

Homework 3

FA-542

Due: March 6, 2022 at 5PM

Problem 1 (50pt)

In R create a report in pdf format using RMarkdown (or, if you choose to use Python instead, create a Jupyter notebook) to:

- (i) Download daily price data for January 1, 1987 through December 31, 2021 of Microsoft stock from Yahoo Finance. You may use the `quantmod` package in R for this purpose.
- (ii) Is there any evidence of serial correlations in the *monthly* log returns. Use autocorrelations and 5% significance level to answer the question. If yes, remove the serial correlations.
- (iii) Is there any evidence of ARCH effects in the monthly log returns? Use the residual series if there are serial correlations in part (ii). Use Ljung-Box statistics for the squared returns (or residuals) with 6 and 12 lags of autocorrelations and 5% significance level to answer the question.
- (iv) Identify an ARCH model for the data and fit the identified model. Write down the fitted model and justify your choice of parameters.