Box 2: Experience of Foreign Investment Flows in Colombian Sovereign Bonds during the Rebalancings of the GBI-EM[1]Index

Introduction

The Government Bond Index - Emerging Markets (GBI-EM)[2], prepared by JP Morgan, is the leading benchmark for global fixed income markets in local currency in emerging economies. Colombia is currently part of the group of 19 issuing countries whose bonds are included in the basket of the index. According to surveys conducted periodically by the same entity, this index has more than USD 200 billion in assets that aim to replicate it annually.

The weighting of each issuer within the index is adjusted monthly. Such adjustments reflect both changes in the market value of the bonds and in the index construction rules, such as adjustments in eligibility criteria or the inclusion of new references or issuers[3].

Given the variability of the weights within the index, and the adjustments implemented by the investors that follow it, some periods have been identified in which Colombia has experienced significant movements in its capital flows that coincide with changes in the country's participation within the GBI-EM (see Romero, Vargas, Cardozo, and Murcia, 2021). Particularly, 3 episodes have been identified in which the weighting of Colombia in the GBI-EM has presented a significant adjustment due to the inclusion of new issuers in the index: the increase in its weighting in March 2014, when the weighting of Colombia increased significantly within the index, as well as the inclusion of China in February 2020 and the entry of India in June 2024, episodes in which the participation of Colombia and other emerging countries was gradually reduced to give rise to new countries within the index.

This box analyzes the dynamics of portfolio foreign investment flows in the Colombian sovereign bond market during episodes of significant adjustments in Colombia's weighting in the GBI-EM index. In general, these rebalancings generate relevant flows, with sales of local securities when the weight of the country decreases, as happened with the inclusion of China and India. The magnitude of these movements depends in part on the evolution of the assets under management (AUM) of the funds that replicate the index, which can cushion or accentuate the outflows. Additionally, index investors tend to anticipate changes, concentrating their adjustments at the beginning of each rebalancing period.

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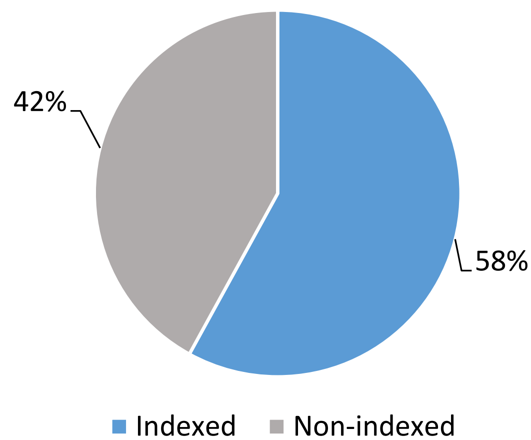
[2] This index measures the performance of local currency-denominated sovereign bonds issued by a group of emerging economies. Its "Global Diversified" version limits exposure to higher-weighted countries through an allocation scheme that reduces the weight of the largest issuers. Thus, the share of each issuer within the index has a ceiling of 10%, seeking greater geographical diversification.

[3] Changes in a country's weighting within the GBI-MS index may be due to both market factors (valuation of securities or currency appreciation) and index construction factors (exogenous effects). The latter include weighting methodology (reduces large issuer participation and redistributes participation to smaller countries), security eligibility criteria (based on liquidity criteria for security eligibility, rebalancing each month may result in outflows of certain references leading to changes in issuer weights) and the addition of new issuers following periodic reviews of compliance with inclusion conditions.

Identification of Indexed Foreign Investment Flows

For the following analyses, the classification proposed by Botero, Murcia, and Villamizar (2025) serves as a basis, as they develop a methodology to identify foreign investors most likely to replicate the performance of the GBI-EM index in the Colombian sovereign debt market. Based on this classification, approximately 58% of holdings of public debt by foreign investors at the end of 1Q25 are in the hands of agents with a high propensity to be benchmark driven (*Graph B2.1*). When disaggregating by type of foreign investor, it is noted that international pension funds concentrate the highest proportion of investors indexed within their group (77% of their public debt holdings), followed by monetary authorities (62%) and mutual funds (51%) (*Table B2.1*).

