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

Due Monday, 3 March, 2014

Exercise 1. Consider the risky assets in group (A), group (B), and groups (A) and (B) combined using one-year histories of daily data with uniform weights for each of the years ending December 31 of 2008-2013. Consider the frontiers that you computed last week for the assets in group (A), group (B), and groups (A) and (B) combined for each of the years ending December 31 of 2008-2013. In each case determine the values of μ (if any) for which the frontier portfolios are long. (You are not being asked for graphs!)

Exercise 2. Compute the long frontiers for the assets in group (A), group (B), and groups (A) and (B) combined for each of the years ending December 31 of 2008-2013. Graph each of these long frontiers along with the associated frontier that you computed earlier and with the volatility and return rate means of each asset that was used to compute it. 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 each of the graphs. Each σ-axis should begin at $\sigma = 0$.)

Remark. You can use the MatLab command "quadprog" to solve the constrained minimization problem for any given $\mu \in [\mu_{\text{mn}}, \mu_{\text{mx}}]$. Documentation for this command is easily found on the web.

Exercise 3. Comment on the relationship of the long frontiers to the associated frontiers in each of the graphs that you generated for Exercise 2. In particular, describe how close they are to each other and give an economic interpretation of what you see.