The LBMA Gold Price: The one-day-ahead conditional variance predictability using the GARCH and EGARCH models

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Abstract

The main goal of this study is to examine whether or not a set of ARMA-GARCH and ARMA-EGARCH models can be used to predict the one-day-ahead conditional variance of the logarithmic return of the LBMA gold price. A secondary goal is to examine the traits of the models that are able to forecast. The data used in the study is the LBMA gold price set at 10:30 AM on bank days between the dates 2000-01-04 to 2020-01-04. To answer the question, ARMA-GARCH type models are implemented where the GARCH type models are restricted to GARCH(1,1) and EGARCH(1,1). The forecasting is done via a rolling window forecast with three different window sizes: 365, 912 and 1825 days. In total are eight models tested in each window which entails there is a total of 24 models to evaluate. The forecasting ability of the models' is evaluated by backtesting the predictive distribution. The backtesting involves the Kolmogorov-Smirnov test as well as analysis of sample histograms. It is found that the best forecasting model over-all is the MA(1)-EGARCH(1,1) with t-distributed white noise terms. Furthermore, the results indicate that using the standard normal distribution to model the white noise will cause an inadequate forecasting ability. Based on the results, it is not possible to determine whether the models, with and without mean model, using the GARCH(1,1) performed better than the ones with the EGARCH(1,1).

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