University of California, Los Angeles
Department of Statistics

Statistics C183/C283 **Instructor: Nicolas Christou**

Review questions

1. Suppose you are constructing two portfolios using the same n stocks. What is the expression of the covariance between these two portfolios in summations form and in matrix/vector form.

2. What is the composition of the minimum risk portfolio using n risky stocks? What is the expected return and variance of this portfolio?

3. Suppose the investor will invest in n risky stocks and suppose she wants expected return E. What is the composition of the portfolio that will minimize the risk. What are the two constraints of this optimization?

4. What is the shape of the frontier in the mean standard deviation space? Describe two methods that can help you find portfolios on the frontier.

5. Refer to question (4). Once you find the two portfolios, how can you use them to trace out the entire frontier?

6. Suppose now you can allocate your money in the n risky stocks and in the risk free asset (so there $n+1$ assets). What is the optimization problem that you need to solve? What is the constraint for this problem?

7. What is the shape of the frontier when the investor has access to the risk free asset? Why are two portfolios on the capital allocation line perfectly correlated?

8. Usually when there are n risky stocks and one risky free asset we draw the tangent to the efficient frontier and the tangency point it is called the optimal portfolio. How do we find the composition of this portfolio.

9. Consider the investing possibilities as in (8). Give the expression that computes the weight of the kth asset of the tangency portfolio.

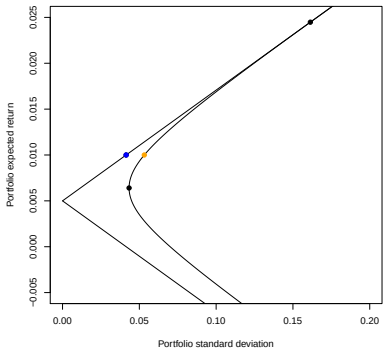
10. Suppose the investor has access to the risky n asset only and suppose that we minimize the risk subject to a prescribed expected return E. Give an expression for the weight of the kth asset of the optimal portfolio

11. What is the expression that computes the composition of a portfolio on the capital allocation line.

12. Is there any restriction on the value of R_f?

13. What is the mutual fund theorem.

14. Explain what is shown in the plot below.



15. Consider two stock A and B. How does the correlation affect the shape of the frontier?