

20**PORTFOLIO RISK & RETURN**

1. In a two-asset portfolio, reducing the correlation between the two assets moves the efficient frontier in which direction?
 - (A) The efficient frontier is stable unless return expectations change. If expectations change, the efficient frontier will extend to the upper right with little or no change in risk.
 - (B) The efficient frontier is stable unless the asset's expected volatility changes. This depends on each asset's standard deviation.
 - (C) The frontier extends to the left, or northwest quadrant representing a reduction in risk while maintaining or enhancing portfolio returns.

2. The particular portfolio on the efficient frontier that best suits an individual investor is determined by:
 - (A) the individual's utility curve.
 - (B) the current market risk-free rate as compared to the current market return rate.
 - (C) the individual's asset allocation plan.

3. According to the CAPM, a rational investor would be least likely to choose as his optimal portfolio:
 - (A) a 100% allocation to the risk-free asset.
 - (B) the global minimum variance portfolio.
 - (C) a 130% allocation to the market portfolio.

4. If the standard deviation of returns for stock X is 0.60 and for stock Y is 0.40 and the covariance between the returns of the two stocks is 0.009, the correlation between stocks X and Y is closest to:
 - (A) 26.6670.
 - (B) 0.0375.
 - (C) 0.0020.

5. Which of the following portfolios falls below the Markowitz efficient frontier?

Portfolio	Expected Return	Expected Standard Deviation
A	7%	14%
B	9%	26%
C	15%	30%
D	12%	22%

- (A) B.
- (B) C
- (C) D.

6. As the correlation between the returns of two assets becomes lower, the risk reduction potential becomes:

- (A) decreased by the same level.
- (B) greater.
- (C) smaller.

7. What is the variance of a two-stock portfolio if 15% is invested in stock A (variance of 0.0071) and 85% in stock B (variance of 0.0008) and the correlation coefficient between the stocks is -0.04 ?

- (A) 0.0007.
- (B) 0.0020.
- (C) 0.0026.

8. Becky Scott and Sid Fiona have the same expectations about the risk and return of the market portfolio; however, Scott selects a portfolio with 30% T-bills and 70% invested in the market portfolio, while Fiona holds a leveraged portfolio, having borrowed to invest 130% of his portfolio equity value in the market portfolio. Regarding their preferences between risk and return and their indifference curves, it is most likely that:

- (A) Scott is willing to take on more risk to increase her expected portfolio return than Fiona is.
- (B) Scott is risk averse but Fiona is not.
- (C) Fiona's indifference curves are flatter than Scott's.

9. Stock 1 has a standard deviation of 10. Stock 2 also has a standard deviation of 10. If the correlation coefficient between these stocks is -1 , what is the covariance between these two stocks?

- (A) 0.00.
- (B) -100.00 .
- (C) 1.00.

10. Which of the following statements about the efficient frontier is *least accurate*?
- (A) Investors will want to invest in the portfolio on the efficient frontier that offers the highest rate of return.
 - (B) Portfolios falling on the efficient frontier are fully diversified.
 - (C) The efficient frontier shows the relationship that exists between expected return and total risk in the absence of a risk-free asset.
11. Historically, which of the following asset classes has exhibited the smallest standard deviation of monthly returns?
- (A) Large-capitalization stocks.
 - (B) Long-term corporate bonds.
 - (C) Treasury bills.
12. In the Markowitz framework, risk is defined as the:
- (A) variance of returns.
 - (B) probability of a loss.
 - (C) beta of an investment.
13. Calculating the variance of a two-asset portfolio *least likely* requires inputs for each asset's:
- (A) beta.
 - (B) weight in the portfolio.
 - (C) standard deviation.
14. Which of the following portfolios falls below the Markowitz efficient frontier?
- | Portfolio | Expected Return | Expected Standard Deviation |
|-----------|-----------------|-----------------------------|
| A | 12.1% | 8.5% |
| B | 14.2% | 8.7% |
| C | 15.1% | 8.7% |
- (A) Portfolio A.
 - (B) Portfolio C.
 - (C) Portfolio B.
15. Which of the following inputs is least likely required for the Markowitz efficient frontier? The:
- (A) level of risk aversion in the market.
 - (B) covariation between all securities.
 - (C) expected return of all securities.
16. There are benefits to diversification as long as:
- (A) the correlation coefficient between the assets is less than 1.
 - (B) there is perfect positive correlation between the assets.
 - (C) there must be perfect negative correlation between the assets.

