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CHOOSING PARAMETERS FOR BAYESIAN SYMBOLIC REGRESSION: AN APPLICATION TO MODELLING COMMODITIES PRICES

Abstract:

This study examines the application of Bayesian Symbolic Regression (BSR) for in-sample modelling of various commodities spot prices. The studied method is a novel one, and it shows promising potential as a forecasting tool. Additionally, BSR offers capabilities for handling variable selection (feature selection) challenges in econometric modeling. The focus of the presented research is to analyze the suitable selection of the initial parameters for BSR in the context of modelling commodities spot prices. Generally, it is a challenge for (conventional) symbolic regression to properly specify the set of operators (functions). Here, the analysis is primarily focused on specific time-series, making the presented considerations especially tailored to time-series representing commodities markets. The analysis is done with an aim to assess the ability of BSR to fit the observed data effectively. The out-of-sample forecasting performance analysis is deferred for investigations elsewhere. Herein, the main objective is to analyze how the selection of initial parameters impacts the accuracy of the BSR model. Indeed, the already known simulations were based on synthetic data. Therefore, herein real-word data from commodities markets are used. The outcomes can be useful for researchers and practitioners further interested in econometric and financial applications of BSR. (Research funded by the grant of the National Science Centre, Poland, under the contract number DEC-2018/31/B/HS4/02021.)

Keywords:

Bayesian symbolic regression, Commodities, Genetic algorithms, Modelling, Symbolic regression, Time-series

JEL Classification: C32, C53, Q02