

MODELING OF RETURNS VOLATILITY THROUGH EGARCH MODEL USING HIGH-FREQUENCY DATA

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SUMMARY

This study compares the conventional EGARCH(1,1) model and its extension which incorporates a realized measure of volatility, namely EGARCH-X(1,1) and REGARCH(1,1) models. The comparison is performed in terms of the estimating method performance and the model fit to the historical FTSE100 and SP500 stock indices over the daily period from January 2000 to December 2017. The models assume the Normal and Student- t distributions for the return errors and are estimated by using the GRG (Generalized Reduced Gradient) Non-Linear method in Excel's Solver and the Adaptive Random Walk Metropolis (ARWM) method which is implemented in Matlab program. The empirical study shows that the Excel's Solver's GRG Non-Linear method is able to estimate the model parameters since the estimation results are not considerably different from those obtained by ARWM method. In terms of fitting performance, the Akaike Information Criterion (AIC) indicates that the Student- t distribution seems to capture heavy tails in return distribution better than the Normal distribution. On the basis of log-likelihood ratio test and AIC, the models with realized measure (realized kernel in this study) provide a significant improvement over the EGARCH-X(1,1) model in each distribution, where the best fit model is given by the REGARCH(1,1) model with Student- t distribution.

Keywords and phrases: ARWM; EGARCH; Excel's Solver; Realized Kernel; Volatility.

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