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Random Coefficient Bivarate INAR model: a non-parametric approach

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Abstract

Random coefficient INteger Auto Regressive (RCINAR) models constitute an important extension of the simple INAR model when the thinning parameter(s) is (are) considered to be random. In the present paper we propose the case that the thinning parameter follows a discrete distribution with positive probability to a finite number of points. We provide an EM algorithm to estimate the model while we link the model to the non-parametric Maximum Likelihood estimate of the mixing distribution. The ideas are then extended to the bivariate case where the thinning parameters is now a matrix of random variables. The finite mixture representation helps a lot to account for the extra variability but also extra correlation to the model.

Real data examples are provided, together with properties and an EM algorithm to facilitate the estimation.

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