

ch6

Student: _____

1. Which of the following statements regarding risk-averse investors is **true**?
 - A. They only care about the rate of return.
 - B. They accept investments that are fair games.
 - C. They only accept risky investments that offer risk premiums over the risk-free rate.
 - D. They are willing to accept lower returns and high risk.
 - E. A and B.

2. Which of the following statements is (are) **true**?
 - I) Risk-averse investors reject investments that are fair games.
 - II) Risk-neutral investors judge risky investments only by the expected returns.
 - III) Risk-averse investors judge investments only by their riskiness.
 - IV) Risk-loving investors will not engage in fair games.
 - A. I only
 - B. II only
 - C. I and II only
 - D. II and III only
 - E. II, III, and IV only

3. Which of the following statements is (are) **false**?
 - I) Risk-averse investors reject investments that are fair games.
 - II) Risk-neutral investors judge risky investments only by the expected returns.
 - III) Risk-averse investors judge investments only by their riskiness.
 - IV) Risk-loving investors will not engage in fair games.
 - A. I only
 - B. II only
 - C. I and II only
 - D. II and III only
 - E. III, and IV only

4. In the mean-standard deviation graph an indifference curve has a _____ slope.
 - A. negative
 - B. zero
 - C. positive
 - D. northeast
 - E. cannot be determined

5. In the mean-standard deviation graph, which one of the following statements is **true** regarding the indifference curve of a risk-averse investor?
- It is the locus of portfolios that have the same expected rates of return and different standard deviations.
 - It is the locus of portfolios that have the same standard deviations and different rates of return.
 - It is the locus of portfolios that offer the same utility according to returns and standard deviations.
 - It connects portfolios that offer increasing utilities according to returns and standard deviations.
 - none of the above.
6. In a return-standard deviation space, which of the following statements is (are) **true** for risk-averse investors? (The vertical and horizontal lines are referred to as the expected return-axis and the standard deviation-axis, respectively.)
- An investor's own indifference curves might intersect.
 - Indifference curves have negative slopes.
 - In a set of indifference curves, the highest offers the greatest utility.
 - Indifference curves of two investors might intersect.
- I and II only
 - II and III only
 - I and IV only
 - III and IV only
 - none of the above
7. Elias is a risk-averse investor. David is a less risk-averse investor than Elias. Therefore,
- for the same risk, David requires a higher rate of return than Elias.
 - for the same return, Elias tolerates higher risk than David.
 - for the same risk, Elias requires a lower rate of return than David.
 - for the same return, David tolerates higher risk than Elias.
 - cannot be determined.
8. When an investment advisor attempts to determine an investor's risk tolerance, which factor would they be **least** likely to assess?
- the investor's prior investing experience
 - the investor's degree of financial security
 - the investor's tendency to make risky or conservative choices
 - the level of return the investor prefers
 - the investor's feeling about loss

Assume an investor with the following utility function: $U = E(r) - 3/2(s^2)$.

9. To maximize her expected utility, she would choose the asset with an expected rate of return of _____ and a standard deviation of _____, respectively.
- 12%; 20%
 - 10%; 15%
 - 10%; 10%
 - 8%; 10%
 - none of the above

10. To maximize her expected utility, which one of the following investment alternatives would she choose?
- A portfolio that pays 10 percent with a 60 percent probability or 5 percent with 40 percent probability.
 - A portfolio that pays 10 percent with 40 percent probability or 5 percent with a 60 percent probability.
 - A portfolio that pays 12 percent with 60 percent probability or 5 percent with 40 percent probability.
 - A portfolio that pays 12 percent with 40 percent probability or 5 percent with 60 percent probability.
 - none of the above.
11. A portfolio has an expected rate of return of 0.15 and a standard deviation of 0.15. The risk-free rate is 6 percent. An investor has the following utility function: $U = E(r) - (A/2)s^2$. Which value of A makes this investor indifferent between the risky portfolio and the risk-free asset?
- 5
 - 6
 - 7
 - 8
 - none of the above
12. According to the mean-variance criterion, which one of the following investments dominates all others?
- $E(r) = 0.15$; Variance = 0.20
 - $E(r) = 0.10$; Variance = 0.20
 - $E(r) = 0.10$; Variance = 0.25
 - $E(r) = 0.15$; Variance = 0.25
 - none of these is dominates the other alternatives.
13. Consider a risky portfolio, A, with an expected rate of return of 0.15 and a standard deviation of 0.15, that lies on a given indifference curve. Which one of the following portfolios might lie on the same indifference curve?
- $E(r) = 0.15$; Standard deviation = 0.20
 - $E(r) = 0.15$; Standard deviation = 0.10
 - $E(r) = 0.10$; Standard deviation = 0.10
 - $E(r) = 0.20$; Standard deviation = 0.15
 - $E(r) = 0.10$; Standard deviation = 0.20

