

AMSC/Math 420, Spring 2014
First Team Homework
Modeling Portfolios: Markowitz Frontiers

Due Monday, 17 February, 2014

Exercise 1. Graph the Markowitz frontier in the $\sigma\mu$ -plane for the risky assets in group (A), group (B), and groups (A) and (B) combined of your project using one-year histories with uniform weights and daily data for the years ending December 31 of 2008-2013. Graph them along with the volatility and return rate means of each asset for each year, and for portfolios that are equidistributed in each group. There should be only six graphs — one for each year. Use different symbols to distinguish points associated with group (A) from those associated with group (B). Comment on any relationships you see between the objects plotted on each graph. (This will be easier to do if you use the same scales for all the graphs. Each σ -axis should begin at $\sigma = 0$.)

Exercise 2. Give \mathbf{f}_{mv} for each of the frontiers computed in Exercise 1. Comment on how these change from year to year for the same groupings of assets.

Exercise 3. Comment on the *Efficient Market Hypothesis* in the light of the graphs that you computed in Exercise 1.