

Hu, Xiang; Zhang, Lianzeng

Ruin probability in a correlated aggregate claims model with common Poisson shocks: application to reinsurance. (English) Zbl 1349.91141

Methodol. Comput. Appl. Probab. 18, No. 3, 675-689 (2016).

Summary: This paper considers a correlated aggregate claims model with common Poisson shocks, which allows for dependence in n ($n \geq 2$) classes of business across m ($m \geq 1$) different types of stochastic events. The dependence structure between different claim numbers is connected with the thinning procedure. Under combination of quota-share and excess of loss reinsurance arrangements, we examine the properties of the proposed risk model. An upper bound for the ruin probability determined by the adjustment coefficient is established through martingale approach. We reduce the problem of optimal reinsurance strategy for maximizing the insurer's adjustment coefficient and illustrate the results by numerical examples.

MSC:

91B30 Risk theory, insurance (MSC2010)

62P05 Applications of statistics to actuarial sciences and financial mathematics

Cited in 2 Documents

Keywords:

common Poisson shocks; thinning procedure; ruin probability; adjustment coefficient; optimal reinsurance

Full Text: [DOI](#)

References:

- [1] Asmussen S, Albrecher H (2010) Ruin probabilities, 2nd edn. World Scientific Press, River Edge · [Zbl 1247.91080](#)
- [2] Badescu, AL; Cheung, ECK; Rabehasaina, L, A two-dimensional risk model with proportional reinsurance, J Appl Probab, 48, 749-765, (2011) · [Zbl 1239.91073](#)
- [3] Bai, L; Cai, J; Zhou, M, Optimal reinsurance policies for an insurer with a bivariate reserve risk process in a dynamic setting, Insurance: Mathematics and Economics, 53, 664-670, (2013) · [Zbl 1290.91075](#)
- [4] Cai, J; Tan, KS, Optimal retention for a stop-loss reinsurance under the var and CTE risk measures, Astin Bulletin, 37, 93-112, (2007) · [Zbl 1162.91402](#)
- [5] Cai, J; Tan, KS; Weng, C; Zhang, Y, Optimal reinsurance under var and CTE risk measures, Insurance: Mathematics and Economics, 43, 185-196, (2008) · [Zbl 1140.91417](#)
- [6] Cossette, H; Marceau, E, The discrete-time risk model with correlated classes of business, Insurance: Mathematics and Economics, 26, 133-149, (2000) · [Zbl 1103.91358](#)
- [7] Cossette, H; Marceau, E; Maume-Deschamps, V, Discrete-time risk models based on time series for count random variables, Astin Bulletin, 40, 123-150, (2010) · [Zbl 1230.91071](#)
- [8] Cossette, H; Marceau, E; Tourelle, F, Risk models based on time series for count random variables, Insurance: Mathematics and Economics, 48, 19-28, (2011) · [Zbl 1218.91074](#)
- [9] Gong, L; Badescu, AL; Cheung, ECK, Recursive methods for a multi-dimensional risk process with common shocks, Insurance: Mathematics and Economics, 50, 109-120, (2012) · [Zbl 1235.91090](#)
- [10] Guerra, M; Centeno, ML, Optimal reinsurance policy: the adjustment coefficient and the expected utility criteria, Insurance: Mathematics and Economics, 42, 529-539, (2008) · [Zbl 1152.91583](#)
- [11] Liang, Z; Guo, J, Upper bound for ruin probabilities under optimal investment and proportional reinsurance, Appl Stoch Model Bus Ind, 24, 109-128, (2008) · [Zbl 1199.91088](#)
- [12] Lindskog, F; McNeil, AJ, Common Poisson shock models: applications to insurance and credit risk modelling, Astin Bulletin, 33, 209-238, (2003) · [Zbl 1087.91030](#)
- [13] Wang, G; Yuen, KC, On a correlated aggregate claims model with thinning-dependence structure, Insurance: Mathematics and Economics, 36, 456-468, (2005) · [Zbl 1120.62095](#)
- [14] Zhang L, Hu X, Duan B (2013) Optimal reinsurance under adjustment coefficient measure in a discrete risk model based on Poisson MA(1) process. Scand Actuar J (ahead-of-print):1-13 · [Zbl 1120.62095](#)

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.