

Error Orthogonal Models and Commutative Orthogonal Block Structure: equivalence

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We establish the equivalence of two important classes of models with Orthogonal Block Structure (OBS), namely:

- Error orthogonal models, whose least squares estimators are UBLUE, having the family of variance-covariance matrices given by $\mathbf{V} = \left\{ \sum_{j=1}^m \gamma_j \mathbf{Q}_j \right\}$;
- COBS, these are the models whose orthogonal projection matrix on the space spanned by the mean vector commutes with the matrices $\mathbf{Q}_1, \dots, \mathbf{Q}_m$.

This equivalence is fruitful since it enables us to use the model structure to estimate variance components.