Cai, Jun; **Tan, Ken Seng**; **Weng, Chengguo**; **Zhang, Yi**
Optimal reinsurance under VaR and CTE risk measures. (English) Zbl 1140.91417
Insur. Math. Econ. 43, No. 1, 185-196 (2008).

Summary: Let X denote the loss initially assumed by an insurer. In a reinsurance design, the insurer cedes part of its loss, say $f(X)$, to a reinsurer, and thus the insurer retains a loss $I_f(X) = X - f(X)$. In return, the insurer is obligated to compensate the reinsurer for undertaking the risk by paying the reinsurance premium. Hence, the sum of the retained loss and the reinsurance premium can be interpreted as the total cost of managing the risk in the presence of reinsurance. Based on a technique used by *A. Müller* and *D. Stoyan* [Comparison Methods for Stochastic Models and Risks, Wiley Series in Probability and Statistics (2002; Zbl 0999.60002)] and motivated by *J. Cai* and *K.S. Tan*, Optimal retention for a stop-loss reinsurance under the VaR and CTE risk measure. Astin Bull. 37 (1), 93–112 (2007)] on using the value-at-risk (VaR) and the conditional tail expectation (CTE) of an insurer's total cost as the criteria for determining the optimal reinsurance, this paper derives the optimal ceded loss functions in a class of increasing convex ceded loss functions. The results indicate that depending on the risk measure's level of confidence and the safety loading for the reinsurance premium, the optimal reinsurance can be in the forms of stop-loss, quota-share, or change-loss.

MSC:

91B30 Risk theory, insurance (MSC2010)

Keywords:

value-at-risk (VaR); conditional tail expectation (CTE); ceded loss; retained loss; increasing convex function; expectation premium principle; stop-loss reinsurance; quota-share reinsurance; change-loss reinsurance

Software:

QRM

Full Text: DOI

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