Lundberg Bounds on the Tails of Compound Distributions

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ABSTRACT

Exponential bounds are derived for the tail probabilities of various compound distributions, generalizing the classical Lundberg inequality of insurance risk theory. Failure rate properties of the compounding distribution including log-convexity and log-concavity are considered in some detail. Mixed Poisson compounding distributions are also considered. A ruin theoretic generalization of the Lundberg inequality is obtained in the case where the number of claims process is a mixed Poisson process. An application to the M/G/1 queue length distribution is given.