ABSTRACT

Stock investment is placing property or capital in various instruments or assets directly or indirectly owned by someone, with the hope that its value will increase or provide profits in the future. The stock market is a complex and uncertain field in shaping stock price trends with various factors influencing the direction of the stock market such as, economic growth, inflation, and monetary policy, playing an important role in the complexity and uncertainty of stock prices. Choosing the right method is useful to influence in identifying and dealing with activity patterns in the data. One method that can be used is 2-Dimensional Geometric Brownian Motion (2-D GBM), which is a development of Geometric Brownian Motion (GBM) to model and predict stock prices based on historical stock prices with the assumption that stock return values are normally distributed. This research aims to model the correlation between two different assets to understand the extent to which the movement of one asset can influence the movement of another asset using 2-D GBM. The use of the selected data is the closing price data of the return from BBNI.JK and the LQ45 Index in the period January 2, 2023 to December 29, 2023. The prediction accuracy results obtained based on the MAPE value of 2.420158% and it can be said that the accuracy level falls into the excellent category. Measurement of investment risk in BBNI.JK shares using the Value at Risk (VaR) Historical Simulation method at a confidence level of 95% and holding periods of 1, 7, and 30 days obtained sequential values of 0.023462, 0.062073, and 0.128504. The VaR value shows the estimated maximum loss that may be obtained by investors.

Keywords: *Stock Investment*, *2-Dimensional Geometric Brownian Motion,*

Geometric Brownian Motion,Value at Risk, Historical Simulation