

ABSTRACT

Machine learning has been widely utilized in the financial sector, including for stock price prediction to support investment decision-making in volatile markets. This study evaluates the performance of a Voting Regressor Ensemble model that integrates Support Vector Regression (SVR) and eXtreme Gradient Boosting Regressor (XGBoost) to forecast the stock price of PT Astra International Tbk. The objective of this research is to assess the effectiveness of the ensemble model in predicting stock prices based on historical data, using technical indicators such as the Relative Strength Index (RSI) and Simple Moving Average (SMA) as predictive features. The target variable is the daily closing stock price for the next period. Each base model is trained separately, and their predictions are combined using a weighted voting approach. The results show that the SVR model delivers the best performance compared to both XGBoost and the ensemble model, achieving an $R^2 = 0.96$, $RMSE = 87.711$, and $MAPE = 1.4\%$. In comparison, the XGBoost model recorded $R^2 = 0.89$, $RMSE = 143.73$, and $MAPE = 2.35\%$, while the ensemble model achieved an $R^2 = 0.954$, $RMSE = 93.742$, and $MAPE = 1.48\%$. These findings indicate that although the ensemble method is designed to improve prediction accuracy, the SVR model remains the most accurate in forecasting the stock price of PT Astra International Tbk.

Keywords: *Machine Learning, Stock Price Prediction, Voting Regressor Ensemble, Support Vector Regression, eXtreme Gradient Boosting Regressor*