17. On a graph of risk, measured by standard deviation and expected return, the efficient frontier represents:
- (A) the set of portfolios that dominate all others as to risk and return.
 - (B) the group of portfolios that have extreme values and therefore are "efficient" in their allocation.
 - (C) all portfolios plotted in the northeast quadrant that maximize return.

18. Which one of the following portfolios cannot lie on the efficient frontier?

Portfolio	Expected Return	Standard Deviation
A	20%	35%
B	11%	13%
C	8%	10%
D	8%	9%

- (A) Portfolio D.
- (B) Portfolio C.
- (C) Portfolio A.

19. Which one of the following portfolios does not lie on the efficient frontier?

Portfolio	Expected Return	Standard Deviation
A	7	15
B	9	12
C	11	10
D	15	15

- (A) C.
- (B) B.
- (C) A.

20. The correlation coefficient between stocks A and B is 0.75. The standard deviation of stock A's returns is 16% and the standard deviation of stock B's returns is 22%. What is the covariance between stock A and B?

- (A) 0.0352.
- (B) 0.3750.
- (C) 0.0264.

21. Which one of the following statements about correlation is NOT correct?

- (A) Potential benefits from diversification arise when correlation is less than +1.
- (B) If the correlation coefficient were 0, a zero-variance portfolio could be constructed.
- (C) If the correlation coefficient were -1, a zero-variance portfolio could be constructed.

22. Which of the following statements about the efficient frontier is *least accurate*?
- (A) A portfolio that plots above efficient frontier is not attainable, while a portfolio that plots below the efficient frontier is inefficient.
 - (B) the efficient frontier is the set of portfolios with the greatest expected return for a given level of risk.
 - (C) The slope of the efficient frontier increases steadily as risk increases.
23. Over the long term, the annual returns and standard deviations of returns for major asset classes have shown:
- (A) a negative relationship.
 - (B) a positive relationship.
 - (C) no clear relationship.

24. An analyst gathered the following data for Stock A and Stock B:

Time Period	Stock A Returns	Stock B Returns
1	10%	15%
2	6%	9%
3	8%	12%

What is the covariance for this portfolio?

- (A) 6.
 - (B) 3.
 - (C) 12.
25. Betsy Minor is considering the diversification benefits of a two-stock portfolio. The expected return of stock A is 14 percent with a standard deviation of 18 percent and the expected return of stock B is 18 percent with a standard deviation of 24 percent. Minor intends to invest 40 percent of her money in stock A, and 60 percent in stock B. The correlation coefficient between the two stocks is 0.6. What is the variance and standard deviation of the two-stock portfolio?
- (A) Variance = 0.02206; Standard Deviation = 14.85%.
 - (B) Variance = 0.03836; Standard Deviation = 19.59%.
 - (C) Variance = 0.04666; Standard Deviation = 21.60%.
26. A portfolio manager adds a new stock that has the same standard deviation of returns as the existing portfolio but has a correlation coefficient with the existing portfolio that is less than +1. Adding this stock will have what effect on the standard deviation of the revised portfolio's returns? The standard deviation will:
- (A) decrease only if the correlation is negative.
 - (B) decrease.
 - (C) increase.

27. Of the six attainable portfolios listed, which portfolios are not on the efficient frontier?

Portfolio	Expected Return	Standard Deviation
A	26%	28%
B	23%	34%
C	14%	23%
D	18%	14%
E	11%	8%
F	18%	16%

- (A) A, B, and C.
- (B) B, C, and F.
- (C) C, D, and E.

28. The basic premise of the risk-return trade-off suggests that risk-averse individuals purchasing investments with higher non-diversifiable risk should expect to earn:

- (A) lower rates of return.
- (B) rates of return equal to the market.
- (C) higher rates of return.

29. A bond analyst is looking at historical returns for two bonds, Bond 1 and Bond 2. Bond 2's returns are much more volatile than Bond 1. The variance of returns for Bond 1 is 0.012 and the variance of returns of Bond 2 is 0.308. The correlation between the returns of the two bonds is 0.79, and the covariance is 0.048. If the variance of Bond 1 increases to 0.026 while the variance of Bond 2 decreases to 0.188 and the covariance remains the same, the correlation between the two bonds will:

- (A) decrease.
- (B) increase.
- (C) remain the same.

