

ABSTRAK

Penelitian ini mengembangkan model prediksi harga penutupan saham PT Bank Rakyat Indonesia (BBRI) menggunakan pendekatan *Deep Learning* berbasis arsitektur *Long Short-Term Memory (LSTM)*. Data historis harga saham BBRI rentang data 10 November 2003 hingga 19 Mei 2025 diproses melalui tahap *preprocessing* meliputi: transformasi data, penghapusan duplikasi dan *missing value*, normalisasi dengan *MinMaxScaler*, serta pembagian data dengan rasio 90:10 untuk pelatihan dan pengujian. Model LSTM dioptimasi melalui eksperimen parameter dengan skenario terbaik mencapai performa optimal pada konfigurasi 2 lapisan LSTM (256-128 unit), *batch size* 64, 50 *epoch*, dan *optimizer Adam*. Hasil evaluasi menunjukkan model mampu memprediksi harga saham dengan **Akurasi mencapai 97,63%** dan nilai **Mean Absolute Percentage Error (MAPE) 2,3717%** (*excellent forecasting*), mengindikasikan kesesuaian tinggi antara prediksi dan data aktual. Analisis visual tren harga dan *moving average* memperkuat temuan bahwa LSTM efektif menangkap pola temporal kompleks dalam data *time series*. Penelitian ini berkontribusi pada pengembangan alat prediksi harga saham berbasis *deep learning*, sekaligus menyediakan rekomendasi investasi berbasis risiko (*hold/buy/sell*) untuk membantu pengambilan keputusan investor. Implikasi praktisnya mencakup potensi integrasi model ke platform *trading* otomatis dan perluasan aplikasi pada sektor keuangan lainnya.

Kata kunci: *Deep Learning, LSTM, Prediksi Harga Saham, Deret Waktu, Optimasi Parameter*

ABSTRACT

This research develops a prediction model for the closing price of PT Bank Rakyat Indonesia (BBRI) shares using a Deep Learning approach based on Long Short-Term Memory (LSTM) architecture. Historical BBRI stock price data from November 10, 2003 to May 19, 2025 is processed through preprocessing stages including: data transformation, removal of duplicates and missing values, normalization with MinMaxScaler, and data division with a 90:10 ratio for training and testing. The LSTM model is optimized through parameter experiments with the best scenario achieving optimal performance in the configuration of 2 LSTM layers (256-128 units), batch size 64, 50 epochs, and Adam optimizer. The evaluation results show that the model is able to predict stock prices with an accuracy of 97,63% and a Mean Absolute Percentage Error (MAPE) value of 2,3717% (excellent forecasting), indicating a high match between predictions and actual data. Visual analysis of price trends and moving averages reinforces the finding that LSTM effectively captures complex temporal patterns in time series data. This research contributes to the development of deep learning-based stock price prediction tools, while providing risk-based investment recommendations (hold/buy/sell) to aid investor decision-making. Practical implications include the potential integration of the model into automated trading platforms and the expansion of applications to other financial sectors.

Keywords: Deep Learning, LSTM, Stock Price Prediction, Time Series, Parameter Optimization