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A generalization of Rao's covariance structure with applications to several linear models.
(English) Zbl 0941.62075
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Summary: This paper presents a generalization of Rao's covariance structure [*C.R. Rao*, Proc. 5th Berkeley Symp. Math. Stat. Probab. Univ. Calif. 1965/66, 1, 355-372 (1967; Zbl 0189.18503)]. In a general linear regression model, we classify the error covariance structure into several categories and investigate the efficiency of the ordinary least squares estimator (OLSE) relative to the Gauss-Markov estimator (GME). The classification criterion considered here is the rank of the covariance matrix of the difference between the OLSE and the GME. Hence our classification includes Rao's covariance structure. The results are applied to models with special structures: a general multivariate analysis of variance model, a seemingly unrelated regression model, and a serial correlation model.

MSC:

62J05 Linear regression; mixed models
62H12 Estimation in multivariate analysis
62J10 Analysis of variance and covariance (ANOVA)

Keywords:

seemingly unrelated regression model; general multivariate analysis of variance model; Rao's covariance structure; ordinary least squares estimator; Gauss-Markov estimator

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