

Chapter 5

Risk and Return

■ Learning Goals

1. Understand the meaning and fundamentals of risk, return, and risk preferences.
2. Describe procedures for assessing and measuring the risk of a single asset.
3. Discuss the measurement of return and standard deviation for a portfolio and the concept of correlation.
4. Understand the risk and return characteristics of a portfolio in terms of correlation and diversification, and the impact of international assets on a portfolio.
5. Review the two types of risk and the derivation and role of beta in measuring the relevant risk of both a security and a portfolio.
6. Explain the capital asset pricing model (CAPM) and its relationship to the security market line (SML), and the major forces causing shifts in the SML.

■ True/False

1. Most managers are risk-averse, since for a given increase in risk they require an increase in return.
Answer: TRUE
Level of Difficulty: 1
Learning Goal: 1
Topic: Fundamentals of Risk and Return
2. The return on an asset is the change in its value plus any cash distribution over a given period of time, expressed as a percentage of its ending value.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 1
Topic: Measuring Single Asset Return
3. For the risk-averse manager, the required return decreases for an increase in risk.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 1
Topic: Fundamentals of Risk and Return

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4. An investment that guarantees its holder \$100 return and another investment that earns \$0 or \$200 with equal chances (i.e., an average of \$100) over the same period have equal risk.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 1
Topic: Fundamentals of Risk and Return
 5. The real utility of the coefficient of variation is in comparing assets that have equal expected returns.
Answer: FALSE
Level of Difficulty: 1
Learning Goal: 2
Topic: Coefficient of Variation
 6. The risk of an asset may be found by subtracting the worst outcome from the best outcome.
Answer: TRUE
Level of Difficulty: 1
Learning Goal: 2
Topic: Measuring Single Asset Risk
 7. The larger the difference between an asset's worst outcome from its best outcome, the higher the risk of the asset.
Answer: TRUE
Level of Difficulty: 1
Learning Goal: 2
Topic: Measuring Single Asset Risk
 8. The risk of an asset can be measured by its variance, which is found by subtracting the worst outcome from the best outcome.
Answer: FALSE
Level of Difficulty: 1
Learning Goal: 2
Topic: Variance and Standard Deviation
 9. Coefficient of variation is a measure of relative dispersion used in comparing the expected returns of assets with differing risks.
Answer: FALSE
Level of Difficulty: 1
Learning Goal: 2
Topic: Coefficient of Variation
 10. The more certain the return from an asset, the less variability and therefore the less risk.
Answer: TRUE
Level of Difficulty: 1
Learning Goal: 2
Topic: Measuring Single Asset Risk
 11. A behavioral approach for assessing risk that uses a number of possible return estimates to obtain a sense of the variability among outcomes is called sensitivity analysis.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 2

Topic: Measuring Single Asset Risk

12. An efficient portfolio is a portfolio that maximizes return for a given level of risk or minimizes risk for a given level of return.
Answer: TRUE
Level of Difficulty: 1
Learning Goal: 3
Topic: Portfolio Risk and Return
13. New investments must be considered in light of their impact on the risk and return of the portfolio of assets because the risk of any single proposed asset investment is not independent of other assets.
Answer: TRUE
Level of Difficulty: 1
Learning Goal: 3
Topic: Portfolio Risk and Return
14. The financial manager's goal for the firm is to create a portfolio that maximizes return in order to maximize the value of the firm.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 3
Topic: Portfolio Risk and Return
15. Two assets whose returns move in the same direction and have a correlation coefficient of +1 are both very risky assets.
Answer: FALSE
Level of Difficulty: 3
Learning Goal: 3
Topic: Portfolio Risk and Return
16. Two assets whose returns move in the opposite directions and have a correlation coefficient of -1 are either risk-free assets or low-risk assets.
Answer: FALSE
Level of Difficulty: 3
Learning Goal: 3
Topic: Correlation and Portfolio Risk
17. Combining negatively correlated assets can reduce the overall variability of returns.
Answer: TRUE
Level of Difficulty: 1
Learning Goal: 4
Topic: Correlation and Portfolio Risk
18. Even if assets are not negatively correlated, the lower the positive correlation between them, the lower the resulting risk.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 4
Topic: Correlation and Portfolio Risk

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19. In general, the lower the correlation between asset returns, the greater the potential diversification of risk.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 4
Topic: Correlation and Portfolio Risk
20. A portfolio of two negatively correlated assets has less risk than either of the individual assets.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 4
Topic: Correlation and Portfolio Risk
21. In no case will creating portfolios of assets result in greater risk than that of the riskiest asset included in the portfolio.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 4
Topic: Correlation and Portfolio Risk
22. A portfolio that combines two assets having perfectly positively correlated returns can not reduce the portfolio's overall risk below the risk of the least risky asset.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 4
Topic: Correlation and Portfolio Risk
23. A portfolio combining two assets with less than perfectly positive correlation can reduce total risk to a level below that of either of the components.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 4
Topic: Correlation and Portfolio Risk
24. Foreign exchange risk is the risk that arises from the danger that a host government might take actions that are harmful to foreign investors or from the possibility that political turmoil in a country might endanger investment made in that country by foreign nationals.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 4
Topic: Foreign Exchange Risk
25. Over long periods, returns from internationally diversified portfolios tend to be superior to those yielded by purely domestic ones. Over any single short or intermediate period, however, international diversification can yield sub par returns—particularly during periods when the dollar is appreciating in value relative to other currencies.
Answer: TRUE
Level of Difficulty: 3
Learning Goal: 4
Topic: International Diversification

26. Combining uncorrelated assets can reduce risk—not as effectively as combining negatively correlated assets, but more effectively than combining positively correlated assets.
Answer: TRUE
Level of Difficulty: 3
Learning Goal: 4
Topic: Correlation and Portfolio Risk
27. Assume your firm produces a good which has high sales when the economy is expanding and low sales during a recession. Your risk will be higher if you invest in another product which is counter cyclical.
Answer: FALSE
Level of Difficulty: 3
Learning Goal: 4
Topic: Correlation and Portfolio Risk
28. A portfolio combining two assets with less than perfectly positive correlation can increase total risk to a level above that of either of the components.
Answer: FALSE
Level of Difficulty: 3
Learning Goal: 4
Topic: Correlation and Portfolio Risk
29. The inclusion of assets from countries that are less sensitive to the U.S. business cycle reduces the portfolio's responsiveness to market movement and to foreign currency fluctuation.
Answer: TRUE
Level of Difficulty: 3
Learning Goal: 4
Topic: International Diversification
30. When the U.S. currency gains in value, the dollar value of a foreign-currency-denominated portfolio of assets decline.
Answer: TRUE
Level of Difficulty: 3
Learning Goal: 4
Topic: Foreign Exchange Risk
31. The creation of a portfolio by combining two assets having perfectly positively correlated returns cannot reduce the portfolio's overall risk below the risk of the least risky asset, whereas a portfolio combining two assets with less than perfectly positive correlation can reduce total risk to a level below that of either of the components.
Answer: TRUE
Level of Difficulty: 4
Learning Goal: 4
Topic: Correlation and Portfolio Risk
32. Beta coefficient is an index of the degree of movement of an asset's return in response to a change in the risk-free asset.
Answer: FALSE
Level of Difficulty: 1
Learning Goal: 5
Topic: Beta and Systematic Risk

