On the Estimation and Application of Max-Stable Processes

by

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Abstract

The theory of max-stable processes generalizes traditional univariate and multivariate extreme value theory by allowing for processes indexed by a time or space variable. We consider a particular class of max-stable processes, known as M4 processes, that are particularly well adapted to modeling the extreme behavior of multiple time series. We develop procedures for determining the order of an M4 process and for estimating the parameters. To illustrate the methods, some examples are given for modeling jumps in returns in multivariate financial time series. We introduce a new measure to quantify and predict the extreme co-movements in price returns.

This is joint work with Richard Smith, University of Wisconsin.