# Some distributional properties of the deficit at the time of ruin

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**Abstract:**

We consider the distribution of the deficit at the time of ruin in risk models. In many situations, the computation or the numerical estimation of ruin probability is a challenging problem. In this work, we give some distributional properties in the case where the claim size distribution has a heavy or light tailed distribution, such as Pareto or exponential claims. We present some new results concerning stochastic comparisons related to the deficit at ruin. We also extend our results to the Gerber-Shiu penalty function. Examples are given to illustrate our results.

**Keywords:**
Gerber-Shiu penalty function; Deficit at ruin; Ruin probability; Compound geometric convolution; Equilibrium distribution.