

Title: Estimation of Proposed Generalized Spatial-Temporal Model

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Abstract:

A generalized spatial-temporal model is postulated, units need not come from grids or lattice, and can be of irregular shapes. The model take into account spatial associations that are assumed to be constant overtime. The temporal associations are also considered but was assumed to be constant over space. The defect of some covariates that are assumed to be constant across time and space can be analyzed.

An estimation procedure is proposed based on the backfitting algorithm. The cochrane-orcutt procedure is integrated into the backfitting algorithm. The bootstrap is also introduced into the backfitting routine to possibly generate basic understanding of the sampling distribution of the estimates of model parameters.

The model and the estimation procedures are applied to rice yield in the Philippines using data from 1990-2002. Neighborhood distance is defined in terms of proximity of provinces (units). The result of estimating the generalized spatial-temporal model using the hybrid for cochrane-orcutt procedure and the backfitting algorithm are superior compared to ordinary least-squares of an ordinary linear model, simple cochrane-orcutt procedure to linear model with autocorrelated errors and restricted MLE to mixed linear model.