Department of Decision Sciences

Statistics Seminars

Tail Forecasting with Multivariate Bayesian Additive Regression Trees

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Zoom

Monday, 30th May 2022
12:00 pm Room 3-E4-SR03
Via Roentgen 1 Milano

Abstract

We develop novel multivariate time series models using Bayesian additive regression trees that posit nonlinear relationships among macroeconomic variables, their lags, and possibly the lags of the errors. The variance of the errors can be stable, driven by stochastic volatility (SV), or follow a novel nonparametric specification. Estimation is carried out using scalable Markov chain Monte Carlo estimation algorithms for each specification. We evaluate the real-time density and tail forecasting performance of the various models for a set of US macroeconomic and financial indicators. Our results suggest that using nonparametric models generally leads to improved forecast accuracy. In particular, when interest centers on the tails of the posterior predictive, flexible models improve upon standard VAR models with SV. Another key finding is that if we allow for nonlinearities in the conditional mean, allowing for heteroskedasticity becomes less important. A scenario analysis reveals highly nonlinear relations between the predictive distribution and financial conditions. Joint work with Todd E. Clark, Florian Huber, Gary Koop and Massimiliano Marcellino.

Reference: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3809866

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