Foreign Investment Dynamics: The Impact of Benchmark-Driven vs. Unconstrained Investors on Local Credit Conditions[1]

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[1] Link to the recently published paper in Borsa Istanbul Review.

Note: The opinions contained herein are the sole responsibility of the authors and do not commit Banco de la República nor its Board of Directors.

Motivation

- Foreign participation in EM sovereign debt markets has surged since the 2010s.
- This has generated a major recomposition of the investor base
- Portfolio investment flows not only affect markets but also have real effects on the economy and, consequently, influence financial stability.
- Not all investors behave the same. It's crucial to understand the type of agents participating in your market.

Literature

- There is a major debate in the literature regarding the effects of foreign participation in emerging sovereign bond markets:

i) Foreign participation can reduce yields and volatility in EME's bond markets:

- Foreign investors diversify the investor base and create greater demand (and liquidity) for local debt securities (Prasad and Rajan, 2008; Peiris, 2010)
- Foreign participation reduces currency mismatches and serves as an alternative source of funding (Burger and Warnock, 2004)

ii) Foreign participation can have negative effects in EME's bond markets:

- Can induce a sudden drying-up of capital flows resulting from an increase in risk aversion (Calvo and Mendoza, 1996; Calvo and Talvi, 2005; Cerutti et al., 2019)
- Increased sensitivity of overall portfolio flows to global financial conditions and increased volatility of yields (Obstfeld, 2012; Ebeke and Lu, 2014; Ebeke and Kyobe, 2015)

Literature

- Beyond the aggregate effect of higher foreign participation, a key strand of the literature shows that its implications depend crucially on the composition of the foreign investor base:
  - Investment funds are more sensitive to global conditions, whereas institutional investors (e.g., international pension funds) respond more strongly to domestic factors (Banco de la República, 2023; Gamboa-Estrada and Sanchez-Jabba, 2024).
  - A rising share of investment funds is associated with higher yield volatility (Ocampo et al., 2025).
  - Investment strategies also matter: benchmark-driven investors, who track global indices such as the J.P. Morgan GBI-EM, adjust their portfolios mechanically in response to index changes and global conditions, thereby amplifying domestic market sensitivity to global shocks (Arslanalp et al., 2020; Miyajima and Shim, 2014).

Summary

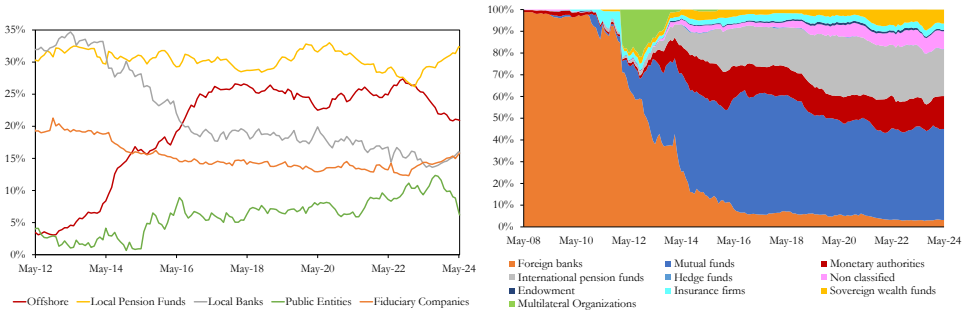
- We introduce a novel strategy to distinguish between benchmark-driven and unconstrained foreign investors in Colombia's sovereign bond market
  - Benchmark-driven investors, who follow passive strategies, make investment decisions primarily influenced by changes in index weights and global factors
  - Unconstrained investors are more responsive to idiosyncratic factors and aim to consistently outperform benchmarks, typically reacting first to local shocks
- Crowding-out channel: we find that local banks adjust their bond holdings in response to foreign investor demand, which in turn affects their lending capacity, reflecting a crowding-out effect.

