# Asset Management Project

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We have three portfolios in our code:
**Baseline:** This is the portfolio we had to design in Part 1. It has constant weights and the portfolio rebalances every month to this weight.

**Retrospective Portfolio:** This is the portfolio we had to design for the latter part of the assignment. Here, the portfolio weights were calculated using daily returns for the period 2010-2020

**Efficient Portfolio:** This is a portfolio we designed to **simulate** the returns of a Markowitz's Maximum Sharpe Ratio weight adjusted portfolio, rebalanced every month. The weights were rebalanced every month using a sliding window.

We selected the below mentioned indices as representatives of the given asset classes. We took the daily returns data from WRDS for each of them from 2010 to 2020 and calculated their risk and return parameters.

| Asset Class | ETF | Annualized Return | Annualized Volatility | Sharpe Ratio | Max Drawdown |
|---|---|---|---|---|---|
| **US Markets** | SPY | 0.005 | 0.174 | 0.029 | 0.337 |
| **International Markets** | ACWX | 0.002 | 0.151 | 0.012 | 0.354 |
| **US Bonds** | VCIT | 0.002 | 0.045 | 0.049 | 0.133 |
| **International Treasury Bond (ex-US)** | IGOV | 0.184 | 0.080 | 0.229 | 0.157 |
| **United States Oil Fund** | USO | -0.187 | 0.36 | -0.518 | 0.952 |

**Is the approach of creating the "Maximum Sharpe Ratio" portfolio valid? Why?**
Yes, Maximum Sharpe Portfolio or Tangency Portfolio is a portfolio on the efficient frontier at the point where the line drawn from the point (0, risk-free rate) is tangent to the efficient frontier. It aims to obtain a combination of weights of given assets that leads to highest returns per unit of total portfolio risk. However, *sharpe ratio assumes the returns to be normally distributed which may not be the case in the financial markets*.

**How is the Maximum Sharpe Ratio Portfolio different from the Target Weight Portfolio? Why?**
While Maximum Sharpe Ratio Portfolio optimizes the returns per unit risk to determine the weight of each asset, the Target Weight Portfolio fixes the weight of each asset right in the beginning which then determines the returns.
**Assumptions:**

1. Risk Free Rate is 0
2. Zero Transaction costs
3. Catered for Dividend Payouts
4. Upto 30% of the portfolio NAV can be shorted
5. Weights for the **Efficient portfolio** were optimised using daily data for a year preceding the month of investment. The weights were rebalanced every month using a sliding window.

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