romero et al. (2021), changes to the foreign investment regime, coupled with the adoption of a more favorable tax framework, reduced administrative barriers, and lowered the effective tax burden for non-resident investors. These policy measures not only made TES a more appealing portfolio asset but also facilitated Colombia's subsequent rise in the GBI-EM index in 2014 by simplifying foreign-investor entry and trading in the local sovereign bond market.

Also, the 2011 launch of centrally cleared COP/USD non-deliverable forwards (NDFs) on the Chicago Mercantile Exchange could have played a supporting role in shaping aggregate inflows,

as it reduced counterparty and operational risks in peso hedging and improved the efficiency and security of currency-risk management for local-currency bond positions. However, the bulk of foreign holdings in Colombian sovereign bonds are unhedged.

As a result of these market-deepening measures, including the removal of requirements to invest through a locally registered investment vehicle operating separately from the global fund, foreign investors expanded their share of the TES market dramatically—from just 1% in 2010 to nearly 25% by 2015 (Graph A.2).

Since 2023, foreign investors have gradually and orderly reduced their holdings of Colombian sovereign bonds, with their market share declining to approximately 15% by October 2025 (Graph A.3). This withdrawal has occurred amid a difficult macroeconomic environment characterized by fiscal deterioration, the suspension of the fiscal rule, the loss of investment grade status for local-currency sovereign bonds, and persistent global conditions of elevated interest rates and heightened uncertainty.

The growing presence of foreign investors, fundamentally reshaped Colombia's sovereign bond market. Their entry provided a valuable new source of funding, but it also heightened sensitivity to global financial shocks. The expansion of foreign investor participation has played a pivotal role in helping Colombia address key aspects of the "original sin" (Eichengreen and Hausmann, 1999) —the historical reliance on foreign-currency borrowing—by facilitating the issuance of longer-term, local-currency sovereign debt. Research by Eichengreen, Hausmann, and Panizza (2023) underscores that, while original sin remains persistent across emerging economies, meaningful progress is possible when countries attract stable foreign demand for local-currency securities and foster deep, liquid domestic markets. Colombia's trajectory since the 2010s reflects these conditions: The establishment of a credible macroeconomic framework, improvements in market infrastructure, and an enhanced capacity to issue longer-tenor debt in local currency to both domestic and foreign investors. While this progress is ongoing and not guaranteed, it demonstrates the constructive role foreign investors can play in strengthening local-currency sovereign debt markets.

In parallel, foreign investors broadened and diversified Colombia's investor base, increased market liquidity, and supported the extension of the sovereign yield curve—mechanisms highlighted by Burger and Warnock (2004) and Peiris (2010) as essential for the deepening of local bond markets. Empirical evidence for Colombia corroborates these benefits: Ocampo et al. (2025) show that a one–standard-deviation increase in foreigners' market share reduces TES yields by roughly 0.5% relative to their mean and lowers yield volatility by about 10%. These effects suggest that, during the years of expanding foreign participation, external investors not only eased government financing costs but also contributed to more stable and resilient market dynamics.

Yet the rise in foreign participation has also created new vulnerabilities. A large body of work—including Obstfeld (2012), Ebeke & Kyobe (2015), and Miyajima & Shim (2014)—shows that when foreigners hold a meaningful share of local-currency sovereign debt, domestic financial conditions become more exposed to global risk factors, shifts in international liquidity, and external monetary shocks.

This pattern is consistent with evidence for Colombia. As for the effects on the credit market, Lopez et al. (2020) show that there have been several episodes in which the reversal of external capital

flows have affected the credit conditions in the local market. For instance, they found that i) the liquidity shock produced by the 2008 global financial crisis reduced the access to credit for banks and, in consequence, limited the supply of credit to export firms, and ii) the rise in the demand of public debt securities by foreigners after the inclusion of the country in the GBI-EM index was associated with a subsequent positive credit dynamic in the country.

