Reaction 2017 - Empirical Exercise

The file `IBM.csv` and `Citigroup.csv` contain ten years of daily closing prices of the IBM and Citigroup stocks.

a. Build a GARCH model with Gaussian innovations for the log returns. Check the model and write down the fitted model.

b. Build a GARCH-M model with Gaussian innovations for the log returns. What is the fitted model?

c. Build a GARCH model with Student-t distribution with 6 degrees of freedom for the log returns. Check the model and write down the fitted model.

d. Build a GARCH model with Student-t distribution for the log returns, including estimation of the degrees of freedom. Write down the fitted model. Let ν be the degrees of freedom of the Student-t distribution. Test the hypothesis $H_0 : \nu = 6$ versus $H_1 : v \neq 6$, using the 5% significance level.

e. Build an EGARCH model for the log returns. What is the fitted model?

f. Compare all the volatility models obtained for the log returns. Is there any significant difference? Why?