Doctoral School of Information and Biomedical Technologies Polish Academy of Sciences

Domain: IT

SUBJECT: Simulation of imprecise rare catastrophic events in insurance system

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Place of research: Instytut Badań Systemowych PAN, ul. Newelska 6, 01-471 Warszawa

Recruitment & Selection: interview

Number of positions: 1

Project Description

The classical approach in insurance mathematics assumes the occurrence of many losses, which have only a small and limited influence on payments from a whole portfolio of an insurer (like, e.g., in the case of automobile crashes). Whereas, together with the progress of climate change, the number of rare events with severe, catastrophic consequences increases (e.g., floods which affect many insureds in a flooded region at once). In the literature, simulation approaches, which enable sampling from a random distribution describing rare and catastrophic events in a numerically efficient way, are known (e.g., the splitting or the importance sampling). Unfortunately, published real data is frequently incomplete or censored. This severely hampers the process of selection and fitting of respective random distributions to values of the losses. Additionally, this data can be based on the experts' opinions or can be imprecise in other ways. The main aim of the project is to develop and apply simulation methods for rare and catastrophic events, also in the case of an imprecise approach. Based on the conducted simulations, insurers' portfolios with various types of financial and insurance instruments (both the classical and the more modern ones, like, e.g., reinsurance contracts and catastrophe bonds), will be numerically compared.

References

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Date: 16.05.2022