30. Smith has more steeply sloped risk-return indifference curves than Jones. Assuming these investors have the same expectations, which of the following best describes their risk preferences and the characteristics of their optimal portfolios? Smith is:

- (A) less risk averse than Jones and will choose an optimal portfolio with a lower expected return.
- (B) more risk averse than Jones and will choose an optimal portfolio with a higher expected return.
- (C) more risk averse than Jones and will choose an optimal portfolio with a lower expected return.

31. The efficient frontier is best described as the set of attainable portfolios that gives investors:

- (A) the highest expected return for any given level of risk.
- (B) the lowest risk for any given level of risk tolerance.
- (C) the highest diversification ratio for any given level of expected return.

32. Which of the following statements about the optimal portfolio is NOT correct? The optimal portfolio:
- (A) is the portfolio that gives the investor the maximum level of return.
 - (B) may be different for different investors.
 - (C) lies at the point of tangency between the efficient frontier and the indifference curve with the highest possible utility.
33. Two assets are perfectly positively correlated. If 30% of an investor's funds were put in the asset with a standard deviation of 0.3 and 70% were invested in an asset with a standard deviation of 0.4, what is the standard deviation of the portfolio?
- (A) 0.151.
 - (B) 0.370.
 - (C) 0.426.
34. If the standard deviation of stock X is 7.2%, the standard deviation of stock Y is 5.4%, and the covariance between the two is -0.0031 , their correlation coefficient is closest to:
- (A) -0.80.
 - (B) -0.19.
 - (C) -0.64.
35. Kendra Jackson, CFA, is given the following information on two stocks, Rockaway and Bridgeport.
- Covariance between the two stocks = 0.0325
 - Standard Deviation of Rockaway's returns = 0.25
 - Standard Deviation of Bridgeport's returns = 0.13
- Assuming that Jackson must construct a portfolio using only these two stocks, which of the following combinations will result in the *minimum* variance portfolio?
- (A) 100% in Bridgeport.
 - (B) 50% in Bridgeport, 50% in Rockaway.
 - (C) 80% in Bridgeport, 20% in Rockaway.
36. Over long periods of time, compared to fixed income securities, equities have tended to exhibit:
- (A) higher average annual returns and higher standard deviation of returns.
 - (B) higher average annual returns and lower standard deviation of returns.
 - (C) lower average annual returns and higher standard deviation of returns.
37. The covariance of the market's returns with the stock's returns is 0.008. The standard deviation of the market's returns is 0.1 and the standard deviation of the stock's returns is 0.2. What is the correlation coefficient between the stock and market returns?
- (A) 0.00016.
 - (B) 0.40.
 - (C) 0.91.

38. An investor's portfolio currently has an expected return of 11% with a variance of 0.0081. She is considering replacing 20% of the portfolio with a security that has an expected return of 12% and a standard deviation of 0.07. If the covariance between the returns on the existing portfolio and the returns on the added security is 0.0058, the variance of returns on the new portfolio will be closest to:
- (A) 0.00545.
(B) 0.00724.
(C) 0.00984.
39. If two stocks have positive covariance:
- (A) they are likely to be in the same industry.
(B) they exhibit a strong correlation of returns.
(C) their rates of return tend to change in the same direction.
40. Stock A has a standard deviation of 0.5 and Stock B has a standard deviation of 0.3. Stock A and Stock B are perfectly positively correlated. According to Markowitz portfolio theory how much should be invested in each stock to minimize the portfolio's standard deviation?
- (A) 100% in Stock B.
(B) 30% in Stock A and 70% in Stock B.
(C) 50% in Stock A and 50% in Stock B.

41. Three portfolios have the following expected returns and risk:

Portfolio	Expected return	Standard deviation
Jones	4%	4%
Kelly	5%	6%
Lewis	6%	5%

risk-averse investor choosing from these portfolios could rationally select:

- (A) Jones, but not Kelly or Lewis.
(B) Jones or Lewis, but not Kelly.
(C) Lewis, but not Kelly or Jones.
42. An investor has a two-stock portfolio (Stocks A and B) with the following characteristics:
- $\sigma_A = 55\%$
 - $\sigma_B = 85\%$
 - Covariance $A,B = 0.09$
 - $W_A = 70\%$
 - $W_B = 30\%$

The variance of the portfolio is closest to:

- (A) 0.39.
(B) 0.25.
(C) 0.54.