Beyond the effects of a higher foreign participation as a whole, its implications depend on the composition of the investor base, reinforcing the need to understand which types of foreign investors are driving inflows and outflows, as this influences how global shocks are transmitted to Colombia's local market.

Empirical studies and evidence for Colombia indicate that portfolio flows are shaped by a combination of global financial conditions, such as U.S. monetary policy and shifts in global risk appetite, and domestic factors, including local policy rates. Yet different investor groups react asymmetrically to these determinants: short-term, market-sensitive investors tend to respond sharply to external shocks, whereas long-horizon institutional investors adjust more gradually and in line with domestic fundamentals. Moreover, benchmark-driven investors, those tracking specific indices, often amplify external volatility through mechanical adjustments, while unconstrained investors respond primarily to underlying economic fundamentals according to the literature.

Empirical analyses by Banco de la República (2024) show that both global and domestic financial conditions influence Colombia's portfolio flows, but the impact differs depending on the type of investor. Global factors—like U.S. monetary policy and global risk indicators—have a strong effect, often leading to capital outflows when conditions tighten. Domestic factors also play a role, but their influence is generally less pronounced.

Disaggregating portfolio flows by investor category, the work of Gamboa and Sanchez (2024) reveals distinct behavioral patterns: investment (mutual) funds are notably more sensitive to global shocks, while international pension funds respond more strongly to domestic interest rates and macroeconomic fundamentals, reflecting their long-term investment horizons. These results are consistent with international evidence, such as that presented by Arslanalp and Tsuda (2015), Bruno and Shin (2015), and Koepke (2019).

Additional evidence from Colombia further underscores this distinction. Ocampo et al. (2025) demonstrate that the increasing participation of mutual funds has heightened yield volatility at shorter maturities and resulted in more frequent, sharp reversals in market positions. These outcomes are consistent with international studies showing that mutual funds tend to behave pro-cyclically —frequently selling assets during periods of global financial stress or when facing investor redemptions (Timmer, 2018; Hui, 2019; Fong et al., 2022).

Another strand of the literature emphasizes investment strategy over investor type, distinguishing between benchmark-driven and unconstrained foreign investors. Benchmark-driven investors, who track indices like the GBI-EM, adjust portfolios mechanically in response to index changes and global conditions, thereby amplifying domestic market sensitivity to external shocks. In contrast, unconstrained investors rely on valuations and fundamentals, helping to partially offset external pressures during periods of stress (Arslanalp & Tsuda, 2015; Miyajima & Shim, 2014; Broner et al., 2020).

Expanding on this perspective, Botero, Murcia, and Villamizar (2025) find that the composition of foreign investors influences not only TES yields but also domestic credit market dynamics. Banks with a greater exposure to unconstrained investors significantly expand lending during capital inflows, whereas those linked to benchmark driven investors tend to exhibit a more muted response, showing that foreign investors can amplify the transmission of global shocks within Colombia — not just through asset prices, but also by constraining credit supply to firms.

3. Financial conditions and the participation of foreign investors

The Central Bank of Colombia uses a straightforward financial conditions index that aggregates key indicators, including interest rates, credit spreads, exchange rates, and asset prices. This index effectively captures the overall stance of financial conditions and their sensitivity to shifts in global volatility and liquidity. Notably, it has shown a significant correlation with internal demand, making it a valuable leading indicator for the domestic economy. The IDOAM index is a composite measure used to monitor financial conditions in Colombia (for the mathematical definition of the index, see Annex B). It aggregates several standardized variables that capture different aspects of financial stress and investor sentiment, including: i) Interest rate spreads between various loan portfolios (corporate and consumer, segmented by maturity) and government bond yields (TES); ii) Confidence indicators (commercial, consumer, and industrial); iii) Expectations for growth, inflation, and survey-based spreads between foreign-currency sovereign bonds and U.S. Treasuries; iv) Market volatility (equity market and TES) and; v) the standard deviation of inflation expectations from the Central Bank's survey. Each variable is standardized and, where appropriate, multiplied by -1 so that a positive movement always signals a tightening in financial conditions. The final index is the simple average of these components, ensuring consistency and interpretability over time. The IDOAM index shows a strong and stable correlation with the annual growth rate of domestic demand in Colombia, suggesting it is a valuable proxy for assessing how financial conditions may influence real economic activity (See Graphs A.4 and A.5).

