Estimation and Change Point Detection for SVR-ARMA-GARCH Models

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Abstract

This study composes of two parts. In the first part, we propose a recursive estimation method for the SVR-ARMA-GARCH models. Our simulation study shows that the one-step-ahead prediction performance based on the proposed estimated models outperform the one by Chen et al. (2009) for the Lorenz system. In the empirical study, we use the daily BDI (Baltic Dry Index) data to demonstrate the advantages of using the proposed estimation procedure. In the second part, we propose a modified CUSUM control limits for change point detection of location-scale time series models. We show via Monte Carlo simulation that the modified CUSUM test achieves better power than the one proposed by Lee et al. (2020) for AR and threshold ARMA models.

Keywords: change point, CUSUM, support vector regression, SVR-ARMA-GARCH model, time series.