

Title: A Comparison: Some Approximations for the Aggregate Claims Distribution

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Abstract: In this paper, we compare several approximations for the aggregate claims distribution in the context of insurance theory. For most combinations of distributions of claim counts and individual claim amounts, the exact distribution of aggregate claims is not available analytically. In this situation, one often prefers to use an approximate distribution for the aggregate claims. Several approximations for the distribution of aggregate claims have been proposed in the literature. In this paper, we have developed saddlepoint approximation for the aggregate claims distribution, and compared with some existing approximations such as NP2, Gamma, IG, and Gamma-IG mixture. We considered several distributions for the aggregate claims to examine the performance of these approximations. It seems that the saddlepoint approximation generally outperforms the other four in terms of relative errors.