The following evidence indicates that the sensitivity of Colombia's domestic financial conditions to global risk factors has evolved in tandem with shifts in foreign investor participation. Periods of elevated foreign ownership in sovereign bonds, particularly between 2014 and 2022, were marked by a stronger transmission of global financial stress to local markets. A VAR model is estimated using monthly data from January 2011 to September 2025. The model incorporates key variables such as a composite global risk indicator (RI)[2], Brent oil prices, the overnight local interest rate and its expectations, foreign portfolio flows, exchange rate depreciation, and the IDOAM index. The estimation is conducted separately for three periods reflecting shifts in foreign investor participation in Colombia's sovereign bond market: (i) limited participation (2011–2013), (ii) high participation (2014–2022), and (iii) declining participation (post-2022). For the specification of the model, see Annex C.

The impulse-response analysis of the IDOAM index reveals an interesting evolution in Colombia's sensitivity to global financial stress across different phases of foreign investor participation (Graphs C.1 to C.3). Notably, during 2014–2022—when foreign investors emerged as the second-largest holders of TES—global shocks were rapidly and clearly transmitted to domestic financial conditions.

[2] This aggregate indicator is constructed as the first principal component of global risk indicators (VIX, MOVE, DXY, and the CDS spread of emerging economies)

Specifically, a one-unit increase in the global risk indicator (RI) resulted in an average 0.15 rise in the IDOAM index over the subsequent 10 months (Graph C.2), underscoring how external volatility directly shaped local market dynamics. This significant sensitivity aligns with international evidence: as foreign ownership deepens, local markets become more reactive to global turbulence, amplifying the transmission of external shocks (Arslanalp et al., 2020; Broner, 2013).

In sharp contrast, during the pre-2014 period—when foreign investors accounted for only a small share of TES holdings—the IDOAM index showed virtually no response to global risk shocks (see Graph C.1). This muted transmission points to the influence of a market dominated by domestic investors, who are generally less reactive to short-term external volatility. As highlighted by Burger & Warnock (2004) and Peiris (2010), domestic investors often serve as an anchor in local-currency sovereign debt markets, dampening the impact of global financial turbulence

In the post-2022 period, the transmission of global financial shocks to Colombia's domestic conditions becomes more moderate. The IDOAM index's response to global risk (RI) remains positive and statistically significant, but its magnitude declines to around 0.05 on average (see Graph C.3). This diminished sensitivity tracks the reduction in foreign investor participation since 2023: as their market share falls, so does their capacity to amplify global volatility within the local market. Nevertheless, the influence of external shocks persists, highlighting that even with reduced foreign participation, global factors continue to shape Colombia's financial local conditions.

To deepen the analysis, a second VAR specification replaces the IDOAM index with the 10-year TES yield, offering a direct lens on how global shocks affect long-term sovereign borrowing costs in domestic currency. The impulse-response functions (Graphs C.4 to C.6) reveal that episodes of heightened global financial stress consistently push up long-term yields across all periods. Before 2014, a one-unit increase in the global risk indicator (RI) leads to an increase of about 30 basis points in the 10-year TES yield with some lags (see Graph C.4). This response was slower but greater than the one observed in the period of elevated foreign participation in the TES market (2014-2022) (Graph C.5). This result is consistent with the prediction of the model developed in Romero et al. (2021), in which the size of the response of local yields to foreign interest rate shifts decreases with the applicable tax rate.[3] Recall that the rise in foreign participation was partly a reaction to the reduction and simplification of the tax burden on foreign portfolio investment.

