Volatility forecast of Google stock daily log returns

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Abstract

This thesis aims to fit an appropriate general atuoreggressive heteroscedastic model to Google stock daily log returns from 2006-02-01 to 2018-01-31. The purpose is to evaluate whether or not the GARCH$(1,1)$ model can be used to predict the one step ahead volatility of the log returns. This is done by applying a back testing procedure and then compute interval forecasts respectively density forecasts. The results indicates that the GARCH$(1,1)$ model assuming a normal distribution in combination with rolling window length of 750 days respectively 1250 days yields correct conditional coverage when the actual coverage probability of the predicted interval is 0.95. It further implies that the interval forecast from the student-t distribution is to cautious, regardless of the window length used, when the actual coverage probability is 0.95. But the results from the density forecasts implies that the GARCH$(1,1)$ model, assuming a student-t distribution and using window length 250 days, yields good predictions. However, the density forecasts also indicates that a skewed student-t distribution might have a better fit. Hence, for further research it is suggested to calculate interval forecast, letting the actual coverage probability, p, vary between 0.8 and 0.95. It is also suggested that in addition to the normal and student-t distribution also include the skewed student-t distribution.

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