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Application of Copula Models for Modeling One-Dimensional Time Series

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Abstract

This paper proposes method of detecting a structural break/shift in time series such as AR(1) with a nonlinear dependence structure of lagged value and the estimation of the break point, based on nonparametric estimations of the dependence's copulas and comparison with some existing tests. However, we assumed the time series to be stationary and homoscedastic. This paper compares the efficiency of the standard test, considering only linear autoregressive dependence nature. A suggested technique is given, some modifications of the evaluation scheme is offered and a more flexible method of detecting structural break is proposed, usefulness of our methodology is demonstrated through some applications to a few macroeconomic and financial time series.

The paper is organized as follows: the first section contains a selective literature review. The second section describes the generation's procedure of time series, used in further calculations. The problem of detection of the structural break with respect to the nonlinear time series is formulated in the third section. The fourth section contains results of evaluations using simulated data. In Sect. 5 we provide examples of our suggested technique. The final section contains "Conclusions".