

GRADUATE SEMINAR

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Predictive Modelling of Extreme Values in Unbalanced Panel Data

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3:30 pm

Math Lounge

Abstract: In my previous graduate seminar, some classic approaches in extreme value theory have been presented. In this talk, predictive modelling of heavy-tailed stock returns under a flexible mixture model setting will be discussed. A robust regression method is used to fit the main body, while the peaks-over-threshold method is employed to model the tails. For the estimation of the tail parts, the Bayesian maximum a posterior estimation with conjugate priors is used to smooth the maximum likelihood estimates (MLEs). This filter tuning process provides stability and efficiency in computation and prediction. Several constrained, non-convex optimization problems have been converted to unconstrained, convex problems by quadratic approximation and variable changes. The approach is applied to a large, multi-period, unbalanced data set of daily returns of global stocks, containing nearly 120,000 records. Out-of-sample prediction results show the out-performance of the smoothed estimates over the MLEs.