**Commodity trading vs. equity trading: which one is more profitable?**

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**Overview**:

Motivation: The goal of predicting/ forecasting stock return is to decide whether to buy, sell or hold the stock. Predicting a value for a time series is much more challenging than predicting a class (buy or sell). We are interested in the probability of an increase/decrease in stock price to form the best decision. We have two hypotheses:

1. External factors such as congressional trading influenced this probability.

2. The equity and commodity markets are correlated (computer chips and Apple, steel and Tesla) and can be utilized to enhance classification models.

Stakeholders: stock exchange market and commodity market

KPIs:

1. Choose equity and commodity stocks:
   * Equity: AAPL, TSLA.
   * Commodity: gold, metal, agriculture.
2. Create models to “guess”/ to impute the missing data
   * Model 1: Logistic regression
   * Model 2: Support Vector Machine
   * Model 3: Random Forests
   * Model 4: K Nearest Neighbor
   * Model 5: Artificial Neural Network
3. Compare the models by computing accuracy, recall, and Sharpe Ratio.
4. **Data Collection**:

Stock and commodity data from January 1, 2023 until December 31, 2023. There are 250 data points because trading market closes on Saturdays, Sundays, and national holidays. The data includes the following parameters (yahoo finance):

1. Date: starting from January 3, 2023 (Tuesday) to December 29, 2023 (Friday). The dates do not include Saturdays, Sundays, and US national holidays.
2. Open: price when the market opens. The opening time is 9:30 am Eastern Time.
3. High/ Low: highest/ lowest prices on that day.
4. Close: price when the market closes. The closing time is 4:00 pm Eastern Time.
5. Adj Close (Adjusted close): the closing price after adjustments for all applicable splits and dividend distributions.
6. Volume: number of shares that have been traded on a given day.

A daily return is computed from the adjusted close as:

where is the daily return on day , and is the adjusted close on day .