

Extended Martins–Rodrigues Method in Detecting Multiple Persistence Change

Aqmal Irfan Ja'afar

Institute of Mathematical Sciences, Faculty of Science, University of Malaya, Kuala Lumpur, Malaysia

Ibrahim Mohamed*

Institute of Mathematical Sciences, Faculty of Science, University of Malaya, Kuala Lumpur, Malaysia

Muhammad Asmu'i Abdul Rahim

Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA (UiTM), Shah Alam, Selangor, Malaysia

Abstract:

The literature on multiple persistence changes in the long memory parameter, remains underexplored. This study presents an extension of the Martins–Rodrigues method for detecting multiple persistence changes in time series processes. The extended algorithm enhances the original framework by allowing the identification of several persistence changes in time series data. The break points are obtained and the performance of the extended algorithm is assessed through Monte Carlo simulations. The findings indicate that the proposed method exhibits strong accuracy and reliability in detecting multiple persistence changes, as evidenced by the higher rejection rate frequency compared with the method of multiple persistence change detection proposed by Leybourne et al (2007). We then apply the extended method to the Philippines inflation rate data and demonstrate that forecasting performance improves after accounting for the detected persistence changes.

Keywords:

Time series, inflation rate, multiple persistence change, extended Martins–Rodrigues method.