

Reliability and Probability Weighted Moment Estimation for Three Parameter Mukherjee-Islam Failure Model

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Abstract : The Mukherjee-Islam Model is commonly used as a simple life time distribution to assess system reliability. The model exhibits a better fit for failure information and provides more appropriate information about hazard rate and other reliability measures as shown by various authors. It is possible to introduce a location parameter at a time (i.e., a time before which failure cannot occur) which makes it a more useful failure distribution than the existing ones. Even after shifting the location of the distribution, it represents a decreasing, constant and increasing failure rate. It has been shown to represent the appropriate lower tail of the distribution of random variables having fixed lower bound. This study presents the reliability computations and probability weighted moment estimation of three parameter model. A comparative analysis is carried out between three parameters finite range model and some existing bathtub shaped curve fitting models. Since probability weighted moment method is used, the results obtained can also be applied on small sample cases. Maximum likelihood estimation method is also applied in this study.

Keywords : comparative analysis, maximum likelihood estimation, Mukherjee-Islam failure model, probability weighted moment estimation, reliability

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