

Homework Assignment # 3

Tengyuan Liang
Business Statistics
Booth School of Business

Problem 1

I am interested in building a portfolio of stocks and bonds... a very convenient way is to invest in two ETFs (Exchange Traded Funds). Let's we choose VTI and VGLT as the ETFs. Build the efficient frontier combining these two ETFs. What allocation gives you the best Sharpe Ratio? If you decide on a 50-50 allocation, what is the probability you will get a return larger than 1% next month? (To make things a little easier, use monthly returns in the last 5 years.)

Problem 2

Assume my current retirement account has \$100,000 invested in the the S&P500. You are my financial advisor and I need you to estimate a plausible range for my investment by the end of my working life (say 20 years from now). What if I save an extra 20k a year and invest it in the market as well?

How does the answer changes if I hold a 50-50 portfolio of stocks (S&P500) and bonds (say U.S. treasuries).

(Hint: I dont know, you are my financial advisor, so go figure it out!! :) Now seriously, using R/Excel to simulate future possible scenarios is the way to go here.)