

Bias reduction of maximum likelihood estimates for a modified skew-normal distribution

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Abstract: This paper presents a modified skew-normal model that contains the normal model as a special case. Unlike the usual skew-normal model, the Fisher information matrix of the proposed model is always non-singular. Despite of this desirable property for the regular asymptotic inference, as with the skew-normal model, in the considered model the divergence of the maximum likelihood estimator of the skewness parameter may occur with positive probability in samples with moderate sizes. As a solution to this problem, a modified score function is used for the estimation of the skewness parameter. It is proved that the modified maximum likelihood estimator is always finite. The quasi-likelihood approach is considered to build confidence intervals. When the model includes location and scale parameters, the proposed method is combined with the unmodified maximum likelihood estimates of these parameters. This is a joint work with Jaime Arrué and Héctor W. Gómez.