Bounds for the Euclidean distance between restricted and unrestricted estimator of parametric functions in the general linear model

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Abstract

Let $\widehat{\kappa}$ and $\widehat{\kappa}_r$ denote the best linear unbiased estimator of a given vector of parametric functions $\kappa = K\beta$ in the general linear model $\mathcal{M} = \{y,\, X\beta,\, \sigma^2 V\}$ and the restricted linear model $\mathcal{M}_r = \{y,\, X\beta \,|\, R\beta = r,\, \sigma^2 V\}$, respectively. Making use of the implied restrictions constituting essential part of $R\beta = r$ with respect to a given vector $\kappa = K\beta$, new bounds for the Euclidean norm of the difference $\widehat{\kappa} - \widehat{\kappa}_r$ are derived. The result is applied to measure an influence of nuisance parameters on estimating parametric functions in linear model.

Keywords

General linear model, Implied linear restrictions, Best linear unbiased estimator, Nuisance parameters.

References

Baksalary, J.K. (1984). A study of the equivalence between Gauss-Markoff model and its augmentation by nuisance parameters. *Math. Operationsforsch. Statist. Ser. Statist. 15*, 3–35.

Baksalary, J.K. and P.R. Pordzik (1992). Implied linear restrictions in the general Gauss-Markov model. *J. Statist. Plann. Inference 30*, 237–248.