**Tutorial Activity 6**

**Week 7**

(a) What stylised features of financial data cannot be explained using linear time series models?

(b) Which of these features could be modelled using a GARCH(1,1) process?

(c) Why, in recent empirical research, have researchers preferred GARCH(1,1) models to pure ARCH(*p*)?

(d) Consider the following GARCH(1,1) model

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If is a daily stock return series, what range of values are likely for the coefficients , , , and ?

(e) Compare and contrast the following models for volatility, noting their strengths and weaknesses.

1. Historical volatilty
2. ARCH(1)
3. GARCH(1,1)

(f) Estimate following models using S&P500 stock market index:

1. Historical volatilty
2. AR(1)-ARCH(1) assuming normal distribution
3. AR(1)-GARCH(1,1) assuming normal distribution

(g) Suppose now that the researcher had estimated the GARCH(1,1) model for a series of returns on a stock index and obtained the following parameter estimates: = 0.0023, , , . Inspect the persistence and postivity condition.