Graph B2.1. Distribution of Public Debt Holdings between Indexed and Non-Indexed Foreigners (% total – March 2025)



Source: *BanRep* and Botero, Murcia and, Villamizar (2025).

Table B2.1. Distribution of Public Debt Holdings between Indexed and Non-Indexed Foreigners (% of Holdings by Group – March 2025)

Foreign agent type	% Total Foreigners' TES holdings	% Total Foreigners' TES holdings belonging To Benchmark driven agents
Mutual Funds	41%	51%
International Pension Funds	24%	77%
Monetary Authorities	16%	62%
Others	19%	32%

Source: *BanRep* and Botero, Murcia and Villamizar (2025).
Note: The percentages in the first column correspond to the share of public debt holdings of each group in the total holdings of foreigners. For their part, the weightings in the second column correspond to the percentage of holdings in the hands of investors classified as follows: the index GBI-EM Global Diversified within each category of foreign investors.

For more details on the participation of these agents in the public debt market, see: Characterization of foreign investors in the TES spot market

As shown in *Graph B2.1,* a significant share of the foreign investment base in sovereign bond corresponds to agents with a high propensity to follow the GBI-EM index, which can increase the sensitivity of the local public debt market to external factors. The literature on capital flows suggests that investors following benchmarks amplify the impact of external factors on local markets (See Balston, Marc, and Melin, 2013; Raddatz et al., 2017; and Arslanalp et al., 2015), thereby increasing the risk of capital outflows that are disconnected from local economic conditions. Likewise, Sushko and Turner (2018) find that the increase in the participation of investors with passive strategies in sovereign bond markets, such as benchmark-driven agents, increases the correlation of yields among emerging country debt securities, decreasing the incidence of local factors in the price formation of these securities.

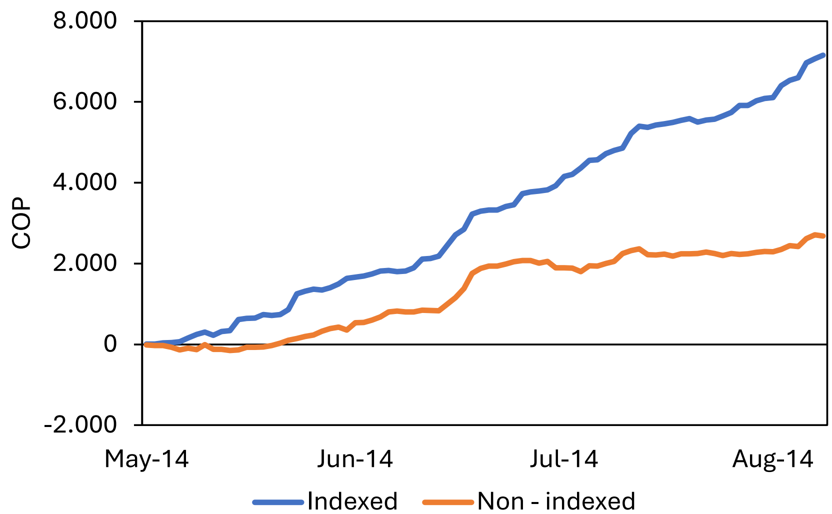
Experience with GBI-EM Index Rebalancing Processes

The first notable change that Colombia's participation in the GBI-EM index experienced was the increase that JP Morgan made in its weighting between May and August 2014[4], increasing it from 3.31% to 7.61%. Following this change, purchases of foreign investment classified as

[4] The main regulatory changes that influenced this decision occurred between 2010 and 2013. Specifically, the following changes were presented: i) in December 2010, the General Regime for Foreign Capital Investments in Colombia and Colombian Capital Investments Abroad was modified, which eliminated the requirement for foreign investors to establish a Foreign Capital Investment Fund to make their investments in the local financial market, allowing, from that moment on, them to be made through local administrators; ii) the tax reform of the end of 2012 educed from 33% to 14% the income tax that foreign investors had to pay for their investments in TES; and iii) in October 2013, the calculation of withholding tax applicable to fixed income securities was simplified. These changes, plus the strengthening of investment grade in Colombia in 2011 and an external scenario characterized by ample liquidity conditions in international markets, allowed JP Morgan to announce in 2014 the increase of Colombia's participation in three of its main emerging debt indices. For more details, see (Romero, Vargas, Cardozo, & Murcia, 2021).

indexed in public debt were observed (*Graph B2.2*). During this 4-month window, indexed agents net bought COP 7.0 t in government bonds. This performance was driven by the fact that these investors adjusted their portfolios by purchasing Colombian sovereign securities, in response to the increase in their weighting in the index. Additionally, at that time, it was observed that foreign investors anticipated the start date of the event and made significant purchases of debt securities since the beginning of 2014.

