



Purdue Statistics Seminars

Seminar Series: Computational Finance Seminar

Date: Wednesday, February 14, 2018

Time: 3:30 – 4:20 p.m.

Location: REC 113

Speaker: Ambrose Lo

Affiliation/Organization: Department of Statistics and Actuarial Science,
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Optimal Reinsurance: A Contemporary Risk Measure Perspective

Abstract. This three-strand talk synthesizes various recent advances in the design of optimal reinsurance in a modern risk management framework. In the first strand, we provide full characterizations of the collection of risk-minimizing optimal reinsurance treaties and put the underlying cost-benefit considerations into perspective. Unlike conventional studies, our results address the issue of (non-)uniqueness of optimal solutions and indicate that ceded loss functions beyond the traditional insurance layers can be optimal in some cases. In the second strand, we develop, on the basis of the no-constraint framework in the first strand, a variation of the Neyman–Pearson Lemma in statistical hypothesis testing theory to solve a wide class of constrained optimal reinsurance problems expeditiously. To illustrate the versatility and superiority of the proposed Neyman–Pearson formulation, we provide complete and explicit solutions of several specific constrained optimal reinsurance problems, many of which were only partially solved in the literature by substantially more difficult means and under extraneous technical assumptions. In the last strand, we describe the set of Pareto-optimal reinsurance policies analytically and visualize the insurer-reinsurer trade-off structure geometrically. The resulting solutions not only cast light on the structure of the Pareto-optimal contracts, but also allow us to portray the resulting insurer-reinsurer Pareto frontier graphically. Their connections to the Neyman–Pearson formulation in the second strand are also explained.