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Robust estimators of accelerated failure time regression with generalized log-gamma errors

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Abstract

The generalized log-gamma (GLG) model is a very flexible family of distributions to analyze datasets in many different areas of science and technology. Estimators are proposed which are simultaneously highly robust and highly efficient for the parameters of a GLG distribution in the presence of censoring. Estimators with the same properties for accelerated failure time models with censored observations and error distribution belonging to the GLG family are also introduced. It is proven that the proposed estimators are asymptotically fully efficient and the maximum mean square error is examined using Monte Carlo simulations. The simulations confirm that the proposed estimators are highly robust and highly efficient for a finite sample size. Finally, the benefits of the proposed estimators in applications are illustrated with the help of two real datasets.

Keywords: Censored data, Quantile distance estimates, τ estimators, Truncated maximum likelihood estimators, Weighted likelihood estimators

1. Introduction

Generalized log-gamma (GLG) regression with censored observations is a large class of Accelerated Failure Time (AFT) models introduced by Lawless

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