

Math 420, Spring 2016

First Project: Solvent Portfolios

presentation Tuesday, 8 March, 2016

report due Thursday, 10 March, 2016

This project explores when frontier portfolios are solvent. Consider the following groups of assets.

- (A) VFINX, VBTIX, VGSIX.
- (B) MAIIX, VFIDX, PCRAX.
- (C) Apple, Ford, Exxon-Mobil.

Identify the funds in (A) and (B) and describe their holdings. (This information should inform some of your subsequent answers.)

Compute the frontiers for the risky assets in group (A), groups (A) and (B) combined, and groups (A), (B), and (C) combined using one-year histories with uniform weights for each of the years ending December 31 of 2010-2015. Do the same for \mathbf{f}_{mv} . Comment on the implications of what you find.

Assuming that the safe investment is U.S. T-Bills, compute \mathbf{f}_{st} . Assuming that the credit-line is three points higher than the U.S. T-Bill rate, compute \mathbf{f}_{ct} . (You should identify when these tangency portfolios do not exist.) Graph the associated efficient frontiers. Comment on the implications of what you find.

In a similar manner, graph the efficient long frontiers, for the risky assets in group (A), groups (A) and (B) combined, and groups (A), (B), and (C) combined, both with and without a safe investment of U.S. T-Bills. Comment on the implications of what you find.

Determine which of the frontier and long frontier portfolios graphed above are solvent. Indicate these on the above graphs, say by using a different color, or using solid and dotted lines. Comment on the implications of what you find.