Summary

- By distinguishing between these investor types, we uncover significant differences in their influence on the financial landscape
  - Banks more exposed to unconstrained investors tend to lend more during periods of high inflows, while those exposed to benchmark-driven investors show a more muted response.
- We also find that banks closely linked to benchmark-driven investors tend to be more reactive to global factors, amplifying the effects of global shocks on local credit conditions.
  - Conversely, banks with greater exposure to unconstrained investors exhibit less sensitivity to these external influences.
  - This confirms that a stronger presence of benchmark-driven investors makes local credit conditions more vulnerable to global financial fluctuations.

Colombian context

Figure: Foreign participation in the Colombian sovereign bond market



(a) Total bond holdings by entity

(b) Bond holdings across foreign investors

Source: Central Securities Depository (DCV) at the Central Bank of Colombia. Panel A illustrates sovereign bond market participation across various entities, while Panel B focuses on the share held by foreign investors.

Data

- Sovereign bond-level data from DCV (2014–2023).
- Credit registry data from SFC (bank-firm loans).
- FX forward positions.

Table: Descriptive statistics for monthly aggregated data

	Obs	Mean	Std	Min	Max
Sovereign bonds data					
foreign investor flows (COP billion)	13,144	33	104	0	3,349
bank-foreigners flows* (COP billion)	660	347	423	0	4286
Corporate loans data					
loan amount (COP billion)	228,212	1.2	10.5	0.0	1,869
loan rate (%)	228,212	17.2	9.8	0.0	49.6
monthly bank-firm loans	228,212	434	864	1	7,756

Note: Authors' calculations. Data on sovereign bonds are from the Central Securities Depository (DCV) and data on commercial loans are from the Colombian Financial Superintendence (SFC).
* Denotes each bank's order book with foreign clients in sovereign bonds (with higher values indicating a bank that actively trades with foreign investors).

Investor Classification Strategy

- Decompose GBI-EM index weight changes: Valuation vs. Exogenous.
- As proposed by Arslanalp et al. (2020), changes in an issuer's weight within this index can be decomposed into:

$$\Delta w_{ct+1} = \underbrace{(w_{ct} * \frac{R_{ct}}{R_{bt}} - w_{ct})}_{\text{valuation}} + \underbrace{(w_{ct+1} - w_{ct} * \frac{R_{ct}}{R_{bt}})}_{\text{exogenous}}, \quad (1)$$

  - Unlike a fixed-weight index, the GBI-EM assigns weights based on the market capitalization of each issuer's eligible bonds. As a result, an issuer's weight fluctuates monthly in response to:
    - Valuation component: changes in market variables, such as exchange rates and bond prices
    - Exogenous component: the index's rebalancing rules

Investor Classification Strategy

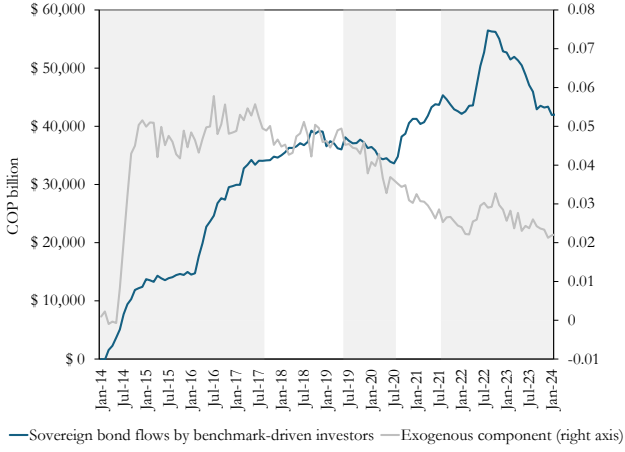
- Panel regression of flows on exogenous weight variation → classify investors.

$$Bonds_{ft} = \alpha_f + \beta_1 \, GBI\_exog_t + v_f \, GBI\_exog_t + \sum_j \beta_j X_{jt} + e_{ft}, \tag{2}$$