Investment	Expected Return $E(r)$	Standard Deviation
1	0.12	0.3
2	0.15	0.5
3	0.21	0.16
4	0.24	0.21

$$U = E(r) - (A/2)s^2, \text{ where } A = 4.0.$$

14. Based on the utility function above, which investment would you select?
- 1
 - 2
 - 3
 - 4
 - cannot tell from the information given

15. Which investment would you select if you were risk neutral?
- A. 1
 - B. 2
 - C. 3
 - D. 4
 - E. cannot tell from the information given
16. The variable (A) in the utility function represents the:
- A. investor's return requirement.
 - B. investor's aversion to risk.
 - C. certainty-equivalent rate of the portfolio.
 - D. minimum required utility of the portfolio.
 - E. none of the above.
17. The exact indifference curves of different investors
- A. cannot be known with perfect certainty.
 - B. can be calculated precisely with the use of advanced calculus.
 - C. although not known with perfect certainty, do allow the advisor to create more suitable portfolios for the client.
 - D. A and C.
 - E. none of the above.
18. The riskiness of individual assets
- A. should be considered for the asset in isolation.
 - B. should be considered in the context of the effect on overall portfolio volatility.
 - C. combined with the riskiness of other individual assets (in the proportions these assets constitute of the entire portfolio) should be the relevant risk measure.
 - D. B and C.
 - E. none of the above.
19. A fair game
- A. will not be undertaken by a risk-averse investor.
 - B. is a risky investment with a zero risk premium.
 - C. is a riskless investment.
 - D. Both A and B are true.
 - E. Both A and C are true.
20. The presence of risk means that
- A. investors will lose money.
 - B. more than one outcome is possible.
 - C. the standard deviation of the payoff is larger than its expected value.
 - D. final wealth will be greater than initial wealth.
 - E. terminal wealth will be less than initial wealth.

21. The utility score an investor assigns to a particular portfolio, other things equal,

- A. will decrease as the rate of return increases.
- B. will decrease as the standard deviation increases.
- C. will decrease as the variance increases.
- D. will increase as the variance increases.
- E. will increase as the rate of return increases.

22. The certainty equivalent rate of a portfolio is

- A. the rate that a risk-free investment would need to offer with certainty to be considered equally attractive as the risky portfolio.
- B. the rate that the investor must earn for certain to give up the use of his money.
- C. the minimum rate guaranteed by institutions such as banks.
- D. the rate that equates "A" in the utility function with the average risk aversion coefficient for all risk-averse investors.
- E. represented by the scaling factor "-.005" in the utility function.

23. According to the mean-variance criterion, which of the statements below is correct?

Investment	E(r)	Standard Deviation
A	10%	5%
B	21%	11%
C	18%	23%
D	24%	16%

- A. Investment B dominates Investment A.
- B. Investment B dominates Investment C.
- C. Investment D dominates all of the other investments.
- D. Investment D dominates only Investment B.
- E. Investment C dominates investment A.

24. Steve is more risk-averse than Edie. On a graph that shows Steve and Edie's indifference curves, which of the following is true? Assume that the graph shows expected return on the vertical axis and standard deviation on the horizontal axis.

- I) Steve and Edie's indifference curves might intersect.
- II) Steve's indifference curves will have flatter slopes than Edie's.
- III) Steve's indifference curves will have steeper slopes than Edie's.
- IV) Steve and Edie's indifference curves will not intersect.
- V) Steve's indifference curves will be downward sloping and Edie's will be upward sloping.

