THETA POWER EXPONENTIATED-X FAMILY OF DISTRIBUTIONS: PROPERTIES AND APPLICATIONS

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SUMMARY

This work introduces a family of theta power-transformed exponentiated distributions. A sub-model, the theta power transformed exponentiated Weibull (TPTEW), is considered in detail. It is of particular interest because the density function assumes a variety of symmetrical and asymmetrical shapes. The new model's parameters have been estimated using four different approaches, including maximum likelihood, least squares, weighted least squares, and Cramer–von Mises. A simulation study has been conducted to assess the effectiveness of the same. Estimates of the TPTEW parameters derived from all four estimation techniques are efficient and very near to the true values, with negligible mean square error and biases for different combinations of parameters. Moreover, the model's usefulness is investigated using three data sets. Based on comparison with the existing most popular distributions in the literature, the results demonstrate that the proposed model provides a better fit to the data.

Keywords and phrases: T-X family; theta power; simulation; estimation; coverage probability, goodness of fit test.

2020 Mathematics Subject Classification: Primary 62E10, secondary 62P05.