ECA 5315 Financial Econometrics

Empirical Assignment

Deadline: Week 8 (9th March 2020, 6.30pm).
Please submit to me during lecture/ mailbox (#14, AS2 Level 6)

You have been hired as a Research Analyst for a brokerage firm. Your first task is to critically evaluate the behavior of stock market prices using Financial Econometrics techniques learnt in ECA5315 (Lectures 1 to 6). The report should have a maximum of 12 pages (including diagrams and charts).

Your Task:

1. Choose a listed company [1] that you are keen to find out more. Do a short summary of the company.

2. Download the following:
   - Historical prices of the company of your interest from 1st Jan 2015 to 31st Dec 2019 (5 years). You can get them from Yahoo! Finance. (https://sg.finance.yahoo.com/)

3. Answer all of the following questions. You are expected to provide a short write-up for each segment. Do NOT simply show diagrams/tables without any explanation. You are also encouraged to provide more evidence (from other sources) to substantiate your claims.

   Part (i): Descriptive Statistics

   (a) Plot the closing share price.
   (b) Calculate different returns (open-close, close-open, close-close) of the share and plot the relevant graphs across time.
   (c) Use a histogram to graph the empirical distribution of the different returns (open-close, close-open, close-close).
   (d) Compare the standard deviation, skewness and kurtosis of the different returns and account the differences between them.

   Part (ii): Efficient Market Hypothesis

   (a) Using *at least 2 tests*, determine whether the closing price and daily returns (close-close) follow a random walk. Discuss whether the Efficient Market Hypothesis is valid.

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[1] We are open to all listed companies worldwide. (Singapore Exchange, Hong Kong Stock Exchange, New York Exchange etc)

Part (iii): Building your own model

(a) Compute the Autocorrelation Function (ACF) and Partial Autocorrelation Function (PACF) of the <u>daily returns (close-close).</u>

(b) Discuss which ARMA model best describes the <u>daily returns</u>. You are reminded to test for auto-correlation and heteroscedasticity of the model residuals.

(c) Illustrate the dynamic variances (across time) using different GARCH models, and explain which is the most suitable model.

(d) Discuss whether your model is able to provide good forecasts of future share price.

<u>**Assessment Guidelines:**</u>

Note that this homework makes up to 20% of your entire marks.
Weightage is as follows: Content: 10%; Evaluation: 5%; Presentation: 5%