ST 56 - COMPARISON BETWEEN BAYESIAN STRUCTURAL EQUATION MODELS WITH ORDERED CATEGORICAL DATA

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ABSTRACT

In this paper, ordered categorical variables are used to compare between linear and nonlinear Bayesian structural equation models, Gibbs Sampling method is applied for estimation and model comparison. Statistical inferences, which involve estimation of parameters and their standard deviations, and residuals analyses for testing the posited model, are discussed. The proposed procedure is illustrated by a simulation data obtained from R program. Data results are obtained from WinBUGS program.

Keywords: Nonlinear Structural Equation Models; Latent Variables; Ordered Categorical Data.

ST 57 - ROBUST PC WITH WILD BOOTSTRAP ESTIMATION OF LINEAR MODEL IN THE PRESENCE OF OUTLIERS, MULTICOLLINEARITY AND HETEROSCEDASTICITY ERROR VARIANCE

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ABSTRACT

The regression model estimator is considered an efficient if it robust and resistance toward the presence of heteroscedasticity variance, multicollinearity or unusual observations called outliers. However, regard to these problems, the wild bootstrap and robust wild bootstrap are no longer efficient since it could not produce the smallest variance. Hence this research investigates the use of robust PC with wild bootstrap techniques on regression model as an estimator for real and simulation data in a situation where multicollinearity, heteroscedasticity and multiple outliers are presence. This paper proposed a robust procedure based on the weighted residuals which combine the Tukey bisquare weighted function, principal component analysis (PCA) to remedy the multicollinearity problems, least trimmed squares (LTS) estimator, robust location and scale, and the wild bootstrap sampling procedure of Wu's and Liu that remedy the heteroscedasticity error variance. The RPCWBootWu and RPCWBootLiu was obtained through a modified version of RBootWu and RBootLiu. Finally, based on the real data and simulation study, the performance of the RPCWBootWu and RPCWBootLiu is compared with the existing RBootWu, RBootLiu and also with BootWu and BootLiu using the biased, RMSE and standard error. The numerical example and simulation study shows that the RPCWBootWu and RPCWBootLiu techniques have proven to be a good alternative estimator for regression model with lower standard error values.

Keywords: Wild Bootstrap, Heteroscedasticity, Multicollinearity and Multiple Outliers PACS.

ST 59 - ESTIMATION PARAMETERS USING BISQUARE WEIGHTED ROBUST RIDGE REGRESSION BRLTS ESTIMATOR IN THE PRESENCE OF MULTICOLLINEARITY AND OUTLIERS

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ABSTRACT

This study presents an improvement to robust ridge regression estimator. We proposed two methods Bisquare ridge least trimmed squares (BRLTS) and Bisquare ridge least absolute value (BRLAV) based on ridge least trimmed squares RLTS and ridge least absolute value (RLAV) respectively. We compared these methods with existing estimators, namely ordinary least squares (OLS) and Bisquare ridge regression (BRID) using three criteria: Bias, Root Mean Square Error (RMSE) and Standard Error (SE) to estimate the parameters coefficients. The results of Bisquare ridge least trimmed squares (BRLTS) and Bisquare ridge least absolute value (BRLAV) are compared with existing methods using real data and simulation study. The empirical evidence shows that the results obtain from the BRLTS are the best among the three estimators followed by BRLAV with the least value of the RMSE for the different disturbance distributions and degrees of multicollinearity.