

Stochastic Prioritization of Dependent Actuarial Risks: Preferences among Prospects

Authors : Ezgi Nevruz, Kasirga Yildirak, Ashis SenGupta

Abstract : Comparing or ranking risks is the main motivating factor behind the human trait of making choices. Cumulative prospect theory (CPT) is a preference theory approach that evaluates perception and bias in decision making under risk and uncertainty. We aim to investigate the aggregate claims of different risk classes in terms of their comparability and amenability to ordering when the impact of risk perception is considered. For this aim, we prioritize the aggregate claims taken as actuarial risks by using various stochastic ordering relations. In order to prioritize actuarial risks, we use stochastic relations such as stochastic dominance and stop-loss dominance that are proposed in the frame of partial order theory. We take into account the dependency of the individual claims exposed to similar environmental risks. At first, we modify the zero-utility premium principle in order to obtain a solution for the stop-loss premium under CPT. Then, we propose a stochastic stop-loss dominance of the aggregate claims and find a relation between the stop-loss dominance and the first-order stochastic dominance under the dependence assumption by using properties of the familiar as well as some emerging multivariate claim distributions.

Keywords : cumulative prospect theory, partial order theory, risk perception, stochastic dominance, stop-loss dominance

Conference Title : ICASQF 2016 : International Conference on Actuarial Science and Quantitative Finance

Conference Location : Amsterdam, Netherlands

Conference Dates : December 01-02, 2016