Graph B2.2. Cumulative Daily Net Flows of Foreign Investment in Public Debt classified as Indexed and Not Indexed to the Index GBI-EM Global Diversified– during the Increase in the Weighting of Colombia (COP Billions)



Source: *BanRep.*

Some studies suggest that this significant inflow of benchmark-driven investors into the local government bond market may have relaxed local financial conditions and increased the sensitivity of debt securities rates to external factors. Authors such as Romero, Vargas, Cardozo, and Murcia (2021) find that, after the increase in the participation of foreign investors in the public debt market in 2014, the rates of both these securities and loans at the local level decreased. Additionally, they find evidence that following this event, the sensitivity of public debt rates to external factors increased. In turn, Botero, Murcia, and Villamizar (2025), find that a greater participation of indexed foreign investors in the public debt market can increase the sensitivity of local financial conditions to the global economic cycle.

Since the sales of benchmark-driven investors can exacerbate the devaluations of debt securities, especially during episodes of greater global risk aversion, we also analyze the rebalancing episodes that decrease the weighting of Colombia, driving outflows by these agents. JP Morgan periodically evaluates the eligibility of new issuers for incorporation into the GBI-EM Index. After meeting a series of requirements[5], a new country can be included. This process usually occurs in a 10-month window, during which the weighting of the new issuer is

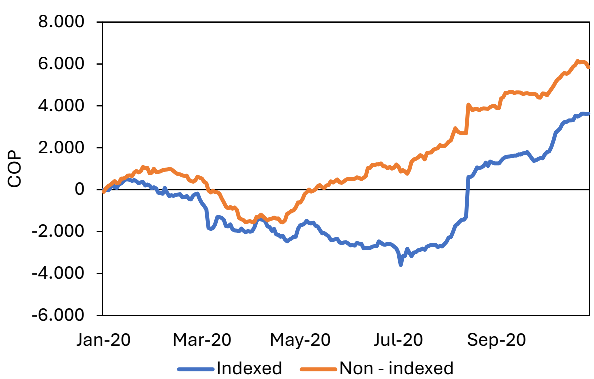
5 To be included in the GBI-EM Global Diversified Index, a country must meet at least one of the following criteria for three consecutive years: (1) its Gross National Income (GNI) per capita must be below the Index Income Ceiling (IIC), defined by J.P. Morgan and adjusted annually according to the growth of global GNI per capita; or (2) its Index Purchasing-Power Parity Ratio (IPR) must be below the threshold set for emerging market.

gradually increased by uniform increases until the target value is reached, while the weighting of the rest of the countries included in the index decreases proportionally. Typically, these adjustments are made at the end of each month, which allows characterizing how foreign investors subsequently adjust their portfolios.

Under this methodology, two new issuers have been included in the index since 2014, resulting in a decrease in the Colombian weighting. Between February and November 2020, China was included; meanwhile, between June 2024 and March 2025, the same was done with India. Both processes were carried out in monthly increments of 1 percentage point until reaching a target weight of 10%. As a result of China's inclusion process in 2020, Colombia's weighting in the index decreased from 6.11% to 5.49% between February and November of that year. Likewise, between June 2024 and March 2025, Colombia's weight in the index increased from 4.63% to 3.83%, due to the India inclusion.

