Forecasting the Term Structure of Interest Rates Using Forecast Combination

Michiel De Pooter* Francesco Ravazzolo Dick van Dijk

Federal Reserve Board | Norges Bank | Erasmus University Rotterdam

Abstract

We address the importance of incorporating macroeconomic information and, in particular, accounting for model uncertainty when forecasting the term structure of interest rates. We first analyze and compare the forecasting performance of several individual term structure models. By incorporating macroeconomic factors, which we extract from a large set of macroeconomic variables, in the different models, we confirm and extend the results found in previous literature that adding macroeconomic information can improve interest rate forecasts. We then show, however, that the predictive power of individual models can vary over time significantly. Models with macroeconomic information are the more accurate in and around recession periods when there is considerable uncertainty about the future path of interest rates. Models without macro information do particularly well in low-volatility subperiods such as the early 1990s. We demonstrate that this issue of model uncertainty can be mitigated by combining forecasts from individual models, with model weights which are based on relative historical forecast performance. We show that forecast combination leads to encouraging gains in predictability and that these gains are consistent over time. In particular, we find that combining forecasts across all individual models, both with and without macro information, after trimming out the worst performing models using the statistical Model Confidence Set approach, gives superior forecasts for short forecast horizons. Combining forecasts of just the models that incorporate macro information results in accurate forecasts for long forecast horizons, especially for longer-maturity interest rates.

Keywords: Term structure of interest rates, Nelson-Siegel model, Affine term structure model, macro factors, forecast combination, Model Confidence Set

JEL *classification*: C5, C11, C32, E43, E47

*Corresponding author. Board of Governors of the Federal Reserve System, Washington, D.C. 20551, US. Tel.: (202) 452-2264, fax: (202) 452-6424. *E-mail addresses*: michiel.d.depooter@frb.gov (M. De Pooter), francesco.ravazzolo@norges-bank.no (F. Ravazzolo), djvandijk@ese.nl (D. van Dijk).