After 2022, the estimated response remains fast but is greater than in the 2014-2022 period (Graph C.6). This could be a reflection of a still substantial presence of foreign investors in the TES market, but with more prominent credit risk considerations after the deterioration of the Colombian fiscal position. Interestingly, the contemporaneous decline in the influence of external financial conditions on domestic financial conditions, illustrated above, may reflect not only the reduced participation of foreign investors—who are highly sensitive to external risk—but also the greater exposure of domestic investors to local public bonds, which increases the relative value of other local assets. As

[3] If foreign investors are subject to a tax rate on the returns obtained on local bonds, then non-arbitrage conditions require that local yields compensate for the tax. The higher the tax rate, the greater the local yields. Consequently, an increase in the foreign interest rate (the opportunity cost of holding the domestic bond), would require an adjustment in the local yields that is positively related to the tax rate. The higher the tax rate, the greater the response of local yields to a shift in the foreign interest rate.

foreigners exit, domestic investors must absorb a larger share of a growing stock of public debt; if loans or other domestic assets are imperfect substitutes for public bonds, they become relatively scarcer and thus more attractive. In this setting, a tightening of foreign financial conditions raises local public-bond yields but has a more muted effect on the prices of other domestic assets and, more generally, on domestic financial conditions. This mechanism is also described in Romero et al. (2021). Overall, the evolution of the impulse-response functions across subsamples provides suggestive evidence that periods of higher foreign investor participation are associated with a stronger pass-through of external volatility into local markets. As foreign participation has waned, this sensitivity has moderated, though global financial factors are still a significant force shaping Colombia's financial landscape.

4. Monetary and FX policy in Colombia

The Central Bank of Colombia's policy framework is anchored in a flexible inflation-targeting regime, with a fully flexible exchange rate serving as the primary line of defense. Within this framework, foreign exchange interventions are reserved for addressing specific market frictions, mitigating disorderly market conditions, or ensuring the proper functioning of financial markets, rather than targeting a particular exchange rate level.

By not committing to a specific exchange-rate target, the Central Bank can focus on achieving its inflation and sustainable growth objectives. This enhances policy credibility, avoids pro-cyclical interest rate hikes, and protects international reserves by limiting FX interventions to exceptional circumstances. Foreign investors in the sovereign bond market understand this framework, recognizing that the Central Bank intervenes infrequently. As a result, they must internalize exchange-rate risk or interest-rate risk. This feature ultimately deepens the market's capacity to absorb shocks and reinforce the scope and benefits of exchange-rate flexibility.

The robustness of this framework was tested during the Covid-19 pandemic shocks. Facing external vulnerabilities—including a high current account deficit, increased public and external debt, and significant exposure to oil prices—the Central Bank allowed substantial exchange rate and long-term interest rate adjustments, and relied on ample external liquidity buffers (international reserves and access to the IMF Flexible Credit Line). This response played a central role in mitigating the effects of global "flight to safety" episodes that triggered capital outflows and exchange rate pressures (See Cardozo et.al. 2023).

During this period, the Central Bank implemented a comprehensive policy mix that included cutting the policy rate from 4.25% to a record low of 1.75% to stimulate demand and credit, as well as expanding repo operations, reducing reserve requirements and conducting outright purchases of government bonds (TES) and private debt instruments to provide liquidity and stabilize markets. It also used FX and FX liquidity intervention mechanisms such as non-deliverable forward sales and FX-swap auctions and to further support market functioning. As mentioned, a key element of this strategy was allowing sizeable adjustments in both the long-term interest rate and the exchange rate before any Central Bank intervention. This approach reduced incentives for speculation against the Bank and facilitated market-driven corrections once uncertainty receded.

Following the pandemic, the Central Bank resumed gradual reserve accumulation, further strengthening external buffers and enhancing resilience to global shocks. Colombia's experience confirms the effectiveness of its policy framework: exchange-rate flexibility serves as the primary shock absorber, complemented by targeted, temporary interventions to address market dysfunctions and preserve orderly conditions in both domestic and external markets.

