Box 3
Forecast Errors and Macroeconomic Shocks in 2025

Cristian David González Téllez
José David Pulido Pescador
Cristian Camilo Quesada Paipa[*]

In 2025, the Colombian economy continued on its path of recovery, with economic activity registering an annual growth of 2.6%, surpassing the 1.5% observed in 2024. In turn, annual headline inflation converged more slowly toward the target, ending 2025 at 5.1%, close to the 5.2% recorded at the end of 2024. Inflation's behavior was influenced by an easing of annual price adjustments for regulated goods and services, which was offset by increased price volatility for food and other goods.

Relative to the projection provided by *Banco de la República's* technical staff in January 2025,[1] economic growth continued in line with expectations, but its components offered varied surprises. On the one hand, total consumption growth exceeded expectations in both the private and public segments. On the other hand, gross capital formation was weaker than anticipated, mainly due to weaker investment in housing and civil works. Inflation was above the forecasts made at the beginning of 2025. Both core inflation, excluding food and regulated items, and food and regulated inflation surpassed the technical staff's forecast during 2025.

This box uses one of the central forecasting models (4GM)[2] to analyze the surprises in the observed inflation data and the GDP gap estimate for 2025 relative to the technical staff's forecast. The purpose of this exercise is to interpret forecast errors, measured as the difference between the observed data for the macroeconomic variables at the end of 2025 and the corresponding projections prepared by the technical staff in January of the same year, and to relate these errors to the explanatory shocks identified by the model. This analysis is similar to that described in De Castro Valderrama et al. (2021) and is part of the internal evaluation carried out annually by the technical staff on its forecasting process. The following exercise analyzes annual headline and core inflation, as well as the GDP gap.

1. Headline and core inflation

Throughout 2025, headline and core inflation were higher than projected, indicating that the technical staff underestimated inflationary pressures in both baskets (Graph R3.1).

Relative to the forecasts of early 2025, the upward surprise in core inflation occurred in the second half of the year and is explained by the supply shocks that affected the prices of the goods and services baskets in the fourth quarter, possibly associated with a more pronounced transmission of the minimum wage increase than the one anticipated for that quarter. This was aggravated by the second round of inflationary supply shocks in the food and regulated products baskets, as detailed below, and by stronger-than-expected demand. This set of fac-

---

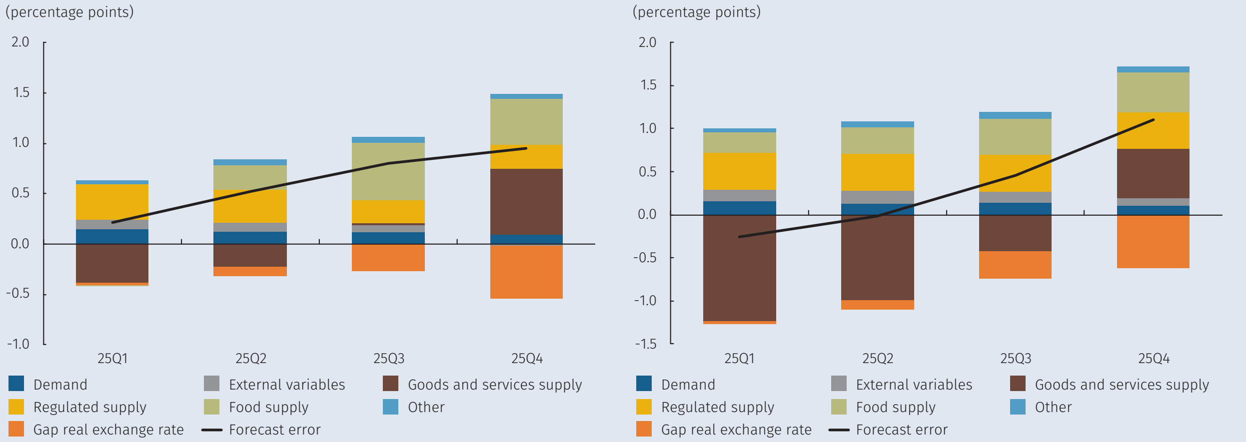
* The authors are members of the Macroeconomic Models Department. The opinions herein expressed are solely the responsibility of the authors and do not necessarily reflect those of the Bank nor its Board of Directors.

1 This Box compares and analyzes the forecasts made in January 2025 with the actual results of 2025

2 See González et al. (2020).

Graph B3.1
Inflation forecast error in 2025
(annual change, end of period)

A. Total inflation (annual change) | B. Inflation excluding food and regulated items (annual change)



Note: The forecast error is the difference between the observed value and the January 2025 projections. A positive value means that the actual observed figure was higher than expected, indicating an underestimation of the variable. Each quarter's bars show the cumulative shocks from the past four quarters that account for the gap between the forecast and the actual data. Therefore, a bar above the horizontal axis signifies that more shocks occurred than initially anticipated by the technical staff.
Source: Authors' own calculations.

tors more than offset the higher-than-expected disinflationary pressures on the real exchange rate. By component, the upward surprises were largely attributable to underestimating the goods component, particularly in the prices of alcoholic beverages, health, and miscellaneous goods, resulting in higher-than-expected inflation. Likewise, the annual variation in the CPI for services was greater than forecast, amid upward surprises in items such as rents, lodging, and domestic services, and food away from home.

