Stellenbosch UNIVERSITY IYUNIVESITHI UNIVERSITEIT

Statistics and Actuarial Science
Statistiek en Aktuariële Wetenskap

NITheCS
National Institute for Theoretical and Computational Sciences

S E M I N A R

Prof Tertius de Wet
(Stellenbosch University)

Nonparametric estimation of the extreme quantiles of compound frequency distributions

ABSTRACT:

Estimation of operational risk reserves is an important part of financial risk management. The accuracy of this estimation depends heavily on the accuracy with which the extreme quantiles of the aggregate loss distributions are estimated. Various approaches have been proposed to estimate the extreme quantiles of this compound distribution, including estimators based on the single-loss and perturbative approximations. These rely on estimating an even more extreme quantile of the underlying severity distribution. However, estimation of these extreme quantiles may be inaccurate due to incorrect parametric distributional assumptions. To circumvent this problem, we propose estimating nonparametrically a less extreme or lower quantile of the severity distribution, hopefully with better accuracy, and then multiplying this lower quantile by a certain factor to obtain an estimate of the required extreme quantile of the compound distribution. The factor or multiplier is derived by using extreme value theory and the single loss and perturbative approximations. The estimators are evaluated by means of a simulation study which suggest that the second-order multiplier estimator based on the second-order perturbative approximation, is a good choice for practical applications.

Prof Tertius de Wet is a lecturer in the Statistics & Actuarial Science Department at Stellenbosch University.

Date:
Friday, 14 March 2025

Time:
13h10-14h10 SAST

***Venues*:**
- Room 2048, 2nd floor
  Van der Sterr Building,
  cnr Victoria & Bosman Streets
  Stellenbosch
- Online

WHO SHOULD ATTEND?
All are welcome.

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