33. Because any investor can create a portfolio of assets that will eliminate all, or virtually all, nondiversifiable risk, the only relevant risk is diversifiable risk.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 5
Topic: Diversifiable and Nondiversifiable Risk
34. Diversifiable risk is the relevant portion of risk attributable to market factors that affect all firms.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 5
Topic: Diversifiable and Nondiversifiable Risk
35. Any investor (or firm) must be concerned solely with nondiversifiable risk because it can create a portfolio of assets that will eliminate all, or virtually all, diversifiable risk.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 5
Topic: Diversifiable and Nondiversifiable Risk
36. Nondiversifiable risk reflects the contribution of an asset to the risk, or standard deviation, of the portfolio.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 5
Topic: Diversifiable and Nondiversifiable Risk
37. The systematic risk is that portion of an asset's risk that is attributable to firm-specific, random causes.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 5
Topic: Systematic and Unsystematic Risk
38. The unsystematic risk can be eliminated through diversification.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 5
Topic: Systematic and Unsystematic Risk
39. The unsystematic risk is the relevant portion of an asset's risk attributable to market factors that affect all firms.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 5
Topic: Systematic and Unsystematic Risk
40. The required return on an asset is an increasing function of its nondiversifiable risk.
Answer: TRUE
Level of Difficulty: 3
Learning Goal: 5

Topic: Diversifiable and Nondiversifiable Risk

41. The beta coefficient is an index of the degree of movement of an asset's return in response to a change in the market return.
Answer: TRUE
Level of Difficulty: 1
Learning Goal: 6
Topic: Beta and Systematic Risk
42. The difference between the return to the market portfolio of assets and the risk-free rate of return represents the premium the investor must receive for taking the average amount of risk associated with holding the market portfolio of assets.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 6
Topic: Market Risk Premium
43. The security market line (SML) reflects the required return in the marketplace for each level of nondiversifiable risk (beta).
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 6
Topic: Security Market Line (SML)
44. The capital asset pricing model (CAPM) links together unsystematic risk and return for all assets.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 6
Topic: Capital Asset Pricing Model (CAPM)
45. The beta coefficient is an index of the degree of movement of an asset's return in response to a change in the risk-free asset return.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 6
Topic: Beta and Systematic Risk
46. The steeper the slope of the security market line, the greater the degree of risk aversion.
Answer: TRUE
Level of Difficulty: 3
Learning Goal: 6
Topic: Security Market Line (SML)
47. The value of zero for beta coefficient of the risk-free asset reflects not only its absence of risk but also the fact that the asset's return is unaffected by movements in the market return.
Answer: TRUE
Level of Difficulty: 3
Learning Goal: 6
Topic: Capital Asset Pricing Model (CAPM)

48. Greater risk aversion results in lower required returns for each level of risk, whereas a reduction in risk aversion would cause the required return for each level of risk to increase.
Answer: FALSE
Level of Difficulty: 3
Learning Goal: 6
Topic: Fundamentals of Risk and Return
49. The slope of the SML reflects the degree of risk aversion; the steeper its slope, the greater the degree of risk aversion.
Answer: TRUE
Level of Difficulty: 4
Learning Goal: 6
Topic: Security Market Line (SML)
50. The CAPM is based on an assumed efficient market in which there are many small investors, each having the same information and expectations with respect to securities; there are no restrictions on investment, no taxes, and no transactions costs; and all investors are rational, view securities similarly, and are risk-averse, preferring higher returns and lower risk.
Answer: TRUE
Level of Difficulty: 4
Learning Goal: 6
Topic: Capital Asset Pricing Model (CAPM)
51. In general, widely accepted expectations of hard times ahead tend to cause investors to become less risk-averse.
Answer: FALSE
Level of Difficulty: 4
Learning Goal: 6
Topic: Security Market Line (SML)
52. On average, during the past 75 years, the return on large-company stocks has exceeded the return on small-company stocks.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 2
Topic: Historical Returns
53. On average, during the past 75 years, the return on small-company stocks has exceeded the return on large-company stocks.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 2
Topic: Historical Returns
54. On average, during the past 75 years, the return on long-term government bonds has exceeded the return on long-term corporate bonds.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 2
Topic: Historical Returns

55. On average, during the past 75 years, the return on long-term corporate bonds has exceeded the return on long-term government bonds.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 2
Topic: Historical Returns
56. On average, during the past 75 years, the inflation rate has exceeded the return on U.S. Treasury bills.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 2
Topic: Historical Returns
57. On average, during the past 75 years, the return on U.S. Treasury bills has exceeded the inflation rate.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 2
Topic: Historical Returns
58. On average, during the past 75 years, the return on U.S. Treasury bills has exceeded the return on long-term government bonds.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 2
Topic: Historical Returns
59. On average, during the past 75 years, the return on large-company stocks has exceeded the return on long-term corporate bonds.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 2
Topic: Historical Returns
60. Coefficient of variation is a measure of relative dispersion that is useful in comparing the risks of assets with different expected returns.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 2
Topic: Coefficient of Variation
61. The higher the coefficient of variation, the greater the risk and therefore the higher the expected return.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 2
Topic: Coefficient of Variation

62. The lower the coefficient of variation, the greater the risk and therefore the higher the expected return.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 2
Topic: Coefficient of Variation
63. Business risk is the chance that the firm will be unable to cover its operating costs and is affected by a firm's revenue stability and the structure of its operating costs (fixed vs. variable).
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 1
Topic: Fundamentals of Risk and Return
64. Financial risk is the chance that the firm will be unable to cover its operating costs and is affected by a firm's revenue stability and the structure of its operating costs (fixed vs. variable).
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 1
Topic: Fundamentals of Risk and Return
65. Interest rate risk is the chance that changes in interest rates will adversely affect the value of an investment; most investments decline in value when the interest rates rise and increase in value when interest rates fall.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 1
Topic: Fundamentals of Risk and Return
66. Liquidity risk is the chance that changes in interest rates will adversely affect the value of an investment; most investments decline in value when the interest rates rise and increase in value when interest rates fall.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 1
Topic: Fundamentals of Risk and Return
67. Market risk is the chance that the value of an investment will decline because of market factors (such as economic, political, and social events) that are independent of the investment.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 1
Topic: Fundamentals of Risk and Return
68. Interest rate risk is the chance that the value of an investment will decline because of market factors (such as economic, political, and social events) that are independent of the investment.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 1
Topic: Fundamentals of Risk and Return