5. Conclusion

In summary, the experience of Colombia's sovereign bond market illustrates both the opportunities and challenges brought by foreign investor participation. While the entry of global investors since 2014 deepened the market, lowered financing costs, and enabled the issuance of longer-term, local-currency debt, it also raised the market's exposure to global financial shocks. The recent reduction in foreign holdings since 2023, amid a difficult macroeconomic environment and persistent global uncertainty, has somewhat decreased this sensitivity. The Central Bank's flexible inflation-targeting regime, supported by robust external buffers and timely interventions, has proven effective in mitigating these risks and preserving financial stability. Looking ahead, continued vigilance regarding the composition and behavior of foreign investors will be essential to assess the risks that shifts in the external environment pose to domestic financial conditions.

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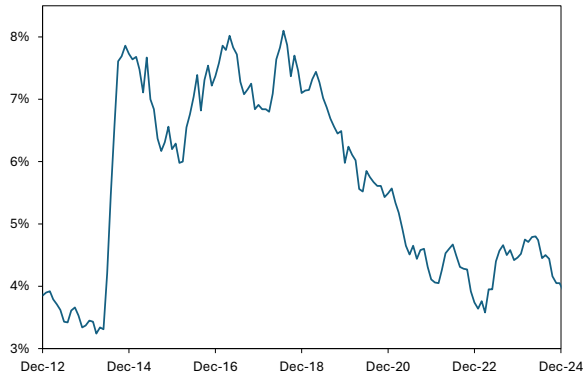
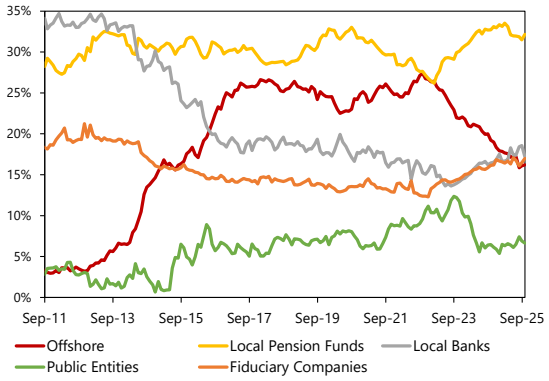
Appendix A. Graphs

Graph A.1. Colombia's share in the GBI-EM index



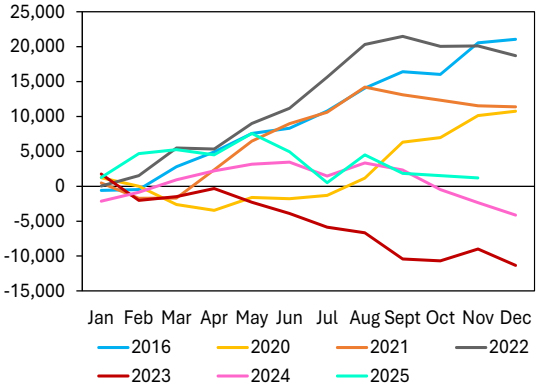
Source: J.P. Morgan

Graph A.2. Sovereign bond balance by investor group (% Total)



Source: Central Bank of Colombia.

Graph A.3. Net flows by foreign investors in the sovereign bond market accumulated per year (COP billion)

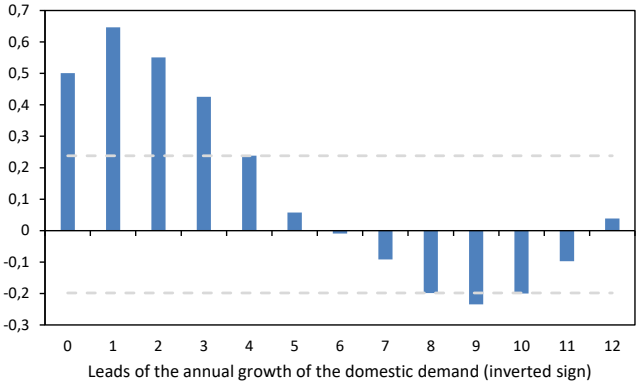


Source: Central Bank of Colombia. **Note:** The last 4 years are incorporated, and the flows from 2016 are added as it is a reference period for its significant volume of purchases,

Graph A.4. IDOAM index

Source: Central Bank of Colombia, Fedesarrollo and Colombian Stock Exchange.

