



Multivariate log-Birnbaum-Saunders regression models

Guillermo Martínez-Flórez*

Departamento de Matemáticas y Estadística, Universidad de Córdoba, Montería, Colombia -
gmartinez@correo.unicordoba.edu.co

Germán Moreno-Arenas

Escuela de Matemáticas, Universidad Industrial de Santander, Bucaramanga, Colombia -
gmorenoa@uis.edu.co

Rafael Bráz Azevedo Farias

Depart. de Estatística e Matemática Aplicada, Universidade Federal do Ceará, Ceará, Brazil -
rafael@dema.ufc.br

Abstract

In this paper we present a multivariate version of the skewed log-Birnbaum-Saunders regression model. This new family of distributions holds good properties, such as the marginal distributions of the dependent variables are univariate skewed log-Birnbaum-Saunders distribution and have the usual log-Birnbaum-Saunders distribution as a particular case. Furthermore, the model parameters are estimated by using maximum-likelihood methods and a closed-form expression for the Fisher's information matrix is presented, which aid us to perform testing hypothesis for model parameters by using approximations obtained from the asymptotic normality of maximum-likelihood estimators. Two real data set are analysed and the results are discussed, illustrating the usefulness of the extension considered.

Keywords: log-linear Birnbaum-Saunders model, sinh-normal distribution, univariate log-Birnbaum-Saunders distribution