

Discussiones Mathematicae
Probability and Statistics 37 (2017) 157–158
 doi:10.7151/dmps.1189

ON NONNEGATIVE MINIMUM BIASED ESTIMATION IN THE LINEAR REGRESSION MODELS

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Abstract

The problem of the nonnegative estimation of the parametric function $\gamma(\beta, \sigma) = \beta' H \beta + h \sigma^2$ in the linear regression model $\mathcal{M}\{y, X\beta, \sigma^2 I\}$, where H is a nonnegative definite matrix and h is a nonnegative scalar, attracted attention of many researchers. S. Gnot, G. Trenkler and R. Zmyślony [J. Multivar. Anal. 54 (1995), 113–125] proposed an approach in which γ is estimated by a quadratic form $y' A y$, where A is a nonnegative definite matrix that satisfies an appropriate optimality criterion associated with minimizing the bias of the estimator.

In the paper, we revisit this approach to estimating γ . In particular, we discuss various methods of computing the matrix A , which in the general case is not given explicitly.

Keywords: linear regression model, nonnegative minimum biased estimators, mean squared error.

2010 Mathematics Subject Classification: 62J05, 62H12.

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Received 27 September 2017

Accepted 18 November 2017