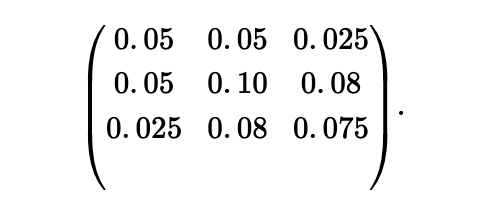
**Homework Questions: 5.1, 5.2, 5.5, 5.10. 5.18**

**Textbook:** Introduction to Statistical Methods for Financial Models by Thomas A Severini

* 1. Consider a three-dimensional return vector ***R*** with mean vector given by (0.04,0.03,0.05) and covariance matrix given by



Let Rp1 denote the return on the portfolio with weight vector (1∕3, 1∕3, 1∕3) and let Rp2 denote the return on the portfolio with weight vector (0.4, 0.4, 0.2).

1. Find the mean and standard deviation of Rp1; see Example 5.1.
2. Find the mean and standard deviation of Rp2.
3. Find the correlation of Rp1 and Rp2.
4. Based on these results, is one of the portfolios preferable to the other? Why

or why not?

* 1. Consider a four-dimensional return vector R with mean vector given by (0.02, 0.10, 0.05, 0.06) and covariance matrix given by

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1. Using the computational method described in Example 5.5, find the portfolio on the minimum-risk frontier with a mean return of 0.05. Find the return standard deviation of the portfolio.
2. Repeat Part (a) for mean returns of 0.06 and 0.07.
3. Based on these results, is it possible to say with certainty that any of these portfolios is not on the efficient frontier? Why or why not? If it is possible, which ones are not on the efficient frontier?
   1. Consider a five-dimensional return vector R with mean vector given by (0.25,0.20,0.30,0.275,0.15) and covariance matrix given by

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Find the weight vector of the minimum-variance portfolio; see Example 5.6.

* 1. Consider a set of three assets with the mean return vector and return covariance matrix as given in Exercise 1.

Using the approach described in Example 5.8, find wmv, the weight vector of the minimum-variance portfolio, and v̄, the weight vector of the zero-investment portfolio given in the statement of Proposition 5.5. Use those results to give the weight vectors of the risk-averse portfolio with parameters λλ=1 and λλ=5.

* 1. Consider a set of five assets with the mean return vector and return covariance matrix as given in Exercise 5. Assume that the risk-free rate of return is μμf=0.01.

Find wT, the weight vector of the tangency portfolio; see Example 5.10.