FIN 5330 I

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Outline

- Replicate the pairs trading results in the paper *Illuminating the Profitability of Pairs Trading: A Test of the Relative Pricing Efficiency of Markets for Water Utility Stocks.*
- Use the historical data in the accompanying file *WaterStocks.csv*.
- Use the BIC criteria for the number of lags to use in all ADF tests. Consider a max number of lags equal to 10.
- Submit your work as either a Jupyter Notebook with Python code or an R Markdown notebook with R code.

Update: March 22, 2019

- I decided that you could take another month trying to get the exact replication of the paper's trading strategy implementation. I don't want you to spin your wheels on a lost cause. So here is what I want you to do instead.
- Estimate equation (6) in the paper for each of your pairs. Then form the residuals as outlined (see equations (7) and (8) in the paper).
- Esimate σ_ϵ from the estimated residuals.
- Calculate the upper and lower bounds for the trading rules as:

$$\text{UpperBound} = +1.0 * \delta_i \hat{\sigma_\epsilon}$$
$$\text{LowerBound} = -1.0 * \delta_i \hat{\sigma_\epsilon}$$

- for $i = \{1, 2, 3\}$ and $\delta = \{0.25, 0.5, 0.75\}$ as in the paper.
- Make three time series graphs with the residuals plotted against the upper and lower bounds for each δ_i.
- Fill in the following table with the number of buy and sell signals for each trading rule:

δ_i	Buy Signals	Sell Signals
0.25		
0.50		
0.75		

- Explain what a *buy signal* and a *sell signal* means in the context of pairs trading.
- For example, identify the first buy and the first sell signals for the $\delta_1 = 0.25$ trading rule and interpret them both qualitatively and quantitatively. How many days is each position held for? What the return on the trade?