Stevens Institute of Technology
School of Business

Fin620: Financial Econometrics
Projects Guidelines

1) **Goal:** the project is intended to provide students with hands-on experience of working with financial time-series, conducting various tests, building models, forecasting, and finally producing managerial implications of the analysis.

2) **Project teams:** teams consist of 3-4 students.

3) **Topic:** each team picks one traded asset with at least 15 years of historical data on spot and futures contracts. Choose assets with sufficient liquidity to make sure time-series will not contain missing values. Some examples of traded assets are:

    a. Stocks and ETFs
    b. Commodities (crude oil, gasoline, natural gas, gold, copper, etc)
    c. Interest rate products

4) Analysis: conduct the following analysis on the **spot** and **futures** prices of the asset.

1. *Basic statistical examination of **daily** and **monthly** prices, returns, and trade volume*
2. *Visual behavior of **daily** and **monthly** prices, returns, and trade volume*
3. *Relationship between returns over different frequencies (daily, weekly, monthly)*
4. *Unit-root tests on prices and returns*
5. *Various ARIMA models fitted to price and returns*
6. *Forecast models for prices, returns, and trade volume*
7. *Various versions of GARCH models*
8. *Multi-variate time-series relationship (VAR, VECM) between spot and futures prices*
9. *Value-at-risk analysis*

5) Components of output (reports and presentations)

a. Overview of the asset and the market for the asset

b. One application for the econometric analysis

c. Properties of the time-series
   i. Descriptive statistics
   ii. Visualization
   iii. Unit-root and seasonality tests

d. ARIMA model of price and return
   i. Forecasting power of the ARIMA model

e. Multi-variate analysis: VAR or VECM?

f. Conditional variance analysis: Various types of GARCH models

g. Value-at-risk analysis

h. Conclusion and managerial implications

6) Deliverables

Project teams will submit project reports in four parts throughout the semester. The list shows components to be included in each report.

a. Report #1: **a,b**

b. Report #2: **c,d**

c. Report #3: **e,f**

d. Final Report: **g,h**