

## Challenges of the Green Bond Market in Romania: Assessing Economic Scenarios\*

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### Abstract

This paper analyzes the macroeconomic impact of the issuance of green bonds and the inflation rate on Romania's Gross Domestic Product during the 2024–2027 period, using a scenario-based econometric model specific to an emerging economy. In the context of increasing interest in sustainable finance and the volatility of inflation in Europe following the COVID-19 pandemic, the study aims to assess how these two factors interact across three distinct macroeconomic scenarios - pessimistic, neutral, and optimistic - on overall economic output. To mitigate multicollinearity between inflation and green bond variables, Principal Component Analysis was applied, generating a composite, uncorrelated predictor. Scenario-specific projections were developed for inflation and green bond issuance based on national forecasts, EU climate policy, and investor behavior. PCA scores were then used as independent variables in separate linear regressions for each scenario to assess their impact on GDP. Results reveal that in the pessimistic scenario—marked by high inflation and declining green investment—the PCA variable has a statistically significant negative effect on GDP, suggesting that green bonds may act as modest stabilizers. In the neutral and optimistic scenarios, however, the PCA scores did not significantly explain GDP variation, indicating that under balanced or favorable macroeconomic conditions, green bonds and inflation have a limited standalone influence. The study offers a novel econometric framework for forecasting in volatile environments and contributes empirical insights to the limited literature on green finance in Eastern Europe. Policymakers should view green bonds not as growth accelerators, but as stabilization tools—particularly valuable under inflationary stress or fiscal uncertainty.

**Keywords:** Green bonds, Romania's Gross Domestic Product, inflation, financial sustainability, econometric analysis