UNIVERSIDADE DE ÉVORA
ESCOLA DE CIÊNCIAS E TECNOLOGIA
DEPARTAMENTO DE MATEMÁTICA

Centro de Investigação em Matemática e Aplicações
Departamento de Matemática
Programa de Doutoramento em Matemática

Seminário

15/2/2023, CLAV-Anfiteatro 1, 15h

Risk assessment in Statistics of Extremes

Lígia Henriques-Rodrigues
(Professora Auxiliar, ligiahr@uevora.pt)

Departamento de Matemática, Escola de Ciências e Tecnologia, Centro de Investigação em Matemática e Aplicações, Instituto de Investigação e Formação Avançada, Universidade de Évora

Abstract: In the field of statistical extreme value theory, risk is generally expressed either by the *value at risk* at a level q (VaR_q), the size of the loss occurred with a fixed probability, q, the upper $(1-q)$-quantile of the loss function, or by the *conditional tail expectation* (CTE), defined as $\text{CTE}_q = \mathbb{E}(X|X > \text{VaR}_q)$, $q \in (0,1)$. We consider heavy-tailed models, i.e. Pareto-type underlying CDFs, with a positive *extreme value index* (EVI), quite common in many areas of application. For these Pareto-type models, the classical EVI-estimators are the Hill (H) estimators, the average of the k log-excesses over a threshold $X_{n-k:n}$. The Hill estimator is crucial for the semi-parametric estimation of both the VaR and the CTE. We present improvements in the performance of the aforementioned VaR- and CTE-estimators, through the use of a reliable EVI–estimator based on generalized means and possibly reduced-bias. (Joint works with Maria Ivette Gomes, Frederico Caeiro and Fernanda Figueiredo.)

Keywords: Extreme value theory, heavy right-tails, risk modelling, value-at-risk estimation, conditional tail expectation, generalized means.

Acknowledgements: This talk is partially supported by Centro de Investigação em Matemática e Aplicações, through project UIDB/04674/2020 of FCT - Fundação para a Ciência e a Tecnologia, Portugal.

fct Fundação para a Ciência e a Tecnologia