69. Event risk is the chance that a totally unexpected event will have a significant effect on the value of the firm or a specific investment.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 1
Topic: Fundamentals of Risk and Return
70. Market risk is the chance that a totally unexpected event will have a significant effect on the value of the firm or a specific investment.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 1
Topic: Fundamentals of Risk and Return
71. Purchasing-power risk is the chance that changes in interest rates will adversely affect the value of an investment; most investments decline in value when the interest rates rise and increase in value when interest rates fall.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 1
Topic: Fundamentals of Risk and Return
72. The risk of a portfolio containing international stocks generally contains less nondiversifiable risk than one that contains only American stocks.
Answer: TRUE
Level of Difficulty: 3
Learning Goal: 4
Topic: International Diversification
73. The risk of a portfolio containing international stocks generally does not contain less nondiversifiable risk than one that contains only American stocks.
Answer: FALSE
Level of Difficulty: 3
Learning Goal: 4
Topic: International Diversification
74. Total security risk is the sum of a security's nondiversifiable and diversifiable risk.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 4
Topic: Diversifiable and Nondiversifiable Risk
75. Total security risk is the sum of a security's nondiversifiable, diversifiable, systematic, and unsystematic risk.
Answer: FALSE
Level of Difficulty: 2
Learning Goal: 4
Topic: Diversifiable and Nondiversifiable Risk

76. The empirical measurement of beta can be approached by using least-squares regression analysis to find the regression coefficient (b_j) in the equation for the slope of the “characteristic line.”
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 5
Topic: Beta and Systematic Risk
77. Investors should recognize that betas are calculated using historical data and that past performance relative to the market average may not accurately predict future performance.
Answer: TRUE
Level of Difficulty: 2
Learning Goal: 5
Topic: Beta and Systematic Risk
78. The beta of a portfolio is a function of the standard deviations of the individual securities in the portfolio, the proportion of the portfolio invested in those securities, and the correlation between the returns of those securities.
Answer: FALSE
Level of Difficulty: 3
Learning Goal: 5
Topic: Portfolio Betas

■ Multiple Choice Questions

1. _____ is the chance of loss or the variability of returns associated with a given asset.
(a) Return
(b) Value
(c) Risk
(d) Probability
Answer: C
Level of Difficulty: 1
Learning Goal: 1
Topic: Fundamentals of Risk and Return
2. The _____ of an asset is the change in value plus any cash distributions expressed as a percentage of the initial price or amount invested.
(a) return
(b) value
(c) risk
(d) probability
Answer: A
Level of Difficulty: 1
Learning Goal: 1
Topic: Fundamentals of Risk and Return

3. Risk aversion is the behavior exhibited by managers who require a greater than proportional _____
- (a) increase in return, for a given decrease in risk.
 - (b) increase in return, for a given increase in risk.
 - (c) decrease in return, for a given increase in risk.
 - (d) decrease in return, for a given decrease in risk.

Answer: B

Level of Difficulty: 1

Learning Goal: 1

Topic: Fundamentals of Risk and Return

4. Last year Mike bought 100 shares of Dallas Corporation common stock for \$53 per share. During the year he received dividends of \$1.45 per share. The stock is currently selling for \$60 per share. What rate of return did Mike earn over the year?
- (a) 11.7 percent.
 - (b) 13.2 percent.
 - (c) 14.1 percent.
 - (d) 15.9 percent.

Answer: D

Level of Difficulty: 2

Learning Goal: 1

Topic: Holding Period Return (Equation 5.1)

5. Prime-grade commercial paper will most likely have a higher annual return than
- (a) a Treasury bill.
 - (b) a preferred stock.
 - (c) a common stock.
 - (d) an investment-grade bond.

Answer: A

Level of Difficulty: 2

Learning Goal: 1

Topic: Risk and Return Fundamentals

6. A common approach of estimating the variability of returns involving forecasting the pessimistic, most likely, and optimistic returns associated with the asset is called
- (a) marginal analysis.
 - (b) sensitivity analysis.
 - (c) break-even analysis.
 - (d) financial statement analysis.

Answer: B

Level of Difficulty: 1

Learning Goal: 2

Topic: Measuring Single Asset Risk

7. The _____ is the extent of an asset's risk. It is found by subtracting the pessimistic outcome from the optimistic outcome.
- (a) return
 - (b) standard deviation
 - (c) probability distribution
 - (d) range

Answer: D

Level of Difficulty: 1

Learning Goal: 2

Topic: Measuring Single Asset Risk

8. The _____ of an event occurring is the percentage chance of a given outcome.
- (a) dispersion
 - (b) standard deviation
 - (c) probability
 - (d) reliability

Answer: C

Level of Difficulty: 1

Learning Goal: 2

Topic: Measuring Single Asset Risk

9. The _____ measures the dispersion around the expected value.
- (a) coefficient of variation
 - (b) chi square
 - (c) mean
 - (d) standard deviation

Answer: D

Level of Difficulty: 1

Learning Goal: 2

Topic: Standard Deviation

10. The _____ is a measure of relative dispersion used in comparing the risk of assets with differing expected returns.
- (a) coefficient of variation
 - (b) chi square
 - (c) mean
 - (d) standard deviation

Answer: A

Level of Difficulty: 1

Learning Goal: 2

Topic: Coefficient of Variation

11. Which asset would the risk-averse financial manager prefer? (See below.)

Asset	A	B	C	D
Initial investment	\$15,000	\$15,000	\$15,000	\$15,000
Annual rate of return				
Pessimistic	8%	5%	3%	11%
Most likely	12%	12%	12%	12%
Optimistic	14%	13%	15%	14%

- (a) Asset A.
 (b) Asset B.
 (c) Asset C.
 (d) Asset D.

Answer: D

Level of Difficulty: 3

Learning Goal: 2

Topic: Expected Return and Standard Deviation (Equation 5.2 and Equation 5.3)

12. The expected value and the standard deviation of returns for asset A is (See below.)

Asset A		
Possible Outcomes	Probability	Returns (%)
Pessimistic	0.25	10
Most likely	0.45	12
Optimistic	0.30	16

- (a) 12 percent and 4 percent.
 (b) 12.7 percent and 2.3 percent.
 (c) 12.7 percent and 4 percent.
 (d) 12 percent and 2.3 percent.

Answer: B

Level of Difficulty: 3

Learning Goal: 2

Topic: Expected Return and Standard Deviation (Equation 5.2 and Equation 5.3)

13. The _____ the coefficient of variation, the _____ the risk.

- (a) lower; lower
 (b) higher; lower
 (c) lower; higher
 (d) more stable; higher

Answer: A

Level of Difficulty: 3

Learning Goal: 2

Topic: Coefficient of Variation

14. Given the following expected returns and standard deviations of assets B, M, Q, and D, which asset should the prudent financial manager select?