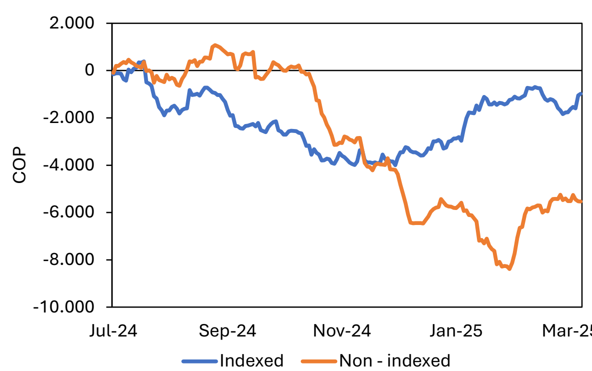
Following the decrease in the weighting of Colombia due to the inclusion of China and India in the GBI-EM index, initial downward pressures were observed in the flows of foreign investment in public debt classified as indexed (*Graph B2.3* and *Graph B2.4*). Thus, on average, indexed agents made sales during the 20 days following the date of each monthly index rebalancing (*Graph B2.5*). In this context, net flows of foreign agents indexed by COP 3.6 trillion (t) and COP -1.0 t in public debt securities were recorded during the same periods in which the inclusion processes of China and India were advanced, respectively. Additionally, in *Graph B2.5* it is observed that, on average, the response of these agents to the monthly rebalancing of the index seems to exhibit a gradual adjustment in the days following the change in weightings. This dynamic was due to the fact that these investors adjusted their portfolios by buying sovereign securities from China and India, and selling securities issued by other emerging economies, including Colombia, which are part of the GBI-EM, in order to adjust to the new index weights.

Graph B2.3. Cumulative Daily Net Flows of Foreign Investment in Public Debt classified as Indexed and Not Indexed to the Index GBI-EM Global Diversified – during the Process of China Inclusion (COP Billions)



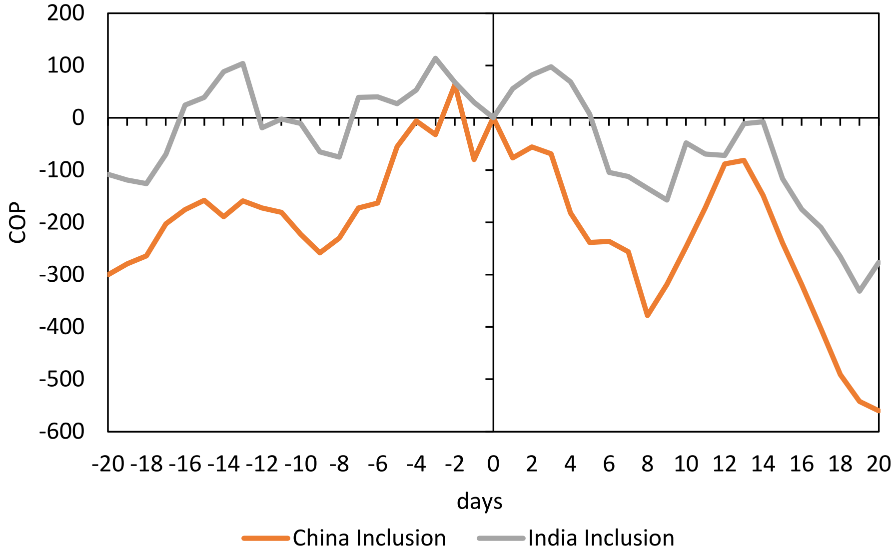
Source: *BanRep*.

Graph B2.4. Cumulative daily net flows of foreign investment in public debt classified as indexed and not indexed to the index GBI-EM Global Diversified – during the Process of India Inclusion (COP Billions)



Source: *BanRep*.