- A. I and V
- B. I and III
- C. III and IV
- D. I and II
- E. II and IV

25. The Capital Allocation Line can be described as the

- A. investment opportunity set formed with a risky asset and a risk-free asset.
- B. investment opportunity set formed with two risky assets.
- C. line on which lie all portfolios that offer the same utility to a particular investor.
- D. line on which lie all portfolios with the same expected rate of return and different standard deviations.
- E. none of the above.

26. Which of the following statements regarding the Capital Allocation Line (CAL) is **false**?
- A. The CAL shows risk-return combinations.
 - B. The slope of the CAL equals the increase in the expected return of a risky portfolio per unit of additional standard deviation.
 - C. The slope of the CAL is also called the reward-to-volatility ratio.
 - D. The CAL is also called the efficient frontier of risky assets in the absence of a risk-free asset.
 - E. Both A and D are true.
27. Given the capital allocation line, an investor's optimal portfolio is the portfolio that
- A. maximizes her expected profit.
 - B. maximizes her risk.
 - C. minimizes both her risk and return.
 - D. maximizes her expected utility.
 - E. none of the above.
28. An investor invests 30 percent of his wealth in a risky asset with an expected rate of return of 0.15 and a variance of 0.04 and 70 percent in a T-bill that pays 6 percent. His portfolio's expected return and standard deviation are _____ and _____, respectively.
- A. 0.114; 0.12
 - B. 0.087; 0.06
 - C. 0.295; 0.12
 - D. 0.087; 0.12
 - E. none of the above
29. An investor invests 30 percent of his wealth in a risky asset with an expected rate of return of 0.13 and a variance of 0.03 and 70 percent in a T-bill that pays 6 percent. His portfolio's expected return and standard deviation are _____ and _____, respectively.
- A. 0.114; 0.128
 - B. 0.087; 0.063
 - C. 0.295; 0.125
 - D. 0.081; 0.052
 - E. none of the above
30. An investor invests 40 percent of his wealth in a risky asset with an expected rate of return of 0.17 and a variance of 0.08 and 60 percent in a T-bill that pays 4.5 percent. His portfolio's expected return and standard deviation are _____ and _____, respectively.
- A. 0.114; 0.126
 - B. 0.087; 0.068
 - C. 0.095; 0.113
 - D. 0.087; 0.124
 - E. none of the above

31. An investor invests 70 percent of his wealth in a risky asset with an expected rate of return of 0.15 and a variance of 0.04 and 30 percent in a T-bill that pays 5 percent. His portfolio's expected return and standard deviation are _____ and _____, respectively.
- A. 0.120; 0.14
 - B. 0.087; 0.06
 - C. 0.295; 0.12
 - D. 0.087; 0.12
 - E. none of the above

You invest \$100 in a risky asset with an expected rate of return of 0.12 and a standard deviation of 0.15 and a T-bill with a rate of return of 0.05.

32. What percentages of your money must be invested in the risky asset and the risk-free asset, respectively, to form a portfolio with an expected return of 0.09?
- A. 85% and 15%
 - B. 75% and 25%
 - C. 67% and 33%
 - D. 57% and 43%
 - E. cannot be determined
33. What percentages of your money must be invested in the risk-free asset and the risky asset, respectively, to form a portfolio with a standard deviation of 0.06?
- A. 30% and 70%
 - B. 50% and 50%
 - C. 60% and 40%
 - D. 40% and 60%
 - E. cannot be determined
34. A portfolio that has an expected outcome of \$115 is formed by
- A. investing \$100 in the risky asset.
 - B. investing \$80 in the risky asset and \$20 in the risk-free asset.
 - C. borrowing \$43 at the risk-free rate and investing the total amount (\$143) in the risky asset.
 - D. investing \$43 in the risky asset and \$57 in the riskless asset.
 - E. Such a portfolio cannot be formed.
35. The slope of the Capital Allocation Line formed with the risky asset and the risk-free asset is equal to
- A. 0.4667.
 - B. 0.8000.
 - C. 2.14.
 - D. 0.41667.
 - E. Cannot be determined.

