

# **Ridge Pretest and Shrinkage Estimation for the Conditional Autoregressive Model**

## **Abstract:**

Multicollinearity, or near-linear dependence, is a phenomenon that occurs when two or more predictors in a multiple regression model are correlated, leading to an increase in the standard error of the coefficients. Increased standard errors mean that the coefficients for some or all independent variables may be found to be significantly equal to 0. In other words, by overinflating the standard errors, multicollinearity makes some variables statistically insignificant when they should be significant. Researchers have used different techniques to deal with multicollinearity, such as dropping one of the correlated variables, combining the variables into a single variable, or using regularization methods such as ridge regression or lasso regression. One of the many techniques to avoid this issue in least squares estimates is the ridge estimation technique for the regression model, which was initially introduced by Hoerl and Kennard (1970). They proposed the ridge estimator to reduce the multicollinearity problem among the regressor variables. In this project, we proposed effective estimation strategies using the ride-type pretest and shrinkage techniques to estimate the regression vector of the conditional autoregressive model.

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