Department of Decision Sciences

Statistics Seminars

Extreme expectile estimation for short-tailed data

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Abstract

The use of expectiles in risk management has recently gathered remarkable momentum due to their excellent axiomatic and probabilistic properties. In particular, the class of elicitable law-invariant coherent risk measures only consists of expectiles. While the theory of expectile estimation at central levels is substantial, tail estimation at extreme levels has so far only been considered when the tail of the underlying distribution is heavy. In this talk I will present the first work to actually handle the short-tailed setting where the loss (e.g. negative log-returns) distribution of interest is bounded to the right and the corresponding extreme value index is negative. An asymptotic expansion of tail expectiles is derived in this challenging context under a general second-order extreme value condition, which allows to come up with two semiparametric estimators of extreme expectiles, and with their asymptotic properties in a general model of strictly stationary but weakly dependent observations. A simulation study and a real data analysis from a forecasting perspective are performed to verify and compare the proposed competing estimation procedures.