Lectures

The lectures concentrated on practical problems of estimation and optimization and relied heavily on Mathematica to illustrate computational issues that would be impossible to incorporate into the Qualifying Examination. However, there are three areas from the lectures in which questions may be drawn from:

1. Construction and closed form solutions of mean-variance quadratic programs; *e.g.*, solutions for QPs without short constraints, the market (tangent) portfolio, and special forms and solutions for the Capital Asset Pricing Model (CAPM).

2. Special mean variance forms to exploit the structure of multi-factor models and for problems in which risk is defined relative to a benchmark (tracking error) rather than in absolute terms.

3. The definition and basic computations associated with Value-at-Risk (VaR) and expected shortfall or conditional VaR (CVaR), including the differences in normalization required between problems in which the whole return distribution is characterized or just the lower tail below some chosen threshold.

Although Mathematica was used extensively in the lectures, in homework assignments, and in the workshop assignment, it is not a topic which will appear on the qualifying examination.

Text

Reading assignments covered the following chapters and sections in Attilio Meucci’s *Risk and Asset Allocation*: 1, 2, 3.1-3.5, 4.1-4.6, 5.1-5.6, 6.1-6.6, 7, 8, and 9.1-9.5

Much of the material covered was more in the spirit of a review as it was assumed that students in the class already had a background in multivariate calculus, linear algebra, and probability and statistics. In addition to areas of the text that cover the topics already mentioned above, students are encouraged to study:
