Toulouse School of Economics—M2 Statistics and Econometrics

Univariate extreme value theory

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Abstract

You should write a report of about 5 pages where you will perform and extreme value analysis to a dataset of your choice. Your report should be sent by email to me **in pdf** at mathieu.ribatet@umontpellier.fr before **date to be announced later**.

For your report you should first select one dataset of your choice. This could be either a financial data set (stock prices, currency exchange rate, ...), or an environmental one (temperature, precipitation, ...) or anything relevant for an extreme value analysis. Beware that you should have enough data!

To get relevant datasets you can proceed as you want but interesting options are:

- `http://www.ecad.eu` for environmental datasets;
- the `quantmod` package for financial datasets.

Here are some guidelines for you analysis:

1. use a block maxima approach:
   i) fit a GEV (possibly with trends, seasonal pattern);
   ii) do model selection and model checking
   iii) derive a return level plot
   iv) get an estimate of the 100–year return level (or $VaR_{1/100}$) and its associated confidence interval.
2. use a peaks over threshold approach:
   i) choose appropriate threshold(s)
   ii) fit a stationary GPD;
   iii) derive a return level plot
   iv) get an estimate of the 100–year return level (or $VaR_{1/100}$) and its associated confidence interval.
3. Compare the two previous modelling strategies and discuss your results.