Asset	Expected Return	Standard Deviation
B	10%	5%
M	16%	10%
Q	14%	9%
D	12%	8%

- (a) Asset B
 (b) Asset M
 (c) Asset Q
 (d) Asset D

Answer: A

Level of Difficulty: 4

Learning Goal: 2

Topic: Expected Return and Standard Deviation (Equation 5.4)

15. The expected value, standard deviation of returns, and coefficient of variation for asset A are (See below.)

Asset A		
Possible Outcomes	Probability	Returns (%)
Pessimistic	0.25	5
Most likely	0.55	10
Optimistic	0.20	13

- (a) 10 percent, 8 percent, and 1.25, respectively.
 (b) 9.33 percent, 8 percent, and 2.15, respectively.
 (c) 9.35 percent, 4.68 percent, and 2, respectively.
 (d) 9.35 percent, 2.76 percent, and 0.3, respectively.

Answer: D

Level of Difficulty: 4

Learning Goal: 2

Topic: Expected Return and Standard Deviation (Equation 5.2, Equation 5.3 and Equation 5.4)

16. A(n) _____ portfolio maximizes return for a given level of risk, or minimizes risk for a given level of return.

- (a) efficient
 (b) coefficient
 (c) continuous
 (d) risk-indifferent

Answer: A

Level of Difficulty: 1

Learning Goal: 3

Topic: Efficient Portfolios

17. A collection of assets is called a(n)

- (a) grouping.
- (b) portfolio.
- (c) investment.
- (d) diversity.

Answer: B

Level of Difficulty: 1

Learning Goal: 3

Topic: Portfolio Risk and Return

18. An efficient portfolio is one that

- (a) maximizes risk for a given level of return.
- (b) maximizes return for a given level of risk.
- (c) minimizes return for a given level of risk.
- (d) maximizes return at all risk levels.

Answer: B

Level of Difficulty: 1

Learning Goal: 3

Topic: Efficient Portfolios

19. The _____ is a statistical measure of the relationship between series of numbers.

- (a) coefficient of variation
- (b) standard deviation
- (c) correlation
- (d) probability

Answer: C

Level of Difficulty: 2

Learning Goal: 3

Topic: Correlation and Portfolio Risk

20. The goal of an efficient portfolio is to

- (a) maximize risk for a given level of return.
- (b) maximize risk in order to maximize profit.
- (c) minimize profit in order to minimize risk.
- (d) minimize risk for a given level of return.

Answer: D

Level of Difficulty: 3

Learning Goal: 3

Topic: Efficient Portfolios

21. Perfectly _____ correlated series move exactly together and have a correlation coefficient of _____, while perfectly _____ correlated series move exactly in opposite directions and have a correlation coefficient of _____.

- (a) negatively; -1 ; positively; $+1$
- (b) negatively; $+1$; positively; -1
- (c) positively; -1 ; negatively; $+1$
- (d) positively; $+1$; negatively; -1

Answer: D

Level of Difficulty: 3

Learning Goal: 3

Topic: Correlation and Portfolio Risk

22. Combining negatively correlated assets having the same expected return results in a portfolio with _____ level of expected return and _____ level of risk.

- (a) a higher; a lower
- (b) the same; a higher
- (c) the same; a lower
- (d) a lower; a higher

Answer: C

Level of Difficulty: 3

Learning Goal: 3

Topic: Correlation and Portfolio Risk

Table 5.1

Year	Expected Return (%)		
	Asset A	Asset B	Asset C
1	6	8	6
2	7	7	7
3	8	6	8

23. The correlation of returns between Asset A and Asset B can be characterized as (See Table 5.1)

- (a) perfectly positively correlated.
- (b) perfectly negatively correlated.
- (c) uncorrelated.
- (d) cannot be determined.

Answer: B

Level of Difficulty: 4

Learning Goal: 3

Topic: Correlation and Portfolio Risk

24. If you were to create a portfolio designed to reduce risk by investing equal proportions in each of two different assets, which portfolio would you recommend? (See Table 5.1)
- (a) Assets A and B
 - (b) Assets A and C
 - (c) none of the available combinations
 - (d) cannot be determined

Answer: A

Level of Difficulty: 4

Learning Goal: 3

Topic: Correlation and Portfolio Risk

25. Combining two negatively correlated assets to reduce risk is known as
- (a) diversification.
 - (b) valuation.
 - (c) liquidation.
 - (d) risk aversion.

Answer: A

Level of Difficulty: 2

Learning Goal: 4

Topic: Correlation and Portfolio Risk

26. In general, the lower (less positive and more negative) the correlation between asset returns,
- (a) the less the potential diversification of risk.
 - (b) the greater the potential diversification of risk.
 - (c) the lower the potential profit.
 - (d) the less the assets have to be monitored.

Answer: B

Level of Difficulty: 3

Learning Goal: 4

Topic: Correlation and Portfolio Risk

27. Combining positively correlated assets having the same expected return results in a portfolio with _____ level of expected return and _____ level of risk.
- (a) a higher; a lower
 - (b) the same; a higher
 - (c) the same; a lower
 - (d) a lower; a higher

Answer: B

Level of Difficulty: 3

Learning Goal: 4

Topic: Correlation and Portfolio Risk

28. Combining two assets having perfectly negatively correlated returns will result in the creation of a portfolio with an overall risk that
- (a) remains unchanged.
 - (b) decreases to a level below that of either asset.
 - (c) increases to a level above that of either asset.
 - (d) stabilizes to a level between the asset with the higher risk and the asset with the lower risk.

Answer: B

Level of Difficulty: 4

Learning Goal: 4

Topic: Correlation and Portfolio Risk

29. Combining two assets having perfectly positively correlated returns will result in the creation of a portfolio with an overall risk that
- (a) remains unchanged.
 - (b) decreases to a level below that of either asset.
 - (c) increases to a level above that of either asset.
 - (d) stabilizes to a level between the asset with the higher risk and the asset with the lower risk.

Answer: D

Level of Difficulty: 4

Learning Goal: 4

Topic: Correlation and Portfolio Risk

30. Systematic risk is also referred to as
- (a) diversifiable risk.
 - (b) economic risk.
 - (c) nondiversifiable risk.
 - (d) not relevant.

Answer: C

Level of Difficulty: 1

Learning Goal: 5

Topic: Diversifiable and Nondiversifiable Risk

31. The purpose of adding an asset with a negative or low positive beta is to
- (a) reduce profit.
 - (b) reduce risk.
 - (c) increase profit.
 - (d) increase risk.

Answer: B

Level of Difficulty: 1

Learning Goal: 5

Topic: Beta and Systematic Risk

32. The beta of the market

- (a) is greater than 1.
- (b) is less than 1.
- (c) is 1.
- (d) cannot be determined.