- We employ a mixed linear model with a random slope. Specifically, the random effect term v_f reflects how investor f's response to GBI_exog_t deviates from the average slope (β_1) across all investors
  - α_f: investor fixed effects
  - GBI_exog_t: exogenous component of Colombia's weight variation in the GBI-EM index, as described in equation (1)
  - (X_{jt}): Set of control variables: (i) returns of Colombian sovereign bonds (GBI-EM), (ii) yield spread between 10-year Colombian bonds and US Treasuries, (iii) monthly COP/USD exchange rate returns, (iv) spread between Colombia's 5-year CDS and the Latin American average, and (v) monthly average of the VIX index.
  - **Coefficient of interest:** v_f

Investor Classification Strategy

Figure: Cumulative bonds flows: benchmark-driven vs exogenous component



Source: DCV and JP Morgan, authors' calculations. Grey areas correspond to periods during which both series present a high and positive correlation.

Robustness check: FX Hedging Behavior

- In principle, benchmark-driven investors should not purchase COP/USD forwards when investing in sovereign bonds, as they are purely following an unhedged exposure in local currency. This is one of the main features of the GBI-EM Index
- We follow Jordà (2005) method of local projections, we examine dynamic effects by estimating sequential regressions in which the dependent variable is shifted forward each month (for $h = 0 - 11$ months).

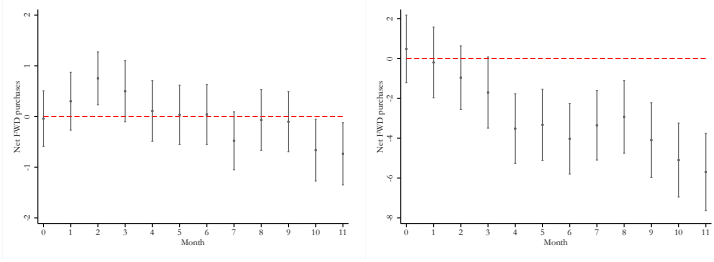
$$FXforward_{f,t+h} = \alpha_f^h + \beta_1^h Bonds_{f,t-1} + \beta_2^h (D_f^{indexed} * Bonds_{f,t-1}) + \sum_j \beta_k^h X_{k,t-1} + e_{f,t+h} \quad (3)$$

  - $D_f^{indexed}$: dummy variable switched on if the foreign investor is benchmark-driven
  - α_f: agent fixed-effects
  - (X_{jt}): Same set of control variables.
  - **Coefficient of interest:** β_2^h

Robustness check: FX Hedging Behavior

- Benchmark-driven investors: minimal FX hedging (aligned with GBI-EM).
- Unconstrained investors: active in forward market.

Figure: FX-forward position of foreign investors in response to bond purchases



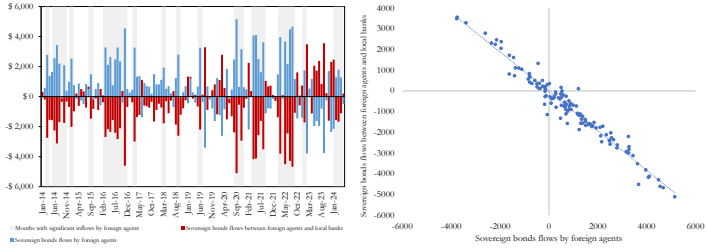
(a) Marginal effect of bond purchases (b) Incremental effect $D_i^{indexed}$

Note: Authors' calculations. The Figure shows coefficients from the regression as presented in equation (3), with robust confidence intervals significant at a 5 percent level.

Banks as Counterparts

- Banks are primary counterparties to foreign flows.
- They absorb or release liquidity via bond trades **(crowding-out channel)**.

Figure: Bond flows by foreign investors and local banks



(a) Bond flows by offshore agents and banks.

(b) Correlation of offshore and banks bond flows.

Source: Central bank of Colombia and authors' calculations. **Note:** Grey areas in panel (a) correspond to periods of high inflows by foreign investors in sovereign bonds.

