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Estimation Approach for a Linear Quantile-Regression Model with Long-Memory Stationary GARMA Errors

Communication Info

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(2) GARMA model
(3) EM algorithm
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Abstract

The aim of this paper is to assess the significant impact of using quantile analysis in multiple fields of scientific research [1]. Here, we focus on estimating conditional quantile functions when the errors follow a GARMA (Generalized Auto-Regressive Moving Average) model[2]. Our key theoretical contribution involves identifying the Quantile-Regression (QR) coefficients within the context of GARMA errors. We propose a modified maximum-likelihood estimation method using an EM algorithm to estimate the target coefficients and derive their statistical properties[3 ,5]. The proposed procedure yields estimators that are strongly consistent and asymptotically normal under mild conditions. In order to evaluate the performance of the proposed estimators, a simulation study is conducted employing the minimum bias and Root Mean Square Error (RMSE) criterion. Furthermore, an empirical application is given to demonstrate the effectiveness of the proposed methodology in practice.

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