Answer: C

Level of Difficulty: 1

Learning Goal: 5

Topic: Beta and Systematic Risk

33. Risk that affects all firms is called

- (a) total risk.
- (b) management risk.
- (c) nondiversifiable risk.
- (d) diversifiable risk.

Answer: C

Level of Difficulty: 1

Learning Goal: 5

Topic: Diversifiable and Nondiversifiable Risk

34. The portion of an asset's risk that is attributable to firm-specific, random causes is called

- (a) unsystematic risk.
- (b) nondiversifiable risk.
- (c) systematic risk.
- (d) None of the above.

Answer: A

Level of Difficulty: 2

Learning Goal: 5

Topic: Systematic and Unsystematic Risk

35. The relevant portion of an asset's risk attributable to market factors that affect all firms is called

- (a) unsystematic risk.
- (b) diversifiable risk.
- (c) systematic risk.
- (d) None of the above.

Answer: C

Level of Difficulty: 2

Learning Goal: 5

Topic: Systematic and Unsystematic Risk

36. _____ risk represents the portion of an asset's risk that can be eliminated by combining assets with less than perfect positive correlation.

- (a) Diversifiable
- (b) Nondiversifiable
- (c) Systematic
- (d) Total

Answer: A

Level of Difficulty: 2

Learning Goal: 5
Topic: Diversifiable and Nondiversifiable Risk

37. Unsystematic risk is not relevant, because
- (a) it does not change.
 - (b) it can be eliminated through diversification.
 - (c) it cannot be estimated.
 - (d) it cannot be eliminated through diversification.

Answer: B
Level of Difficulty: 2
Learning Goal: 5
Topic: Systematic and Unsystematic Risk

38. Strikes, lawsuits, regulatory actions, and increased competition are all examples of
- (a) diversifiable risk.
 - (b) nondiversifiable risk.
 - (c) economic risk.
 - (d) systematic.

Answer: A
Level of Difficulty: 2
Learning Goal: 5
Topic: Diversifiable and Nondiversifiable Risk

39. War, inflation, and the condition of the foreign markets are all examples of
- (a) diversifiable risk.
 - (b) nondiversifiable risk.
 - (c) economic risk.
 - (d) unsystematic.

Answer: B
Level of Difficulty: 2
Learning Goal: 5
Topic: Diversifiable and Nondiversifiable Risk

40. A beta coefficient of +1 represents an asset that
- (a) is more responsive than the market portfolio.
 - (b) has the same response as the market portfolio.
 - (c) is less responsive than the market portfolio.
 - (d) is unaffected by market movement.

Answer: B
Level of Difficulty: 2
Learning Goal: 5
Topic: Beta and Systematic Risk

41. A beta coefficient of -1 represents an asset that
- (a) is more responsive than the market portfolio.
 - (b) has the same response as the market portfolio but in opposite direction
 - (c) is less responsive than the market portfolio.
 - (d) is unaffected by market movement.

Answer: B

Level of Difficulty: 2

Learning Goal: 5

Topic: Beta and Systematic Risk

42. A beta coefficient of 0 represents an asset that
- (a) is more responsive than the market portfolio.
 - (b) has the same response as the market portfolio.
 - (c) is less responsive than the market portfolio.
 - (d) is unaffected by market movement.

Answer: D

Level of Difficulty: 2

Learning Goal: 5

Topic: Beta and Systematic Risk

43. An investment banker has recommended a \$100,000 portfolio containing assets B, D, and F. \$20,000 will be invested in asset B, with a beta of 1.5; \$50,000 will be invested in asset D, with a beta of 2.0; and \$30,000 will be invested in asset F, with a beta of 0.5. The beta of the portfolio is
- (a) 1.25
 - (b) 1.33
 - (c) 1.45
 - (d) unable to be determined from the information provided.

Answer: C

Level of Difficulty: 3

Learning Goal: 5

Topic: Portfolio Beta (Equation 5.7)

44. The higher an asset's beta,
- (a) the more responsive it is to changing market returns.
 - (b) the less responsive it is to changing market returns.
 - (c) the higher the expected return will be in a down market.
 - (d) the lower the expected return will be in an up market.

Answer: A

Level of Difficulty: 3

Learning Goal: 5

Topic: Beta and Systematic Risk

45. An increase in nondiversifiable risk
- (a) would cause an increase in the beta and would lower the required return.
 - (b) would have no effect on the beta and would, therefore, cause no change in the required return.
 - (c) would cause an increase in the beta and would increase the required return.
 - (d) would cause a decrease in the beta and would, therefore, lower the required rate of return.

Answer: C

Level of Difficulty: 3

Learning Goal: 5

Topic: Beta and Systematic Risk

46. An increase in the Treasury Bill rate _____ the required rate of return of a common stock.
- has no effect on
 - increases
 - decreases
 - cannot be determined by
- Answer: B
Level of Difficulty: 3
Learning Goal: 5
Topic: Capital Asset Pricing Model (CAPM)
47. An example of an external factor that affects a corporation's risk or beta, and hence required rate of return would be
- financing mix.
 - toxic spills.
 - asset mix.
 - change in top management.
- Answer: B
Level of Difficulty: 3
Learning Goal: 5
Topic: Beta and Systematic Risk
48. The beta of a portfolio is
- the sum of the betas of all assets in the portfolio.
 - irrelevant, only the betas of the individual assets are important.
 - does not change over time.
 - is the weighted average of the betas of the individual assets in the portfolio.
- Answer: D
Level of Difficulty: 3
Learning Goal: 5
Topic: Portfolio Beta

You are going to invest \$20,000 in a portfolio consisting of assets X, Y, and Z, as follows:

Table 5.2

Asset	Annual Return	Probability	Beta	Proportion
X	10%	0.50	1.2	0.333
Y	8%	0.25	1.6	0.333
Z	16%	0.25	2.0	0.333

49. Given the information in Table 5.2, what is the expected annual return of this portfolio?
- 11.4%
 - 10.0%
 - 11.0%
 - 11.7%
- Answer: C
Level of Difficulty: 4
Learning Goal: 5

Topic: Portfolio Beta (Equation 5.7)

50. The beta of the portfolio in Table 5.2, containing assets X, Y, and Z, is
- (a) 1.5.
 - (b) 2.4.
 - (c) 1.6.
 - (d) 2.0.

Answer: C

Level of Difficulty: 4

Learning Goal: 5

Topic: Portfolio Beta (Equation 5.7)

51. The beta of the portfolio in Table 5.2 indicates this portfolio
- (a) has more risk than the market.
 - (b) has less risk than the market.
 - (c) has an undetermined amount of risk compared to the market.
 - (d) has the same risk as the market.