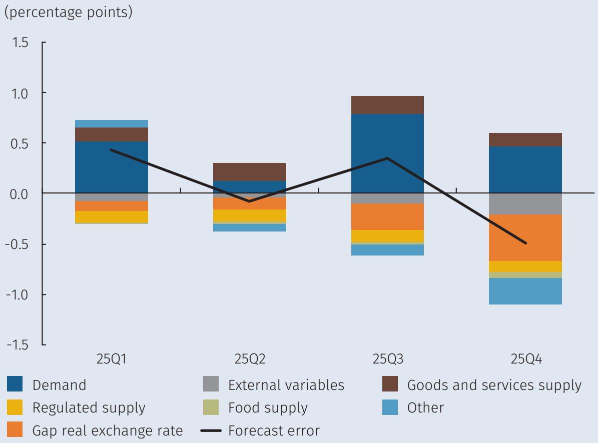
For headline inflation, the forecast error shows that the technical staff underestimated inflation across all quarters of the year. These upward surprises in headline inflation are mainly explained by greater supply shocks in the regulated and food baskets, along with the other factors previously mentioned for core inflation. Regarding food, the underestimation of annual price changes was largely concentrated in the second half of the year and was partly explained by a more unfavorable agricultural cycle than expected, which, together with adverse weather conditions, led to higher prices of perishables. Added to the above were higher prices for processed foods, driven by higher-than-expected international prices and costs. With regard to regulated items, the adjustments in fuel prices, public transport fares, and the price of public utilities[3] turned out to be greater than what was incorporated in the initial macroeconomic forecast.

2. GDP gap

The macroeconomic forecast for GDP at the beginning of 2025 assumed international financial conditions would remain broadly similar to those of the previous year, with external demand growth equal to that of 2024. Regarding domestic factors, private consumption was expected to accelerate at a moderate pace during the year, continuing the economic recovery process that began in 2024. This, together with a recovery in investment, would boost the growth of domestic demand. All of the above would allow economic activity to recover throughout the year and narrow the negative output gap the economy has been experiencing since 2024.

3 The upward surprise in the price of public services was mainly explained by a greater increase in water, sewerage, and gas rates.

Graph B3.2
Change in output gap estimate
(annualized quarterly)



Note: The forecast error is the difference between the observed value and the January 2025 projections. A positive value means that the actual observed figure was higher than expected, indicating an underestimation of the variable. Each quarter's bars show the cumulative shocks from the past four quarters that account for the gap between the forecast and the actual data. Therefore, a bar above the horizontal axis signifies that more shocks occurred than initially anticipated by the technical staff.
Source: Authors' own calculations.

The output gap, estimated using observed GDP data for 2025 and compared with early 2025 forecasts, showed heterogeneous behavior throughout the year (Graph B3.2). The quarterly GDP gap was underestimated in the first and third quarters of the year, was in line with expectations in the second quarter, and was overestimated in the fourth quarter. The underestimated gap in both the first and third quarters was primarily due to stronger-than-expected demand, driven by more positive demand shocks. This was associated with household consumption exhibiting higher spending on durable and semi-durable goods than projected, as well as increased final consumption expenditure by the government.

In contrast, the overestimation of the GDP gap in the fourth quarter, despite lower-than-expected GDP growth, was mainly explained by an unforeseen slowdown in demand (fewer cumulative demand shocks), a smaller-than-expected real exchange rate gap, and lower oil prices than projected. These shocks are classified under the "Other" category in Graph B3.2. By components, the narrower output gap was driven by lower dynamism and revisions to fixed and total investment levels, which remained well below their pre-pandemic levels.

In summary, although the Colombian economy recorded a 2.6% increase in 2025, matching expectations at the beginning of the year, the estimated output gap relative to observed GDP data shows heterogeneous forecast errors throughout the year. In particular, the data for the first and third quarters of the year showed stronger-than-anticipated excess demand, a pattern that was reversed in the last quarter. Conversely, inflation was higher than anticipated due to both inflationary supply shocks and stronger domestic demand, primarily in the first three quarters of the year.

References

De Castro-Valderrama, M., S. Forero-Alvarado, N. Moreno-Arias, and S. Naranjo-Saldarriaga. 2021. "Unraveling the Exogenous Forces Behind Analysts' Macroeconomic Forecasts." *Borradores de Economía*, no. 1184. Bogotá, Colombia: *Banco de la República*.

González, A., A. Guarín, D. Rodríguez-Guzmán, and H. Vargas-Herrera. 2020. "4GM: A New Model for Monetary Policy Analysis in Colombia." *Borradores de Economía*, no. 1106. Bogotá, Colombia: *Banco de la República*.

Ramos-Veloza, M., S. Naranjo-Saldarriaga, and J. Pulido. 2026. "Wage Dynamics, Unemployment, and Inflation: Enhancing the 4GM Semi-Structural Model." *Borradores de Economía*, no. 1341. Bogotá, Colombia: *Banco de la República*.