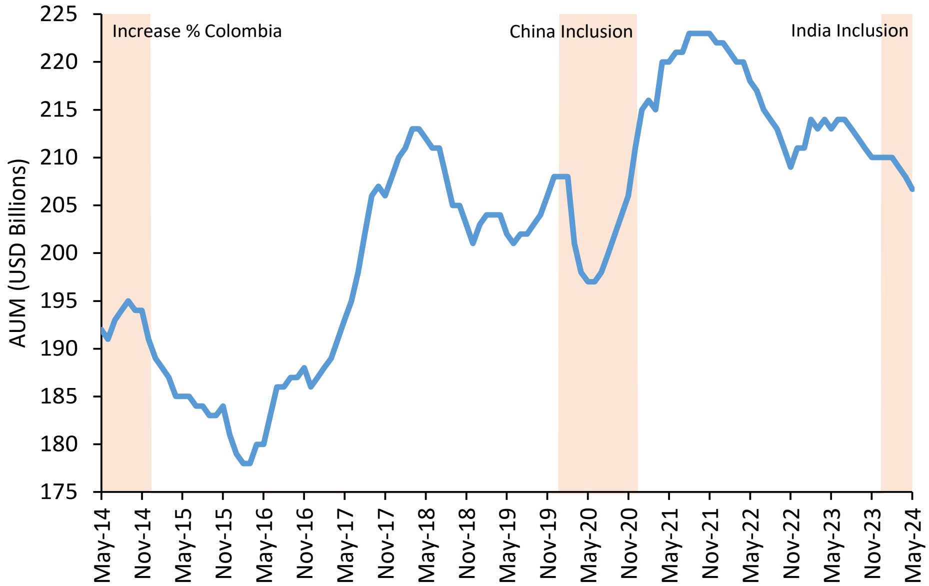
Graph B2. 5. Cumulative Daily Net Flows of Foreign Investment in Public Debt Classified as Indexed to the Index GBI-EM Global Diversified, 20 days around the Monthly Index Rebalancing Date – during the Inclusion Process of China (2020) and India (2024) (COP Billions)



Source: *BanRep*.
Note: The graph shows the cumulative average flows of foreign investment in government debt 20 days before and 20 days after the monthly rebalancing days (last business day of each month) of the GBI-EM index during the 10-month periods in which China and India were included as new issuers in the index.

As shown in *Graphs B2.3* and *B2.4*, towards the final stages of the processes of inclusion of China and India in the GBI-EM index, an upward correction in indexed foreign investment flows was observed. This performance may in turn be associated with the increase in assets under management (AUM) of funds replicating this index during such periods, given that AUMs determine the resource base available for investment by these agents (*Graph B2.6*). AUMs reflect the total value of assets managed by portfolios that follow the benchmark and are estimated monthly by JP Morgan based on investor surveys. As AUM increases, it is reasonable to expect higher inflows of foreign investment into the public debt markets of the countries that are part of the index, given the greater volume of resources available. In contrast, a reduction in AUMs could result in lower inflows or even capital outflows.

Graph B2.6. Evolution of Assets under Administration of the Index GBI-EM Global Diversified (Billions of Dollars)



Source: JP Morgan.

To demonstrate the relevance of AUMs in the flows of index investors, the observed flows were compared with two scenarios: one in which AUMs remain constant during the rebalancing period and another in which they increase by 2.5% gradually (*Graph B2.7* and *Graph B2.8*). The first exercise, which isolates the effect of the reduction in the weighting of Colombia without considering changes in the AUM, suggests that the outputs would have reached COP 5 t and COP 8 t during the inclusion processes of China and India, respectively (lines with circular markers in the graphs). These flows are estimated based on the percentage drop in the Colombian peso in the index during the rebalancing processes and then calculate the reduction that Colombian public debt portfolios of investors classified as indexed due to this adjustment should have, also taking into account a series of additional assumptions[6]. In contrast, the second fiscal year incorporates a cumulative increase of 2.5% in the AUM of the index, distributed in monthly increments of 0.25%[7] (dotted lines in graphs). Thus, it is assumed that these increases are reflected as additional inputs to the public debt portfolio of investors classified as indexed and, therefore, translated into net purchase flows of these agents.

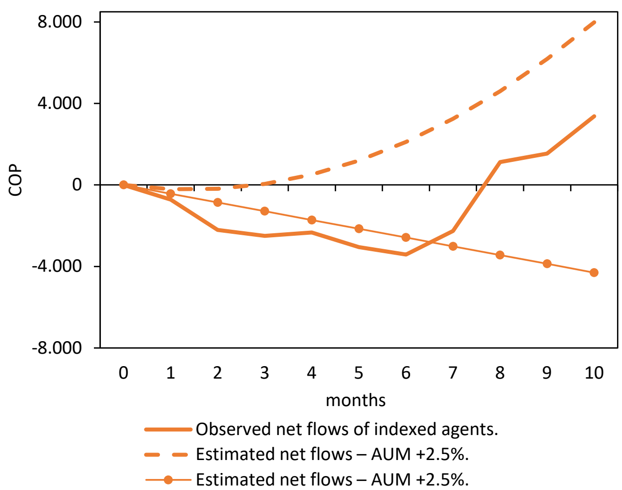
In this way, taking into account the changes in the weighting of Colombia and the AUM of the index, it is considered that this second factor could have influenced the recovery of indexed foreign investment flows towards the end of the adjustment periods due to the inclusion of India and China. Although the first year suggests significant selling pressure from indexed foreign investors, due to the effect of the decrease in the weighting of Colombia, the second exercise

