Forecasting the Term Structure of Interest Rates with Possibly Misspecified Models

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Abstract

Since Diebold and Li(2006) showed the outstanding performance of a dynamic Nelson-Sieglel model (DNSM) in forecasting the yield curve, the DNSM has been widely used in many macro and finance area. Because of its parsimonious but flexible model specification the conventional Bayesian model-averaging method based on the bayes factor gives a weight of nearly one on the DNSM excluding a standard arbitrage-free affine term structure model(AFTSM). In particular, the DNSM produces better forecasts than the AFTSM. Nevertheless, the AFTSM has been also commonly used because it provides richer economically interpretable outcomes such as term premium and model-implied term structure of real interest rates. Given the popularity of these two frameworks, in this paper we investigate whether the relative importance of each model varies over time. For this we rely on Waggoner and Zha (2012)'s approach to merging the possibly misspecified models. Further, we compare out-of sample prediction performance from the merged model with a Markov-switching model weight to those of the DNSM, ATSM and the merged model with a constant model weight for seven different maturities and forecast horizons of 1, 3, 6 and 12 months. Our estimation results indicate that the relative importance of the models is strongly time-varying and it seems to be associated with changes in the conditional covariance structure of the bond yields. More importantly, we find that the merged model with a Markov-switching model weight is most supported by the data in terms of the predictive accuracy in comparison with the competing models.

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Keywords: Model combination, forecasting, Markov switching process, Bayesian MCMC method, Yield curve, Affine term structure model

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