Working papers economics - Experimenting with Large Language Models for Inflation Forecasting in Colombia

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The paper proposes an innovative, systematic, and reproducible framework for inflation forecasting using LLMs, demonstrating that the progressive incorporation of macroeconomic information, economic structure, and contemporaneous shocks can generate projections that are more dynamic and more consistent with real-time economic conditions.

Publication Date: Friday, 16 of October 2026 **Approach**
The document adopts a sequential and cumulative experimental design composed of six configurations that make it possible to study how Colombia's annual inflation forecasts evolve as the information set expands and the degree of economic discipline imposed on the LLMs (GPT-4o and Gemini 2.5 Pro) increases.

Steps 0 and 1 correspond to univariate inflation forecasting exercises. Steps 2 and 3 extend the analysis toward the joint and mutually consistent generation of paths for inflation, the exchange rate, the monetary policy rate, and GDP growth, progressively incorporating historical time series and contextual variables. Steps 4 and 5 add explicit macroeconomic relationships as well as validation and consistency-review procedures.

Step 5 represents the most comprehensive configuration, as it integrates contemporaneous domestic and external information gathered through web searches, identifies and quantifies shocks, evaluates their transmission mechanisms, and conditions joint forecasts on these factors. Each configuration is executed daily and produces 24-month monthly inflation forecasts, accompanied by qualitative explanations, through a Python-based workflow that queries the OpenAI and Google APIs.

Contribution
The study's main contribution is the development of a standardized, controlled, and reproducible framework for generating real-time macroeconomic forecasts with LLMs, in contrast to much of the previous literature, which relies on retrospective or pseudo-out-of-sample exercises.

By producing date-stamped forecast runs and historical data vintages that reflect the information set available at the time of forecasting, the design helps mitigate look-ahead bias and temporal information leakage. At the same time, it enables a transparent assessment of how forecasts respond to the sequential incorporation of historical

data, contextual indicators, theoretical structure, and contemporaneous information.

Results

The results show that the informational environment substantially influences the shape and persistence of forecasts. Steps 0–3 generate trajectories that converge relatively quickly and almost monotonically toward the 3% inflation target, whereas Steps 4 and 5 produce more persistent and non-monotonic profiles, characterized by an initial increase followed by gradual disinflation, with inflation still remaining above target at the end of the forecast horizon.

In particular, Step 5 explicitly incorporates contemporaneous domestic and external shocks and their interactions, repeatedly identifying pressures associated with international oil, food, and fertilizer prices, transportation costs, and disruptions in global supply chains, together with domestic factors such as minimum wage adjustments and indexation, inflation expectations, and strong demand conditions.

The resulting trajectories display a qualitative pattern similar to the expectations reported in the Banco de la República's Monthly Survey of Economic Analysts' Expectations, although they tend to remain above those expectations during part of 2026.

Fuente: https://www.banrep.gov.co/en/publications-research/working-papers-economics/experimenting-llm-inflation-forecasting