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Optimal reinsurance via Dirac-Feynman approach. (English) Zbl 1429.91284

Methodol. Comput. Appl. Probab. 21, No. 2, 647-659 (2019).

Summary: In this paper, the Dirac-Feynman path calculation approach is applied to analyse finite time ruin probability of a surplus process exposed to reinsurance by capital injections. Several reinsurance optimization problems on optimum insurance and reinsurance premium with respect to retention level are investigated and numerically illustrated. The retention level is chosen to decrease the finite time ruin probability and to guarantee that reinsurance premium covers an average of overall capital injections. All computations are based on Dirac-Feynman path calculation approach applied to the convolution type operators perturbed by Injection operator (shift type operator). In addition, the effect of the Injection operator on ruin probability is analysed.

MSC:

91G05 Actuarial mathematics

62P05 Applications of statistics to actuarial sciences and financial mathematics

58D30 Applications of manifolds of mappings to the sciences

Keywords:

ruin probability; reinsurance; capital injection; retention level; Dirac-Feynman approach

Full Text: [DOI](#)

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