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Evaluating the performance of the GARCH(1,1) model. A real life simulated saga.

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Abstract

Financial data is known to have non-constant variance, also known as volatility clustering, or heteroscedasticity. In this thesis we are concerned with the VaR prediction of the GARCH(1,1) model on both real life data (Nasdaq compsite index), and for a simulated data set. We will assume both a standard normal and a t-distributed error term for the innovation, and the model performance will be evaluated by measuring the fraction of violations, and their independence. For real life data, both model versions suffer from underestimation of the 95% VaR, in particular when considering time periods including financial crises. Both models performs satisfactory on the simulated data, indicating that the modelling and backtesting procedures are working properly. In general the results seem to favour the GARCH(1,1) model with conditionally normal error terms over the t-distribution when predicting VaR.

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