

Decomposition of Multicollinear Data and Time Series using Backfitting and Additive Models

by

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Abstract

The backfitting algorithm for estimating additive models is used to decompose the component shares being explained by a set of predictors on a dependent variable in the presence of linear dependencies in a model. Multicollinearity and non-orthogonality of independent variables affects the consistency and efficiency of the parameter estimates. The iterative nature of the proposed estimation procedure addresses this problem by estimating shares one at a time, relative to the importance of the variables in the model.

Simulated data show that backfitting the OLS procedure and using additive smoothing splines fair relatively well against OLS in producing share estimates under different scenarios. The predictive ability of the methodology becomes more apparent as the level of multicollinearity increases.

Keywords: Multicollinearity, Least Squares, Additive Models, Backfitting.