

Research on the Relationship between Macro Variables and Term Structure of Interest Rates

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Abstract

This paper explores the relationship between macro-economic variables and the term structure of interest rates. Four parameters embedded in Nelson and Siegel (1987) model are used as the proxies of yield curve, which are β_0 (represents the level of the yield curve); β_1 (represents the slope of the curve) β_2 (represents the curvature of the yield curve); and τ (represents the exponential rate of decay of slope and curvature of the yield curve. In addition, the macro-economic variables included in this study are: consumer price index growth (CPIG); central bank discount rate (CBDR); and manufacturing capacity utilisation rate (MCUR). Utilising impulse responses, variance decomposition techniques, and out-of-sample performance of the VAR model, the study then assesses the existence (and effect of) feedback relationships among the variables and the predictive reliability of the model.

From the results of the forecast error variance tests, the study concludes that only two of the yield-curve parameters (β_1 and β_2) had significant bi-directional feedback relationships with the macro variables, and then only with the macro-economic variables CPIG and MCUR. Although the third macro-economic variable, CBDR, is influenced by β_1 and β_2 , this relationship was uni-directional. The analysis of the impulse response function indicates that the shocks of sudden changes in each of the macro-economic variables and yield-curve factors have significant impacts on all other variables (except for τ). Finally, a robust test of the predictability of the VAR model with out-of-sample data shows that our model offers the investors and regulators a useful information for predicting future movements of the macro-economic fundamentals and the yield curves.

Keywords: term structure of interest rates, VAR model, impulse responses, variance decomposition.