

ABSTRAK

**ANALISIS PEMODELAN TIME SERIES DATA SAHAM IDX HIGH
DIVIDEND 20 MENGGUNAKAN ALGORITMA LSTM, RNN, DAN ARIMA**

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Penelitian ini bertujuan membandingkan kinerja model *Long Short-Term Memory (LSTM)*, *Recurrent Neural Network (RNN)*, dan *Autoregressive Integrated Moving Average (ARIMA)* dalam memprediksi harga saham indeks IDXHIGHDIV20. Data yang digunakan berupa harga penutupan (*Close*) dari 20 saham periode 1 Januari 2018–15 Januari 2026 yang diperoleh dari Yahoo Finance.

Metode penelitian bersifat kuantitatif dengan *preprocessing MinMax Scaler*, pembentukan *data supervised lookback* 30 hari, serta pembagian data latih dan uji 80:20. Evaluasi dilakukan menggunakan *Root Mean Square Error (RMSE)*. Uji normalitas residual menunjukkan data tidak berdistribusi normal, sehingga perbandingan performa model dilakukan menggunakan uji nonparametrik Friedman.

Hasil penelitian menunjukkan RNN memiliki kinerja terbaik, dengan rata-rata RMSE 115,64, lebih rendah dibandingkan LSTM (151,69) dan ARIMA (1441,74). Total RMSE juga menguatkan keunggulan RNN (2312,85) dibandingkan LSTM (3033,83) dan ARIMA (28834,88). Uji Friedman menghasilkan Chi-Square = 40,000 dengan $p < 0,001$, yang menunjukkan perbedaan kinerja model yang signifikan secara statistik. Jadi RNN adalah model paling optimal dalam memprediksi harga saham IDX High Dividend 20.

Kata kunci: Prediksi harga saham, *Time series*, LSTM, RNN, ARIMA, RMSE.

ABSTRACT

**TIME SERIES MODELING ANALYSIS OF IDX HIGH DIVIDEND 20 STOCK
DATA USING LSTM, RNN, AND ARIMA ALGORITHMS**

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This study aims to compare the performance of the Long Short-Term Memory (LSTM), Recurrent Neural Network (RNN), and Autoregressive Integrated Moving Average (ARIMA) models in predicting stock prices within the IDXHIGHDIV20 index. The dataset consists of closing prices from 20 constituent stocks covering the period from January 1, 2018 to January 15, 2026, obtained from Yahoo Finance.

The research adopts a quantitative approach, employing MinMax Scaler preprocessing, supervised data transformation using a 30-day lookback window, and an 80:20 train-test split. Model performance was evaluated using the Root Mean Square Error (RMSE). Normality testing of residuals indicated that the data were not normally distributed, therefore the Friedman nonparametric test was used to statistically compare model performance.

The results show that the RNN model achieved the best performance with the lowest average RMSE of 115.64, outperforming LSTM (151.69) and ARIMA (1441.74). Total RMSE values further confirm the superiority of RNN (2312.85) compared to LSTM (3033.83) and ARIMA (28834.88). The Friedman test produced a Chi-Square value of 40.000 with $p < 0.001$, indicating statistically significant performance differences among the three models. Thus, RNN is concluded to be the most optimal model for predicting stock prices within the IDX High Dividend 20 index.

Keywords: *Stock price prediction, Time series, LSTM, RNN, ARIMA, RMSE.*