Answer: A

Level of Difficulty: 4

Learning Goal: 5

Topic: Portfolio Beta (Equation 5.7)

52. As randomly selected securities are combined to create a portfolio, the _____ risk of the portfolio decreases until 10 to 20 securities are included. The portion of the risk eliminated is _____ risk, while that remaining is _____ risk.
- (a) diversifiable; nondiversifiable; total
 - (b) relevant; irrelevant; total
 - (c) total; diversifiable; nondiversifiable
 - (d) total; nondiversifiable; diversifiable

Answer: C

Level of Difficulty: 4

Learning Goal: 5

Topic: Diversifiable and Nondiversifiable Risk

53. The _____ describes the relationship between nondiversifiable risk and return for all assets.
- (a) EBIT-EPS approach to capital structure
 - (b) supply-demand function for assets
 - (c) capital asset pricing model
 - (d) Gordon model

Answer: C

Level of Difficulty: 1

Learning Goal: 6

Topic: Capital Asset Pricing Model (CAPM)

54. Examples of events that increase risk aversion include
- (a) a stock market crash.
 - (b) assassination of a key political leader.
 - (c) the outbreak of war.
 - (d) all of the above.

Answer: D

Level of Difficulty: 2

Learning Goal: 6

Topic: Capital Asset Pricing Model (CAPM)

55. In the capital asset pricing model, the beta coefficient is a measure of _____ risk and an index of the degree of movement of an asset's return in response to a change in _____.
- (a) diversifiable; the prime rate
 - (b) nondiversifiable; the Treasury bill rate
 - (c) diversifiable; the bond index rate
 - (d) nondiversifiable; the market return

Answer: D

Level of Difficulty: 2

Learning Goal: 6

Topic: Capital Asset Pricing Model (CAPM)

56. Asset Y has a beta of 1.2. The risk-free rate of return is 6 percent, while the return on the market portfolio of assets is 12 percent. The asset's market risk premium is
- (a) 7.2 percent.
 - (b) 6.0 percent.
 - (c) 13.2 percent.
 - (d) 10 percent.

Answer: B

Level of Difficulty: 2

Learning Goal: 6

Topic: Capital Asset Pricing Model (CAPM) (Equation 5.8)

57. In the capital asset pricing model, the beta coefficient is a measure of
- (a) economic risk.
 - (b) diversifiable risk.
 - (c) nondiversifiable risk.
 - (d) unsystematic risk.

Answer: C

Level of Difficulty: 2

Learning Goal: 6

Topic: Capital Asset Pricing Model (CAPM)

58. Asset P has a beta of 0.9. The risk-free rate of return is 8 percent, while the return on the market portfolio of assets is 14 percent. The asset's required rate of return is
- (a) 13.4 percent.
 - (b) 6.0 percent.
 - (c) 5.4 percent.
 - (d) 10 percent.

Answer: A

Level of Difficulty: 3

Learning Goal: 6

Topic: Capital Asset Pricing Model (CAPM) (Equation 5.8)

59. As risk aversion increases
- (a) a firm's beta will increase.
 - (b) investors' required rate of return will increase.
 - (c) a firm's beta will decrease.
 - (d) investors' required rate of return will decrease.

Answer: B

Level of Difficulty: 3

Learning Goal: 6

Topic: Capital Asset Pricing Model (CAPM)

60. An increase in the beta of a corporation indicates _____, and, all else being the same, results in _____.
- (a) a decrease in risk; a higher required rate of return and hence a lower share price
 - (b) an increase in risk; a higher required rate of return and hence a lower share price
 - (c) a decrease in risk; a lower required rate of return and hence a higher share price
 - (d) an increase in risk; a lower required rate of return and hence a higher share price

Answer: B

Level of Difficulty: 4

Learning Goal: 6

Topic: Capital Asset Pricing Model (CAPM)

61. A change in the risk-free rate would not be due to
- (a) an international trade embargo.
 - (b) a change in Federal Reserve policy.
 - (c) foreign competition in the firm's product market area.
 - (d) None of the above.

Answer: C

Level of Difficulty: 4

Learning Goal: 6

Topic: Capital Asset Pricing Model (CAPM)

62. Nicole holds three stocks in her portfolio: A, B, and C. The portfolio beta is 1.40. Stock A comprises 15 percent of the dollar value of her holdings and has a beta of 1.0. If Nicole sells all of her investment in A and invests the proceeds in the risk-free asset, her new portfolio beta will be:
- (a) 0.60.
 - (b) 0.88.
 - (c) 1.00.
 - (d) 1.25.

Answer: D

Level of Difficulty: 4

Learning Goal: 5

Topic: Portfolio Beta (Equation 5.7)

63. Nico owns 100 shares of stock X which has a price of \$12 per share and 200 shares of stock Y which has a price of \$3 per share. What is the proportion of Nico's portfolio invested in stock X?
- (a) 77%
 - (b) 67%
 - (c) 50%
 - (d) 33%

Answer: B

Level of Difficulty: 3

Learning Goal: 5

Topic: Portfolio Weights (Equation 5.5)

64. Nico wants to invest all of his money in just two assets: the risk free asset and the market portfolio. What is Nico's portfolio beta if he invests a quarter of his money in the market portfolio and the rest in the risk free asset?
- (a) 0.00
 - (b) 0.25
 - (c) 0.75
 - (d) 1.00

Answer: B

Level of Difficulty: 3

Learning Goal: 5

Topic: Portfolio Weights (Equation 5.5)

65. What is the expected market return if the expected return on asset X is 20 percent, its beta is 1.5, and the risk free rate is 5 percent?
- (a) 5.0%
 - (b) 7.5%
 - (c) 15.0%
 - (d) 22.5%

Answer: C

Level of Difficulty: 3

Learning Goal: 5

Topic: Capital Asset Pricing Model (CAPM) (Equation 5.8)

66. What is the expected risk-free rate of return if asset X, with a beta of 1.5, has an expected return of 20 percent, and the expected market return is 15 percent?
- (a) 5.0%
 (b) 7.5%
 (c) 15.0%
 (d) 22.5%

Answer: A

Level of Difficulty: 3

Learning Goal: 6

Topic: Capital Asset Pricing Model (CAPM) (Equation 5.8)

67. What is the expected return for asset X if it has a beta of 1.5, the expected market return is 15 percent, and the expected risk-free rate is 5 percent?
- (a) 5.0%
 (b) 7.5%
 (c) 15.0%
 (d) 20.0%

Answer: D

Level of Difficulty: 3

Learning Goal: 6

Topic: Capital Asset Pricing Model (CAPM) (Equation 5.8)

68. What is Nico's portfolio beta if he invests an equal amount in asset X with a beta of 0.60, asset Y with a beta of 1.60, the risk-free asset, and the market portfolio?
- (a) 1.20
 (b) 1.00
 (c) 0.80
 (d) 0.60

Answer: C

Level of Difficulty: 3

Learning Goal: 5

Topic: Portfolio Beta (Equation 5.7)

Consider the following two securities X and Y.

