

QF624-2025-W3

Number of participants: 36



1.

Consider two assets, A and B, with expected returns of 6% and 8% respectively. The standard deviation of returns for Asset A is 10%, and for Asset B is 12%. The correlation coefficient between the returns of Asset A and Asset B is 0.2. What is the variance of a portfolio consisting of 40% Asset A and 60% Asset B?

17 correct answers
out of 20
respondents

0.0128



1 vote



0.0079



17 votes

0.0108



0 votes

0.0112



2 votes



2.

Consider a portfolio optimization scenario under Modern Portfolio Theory where an investor seeks to construct a portfolio from three assets. The objective is to maximize the expected return of the portfolio subject to a specified level of risk. Which ones are essential of the optimization problem?

6 correct answers

out of 27
respondents



Calculating the historical return of each asset to determine future performance.



26%

7 votes



Consider the correlation between asset returns when calculating portfolio volatility.



63%

17 votes

Restricting the portfolio to contain only the asset with the highest expected return.



0%

0 votes



Defining the weights for each asset in the portfolio subject to constraint such as the sum of the weights equals 1.



89%

24 votes



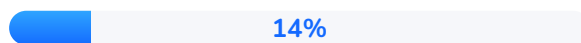
3.

An investor decides to construct an equal-weight portfolio of four assets. According to Modern Portfolio Theory, which of the following statements is true regarding the risk and return characteristics of this equal-weight portfolio?

15 correct answers

out of 22
respondents

The portfolio's variance is the average of the variances of the individual assets.



3 votes

The portfolio's variance is the sum of the variances of the individual assets.



1 vote



The portfolio's expected return is the average of the expected returns of the individual assets.



15 votes

The portfolio's expected return is the sum of the expected returns of the individual assets.



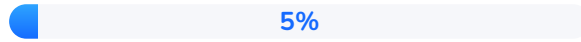
3 votes



4. A key feature of the GMVP is that it does not depend on:

15 correct answers
out of 19
respondents

The covariance
matrix



1 vote



The vector of
expected returns



15 votes

The budget
constraint



3 votes

The Lagrange
multiplier



0 votes



5. In the MVO formulation $\max_w (w^T \mu - \frac{1}{2} \lambda w^T \Sigma w)$ s.t. $w^T \mathbf{1} = 1$, what is the limiting portfolio as $\lambda \rightarrow 0^+$?

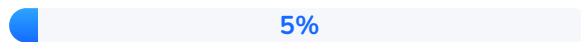
13 correct answers
out of 20 respondents

The global minimum-variance portfolio



4 votes

The equally weighted portfolio



1 vote



Fully invested in the single asset with the highest expected return



13 votes

Fully invested in the single asset with the lowest variance



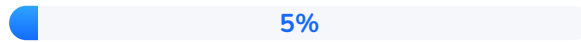
2 votes



6. Conversely, as $\lambda \rightarrow +\infty$, the MVO solution approaches:

17 correct answers
out of 19
respondents

The maximum-
return (corner)
portfolio



1 vote

The equally
weighted portfolio



0 votes



The global
minimum-variance
portfolio



17 votes

The tangency
portfolio
(assuming a risk-
free asset)



1 vote



7. **As you vary λ over $(0, \infty)$, the set of optimal $(\sigma, \mathbb{E}[R])$ pairs traces out the classic efficient frontier." In the risk–return plane this frontier is:**

14 correct answers
out of 18
respondents

A straight line

0%

0 votes

A parabola
opening upward

11%

2 votes



A hyperbola

78%

14 votes

An ellipse

11%

2 votes



8.

The Efficient Frontier is a critical concept in portfolio optimization under Modern Portfolio Theory (MPT). Which of the following statements accurately describes the Efficient Frontier?

16 correct answers
out of 19
respondents

It is a single portfolio that provides the maximum return irrespective of the level of risk.

0%

0 votes

It is a graph that displays the expected returns of individual assets against their respective standard deviations.

11%

2 votes

It is the set of all possible portfolios that can be constructed with a given set of assets.

5%

1 vote

It represents a set of portfolios that offer the highest expected return for different levels of risk.

84%

16 votes



An investor is considering two assets for a portfolio, Asset 1 and Asset 2. The annual returns, variances, and the correlation coefficient between the two assets are as follows: Expected return of Asset 1: 7%, Variance of Asset 1: 9% Expected return of Asset 2: 10%, Variance of Asset 2: 16% Correlation coefficient between Asset 1 and Asset 2: 0.5 Assuming the investor wants to construct a minimum variance portfolio with these two assets, what are the weights of Assets 1 and 2 in this portfolio?



9.

0 correct answer
out of 0 respondent

Asset 1: 40%,
Asset 2: 60%

0%

0 votes

Asset 1: 70%,
Asset 2: 30%

0%

0 votes



Asset 1: 77%,
Asset 2: 23%

0%

0 votes

Asset 1: 67%,
Asset 2: 33%

0%

0 votes

The Sharpe-ratio objective



10. $SR(w) = \frac{w^T \mu - R_f}{\sqrt{w^T \Sigma w}}$ is generally non-convex because:

17 correct answers

out of 21 respondents

the numerator
 $w^T \mu - R_f$ is
non-linear in w

0%

0 votes

the denominator
 $\sqrt{w^T \Sigma w}$ makes
the ratio a non-
convex function

81%

17 votes

the budget
constraint
 $w^T \mathbf{1} = 1$ is non-
convex

19%

4 votes

Σ need not be
positive definite

0%

0 votes