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INTISARI

ANALISIS *NONLINEAR AUTOREGRESSIVE NETWORK WITH EXOGENOUS* (NARXNET) PADA PERAMALAN HARGA SAHAM

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Besarnya kebutuhan untuk memprediksi harga saham mendorong munculnya riset dan pengembangan metode untuk memprediksi harga saham. Skripsi ini membahas peramalan harga saham dengan pembelajaran mesin pada dua pendekatan yaitu *Nonlinear Autoregressive Network* (NARNET) dan *Nonlinear Autoregressive Network with Exogenous* (NARXNET). Metode NARNET dan NARXNET adalah pengembangan dari jaringan syaraf tiruan, yang terdiri dari tiga lapisan, dan menggunakan fungsi aktivasi sigmoid. Kedua metode diterapkan pada studi kasus menggunakan data historis penutupan harga saham PT.Bank Rakyat Indonesia (BRI) pada rentang waktu 30 Oktober 2017 hingga 2 Desember 2022, diperoleh kesimpulan performa metode NARXNET lebih unggul dari metode NARNET. Performa metode diukur dengan *Mean Squared Error* (MSE), *Mean Absolute Percentage Error* (MAPE), dan Dstat. Diperoleh hasil berturut-turut yaitu $4{,}03*10^{-4}$; 0,13% dan 78%. Pada penerapan model untuk memprediksi harga penutupan saham lima periode akan datang diestimasi harga saham sebesar Rp4.940, Rp4.877, Rp4.783, Rp4.818, Rp4.865.

Kata kunci: Peramalan, Autoregresif, saham, NARNET, NARXNET.

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ABSTRACT

ANALYSIS OF NONLINEAR AUTOREGRESSIVE NETWORK WITH EXOGENOUS (NARXNET) IN STOCK PRICE FORECASTING

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The magnitude of the need to predict stock prices encourages research and development of methods to predict stock prices. This thesis discusses stock price forecasting using machine learning in two approaches: Nonlinear Autoregressive Network (NARNET) and Nonlinear Autoregressive Network with Exogenous (NARXNET). The NARNET and NARXNET methods are the development of artificial neural networks consisting of three layers and using the sigmoid activation function. Both methods were applied to case studies using historical data on the closing price of PT. Bank Rakyat Indonesia (BRI) shares from 30 October 2017 to 2 December 2022. It was concluded that the performance of the NARXNET method was superior to the NARNET method. Method performance is measured by Mean Squared Error (MSE), Mean Absolute Percentage Error (MAPE), and Dstat. The successive results are $4.03*10^{-4}$, 0.13%, and 78%. In applying the model to predict the closing price of shares for five future periods, successive results are obtained, namely Rp4,940; Rp4,877; Rp4,783; Rp4,818 and Rp4,865.

Keywords: Forecasting, Autoregressive, stocks, NARNET, NARXNET.