[6] The exercise is based on the following assumptions: i) investors classified as indexed, which represent 53% of the holdings of foreigners in public debt, strictly replicate the composition of the index, without margin of deviation; ii) there are no changes in market factors during the next ten months, that is, stability is assumed in both the prices of public debt securities and the representative market exchange rate (TRM in Spanish); and iii) investors classified as non-indexed do not make adjustments in their public debt positions throughout the analysis period.

[7] This assumption is based on the average growth observed in the AUMs during the three rebalancing events analyzed in this box.

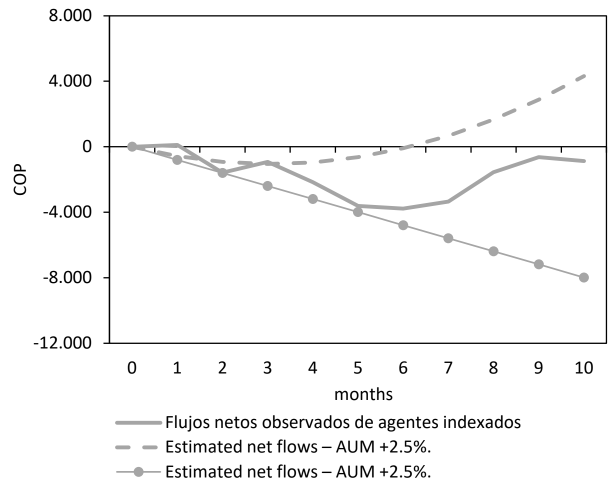
shows that, if increases in AUM are considered, these effects can be mitigated, as was also observed with the data for both rebalancing events.

Graph B2.7. Cumulative Daily Net Flows of Foreign Investment in Public Debt Classified as Indexed to the Index GBI-EM Global Diversified – during the Inclusion Process of China (COP Billions)



Source: *BanRep.*

Graph B2.8. Cumulative Daily Net Flows of Foreign Investment in Public Debt Classified as Indexed to the Index GBI-EM Global Diversified – during the Inclusion Process of India (Billions)



Source: *BanRep.*

Conclusions

GBI-EM Index rebalancing processes can have significant impacts on foreign investment flows in the public debt market, as a relevant proportion of investors participating in this segment replicate the composition of the index, which can also affect market sensitivity to external factors. In this context, changes in the weighting of a country within the basket imply adjustments in the portfolios of these agents, which result in buying or selling pressures on the sovereign debt securities of that country. Particularly, when new issuers are incorporated into the index, as happened with China in 2020 and India in 2024, the relative share of other countries, including Colombia, tends to decrease, generating capital outflows by index investors.

A key factor that affects the magnitude and direction of these flows is the evolution of the AUMs of the GBI-EM index. During the rebalancing processes analyzed, increases in AUM have been observed that could be associated with recoveries in foreign investment flows by the end of those periods. These increases in AUMs mitigate sales pressures from lower relative weighting and may even generate net purchases, as evidenced during the inclusion of China and India. Conversely, falls in AUMs amplify sales pressures, as occurred at the beginning of India's inclusion process. Therefore, timely monitoring of the evolution of AUMs is critical to anticipating the potential impact of these rebalancings on the local government debt market.

Additionally, it has been identified that foreign investors classified as indexed tend to anticipate changes in the composition of the index, concentrating the most significant sales at the beginning of the rebalancing period. This performance was evident in the inclusion processes of China and India, where relevant outflows were observed at the beginning, followed by a partial recovery, possibly influenced by variations in AUM.