

## ROBUST ESTIMATORS FOR MARSHALL-OLKIN EXTENDED BURR III DISTRIBUTION

SALWA A. MOUSA

Department of Statistics, Faculty of Commerce (Girls Campus), Al-Azhar University, Cairo, Egypt

### ABSTRACT

The parameter estimation of the Marshall–Olkin extended Burr III (MOEBIII) distribution, which is a generalization of the Burr III distribution is considered. The maximum likelihood (ML) estimation of the parameters of the MOEBIII distribution is introduced by Al-Saiari *et al.* (2016). However, ML is often used to estimate the parameters of the Burr III distribution; this method is very sensitive to the presence of outliers in the data.

This paper presents M-estimation as a robust method, based on the quantile function to estimate the parameters of the MOEBIII distribution for complete data with outliers. A simulation study and areal data are used to illustrate the performance of M-estimator and ML estimator. The numerical results show that the M-estimator, generally is appropriate than the ML, in terms of the bias and mean square error when there are outliers in the data.

**KEYWORDS:** Marshall–Olkin Extended Burr III, Maximum Likelihood, M-estimator, Robust estimator, Outliers