On randomized reinsurance contracts

Hansjoerg Albrecher [a]   Arian Cani [b]
[a] University of Lausanne and Swiss Finance Institute,
Quartier UNIL-Dorigny, Lausanne, Switzerland
hansjoerg.albrecher@unil.ch
[b]University of Lausanne, Quartier UNIL-Dorigny, Lausanne, Switzerland
arian.cani@unil.ch

The design of optimal reinsurance treaties is a classical problem in risk theory. The identified optimality results are then typically based on a deterministic reinsurance rule. In the framework of a one-year reinsurance model including regulatory solvency constraints and the associated cost of capital, in this paper we propose a randomized stop-loss reinsurance strategy and investigate the effects of randomizing on the expected profit after reinsurance. We provide an analytical characterization of the resulting optimal stop-loss retention level. The proposed randomized strategy turns out to outperform the classical deterministic strategy in a number of cases.