ABSTRACT

One way to minimize risk when investing is to create a portfolio from a combination of several stocks. Value at Risk (VaR) estimates the maximum loss that may occur in a certain period. VaR has disadvantage of being incoherent due to non-subadditivity. The Conditional Value at Risk (CVaR) method is used to overcome this weakness. CVaR is the amount of loss that will be borne if a loss exceeds the VaR value. Stock data is generally in the form of time series and is volatile, so ARIMA-GARCH modeling is needed. ARIMA modeling in R software can be done using the `auto.arima()` function. Financial assets often exhibit non-linear dependencies between assets. This becomes an obstacle in portfolio risk analysis because a suitable joint distribution cannot be found. The vine copula method is used to model joint distribution in multivariate data and is flexible because it does not require normality assumptions. The best vine copula model was selected based on the smallest AIC value, namely the C-vine t copula model which was then used to calculate VaR and CVaR on the BBCA, BBRI, and AMRT stock return portfolios for the period 1 December 2019 to 30 December 2023. At a confidence level of 95% the calculation results were obtained VaR is 1.525% and CVaR is 1.673%. The validity of both risk calculation methods has been tested using the Kupiec test with valid results.

Keywords: Value at Risk, Conditional Value at Risk, Auto ARIMA, Vine Copula, Kupiec Test