Graph A.5. Correlation between the IDOAM index and the annual growth of the domestic demand (with inverted sign)



Source: Authors' calculations based on data from the Central Bank of Colombia and DANE (National Administrative Department of Statistics).
The dotted grey areas represent the lower and upper bounds of the 95% confidence intervals.

Appendix B. IDOAM index specification

The IDOAM index is calculated as follows:

$$\boldsymbol{IDOAM}_t = \frac{1}{I}\sum_{i=1}^{I}\frac{X_{it} - \mu_i}{\sigma_i}$$

Where: $\boldsymbol{X_{it}}$ is the observed value of variable i, including: credit-market spreads — loan–TES spreads for preferred and consumer portfolios across four maturity buckets (<1 year, 1–3 years, 3–5 years, and >5 years)— together with three confidence indicators (business, consumer, and industrial). It also incorporates expectations from the Financial Opinion Survey (EOF, by its Spanish acronym) on GDP growth, inflation, and the spread between foreign-currency sovereign bonds and US Treasuries, along with measures of conditional volatility in the equity and TES markets, and the cross-sectional dispersion of inflation expectations from the Central Bank survey. TES refers to Colombia's local-currency sovereign bonds.

The parameters μ_i and σ_i are the historical mean and standard deviation of each variable i. Confidence indicators and GDP-growth expectations are multiplied by -1 so that a positive movement always signals a deterioration in financial conditions.

Appendix C. VAR model specification

Given the potential for an interdependent or simultaneous relationship between the IDOAM and OIS rates, we estimate a VAR(p) model using monthly data from January 2011 to September 2025. The specification is:

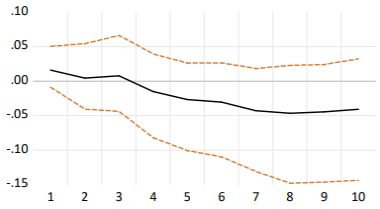
$$\boldsymbol{y}_t = \boldsymbol{A}_0 + \sum_{p=1}^{P}\boldsymbol{A}_p\,\boldsymbol{y}_{t-p} + \boldsymbol{\varepsilon}_t \quad \boldsymbol{\varepsilon}_t \sim N\,(0,\,\boldsymbol{\Sigma}_t)$$

where: $\boldsymbol{y}_t$ is the vector of endogenous variables, including: the first principal component of global risk indicators (VIX, MOVE, DXY, and the CDS spread of emerging economies), which we refer to as RI; the Brent oil price; the overnight rate and its 1-year-ahead expectations; foreign portfolio flows; the 12-month depreciation of the exchange rate against the U.S. dollar; and the IDOAM index. $\boldsymbol{\Sigma}_t$ is the variance–covariance matrix of the model.

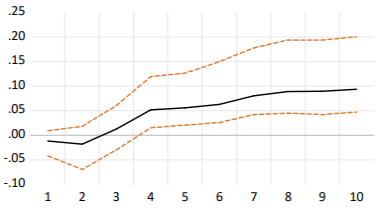
To account for structural changes associated with foreign investor participation in the sovereign bond market, the VAR is estimated over three subsamples: (*i*) before 2014; (*ii*) 2014–2022; and (*iii*) after 2022, corresponding to the three phases of foreign investor dynamics in Colombia's local-currency government bond market. Graphs C.4 to C.6 report the estimated response of the IDOAM index to shocks in selected variables of the VAR.

