Box 3: Active Management of Foreign Reserves

The management of foreign reserves follows two investment styles: passive and active. The objective of the former is to replicate, as closely as possible, the risk characteristics of a benchmark index while aiming to generate positive returns and minimize transaction costs. The latter allows deviations from the benchmark index composition within predefined limits to obtain higher returns. In 1994, *Banco de la República* established an active management program under which portfolio managers invest the allocated resources in accordance with specific investment guidelines and a defined risk budget. Since its inception, active management has outperformed the benchmark index by 9 basis points (bps) and by 10 bps over a five-year window; that is, had the portfolio been managed exclusively under a passive approach, its performance would have been lower[1].

The participation of multiple managers within the active management program provides several key benefits. First, it allows for diversification across investment styles, as each administrator may apply different approaches, thereby reducing the risk of concentration in a single market view. Second, it improves the portfolio's risk–return profile, since combining heterogeneous strategies can result in lower volatility for a given level of expected return. Third, it enhances resilience across different market cycles, as some managers may outperform in upward environments, while others may do so in downward or volatile conditions, thereby smoothing overall performance. Finally, it enables a richer comparative assessment, allowing the identification of which strategies add value, and which do not within a common reference framework.

As part of the ongoing evaluation of the external managers' performance, the Bank relies on a set of metrics that enables the identification of which managers are consistent regarding their performance over time and the determination of the share of active management to be allocated to each of them. This box describes some of the indicators[2] used in this monitoring process[3]:

The capture ratio is a metric used to assess the performance of an investment portfolio relative to a benchmark index during periods of market upturns or downturns. This ratio consists of two components:

- The upside capture ratio, which measures the extent to which a portfolio captures the benchmark index's positive returns during upward market trends. When this ratio is above 1, it suggests that the portfolio manager generates returns above those of the benchmark index during market upturns. Conversely, a value below 1 suggests that the portfolio manager generates lower returns than those of the benchmark index under the same conditions.

- The downside capture ratio, which measures the extent to which a portfolio captures the benchmark index's negative returns during downward market trends. A ratio above 1 suggests that the portfolio manager generates lower returns than those of the benchmark index during periods of market downturns. Conversely, values below 1 suggest that the portfolio manager generates returns above those of the benchmark index under the same conditions.

1 Information as of 31 December 2024.

2 All graphs presented in this box are for illustrative purposes and have been constructed using fictitious data; therefore, they do not reflect the actual performance of foreign reserve administrators.

3 The selection of external administrators is conducted through a rigorous process that involves a variety of financial and non-financial criteria, along with a thorough, detailed evaluation. For further information on the administrator's selection process regarding the active management program, see Section 3.3.4: External Management Program.

The capture ratio is calculated as the ratio between the upside capture ratio and the downside capture ratio. Graph B3.1 illustrates different levels of these ratios for six hypothetical administrators in the active management program over twelve-month and ten-year periods.

The graph is divided into four quadrants that allow portfolios to be classified according to their performance in upward and downward markets:

- Upper-left quadrant (best outcome): Represents portfolios that effectively capture positive returns during market upturns while simultaneously limiting their exposure to losses during market downturns.
- Lower-left quadrant (conservative): Represents portfolios with low capture of both positive and negative returns, suggesting a more defensive or conservative approach.
- Upper-right quadrant (aggressive): Represents portfolios that strongly capture positive returns but also experience significant losses during market downturns.
- Lower-right quadrant (worst outcome): Represents portfolios with limited participation in positive returns and high exposure to losses, reflecting unfavorable performance in both scenarios.

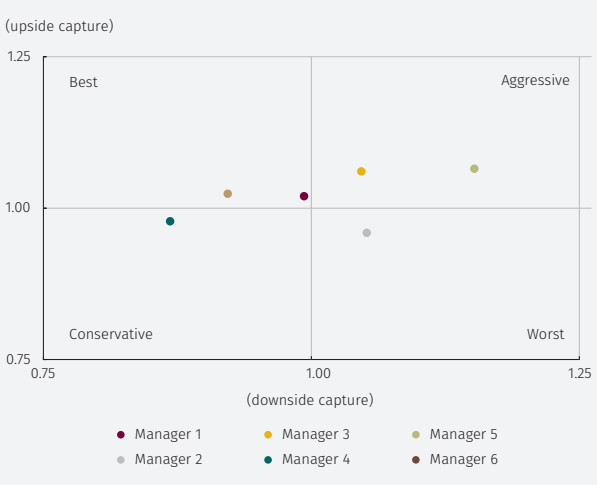
It is worth noting that it is not necessarily desirable for all external managers to be positioned within the same quadrant. This is because each manager exhibits distinct characteristics and investment styles, which contribute to diversification and to the overall portfolio's risk–return.

