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CUSUM test for general nonlinear integer-valued GARCH models: comparison study

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Abstract

This study considers the problem of testing a parameter change in general nonlinear integer-valued time series models where the conditional distribution of current observations is assumed to follow a one-parameter exponential family. We consider score-, (standardized) residual-, and estimate-based CUSUM tests and show that their limiting null distributions take the form of the functions of Brownian bridges. Based on the obtained results, we then conduct a comparison study of the performance of CUSUM tests through the use of Monte Carlo simulations. Our findings demonstrate that the standardized residual-based CUSUM test largely outperforms the others.

Keywords Time series of counts · Exponential family · Autoregressive models · Parameter change test · CUSUM test · Comparison of tests

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