Graph C.1. Some impulse response functions for the IDOAM index – period of low foreign participation (2011 – 2013)

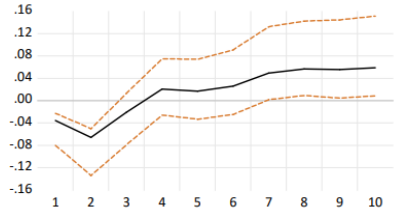
a) Response of IDOAM to RI



b) Response of IDOAM to overnight rate



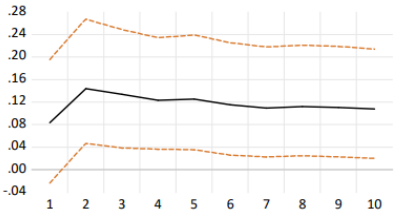
c) Response of IDOAM to 1-year-ahead overnight rate expectations



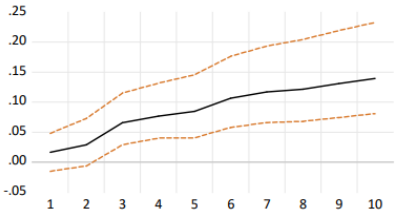
Source: Authors' calculations. The figures show the response of the IDOAM index to Cholesky one-standard-deviation innovations with 95% confidence intervals using Hall's percentile bootstrap with 999 replications, based on the VAR model.

Graph C.2. Some impulse response functions for the IDOAM index – period of high foreign participation (2014 – 2022)

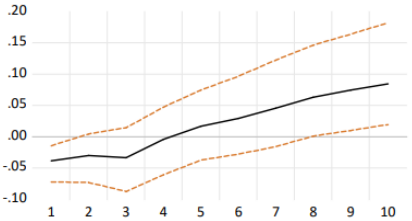
a) Response of IDOAM to RI



b) Response of IDOAM to overnight rate



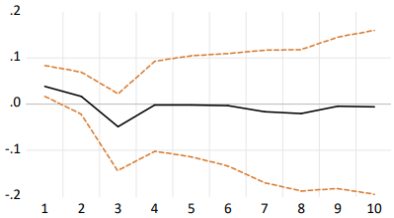
c) Response of IDOAM to 1-year-ahead overnight rate expectations



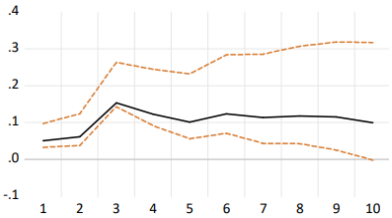
Source: Authors' calculations. The figures show the response of the IDOAM index to Cholesky one-standard-deviation innovations with 95% confidence intervals using Hall's percentile bootstrap with 999 replications, based on the VAR model.

Graph C.3. Some impulse response functions for the IDOAM index – period of declining foreign participation (2023–2025)

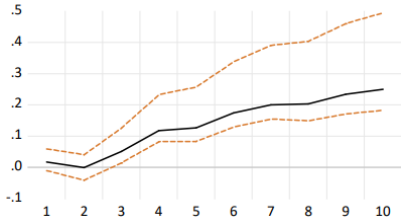
a) Response of IDOAM to RI



b) Response of IDOAM to overnight rate



c) Response of IDOAM to 1-year-ahead overnight rate expectations

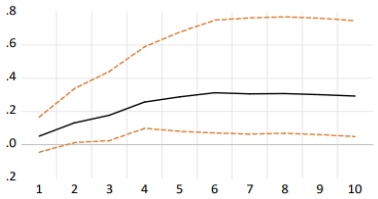


Source: Authors' calculations. The figures show the response of the IDOAM index to Cholesky one-standard-deviation innovations with 95% confidence intervals using Hall's percentile bootstrap with 999 replications, based on the VAR model.

