On Devising Various Alarm Systems for Insurance Companies

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Abstract

One possible way of risk management for an insurance company is to develop an early and appropriate alarm system before the possible ruin. The ruin is defined through the status of the aggregate risk process, which in turn is determined by premium accumulation as well as claim settlement out-go for the insurance company. The main purpose of this work is to design an effective alarm system before the possible ruin and to recommend augmentation of capital of suitable magnitude actions at those points to prevent or reduce the chance of ruin. In the different methods considered, the alarm is signaled on the basis of the past history of the risk process and/or properties of claim distribution. Depending on method adopted, the alarm time can be a random one or a fixed parameter of claim distribution (and premium function). To draw a fair measure of effectiveness of alarm system(s), comparison is drawn between a process equipped with alarm system, with capital being added at the sound of every alarm, and the corresponding process without any alarm system but an equivalently higher initial capital. We obtain conditions in terms of interest rate when having the alarm system is more rewarding. Finally, the formulation is extended to cover to multiple risk processes, paving away to alarm system for reinsurance contracts.

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