UNIVERSITI TEKNOLOGI MARA

COMPARATIVE PERFORMANCE ON ARIMA AND GARCH MODELS IN MODELLING VOLATILITY OF KIJANG EMAS

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ABSTRACT

In financial time series, modelling and forecasting volatile data gain a huge interest among researchers. In brief, volatility is known where the conditional variance changes between extremely high and extremely low values. In this study, modelling and forecasting performance will be carried out using a set of real data which is Kijang Emas prices. The model investigated were Box-Jenkins Autoregressive Integrated Moving Average (ARIMA) model and Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model. The overall behavior of Kijang Emas prices stated that there were trend, irregular and cyclical components exist and no seasonality component exists in the data series. In estimating the parameters for both Box-Jenkins ARIMA model and GARCH model, Maximum Likelihood Estimation (MLE) were used. The modelling performance of ARIMA were evaluated by using Akaike's Information Criterion (AIC) and Schawartz Information Criterion (BIC). The results of the study concluded that ARIMA(1,1,1) is the best model by comparing the AIC and BIC value. For GARCH model, only AIC were used and by comparing the value of AIC, GARCH(1,1) is choose as the best model. Next, the forecasting performance of both models will be evaluated by using Root Mean Square Error (RMSE) and Mean Absolute Percentage Error (MAPE). The process of modelling ARIMA was done using Eviews and R was used for modelling GARCH. In terms of forecasting performance between ARIMA(1,1,1) and GARCH(1,1) models, it can be concluded that GARCH(1,1) is a better model for Kijang Emas prices data compared to ARIMA(1,1,1).

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