Bartlett Correction of Empirical Likelihood for Dependent Data

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Abstract

Bartlett correction, which improves the coverage accuracies of confidence regions, is one of the desirable features of empirical likelihood. For empirical likelihood with dependent data, previous studies on Bartlett correction are mainly restricted to Gaussian short-memory time series. By establishing the validity of Edgeworth expansion for the signed root empirical log-likelihood ratio statistics, we show that Bartlett correction is applicable to empirical likelihood for non-Gaussian short-memory time series and Gaussian long-memory time series. In addition, we extend the results for spatial lattice data. In particular, the order of the coverage errors of Bartlett corrected confidence regions depend on the underlying dependent structure and vary for different case.