

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

Due Monday, 24 February, 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. Assume that μ_{si} is the US Treasury Bill rate at the end of the given year, and that μ_{cl} is three percentage points higher.

Compute the Markowitz efficient frontiers taking into account the risk-free assets 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 efficient frontiers along 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 $\sigma = 0$.)

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

Exercise 3. As a team discuss how you plan to address the questions raised in your project with the instructor. Write a paragraph that reflects the outcome of that discussion.