

First-order fractionally integrated non-separable spatial autoregressive (FINSSAR(1,1)) model and some of its properties

Abstract

Spatial modelling has its applications in many fields. There exist in the literature a class of models known as the fractionally integrated separable spatial autoregressive (FISSAR) model. In this paper the objective of our research is to develop a non-separable counterpart of the FISSAR model. We term this model as the fractionally integrated non-separable spatial autoregressive (FINSSAR) model. The FINSSAR model is a more general model as it encompasses the FISSAR and the standard separable autoregressive (SSAR) models. The theoretical autocovariance function and the spectral function of the model are obtained and some numerical results is presented. This model may be able to model many type of real phenomena

Keyword: Spatial autoregressive model; Separable; Non-separable; Long memory, Fractional autoregressive; FISSAR model; Regression estimation; Whittle's estimation.