Another indicator is the batting average, which measures the ability of a manager to generate positive excess returns relative to the benchmark index; in other words, their ability to "beat the index." This indicator is calculated as the number of periods in which the manager outperforms the benchmark index, divided by the total number of observations during a given period. Graph B3.2 presents the results of this indicator for twelve-month and ten-year periods.

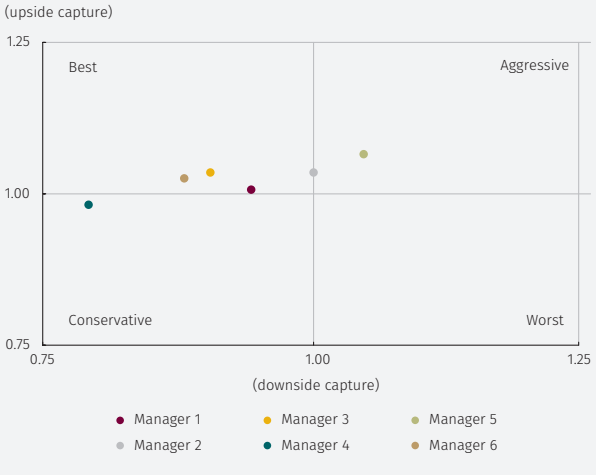
In Panels A and B, the batting average is shown as a percentage, and the green line represents the 50% threshold. Panel A shows that Manager 4 outperformed the benchmark index in fewer than 50% of the observations over a twelve-month period. In contrast, Manager 6

Graph B3.1
Example Performance Metrics for Hypothetical Managers

A. 12 Months



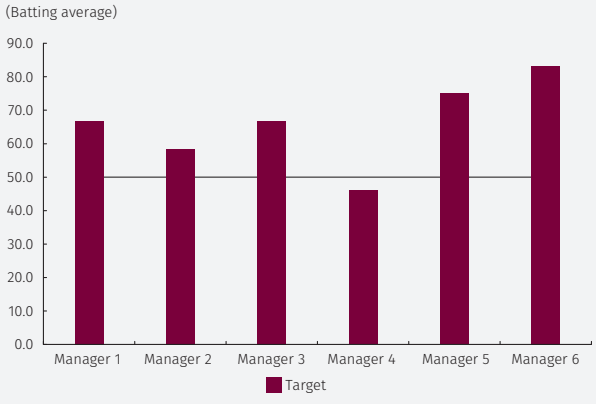
B. 10 Years



Source: *Banco de la República*, International Investments.

