Box Article No. 2
An Evaluation of the BSP's 2023 Forecasting Performance[1]

The BSP regularly evaluates its inflation forecasting performance as part of its continuing efforts to enhance macroeconomic forecasting models and promote transparency in monetary policy formulation.[2] This article offers a summary of the latest assessment of the BSP's forecasting performance for 2023, specifically examining the (a) month-ahead inflation forecasts; (b) annual inflation forecasts; and (c) standard statistics for forecast accuracy, unbiasedness, efficiency, and benchmarking. Compared with the 2022 results, forecast errors in 2023 for both month- and year-ahead forecasts were larger due to significant volatility in commodity prices from continued supply disruptions in key food items and higher oil prices.

A. Month-ahead inflation forecasts

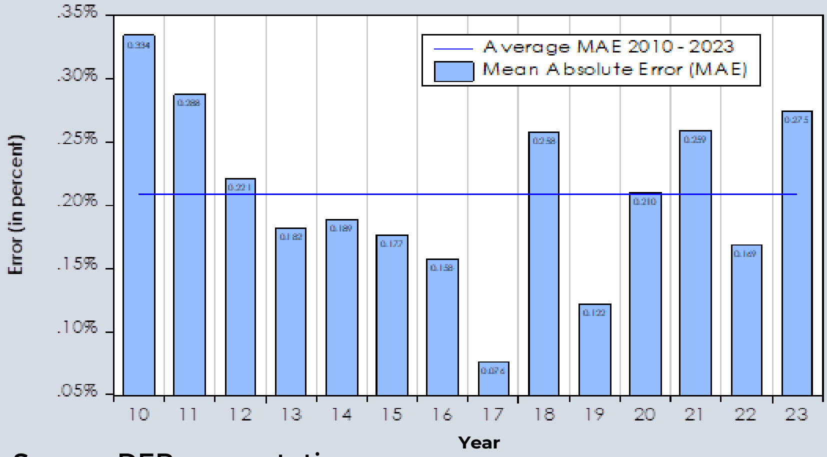
The BSP's month-ahead inflation forecasts in 2023 yielded slightly higher forecast errors compared with those in 2022 and the historical average. Monthly inflation generally settled within the forecast range announced by the BSP in 2023, with breaches only in the forecast ranges for January and October. Nonetheless, the BSP's month-ahead inflation forecasts registered lower forecast errors compared with the median estimates from private sector analysts in Bloomberg's monthly survey.

Headline inflation in January 2023 rose to 8.7 percent year-on-year, exceeding the announced forecast range of 7.5 to 8.3 percent. Headline inflation exceeded the forecast range after electricity rates, domestic fuel prices, and prices of vegetables and meat rose by much more than expected due to supply disruptions and severe weather disturbances. The implementation of higher water rebasing rates and higher excise taxes, as well as the sharper-than-anticipated uptick in rental costs, contributed to the breach.

Meanwhile, inflation in October 2023 decelerated to 4.9 percent and fell below the forecast range of 5.3 to 6.1 percent. Inflation fell below forecast as the prices of vegetables and rice fell faster than anticipated owing to improved weather conditions and additional harvests.

From 2010 to 2023, actual inflation settled within the month-ahead inflation forecast band in 153 out of 167 months (91.6 percent), with a mean absolute error (MAE) of 0.22 ppt (**Chart 1**). The MAE of the BSP month-ahead inflation forecasts rose in 2023 from the 2022 result on account of more volatile changes in monthly inflation.[3] Nevertheless, the uptick in the MAE for 2023 was still in line with previous recent episodes of above-target inflation in 2018 and 2021. The BSP's MAE is also lower than the 0.41-ppt MAE of the month-ahead consensus forecasts from Bloomberg's monthly survey of private sector analysts.

