FE570 Homework Assignment #2

Due Date: In class on May 10, 2019 (Friday).

Data Files: Datasets are available from the course website on Canvas.

Problem 1 Pair trading strategy can be simplified as: buy a portfolio consisting of long shares A with log return x_t and short shares B with log return y_t when

$$y_t - \alpha x_t = c - \Delta$$

and sell the portfolio when

$$y_t - \alpha x_t = c + \Delta$$

The key is to find A, B and Δ. In this problem, you are given two stocks Exxon Mobile (xom) and Chevron (cvx) as A and B. You need to show there exists α and c such that the linear combination $z_t = y_t - \alpha x_t + c$ is I(0) i.e. stationary. Please follow a two step Engle and Granger procedure first, and then apply the trading rule for the two stocks (using Close price to calculated log returns) provided:

1. Estimate the co-integrating relation (e.g. with a linear regression).
2. Test for stationarity of the residual (z_t) using Augmented-Dickey-Fuller unit root test.
3. Use $\Delta = 2 * std(z_t)$ to identify long and short portfolio signals. Please present your results as a table of long and short signals along with dates.