ABSTRACT

This study models the dynamic term structure of Indonesia's government bond yield curve (2002-2024) by bridging the gap between curve-fitting stability and macro-financial transmission mechanisms. Using a two-stage quantitative explanatory approach, the yield curve is first estimated via the Nelson-Siegel (NS) and Nelson-Siegel-Svensson (NSS) models. Methodological evaluation reveals that the Dual Annealing optimization algorithm produces the most robust latent factors, level β_0, slope β_1, and curvature β_2 and β_3, mitigating the artificial outliers frequently generated by deterministic methods like Newton-Rhapson. In the second stage, these optimized factors are integrated into a VAR-X model to analyze the transmission of macroeconomic shocks (inflation, BI Rate, GDP, and USD/IDR volatility) through Impulse Response Functions (IRF) and Forecast Error Variance Decomposition (FEVD). Empirical results demonstrate a distinct hierarchy of macroeconomic determinants. The level factor β_0 is significantly driven by the BI Rate and USD/IDR volatility, reflecting the market's sensitivity to monetary policy expectations and external risk premiums. Inflation shows no significant impact, suggesting well-anchored long-term expectations, while higher GDP tends to compress long-term risk premia. The slope factor β_1 is primarily influenced by the BI Rate; policy shocks induce curve flattening as short-term yields adjust more rapidly than long-term ones. Conversely, curvature factors β_2 and β_3 are largely unresponsive to monthly macro shocks, driven instead by market microstructure, liquidity, and preferred habitat dynamics.Theoretically, these findings reject the pure Expectations Hypothesis, aligning instead with an Expectations-Term Premium framework augmented by market segmentation. Practically, the study implies that Bank Indonesia and debt-management authorities must prioritize monetary credibility and external risk mitigation to control long-term borrowing costs, while addressing market depth to manage medium-maturity dynamics.

Keywords: yield curve, term structure, Nelson-Siegel, Nelson-Siegel-Svensson, dual annealing, VAR-X, level-slope-curvature, BI Rate, exchange-rate volatility, Indonesia.