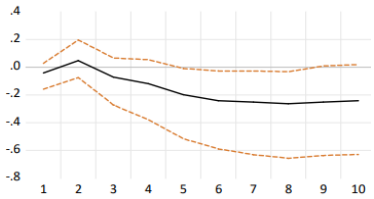
Additionally, we estimate the same VAR model replacing the IDOAM with the returns of 10-year sovereign bonds. Graphs C.4 to C.6 report the estimated response of 10-year sovereign bond yields to shocks in selected endogenous variables of the VAR.

Graph C.4. Some impulse response functions for 10-year bond yields – period of low foreign participation (2011 – 2013)

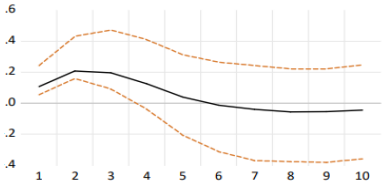
a) Response of 10-year bonds to RI



b) Response of 10-year bonds to overnight rate



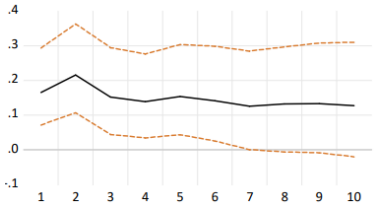
c) Response of 10-year bonds to 1-year-ahead overnight rate expectations



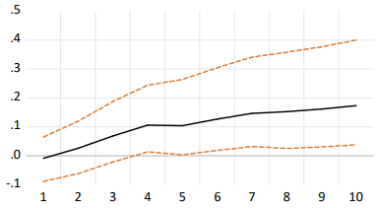
Source: Authors' calculations. The figures show the response of 10-year sovereign bond yields to Cholesky one-standard-deviation innovations with 95% confidence intervals using Hall's percentile bootstrap with 999 replications, based on the VAR model.

Graph C.5. Some impulse response functions for 10-year bond yields – period of high foreign participation (2014 – 2022)

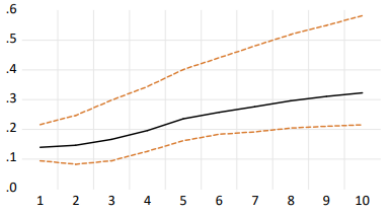
a) Response of 10-year bonds to RI



b) Response of 10-year bonds to overnight rate



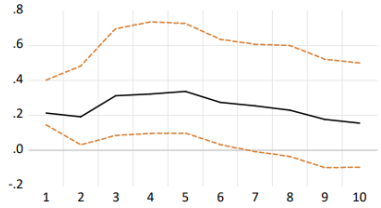
c) Response of 10-year bonds to 1-year-ahead overnight rate expectations



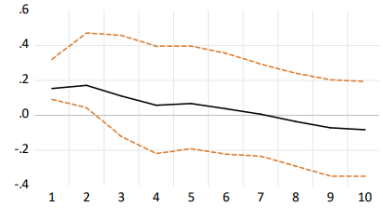
Source: Authors' calculations. The figures show the response of 10-year sovereign bond yields to Cholesky one-standard-deviation innovations with 95% confidence intervals using Hall's percentile bootstrap with 999 replications, based on the VAR model.

Graph C.6. Some impulse response functions for 10-year bond yields – period of declining foreign participation (2023–2025)

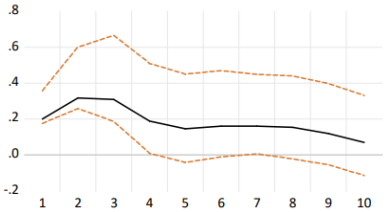
a) Response of 10-year bonds to RI



b) Response of 10-year bonds to overnight rate



c) Response of 10-year bonds to 1-year-ahead overnight rate expectations



Source: Authors' calculations. The figures show the response of 10-year sovereign bond yields to Cholesky one-standard-deviation innovations with 95% confidence intervals using Hall's percentile bootstrap with 999 replications, based on the VAR model.