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Log-Folded-t Models for Insurance Loss Data

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A rich variety of probability distributions has been proposed in the actuarial literature for fitting of insurance loss data. Examples include: lognormal, log-t, various versions of Pareto, loglogistic, Weibull, gamma and its variants, and generalized beta of the second kind distributions, among others. In this paper, we supplement the literature by adding the log-folded-normal and log-folded-t families. Shapes of the density function and key distributional properties of the “folded” distributions are presented along with three methods for the estimation of parameters: method of maximum likelihood, method of moments, and method of trimmed moments. Further, large- and small-sample properties of these estimators are studied in detail. Finally, we fit the newly proposed distributions to data which represent the total damage done by 827 fires in Norway for the year 1988. The fitted models are then employed in a few quantitative risk management examples, where point and interval estimates for several value-at-risk measures are calculated.