Statistics Colloquium

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"E-backtesting"

MONDAY, APRIL 17, 2023, at 4:30 PM
Jones 303, 5747 S. Ellis Avenue
Refreshments before the seminar at 4:00 PM in Jones 303.

ABSTRACT

In the recent Basel Accords, the Expected Shortfall (ES) replaces the Value-at-Risk (VaR) as the standard risk measure for market risk in the banking sector, making it the most important risk measure in financial regulation. One of the most challenging tasks in risk modeling practice is to backtest ES forecasts provided by financial institutions. To design a model-free backtesting procedure for ES, we make use of the recently developed techniques of e-values and e-processes. Model-free e-statistics are introduced to formulate e-processes for risk measure forecasts, and unique forms of model-free e-statistics for VaR and ES are characterized using recent results on identification functions. For a given model-free e-statistic, optimal ways of constructing the e-processes are studied. The proposed method can be naturally applied to many other risk measures and statistical quantities. We conduct extensive simulation studies and data analysis to illustrate the advantages of the model-free backtesting method, and compare it with the ones in the literature.