

Prediction Distribution of Future Regression and Residual Sum of Squares Matrices for Multivariate Simple Regression Model with Correlated Normal Responses

Shahjahan Khan

Department of Mathematics & Computing, Australian Centre for Sustainable Catchments, University of Southern Queensland, Toowoomba, Queensland, Australia. Email: khans@usq.edu.au

Abstract

This paper considers multivariate simple regression model under normally distributed errors, for both realized and future responses, with unknown regression parameters (β) and covariance matrix (Σ). The prediction distributions of the future regression matrix (FRM) and future residual sum of squares matrix (FRSSM) for the future regression model are obtained. Conditional on the realized responses, the FRM follows a matrix T distribution whose shape parameter depends on the sample size and the dimension of the regression parameters in the model, and the FRSSM follows a scaled generalized beta distribution. The same results have been obtained by both the classical and Bayesian methods under uniform prior.

Keywords: Multivariate simple regression model, invariant differentials, uniform prior, predictive inference, future regression matrix and residual sum of squares matrix, and matrix normal, matrix T and generalized beta distributions.

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