Table 5.3

Security	Return	Standard Deviation	Beta
X	20.0%	20.0%	1.50
Y	10.0%	30.0%	1.0
Risk-free asset	5.0%		

69. Which asset (X or Y) in Table 5.3 has the least total risk? Which has the least systematic risk?
- (a) X; X.
 (b) X; Y.
 (c) Y; X.
 (d) Y; Y.

Answer: B

Level of Difficulty: 3

Learning Goal: 5

Topic: Systematic and Unsystematic Risk

70. Using the data from Table 5.3, what is the systematic risk for a portfolio with two-thirds of the funds invested in X and one-third invested in Y?
- (a) 0.88
 - (b) 1.17
 - (c) 1.33
 - (d) 1.67

Answer: C

Level of Difficulty: 2

Learning Goal: 5

Topic: Portfolio Beta (Equation 5.7)

71. Using the data from Table 5.3, what is the portfolio expected return and the portfolio beta if you invest 35 percent in X, 45 percent in Y, and 20 percent in the risk-free asset?
- (a) 12.5%, 0.975
 - (b) 12.5%, 1.975
 - (c) 15.0%, 0.975
 - (d) 15.0%, 1.975

Answer: A

Level of Difficulty: 3

Learning Goal: 5

Topic: Portfolio Return and Portfolio Beta (Equation 5.5 and Equation 5.7)

72. Using the data from Table 5.3, what is the portfolio expected return if you invest 100 percent of your money in X, borrow an amount equal to half of your own investment at the risk free rate and invest your borrowings in asset X?
- (a) 15.0%
 - (b) 22.5%
 - (c) 25.0%
 - (d) 27.5%

Answer: D

Level of Difficulty: 4

Learning Goal: 5

Topic: Portfolio Return (Equation 5.5)

73. What is the market risk premium if the risk free rate is 5 percent and the expected market return is given as follows?

State of Nature	Probability	Return
Boom	20%	30%
Average	70%	15%
Recession	10%	-5%

- (a) 10.5%
- (b) 11.0%
- (c) 16.0%
- (d) 16.5%

Answer: B

Level of Difficulty: 3

Learning Goal: 2

Topic: Expected Return and CAPM (Equation 5.2 and 5.8)

74. Nico bought 100 shares of Cisco Systems stock for \$24.00 per share on January 1, 2002. He received a dividend of \$2.00 per share at the end of 2002 and \$3.00 per share at the end of 2003. At the end of 2004, Nico collected a dividend of \$4.00 per share and sold his stock for \$18.00 per share. What was Nico's realized return during the three year holding period?
- (a) -12.5%
 (b) +12.5%
 (c) -16.7%
 (d) +16.7%

Answer: B

Level of Difficulty: 3

Learning Goal: 2

Topic: Measuring Single Asset Return (Equation 5.1)

75. Nico bought 100 shares of Cisco Systems stock for \$24.00 per share on January 1, 2002. He received a dividend of \$2.00 per share at the end of 2002 and \$3.00 per share at the end of 2003. At the end of 2004, Nico collected a dividend of \$4.00 per share and sold his stock for \$18.00 per share. What was Nico's realized return during the three year holding period? What was Nico's compound annual rate of return?
- (a) -12.5%; -4.4%
 (b) +12.5%; +4.4%
 (c) -16.7%; -4.4%
 (d) +16.7%; +4.4%

Answer: B

Level of Difficulty: 4

Learning Goal: 2

Topic: Measuring Single Asset Return (Equation 5.1)

■ Essay Questions

1. Jeremy Irons purchased 100 shares of Ferro, Inc. common stock for \$25 per share one year ago. During the year, Ferro, Inc. paid cash dividends of \$2 per share. The stock is currently selling for \$30 per share. If Jeremy sells all of his shares of Ferro, Inc. today, what rate of return would he realize?

$$\text{Answer: Realized return} = \frac{\$30 - \$25 + \$2}{\$25} = 28\%$$

Level of Difficulty: 2

Learning Goal: 1

Topic: Holding Period Return (Equation 5.1)

2. Ralph's Ratchets Corporation purchased ratchets rotator one year ago for \$6,500. During the year it generated \$4,000 in cash flow. If Ralph sells it, he could receive \$6,100 for it. What is ratchets rotator's rate of return?

$$\text{Answer: Realized return} = \frac{\$6,100 - \$6,500 + \$4,000}{\$6,500} = 55\%$$

Level of Difficulty: 2

Learning Goal: 1

Topic: Holding Period Return (Equation 5.1)

3. Asset A was purchased six months ago for \$25,000 and has generated \$1,500 cash flow during that period. What is the asset's rate of return if it can be sold for \$26,750 today?

$$\text{Answer: Realized return} = \frac{\$26,750 - \$25,000 + \$1,500}{\$25,000} = 13\%$$

$$\text{Annual rate of return} = 13\% \times 2 = 26\%$$

Level of Difficulty: 2

Learning Goal: 1

Topic: Holding Period Return (Equation 5.1)

4. Given the following information about the two assets A and B, determine which asset is preferred.

	A	B
Initial Investment	\$5,000	\$5,000
Annual rate of return		
Pessimistic	9%	7%
Most Likely	11	11
Optimistic	13	15
Range	4	8

Answer: Asset A is preferred because it has a lower range for the same expected return.

Level of Difficulty: 2

Learning Goal: 2

Topic: Expected Return and Standard Deviation (Equation 5.2 and Equation 5.3)

5. Assuming the following returns and corresponding probabilities for asset A, compute its standard deviation and coefficient of variation.

Asset A	
Rate of Return	Probability
10%	30%
15	40
20	30

Answer:

K	P	KP	$-(K - K)^2 P$
10%	30%	5.0	$(10 - 13.5)^2 0.30 = 6.125$
15	40	4.5	$(15 - 13.5)^2 0.40 = 0.675$
20	30	4.0	$(20 - 13.5)^2 0.30 = 8.450$
		13.5%	15.25%

$$SD = 3.91\%$$

$$CV = SD/K = 3.91/13.5 = 0.29$$

Level of Difficulty: 3

Learning Goal: 2

Topic: Expected Return, Standard Deviation and Coefficient of Variation (Equation 5.2, Equation 5.3 and Equation 5.4)

6. Champion Breweries must choose between two asset purchases. The annual rate of return and related probabilities given below summarize the firm's analysis.

Asset A		Asset B	
Rate of Return	Probability	Rate of Return	Probability
10%	30%	5%	40%
15	40	15	20
20	30	25	40

For each asset, compute

- the expected rate of return.
- the standard deviation of the expected return.
- the coefficient of variation of the return.
- Which asset should Champion select?

