Ruin and deficit at ruin under an extended order statistics risk process

Vladimir K. Kaishev*
Cass Business School, City University London

Abstract

We present a closed form expression for the joint distribution of the time to ruin and the deficit at ruin assuming that claim arrivals follow a point process with an extended order statistics (OS) property. We generalize the classical OS property by allowing the claim arrivals cumulative intensity function to be any (possibly discontinuous) non-decreasing function. This is appealing for insurance applications since it allows to consider clusters of claims arriving instantaneously, which is illustrated on several examples. We show that corollaries of our main result generalize previous non-ruin formulas obtained for the case of stationary Poisson claim arrivals and for claim arrivals following a classical OS point process with a continuous cumulative intensity function.

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