43. An investment advisor is considering a portfolio that is 60% invested in a broad-based stock index fund with the remainder invested in a taxable bond fund. The stock index fund has an expected return of 7% and variance of 0.04, while the bond fund has an expected return of 3% and a variance of 0.0081. If the covariance of returns between the bond and index funds is 0.0108, the standard deviation of returns for the overall portfolio is closest to:
- (A) 1.58%.
 - (B) 14.45%.
 - (C) 12.56%
44. Assets A (with a variance of 0.25) and B (with a variance of 0.40) are perfectly positively correlated. If an investor creates a portfolio using only these two assets with 40% invested in A, the portfolio standard deviation is closest to:
- (A) 0.3400.
 - (B) 0.3742.
 - (C) 0.5795.
45. If the standard deviation of stock A is 10.6%, the standard deviation of stock B is 14.6%, and the covariance between the two is 0.015476, what is the correlation coefficient?
- (A) +1.
 - (B) 0.
 - (C) 0.0002.
46. Adding a stock to a portfolio will reduce the risk of the portfolio if the correlation coefficient is less than which of the following?
- (A) +0.50.
 - (B) 0.00.
 - (C) +1.00.
47. Investors who are less risk averse will have what type of indifference curves for risk and expected return?
- (A) Flatter.
 - (B) Inverted.
 - (C) Steeper.
48. A portfolio manager invests 40% of a portfolio in Asset X, which has an expected standard deviation of returns of 15%, and the remainder in Asset Y, which has an expected standard deviation of returns of 25%. If the covariance of returns between assets X and Y is 0.0158, the expected standard deviation of portfolio returns is closest to:
- (A) 2.7%.
 - (B) 16.3%.
 - (C) 18.4%.

49. According to Markowitz, an investor's optimal portfolio is determined where the:
- (A) investor's utility curve meets the efficient frontier.
 - (B) investor's highest utility curve is tangent to the efficient frontier.
 - (C) investor's lowest utility curve is tangent to the efficient frontier.
50. Which of the following statements best describes an investment that is not on the efficient frontier?
- (A) There is a portfolio that has a lower return for the same risk.
 - (B) The portfolio has a very high return.
 - (C) There is a portfolio that has a lower risk for the same return.
51. A portfolio currently holds Randy Co. and the portfolio manager is thinking of adding either XYZ Co. or Branton Co. to the portfolio. All three stocks offer the same expected return and total risk. The covariance of returns between Randy Co. and XYZ is +0.5 and the covariance between Randy Co. and Branton Co. is -0.5. The portfolio's risk would decrease:
- (A) more if she bought Branton Co.
 - (B) more if she bought XYZ Co.
 - (C) most if she put half your money in XYZ Co. and half in Branton Co.
52. Stock A has a standard deviation of 4.1% and Stock B has a standard deviation of 5.8%. If the stocks are perfectly positively correlated, which portfolio weights minimize the portfolio's standard deviation?

	Stock A	Stock B
(A)	0%	100%
(B)	100%	0%
(C)	63%	37%

53. If the standard deviation of returns for stock A is 0.40 and for stock B is 0.30 and the covariance between the returns of the two stocks is 0.007 what is the correlation between stocks A and B?
- (A) 17.14300.
 - (B) 0.00084.
 - (C) 0.05830.
54. Which of the following possible portfolios is least likely to lie on the efficient frontier?

Portfolio	Expected Return	Standard Deviation
X	9%	12%
Y	11%	10%
Z	13%	15%

- (A) Portfolio Z.
- (B) Portfolio Y.
- (C) Portfolio X.

55. A line that represents the possible portfolios that combine a risky asset and a risk-free asset is most accurately described as a:
- (A) capital allocation line.
 - (B) capital market line.
 - (C) characteristic line.

56. An investor has identified the following possible portfolios. Which portfolio cannot be on the efficient frontier?

Portfolio	Expected Return	Standard Deviation
V	18	35
W	12	16
X	10	10
Y	14	20
Z	13	24

- (A) X.
- (B) Z.
- (C) Y.

57. An analyst gathers the following data about the returns for two stocks.

	Stock A	Stock B
E(R)	0.04	0.09
σ^2	0.0025	0.0064
Cov _{A,B}	= 0.001	

The correlation between the returns of Stock A and Stock B is closest to:

- (A) 0.25.
- (B) 0.50.
- (C) 0.63.

