

A Truncated Type of Gerber-Shiu Function in the Classical Risk Model with Surplus-Dependent Premium

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Abstract

In this talk, a truncated type of Gerber-Shiu function incorporating the minimum and the maximum surplus before ruin is proposed. In the classical Poisson risk model with the surplus-dependent premium (e.g. Cheung (2011)), a structure form of the truncated Gerber-Shiu function is derived. It shows that the key component lies in the so-called transition function. Then we obtain the explicit expressions of the transition function when the surplus-dependent premium rate is assumed as (i) constant, a form of (ii) linear function (e.g. credit interest model), and (iii) step function (e.g. threshold strategy model). Moreover, various joint distributions of ruin-related quantities involving the maximum and the minimum surplus prior to ruin are obtained. Lastly, a MAP (Markovian Arrival Process) risk model is also considered.

Keywords: Truncated Gerber-Shiu function, Compound Poisson model, Surplus-dependent premium rate, Transition function.