Chart 1
MAE of Inflation Forecasts from 2010 to 2023

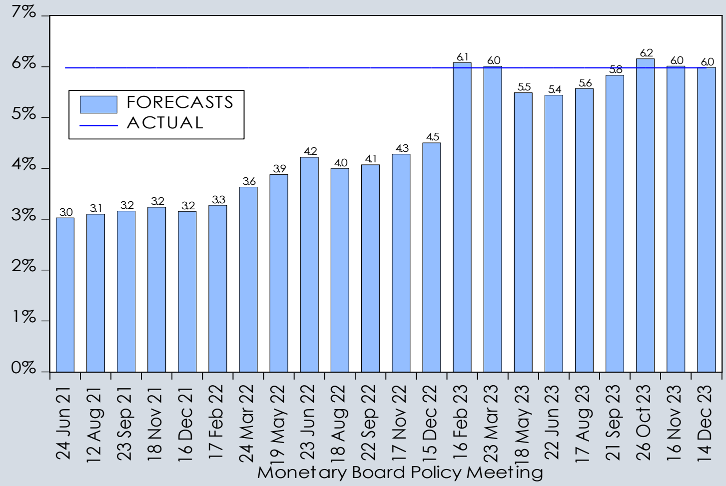


Source: DER computations

B. Annual inflation forecasts

Annual inflation was 6.0 percent for 2023 while the baseline inflation forecasts presented during the BSP monetary policy meetings ranged from 3.0 to 6.0 percent. The annual inflation forecast for 2023 was gradually revised upward throughout 2022, with the exercise first indicating a breach of the inflation target in the 23 June 2022 monetary policy meeting (**Chart 2**). In addition, the BSP's risk-adjusted forecasts[4] shifted toward the upside beginning with the 19 May 2022 monetary policy round in view of upside risks linked to higher food prices, electricity rates, transport fare adjustments, and minimum wage adjustments.

Chart 2
Annual Baseline Inflation Forecasts for 2023

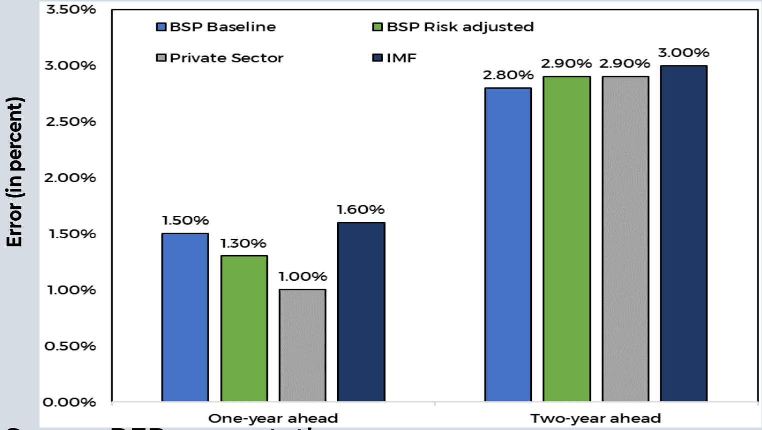


Source: DER computations

Meanwhile, persistent supply shocks in both global and domestic commodity markets prompted upward revisions in the BSP's annual inflation forecasts for 2023. Higher global crude oil prices due to geopolitical tensions and the peso depreciation, in part caused by the monetary policy tightening in advanced economies, drove domestic inflation. Several identified risks also began to materialize in the form of higher food prices, water rates, transport fare adjustments, and higher-than-expected minimum wage adjustments. In response, the BSP revised its annual inflation forecasts for 2023 sharply upward to 6.3 percent during the 16 February 2023 monetary policy meeting from 4.5 percent in the previous meeting.

The forecast errors for the BSP's one-year ahead baseline and risk-adjusted inflation forecasts were higher compared with the private sector's mean one-year ahead forecasts, but lower compared with the IMF's baseline outlook. Meanwhile, the two-year ahead forecasts of the BSP had a slightly lower forecast error compared with both the private sector and the IMF (**Chart 3**). As of December 2022, the BSP's baseline inflation forecast for 2023 stood at 4.5 percent, whereas those for the private sector and IMF were at 5.0 percent and 4.3 percent, respectively. Meanwhile, the BSP's two-year ahead baseline inflation forecast of 3.2 percent had a slightly lower forecast error compared with the private sector's forecast of 3.1 percent and the IMF's 3.0 percent.

