



Research Article

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Some empirical results using block bootstrap in estimating the coefficients of a periodic autoregressive model

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DOI: <https://doi.org/10.2478/bjir-2023-0004>

Abstract

The bootstrap proposed by Efron (1979) resulted a useful method in estimating the distribution of an estimator or a test statistic by resampling the data in the case of independent and identically distributed observations. Although it was not as effective in the case of dependent data as in the case of independent and identically distributed data, an adaptation was obtained using the block bootstrap. The block bootstrap consists in dividing the data into blocks of observations and then resampling these blocks with replacement. When resampling periodic data, we must take in consideration the periodicity present.

Periodically correlated time series and in particular those related with PAR processes have been object of many recent studies due to numerous applications in real data problems. The aim of this paper is to use a block bootstrap procedure proposed, Block Bootstrap of the Residuals, in the case of PAR (Periodic Autoregressive) models. The results obtained in the case of estimating the coefficients in a PAR model studied are very good and are characterized by small values of Bias, Mean Squared Error and Standard Deviation. Also the bootstrap estimations obtained are closer to the true values than the usual classic point estimations.

Keywords: Block bootstrap, periodicity, Periodic Autoregressive (PAR) models, estimation, confidence interval, resampling.

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Balkan Journal of Interdisciplinary Research (Austria) E – ISSN 2411- 9725 / ISSN 2410-759X

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