36. Consider a T-bill with a rate of return of 5 percent and the following risky securities:

Security A: $E(r) = 0.15$; Variance = 0.04

Security B: $E(r) = 0.10$; Variance = 0.0225

Security C: $E(r) = 0.12$; Variance = 0.01

Security D: $E(r) = 0.13$; Variance = 0.0625

From which set of portfolios, formed with the T-bill and any one of the 4 risky securities, would a risk-averse investor always choose his portfolio?

- A. The set of portfolios formed with the T-bill and security A.
- B. The set of portfolios formed with the T-bill and security B.
- C. The set of portfolios formed with the T-bill and security C.
- D. The set of portfolios formed with the T-bill and security D.
- E. Cannot be determined.

You are considering investing \$1,000 in a T-bill that pays 0.05 and a risky portfolio, P, constructed with 2 risky securities, X and Y. The weights of X and Y in P are 0.60 and 0.40, respectively. X has an expected rate of return of 0.14 and variance of 0.01, and Y has an expected rate of return of 0.10 and a variance of 0.0081.

37. If you want to form a portfolio with an expected rate of return of 0.11, what percentages of your money must you invest in the T-bill and P, respectively?

- A. 0.25; 0.75
- B. 0.19; 0.81
- C. 0.65; 0.35
- D. 0.50; 0.50
- E. cannot be determined

38. If you want to form a portfolio with an expected rate of return of 0.10, what percentages of your money must you invest in the T-bill, X, and Y, respectively if you keep X and Y in the same proportions to each other as in portfolio P?

- A. 0.25; 0.45; 0.30
- B. 0.19; 0.49; 0.32
- C. 0.32; 0.41; 0.27
- D. 0.50; 0.30; 0.20
- E. cannot be determined

39. What would be the dollar values of your positions in X and Y, respectively, if you decide to hold 40% percent of your money in the risky portfolio and 60% in T-bills?

- A. \$240; \$360
- B. \$360; \$240
- C. \$100; \$240
- D. \$240; \$160
- E. Cannot be determined

40. What would be the dollar value of your positions in X, Y, and the T-bills, respectively, if you decide to hold a portfolio that has an expected outcome of \$1,200?
- A. Cannot be determined
 - B. \$54; \$568; \$378
 - C. \$568; \$54; \$378
 - D. \$378; \$54; \$568
 - E. \$108; \$514; \$378
41. A reward-to-volatility ratio is useful in:
- A. measuring the standard deviation of returns.
 - B. understanding how returns increase relative to risk increases.
 - C. analyzing returns on variable rate bonds.
 - D. assessing the effects of inflation.
 - E. none of the above.
42. The change from a straight to a kinked capital allocation line is a result of:
- A. reward-to-volatility ratio increasing.
 - B. borrowing rate exceeding lending rate.
 - C. an investor's risk tolerance decreasing.
 - D. increase in the portfolio proportion of the risk-free asset.
 - E. none of the above.
43. The first major step in asset allocation is:
- A. assessing risk tolerance.
 - B. analyzing financial statements.
 - C. estimating security betas.
 - D. identifying market anomalies.
 - E. none of the above.
44. Based on their relative degrees of risk tolerance
- A. investors will hold varying amounts of the risky asset in their portfolios.
 - B. all investors will have the same portfolio asset allocations.
 - C. investors will hold varying amounts of the risk-free asset in their portfolios.
 - D. A and C.
 - E. none of the above.
45. Asset allocation
- A. may involve the decision as to the allocation between a risk-free asset and a risky asset.
 - B. may involve the decision as to the allocation among different risky assets.
 - C. may involve considerable security analysis.
 - D. A and B.
 - E. A and C.

46. In the mean-standard deviation graph, the line that connects the risk-free rate and the optimal risky portfolio, P, is called _____.
- the Security Market Line
 - the Capital Allocation Line
 - the Indifference Curve
 - the investor's utility line
 - none of the above
47. Treasury bills are commonly viewed as risk-free assets because
- their short-term nature makes their values insensitive to interest rate fluctuations.
 - the inflation uncertainty over their time to maturity is negligible.
 - their term to maturity is identical to most investors' desired holding periods.
 - Both A and B are true.
 - Both B and C are true.

