The Chinese University of Hong Kong
Department of Statistics

Seminar

Modeling Maxima with Autoregressive Conditional Frechet Model

By

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Abstract

This paper introduces a novel dynamic generalized extreme value (GEV) framework for modeling the time-varying behavior of maxima in financial time series. Specifically, an autoregressive conditional Frechet (AcF) model is proposed in which the maxima are modeled by a Frechet distribution with time-varying scale parameter (volatility) and shape parameter (tail index) conditioned on past information. The AcF provides a direct and accurate modeling of the time-varying behavior of maxima and furthermore offers a new angle to study the tail risk dynamics in financial markets. Probabilistic properties of AcF are studied, and a maximum likelihood estimator is used for model estimation, with its statistical properties investigated. Simulations show the flexibility of AcF and confirm the reliability of its estimators. Two real data examples on cross-sectional stock returns and high-frequency foreign exchange returns are used to demonstrate the AcF modeling approach, where significant improvement over the static GEV has been observed for market tail risk monitoring and conditional VaR estimation. Empirical result of AcF is consistent with the findings of the dynamic peak-over-threshold (POT) literature that the tail index of financial markets varies through time.

Date: January 15, 2019 (Tuesday)
Time: 2:30 p.m. - 3:30 p.m.
Venue: Science Centre L2
The Chinese University of Hong Kong

ALL INTERESTED ARE WELCOME !!