Banks as Counterparts

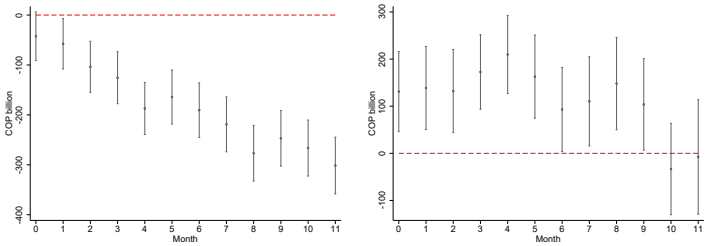
- To corroborate that local banks are the main counterpart of foreign agents in the sovereign bond market, we estimate the following regression:

$$Bonds_{i,t+h}^{banks} = \alpha_i^h + \alpha_t^h + \beta_1^h exposure_{it} + \beta_2^h D_t^{flows} + \beta_3^h (D_t^{flows} * exposure_{it}) + e_{i,t+h} \quad (4)$$

  - $Bonds_{i,t+h}^{banks}$: net bond purchases (flows) by local bank i
  - $exposure_{it}$: total volume of gross transactions - purchases plus sales - between bank i and foreign clients in a given month
  - D_t^{flows}: dummy variable activated either during periods of sizable portfolio inflows (greater than the 75^{th} percentile) or outflows (lower than the 25^{th} percentile)
  - α_i^h: agent fixed-effects
  - α_t^h: time fixed-effects
  - **Coefficient of interest:** β_3^h

Banks as Counterparts

Figure: Local banks' net bond purchases in response to portfolio flows



(a) Portfolio inflows (b) Portfolio outflows

Note: Authors' calculations. The figure shows the interaction term coefficient between D_t^{flows} and $exposure_{it}$ as presented in equation (4), with robust confidence intervals significant at a 5 percent level.

Impact on Bank Lending

- We analyze whether changes in sovereign bond holdings by banks influence their lending behavior

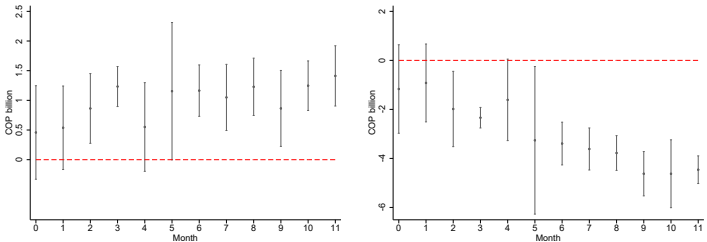
$$Loan_{ji,t+h} = \alpha^h_{ji} + \alpha^h_{jt} + \beta^h_1 exposure_{it} + \beta^h_2 (D^{flows}_t * exposure_{it}) + e_{ji,t+h}, \quad (5)$$

  - $Loan_{ji}$: monthly amount of new corporate loans issued by bank i to firm j
  - $exposure_{it}$: total volume of gross transactions - purchases plus sales - between bank i and foreign clients in a given month
  - D^{flows}_t: dummy variable activated either during periods of sizable portfolio inflows (greater than the 75^{th} percentile)
  - α_{ji}: firm-bank fixed effects
  - α_{jt}: firm-time fixed effects
  - **Coefficient of interest:** β^h_2

Impact on Bank Lending

- More lending after selling bonds (inflows).
- Less lending after buying bonds (outflows).

Figure: Effects of portfolio flows on new corporate loans



(a) Portfolio inflows (b) Portfolio outflows

Note: Authors' calculations with robust confidence intervals significant at a 5 percent level.