Graph B3.2
Example of Batting Average for Hypothetical Managers

A. 12 Months

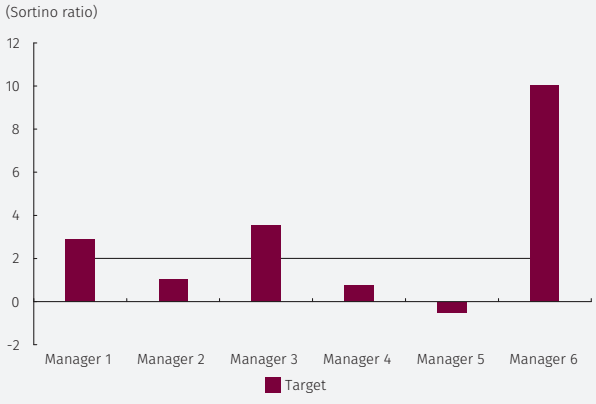


B. 10 Years

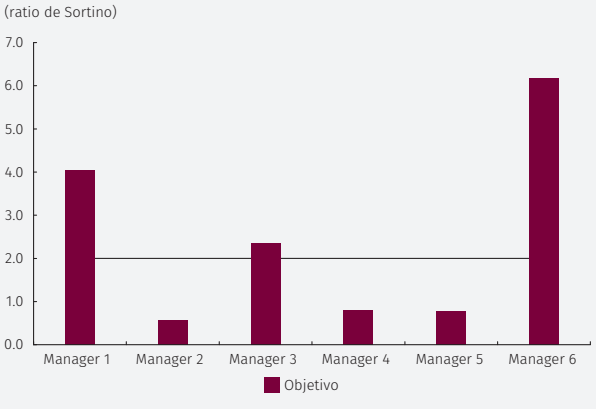
Source: *Banco de la República*, International Investments.

Graph B3.3
Example of Sortino Ratio for Hypothetical Managers

A. 12 Months



B. 10 Years



Source: *Banco de la República*, International Investments.

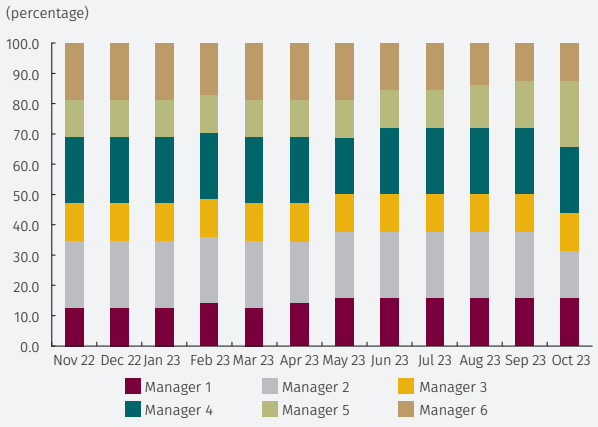
was the one that most frequently outperformed the benchmark index, exceeding the 50% threshold both over the twelve-month and ten-year horizons.

A third index includes the Sortino ratio, which measures the excess return of an investment relative to a predefined target, adjusted for risk. In the active management program, the target return corresponds to the returns of the benchmark index. Unlike other metrics, this ratio considers only the volatility of negative excess returns, based on the premise that investors are more sensitive to downturns than upturns regarding returns.

Graph B3.3 presents the Sortino ratio results for six hypothetical managers within the active management program. A negative value in this ratio reflects a negative excess return relative to the benchmark index, as observed for Manager 5 over a twelve-month period (Panel A). In contrast, a positive value indicates that excess returns have been positive. Regarding Manager 6, their high positive Sortino ratio can be attributed to two factors: a significant positive excess return and low volatility in negative returns over the evaluated period. In summary, this ratio captures the balance between generating high excess returns and maintaining low exposure to the risk of negative excess returns.

On the other hand, a monthly optimal allocation exercise is conducted to distribute resources among the managers of the active management for foreign reserves, based on information about their historical performance: returns, risk, and correlation with other managers. The objective of the optimization exercise is to maximize the excess return of the entire active management program, subject to its total risk, a metric known as the information ratio. This optimization enables the identification, over time, of those managers to whom a larger allocation of resources should be assigned, given their ability to generate risk-adjusted

Graph B3.4
Example of Batting Average for Hypothetical Managers



Source: *Banco de la República*, International Investments.

excess returns. For example, Graph B3.4 illustrates the hypothetical allocation across five managers, in accordance with the optimization model[4].

Graph B3.4 exhibits that, as of the most recent reporting date and based exclusively on historical performance, Manager 4 could maintain its current share of resources under management. On the other hand, for both Manager 5 and Manager 2, the exercise indicates a potential change in their resource allocation. This type of tool complements the monitoring of managers' performance and provides deeper insight into the reasons why the model would suggest a higher or lower allocation to a given manager, which could ultimately affect the future number of resources managed by the firms participating in the program. Currently, the allocation of resources among managers within the program considers, in addition to performance, other variables such as the firm's assets under management, quality of client service, investment and risk management processes, and knowledge transfer. The indicators presented in this box, which are based exclusively on financial information, serve to complement the evaluation and support decision-making regarding resource allocation among managers. This has contributed to strengthening the active mandate's performance over time, resulting in favorable outcomes that benefit the foreign reserve investment portfolio's performance.

4 The allocation represents the percentage of the program's total size under management.