ABSTRACT

Stock prices are an important aspect in determining investment decisions. One of the Islamic banking stocks in Indonesia is PT Bank Syariah Indonesia Tbk (BRIS). This study focuses on forecasting the stock price of BRIS by optimizing the hyperparameters of the Extreme Gradient Boosting (XGBoost) model using Chaotic Particle Swarm Optimization (CHOPSO). The data used to develop the model consist of daily historical stock data of BRIS, including opening price, closing price, highest price, lowest price, and trading volume. Data preprocessing and feature selection were conducted prior to model development. CHOPSO was applied to identify the optimal hyperparameters of XGBoost in order to overcome the limitations of conventional PSO, which tends to be trapped in local optimum solutions. The model performance was evaluated using the Mean Absolute Percentage Error (MAPE) metric due to its ease of interpretation. The results indicate that the XGBoost-CHOPSO model provides better forecasting performance compared to the default XGBoost and XGBoost-CHOPSO models, achieving a MAPE value of 1,8901%. This study demonstrates that hyperparameter optimization of XGBoost using CHOPSO is effective in improving forecasting accuracy and can be utilized to support investment decision-making.

Keywords: Stock forecasting, BRIS, XGBoost, Chaotic Particle Swarm Optimization