TIME SERIES APPROACH FOR MODELING AND FORECASTING RICE IMPORTS IN SRI LANKA

K. A. I. D. Karunanayake[1*] and M.C. Alibuhtto[2]

[1]Faculty of Graduate Studies, University of Kelaniya, Sri Lanka.

[,2]Department of Mathematical Sciences, Faculty of Applied Sciences, South Eastern University of Sri Lanka, Sammanthurai, Sri Lanka.

[*]idk170417@gmail.com

Rice import forecasts are helping to farmers cope with the decline in paddy production. Also, forecast the amount of rice imported by consumers, as this indirectly indicates the amount of local production. The main objective of this study is to develop a time series model to forecast rice imports in Sri Lanka. Autoregressive moving average (ARMA) and Exponential generalized autoregressive conditional heteroscedasticity (EGARCH) models were applied to monthly data collected from Sri Lanka Customs for the period January 2001 to July 2021 and validated the model using data from August 2021 to July 2022. Mean absolute error (MAE) and Mean squared error (MSE) were employed to examine the accuracy of forecasting. Based on the results of this study, the ARMA (1,0) and EGARCH (1,1) models were identified as possible models for rice import forecasting. However, ARMA (1,0) model is not suitable for forecasting rice imports due to the presence of heteroscedasticity. Therefore, the EGARCH (1,1) model was selected as the best model for forecasting. In addition, the rice import forecast for the next 6 months shows that the volume of rice imports will decrease. The MAE and MSE for the fitted model are 2.447 and 9.082 respectively. This model needs to be updated time to time to account for constantly changing data for future forecasts.

Keywords*: AR, EGARCH, Forecasting, MAE, MSE*