58. An investor calculates the following statistics on her two-stock (A and B) portfolio.

- $\sigma_A = 20\%$
- $\sigma_B = 15\%$
- $r_{A,B} = 0.32$
- $W_A = 70\%$
- $W_B = 30\%$

The portfolio's standard deviation is closest to:

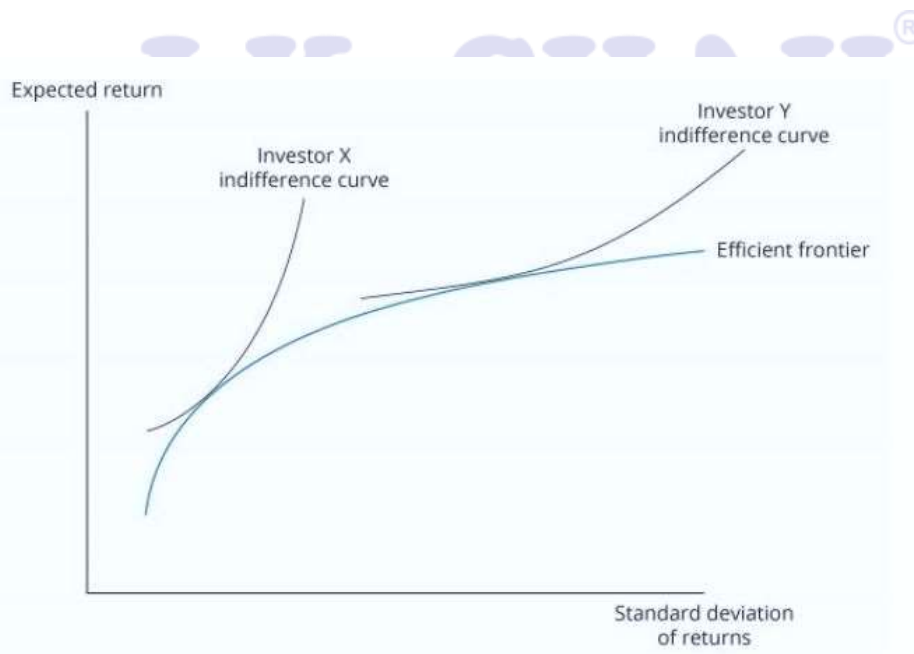
- (A) 0.1600.
- (B) 0.1832.
- (C) 0.0256.

59. The optimal portfolio in the Markowitz framework occurs when an investor achieves the diversified portfolio with the:
- (A) highest return.
 - (B) lowest risk.
 - (C) highest utility.
60. Which of the following statements about portfolio theory is least accurate?
- (A) Assuming that the correlation coefficient is less than one, the risk of the portfolio will always be less than the simple weighted average of individual stock risks.
 - (B) For a two-stock portfolio, the lowest risk occurs when the correlation coefficient is close to negative one.
 - (C) When the return on an asset added to a portfolio has a correlation coefficient of less than one with the other portfolio asset returns but has the same risk, adding the asset will not decrease the overall portfolio standard deviation.
61. Risk aversion means that an individual will choose the less risky of two assets:
- (A) even if it has a lower expected return.
 - (B) in all cases.
 - (C) if they have the same expected return.
62. Using the following correlation matrix, which two stocks would combine to make the lowest risk portfolio? (Assume the stocks have equal risk and returns.)

Stock	A	B	C
A	+ 1	--	--
B	- 0.2	+ 1	--
C	+ 0.6	- 0.1	+ 1

- (A) A and B.
 - (B) A and C.
 - (C) C and B.
63. A stock has an expected return of 4% with a standard deviation of returns of 6%. A bond has an expected return of 4% with a standard deviation of 7%. An investor who prefers to invest in the stock rather than the bond is best described as:
- (A) risk averse.
 - (B) risk neutral.
 - (C) risk seeking.

64. Which of the following statements regarding the covariance of rates of return is least accurate?
- (A) Covariance is positive if two variables tend to both be above their mean values in (the same time periods).
 - (B) If the covariance is negative, the rates of return on two investments will always move in different directions relative to their means.
 - (C) Covariance is not a very useful measure of the strength of the relationship between rates of return.
65. If the standard deviation of asset A is 12.2%, the standard deviation of asset B is 8.9%, and the correlation coefficient is 0.20, what is the covariance between A and B?
- (A) 0.0001.
 - (B) 0.0022.
 - (C) 0.0031.
66. The graph below combines the efficient frontier with the indifference curves for two different investors, X and Y.



Which of the following statements about the above graph is least accurate?

- (A) Investor X's expected return is likely to be less than that of Investor Y.
- (B) The efficient frontier line represents the portfolios that provide the highest return at each risk levels.
- (C) Investor X is less risk-averse than Investor Y