Answers:(a)

Asset A	Asset B
Return × Pr	Return × Pr
10% × 0.30 = 3%	5% × 0.40 = 2%
15 × 0.40 = 6	15 × 0.20 = 3
20 × 0.30 = 6	25 × 0.40 = 10

Expected Return = 15% Expected Return = 15%

(b) Asset A

$$(10\% - 15\%)^2 \times 0.30 = 7.5\%$$

$$(15\% - 15\%)^2 \times 0.40 = 0\%$$

$$(20\% - 15\%)^2 \times 0.30 = 7.5\%$$

$$\underline{15\%}$$

Standard Deviation of A = 3.87%

Asset B

$$(5\% - 15\%)^2 \times 0.40 = 40\%$$

$$(15\% - 15\%)^2 \times 0.20 = 0\%$$

$$(25\% - 15\%)^2 \times 0.40 = 40\%$$

$$\underline{80\%}$$

Standard Deviation of B = 8.94%

$$(c) CVA = 3.87/15 = 0.26 \quad CVB = 8.94/15 = 0.60$$

(d) Asset A; for 15% rate of return and lesser risk.

Level of Difficulty: 4

Learning Goal: 2

Topic: Expected Return, Standard Deviation and Coefficient of Variation (Equation 5.2, Equation 5.2 and Equation 5.4)

7. The College Copy Shop is in process of purchasing a high-tech copier. In their search, they have gathered the following information about two possible copiers A and B.

	A		B	
Initial Investment	\$10,000		\$10,000	
Annual rate of return				
	Return	Prob.	Return	Prob.
Pessimistic	11%	0.30	9%	0.30
Most Likely	18	0.45	18	0.45
Optimistic	22	0.25	25	0.25

- (a) Compute expected rate of return for each copier.
- (b) Compute variance and standard deviation of rate of return for each copier.
- (c) Which copier should they purchase?

Answer: a and b.

COPIER A				COPIER B			
K	P	KP	K ² P	K	P	KP	K ² P
11%	0.30	3.30%	36.3	9%	0.30	2.7%	24.3
18	0.45	8.10	145.8	18	0.45	8.1	145.8
22	0.25	<u>5.50</u>	<u>121.0</u>	25	<u>0.25</u>	<u>6.25</u>	156.25
		16.9%	303.1		17.05%	326.35	

Expected value = 16.9% Expected value = 17.05%
 Variance = 303.1 – 16.9² = 17.49 Variance = 326.35 – 17.05² = 35.65
 SD = 4.18% SD = 5.97%

(c) CV = SD / k
 Copier A: CV = 4.18/16.90 = 0.25
 Copier B: CV = 5.97/17.05 = 0.35

The College Copy Shop should buy copier A.

Level of Difficulty: 4

Learning Goal: 2

Topic: Expected Return and Standard Deviation (Equation 5.2 and Equation 5.3)

8. Given the following probability distribution for assets X and Y, compute the expected rate of return, variance, standard deviation, and coefficient of variation for the two assets. Which asset is a better investment?

X		Y	
Return	Prob.	Return	Prob.
8%	0.10	10%	0.25
9	0.20	11	0.35
11	0.30	12	0.40
12	0.40		

Answer:

Asset X				Asset Y			
K	P	KP	K ² P	K	P	KP	K ² P
8%	0.10	0.80%	6.40	10%	0.25	2.5%	25.0
9	0.20	1.80	16.20	11	0.35	3.85	42.35
11	0.30	3.30	36.30	12	0.40	4.80	57.60
12	0.40	4.80	57.60				
		10.7%	116.5			11.15%	124.95

Expected value = 10.7%

Variance = $116.5 - 10.7^2 = 2.01$

SD = 1.42%

CV = SD/k

Asset X: CV = $1.42/10.70 = 0.13$

Asset Y: CV = $0.79/11.15 = 0.07$

Asset Y is preferred.

Expected value = 11.15%

Variance = $124.95 - 11.15^2 = 0.63$

SD = 0.79%

Level of Difficulty: 4

Learning Goal: 2

Topic: Expected Return, Standard Deviation and Coefficient of Variation (Equation 5.2, Equation 5.3 and Equation 5.4)

9. Russo's Gas Distributor, Inc. wants to determine the required return on a stock portfolio with a beta coefficient of 0.5. Assuming the risk-free rate of 6 percent and the market return of 12 percent, compute the required rate of return.

Answer: $K = RF + b(K_m - RF)$

$= 0.06 + 0.5(0.12 - 0.06) = 0.09 = 9\%$

The company should expect at least 9 percent return on the stock portfolio.

Level of Difficulty: 2

Learning Goal: 6

Topic: Capital Asset Pricing Model (CAPM) (Equation 5.8)

10. Assuming a risk-free rate of 8 percent and a market return of 12 percent, would a wise investor acquire a security with a Beta of 1.5 and a rate of return of 14 percent given the facts above?

Answer: $K = RF + b(K_m - RF)$

$$= 0.08 + 1.5(0.12 - 0.08) = 0.14 = 14\%$$

Yes, a security with a beta of 1.5 should yield 14 percent rate of return.

Level of Difficulty: 3

Learning Goal: 6

Topic: Capital Asset Pricing Model (CAPM) (Equation 5.8)

11. Mr. Thomas is considering investment in a project with beta coefficient of 1.75. What would you recommend him to do if this investment has an 11.5 percent rate of return, risk-free rate is 5.5 percent, and the rate of return on the market portfolio of assets is 8.5 percent?

Answer: $K = RF + b(K_m - RF)$

$$= 0.055 + 1.75(0.085 - 0.055) = 0.108 = 10.8\%$$

Mr. Thomas should invest in the project because the project's actual rate of return (11.5 percent) is greater than the project's required rate of return (10.8 percent).

Level of Difficulty: 3

Learning Goal: 6

Topic: Capital Asset Pricing Model (CAPM) (Equation 5.8)

12. Nico bought 100 shares of Cisco Systems stock for \$24.00 per share on January 1, 2002. He received a dividend of \$2.00 per share at the end of 2002 and \$3.00 per share at the end of 2003. At the end of 2004, Nico collected a dividend of \$4.00 per share and sold his stock for \$18.00 per share. What was Nico's realized return during the three year holding period? What was Nico's compound annual rate of return? Explain the difference?

Answer: $\text{Realized return} = \frac{\$24 - \$18 + \$9}{\$24} = 12.5\%$

Compound Return:

$$\$24 = \$2/(1 + R)^1 + \$3/(1 + R)^2 + (\$4 + 18)/(1 + R)^3$$

Solve for R either with a calculator or through trial and error. The calculator is approximately 4.4 percent.

The reason the realized holding period return is so much larger than the compound rate of return is that the realized return does not account for the time value of money.

Level of Difficulty: 3

Learning Goal: 2

Topic: Measuring Single Asset Return (Equation 5.1)