

Forecasting Financial Times Series with Long Memory and Structural Break

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Extended Abstract

The aim of this study is to compare two easy-to implement methods for forecasting long memory time series subject to structural break. These two methods are robust against the issue of *spurious long memory* [1] in which cases the change(s) in the structure of the series might be mistaken as long memory, or it might even be a co-existence of strong dependence and structural change.

We study the annual series of consumer price index (CPI)¹ of three countries USA, Norway, and Sweden respectively from 1914 to 2021, 1866 to 2021 and 1831 to 2021.

By applying some tests (Geweke and Porter-Hudak (GPH), Exact Local Whittle (ELW), Bai and Perron, Chow), we show that the series contain both long memory and structural breaks.

After fitting appropriate model in each case, we implement the two-stage forecasting (TSF) approach developed by Papailias et al. [2] and the Approximated Autoregressive (AR) method developed by Wang et al. [3].

To assess the performance of the forecasting methods, the last eleven (11) years CPI values were used as test data set and the root mean squared errors (RMSE) for different forecast horizons as metric.

The results revealed that when there is a strong long memory component and structural break, the TSF method performs better than AR method on the short horizon, but the AR method seems to perform better for long horizon of forecasting.

References

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¹ data source: <http://www.bis.org/statistics/cp.htm>