Benchmark-Driven vs. Unconstrained Effects

- We now assess whether benchmark-driven and unconstrained agents have differing impacts on the credit market

$$Loan_{ji,t+h} = \alpha^h_{ji} + \alpha^h_{jt} + \beta^h_1 Expo^U_{it} + \beta^h_2 Expo^{BD}_{it} + \beta^h_3 (D^{flows}_t * Expo^{BD}_{it}) + \beta^h_4 (D^{flows}_t * Expo^U_{it}) + e_{ji,t+h} \quad (6)$$

  - $Loan_{ji}$: monthly amount of new corporate loans issued by bank i to firm j
  - $Expo^{BD}_{it}$ and $Expo^U_{it}$: total volume of gross transactions - purchases plus sales - between bank i and foreign clients in a given month, weighted by the monthly share of each investor type (benchmark-driven and unconstrained) in the overall pool
  - D^{flows}_t: dummy variable activated either during periods of sizable portfolio inflows (greater than the 75^{th} percentile)
  - α_{ji}: firm-bank fixed effects
  - α_{jt}: firm-time fixed effects
  - **Coefficients of interest:** β^h_3 and β^h_4

Benchmark-Driven vs. Unconstrained Effects

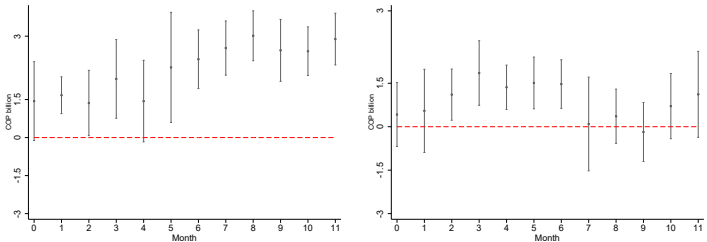
Unconstrained:

- Stronger lending response

Benchmark-Driven:

- Weaker response

Figure: Investor-type effects of portfolio flows on new corporate loans



(a) Inflows of unconstrained investors (b) Inflows of Benchmark-driven investors

Note: Authors' calculations with robust confidence intervals significant at a 5 percent level.

Response to Global Financial Cycle

- Do local banks respond differently to Global Financial Conditions (GFC) based on their exposure to different types of foreign investors in the sovereign bond market?

$$Loan_{jit} = \alpha_{ji} + \beta_1 \ln(VIX_t) * Expo_{it}^{BD} + \beta_2 \ln(VIX_t) * Expo_{it}^{U} + \beta_3 \ln(CDS_t) * Expo_{it}^{BD} + \beta_4 \ln(CDS_t) * Expo_{it}^{U} + \beta_5 Z_t + e_{jit}$$

  - $ln(VIX_t)$: proxy for the GFC
  - CDS_t: Colombia's 5-year Credit Default Swaps
  - Z_t: set of macro control variables: domestic policy rate, GDP growth, exchange rate changes, and inflation
  - α_{ji}: bank-firm fixed-effects
  - We also control for a set of bank characteristics
  - **Coefficients of interest:** β_1^h, β_2^h, β_3^h and β_4^h

Response to Global Financial Cycle

- Benchmark-driven investors amplify global shocks.

Table: Global financial cycle analysis

	Log loan amount	
ln(VIX)	-0.033***	
	(0.0078)	
ln(VIX) × Expo^{U}	0.32***	-0.048
	(0.096)	(0.59)
ln(VIX) × Expo^{BD}	-0.35***	0.061
	(0.098)	(0.60)
ln(CDS)	-0.055***	
	(0.016)	
ln(CDS) × Expo^{U}	0.25**	-0.26
	(0.10)	(0.69)
ln(CDS) × Expo^{BD}	-0.25**	0.26
	(0.11)	(0.70)
Observations	228,212	228,212
Macro controls and trend	✓	
Bank controls	✓	
Bank × Firm and Firm × Time F.E.	✓	✓

Note: Authors' calculations. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Conclusions

- Investor's composition matters for financial stability.
- Banks adjust credit supply depending on the counterparties involved in the bond market.
- Benchmark-driven flows increase the sensitivity to global shocks.
- Consider investor heterogeneity in macro-financial surveillance.

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