

ABSTRACT

The exchange rate is the exchange between two different currencies. Exchange rates are updated daily or at specific times without prior notice. The exchange rate of the Rupiah against the US Dollar experiences depreciation every year, influenced by several factors such as interest rates and inflation. Exchange rate data is included in time series data, so forecasting is carried out using time series analysis. Exchange rate data is dynamic and exhibits long-term dependence or long memory. The Autoregressive Fractionally Integrated Moving Average (ARFIMA) model is an extension of the ARIMA method designed to handle time series data with long memory properties. Therefore, the ARFIMA model is the best method for modeling time series data with long memory effects, where the differencing value (d) is fractional. This study uses daily exchange rate data of the Rupiah against the US Dollar for the period from January 1, 2023, to June 28, 2024. The data has a Hurst statistic value of 0,8474787, which falls within the range of $0,5 < H < 1$, making it suitable for the ARFIMA model. The best model obtained is ARFIMA([16],d,[2,7,10]) with a differencing value of 1,185968, where all parameters are significant, pass the normality test, independence test, and residual homoscedasticity test, and have the lowest AIC value of -8.427,8. The ARFIMA([16],d,[2,7,10]) model demonstrates excellent forecasting ability, as indicated by a MAPE value of 2,39%, calculated from the forecasting results and actual values.

Keywords: Exchange Rates, Forecasting, Long Memory, ARFIMA, Hurst, AIC, MAPE