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# HKMetrics-Seminar@Heidelberg

Research seminar in Econometrics and Statistics

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## A Randomized Missing Data Approach to Robust Filtering and Forecasting

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Federal Reserve Board of Governors

**November 30, 15:00 – 16:00**

**Alfred-Weber-Institute, Bergheimer Str. 58, Room 01.030**

**Abstract:**

We put forward a simple new randomized missing data (RMD) approach to robust filtering of state-space models, motivated by the idea that the inclusion of only a small fraction of available highly precise measurements can still extract most of the attainable efficiency gains for filtering latent states, estimating model parameters, and producing out-of-sample forecasts. In our general RMD framework, we develop two alternative implementations: endogenous (RMD-N) and exogenous (RMD-X) randomization of missing data. A degree of robustness to outliers and model misspecification is achieved by purposely randomizing over the utilized subset of data measurements in their original time series order while treating the rest as if missing. The arising robustness-efficiency trade-off is controlled by varying the fraction of randomly utilized measurements. Our RMD framework thus relates to but is different from a wide range of machine learning methods trading off bias against variance. It also provides a time-series extension of bootstrap aggregation (bagging). As an empirical illustration, we show consistently attractive performance of RMD filtering and forecasting in popular state space models for extracting inflation trends known to be hindered by measurement outliers.

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