Chart 3
One- and Two-year Ahead Absolute Forecast Errors for 2023



Source: DER computations

A counterfactual analysis using actual values of all explanatory variables was also performed to show how the BSP's workhorse model tracked the inflation path for 2023. The exercise uses actual values of the exogenous variables, such as oil prices and non-oil prices, among others, to estimate an ex-post projected path of inflation. This is a way to test the model's validity by making sure that it fits the data well by eliminating the uncertainty from the setting of assumptions for exogenous variables. Assuming that the actual values of all the exogenous variables, as well as the add-ons for food prices, electricity rates, and other add-ons, were known beforehand, the one-year ahead annual inflation forecasts for 2023 would be 5.7 percent if the forecast was made in December 2022. This is equivalent to an MAE of 0.3 ppt for 2023, given the actual inflation of 6.0 percent.

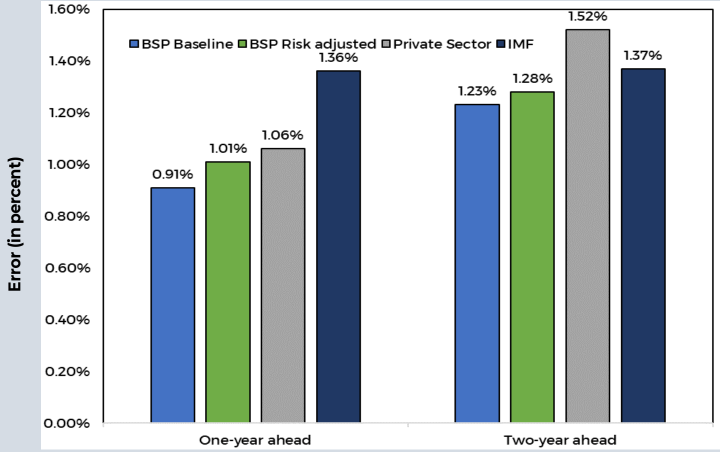
C. Statistical tests and enhancements of models

In terms of accuracy, the BSP's inflation forecasts have a statistically adequate level of precision with lower forecast errors compared to benchmark statistical models over the sample period. Second, tests for unbiasedness and efficiency indicate that the baseline forecasts do not systematically over- or under-predict inflation across the sample period.

Third, benchmarking with the private sector and the IMF forecasts shows that the BSP's baseline forecasts have lower errors across the sample from 2011 to 2023

(**Chart 4**). The BSP's annual inflation forecasts have lower forecast errors compared with the private sector's and the IMF's average from 2011 to 2023. The baseline annual forecasts have slightly lower forecast errors compared with the risk-adjusted forecasts over the period of 2011 to 2023. The MAE of the BSP's baseline and risk-adjusted forecasts were also lower compared with the MAE of the forecasts from the private sector and the IMF. Similarly, the MAE of the BSP's two-year ahead baseline forecast is slightly lower compared with the risk-adjusted forecast, and both baseline and risk-adjusted errors are still lower than those of the private sector and IMF.

Chart 4
One- and Two-year Ahead Annual MAE



Source: DER computations

D. Efforts on model development and capacity building for forecasting and policy analysis

To further enhance the forecasting performance of the BSP models, the Department of Economic Research constantly refines its suite of models to better guide monetary policy analysis and formulation through multi-year technical assistance (TA) projects with the IMF's Institute for Capacity Development (ICD) and the Japan International Cooperation Agency (JICA). For 2024, the DER is continuing its TA with the IMF on the Policy Analysis Model for the Philippines (PAMPh) and will undertake various projects, such as the nowcasting of selected macroeconomic variables, to support the scheduled transition to the PAMPh as the BSP's workhorse model.

Endnotes

1/ The authors are Sanjeev A. Parmanand, Mark Rex S. Romaraog, and Jan Christopher G. Ocampo of the Department of Economic Research.

2/ Results of the previous forecast evaluation were published in Abenoja et al. (2022) and in the Monetary Policy Report in May 2022.

3/ The standard deviation of month-on-month (m-o-m) inflation rose to 0.6 percent in 2023 from 0.3 percent in 2022 due to severe weather disturbances and ongoing geopolitical tensions, which contributed to more volatile movements in commodity prices.

4/ In addition to the baseline forecasts, the BSP considers different scenarios that pertain to upside and downside risks to the baseline inflation outlook and assigns probability values for each. These upside and downside risks are summarized in a risk matrix. The risk-adjusted inflation is equivalent to the baseline inflation forecast plus the probability-weighted impact of the different upside and downside risks to the inflation outlook. The first risk-adjusted forecasts were published last October 2023.