Your client, Bo Regard, holds a complete portfolio that consists of a portfolio of risky assets (P) and T-Bills. The information below refers to these assets.

E(R_p)	12.00%
Standard Deviation of P	7.20%
T-Bill rate	3.60%
Proportion of Complete Portfolio in P	80%
Proportion of Complete Portfolio in T-Bills	20%
Composition of P:	
Stock A	40.00%
Stock B	25.00%
Stock C	35.00%
Total	100.00%

48. What is the expected return on Bo's complete portfolio?
- 10.32%
 - 5.28%
 - 9.62%
 - 8.44%
 - 7.58%
49. What is the standard deviation of Bo's complete portfolio?
- 7.20%
 - 5.40%
 - 6.92%
 - 4.98%
 - 5.76%
50. What is the equation of Bo's Capital Allocation Line?
- $E(r_C) = 7.2 + 3.6 * \text{Standard Deviation of C}$
 - $E(r_C) = 3.6 + 1.167 * \text{Standard Deviation of C}$
 - $E(r_C) = 3.6 + 12.0 * \text{Standard Deviation of C}$
 - $E(r_C) = 0.2 + 1.167 * \text{Standard Deviation of C}$
 - $E(r_C) = 3.6 + 0.857 * \text{Standard Deviation of C}$

51. What are the proportions of Stocks A, B, and C, respectively in Bo's complete portfolio?
- 40%, 25%, 35%
 - 8%, 5%, 7%
 - 32%, 20%, 28%
 - 16%, 10%, 14%
 - 20%, 12.5%, 17.5%
52. To build an indifference curve we can first find the utility of a portfolio with 100% in the risk-free asset, then
- find the utility of a portfolio with 0% in the risk-free asset.
 - change the expected return of the portfolio and equate the utility to the standard deviation.
 - find another utility level with 0% risk.
 - change the standard deviation of the portfolio and find the expected return the investor would require to maintain the same utility level.
 - change the risk-free rate and find the utility level that results in the same standard deviation.
53. The Capital Market Line
- is a special case of the Capital Allocation Line.
 - represents the opportunity set of a passive investment strategy.
 - has the one-month T-Bill rate as its intercept.
 - uses a broad index of common stocks as its risky portfolio.
- I, III, and IV
 - II, III, and IV
 - III and IV
 - I, II, and III
 - I, II, III, and IV
54. An investor invests 40 percent of his wealth in a risky asset with an expected rate of return of 0.18 and a variance of 0.10 and 60 percent in a T-bill that pays 4 percent. His portfolio's expected return and standard deviation are _____ and _____, respectively.
- 0.114; 0.112
 - 0.087; 0.063
 - 0.096; 0.126
 - 0.087; 0.144
 - none of the above
55. An investor invests 70 percent of his wealth in a risky asset with an expected rate of return of 0.11 and a variance of 0.12 and 30 percent in a T-bill that pays 3 percent. His portfolio's expected return and standard deviation are _____ and _____, respectively.
- 0.086; 0.242
 - 0.087; 0.267
 - 0.295; 0.123
 - 0.087; 0.182
 - none of the above

You invest \$100 in a risky asset with an expected rate of return of 0.11 and a standard deviation of 0.20 and a T-bill with a rate of return of 0.03.

56. What percentages of your money must be invested in the risky asset and the risk-free asset, respectively, to form a portfolio with an expected return of 0.08?
- A. 85% and 15%
 - B. 75% and 25%
 - C. 62.5% and 37.5%
 - D. 57% and 43%
 - E. cannot be determined
57. What percentages of your money must be invested in the risk-free asset and the risky asset, respectively, to form a portfolio with a standard deviation of 0.08?
- A. 30% and 70%
 - B. 50% and 50%
 - C. 60% and 40%
 - D. 40% and 60%
 - E. Cannot be determined.
58. The slope of the Capital Allocation Line formed with the risky asset and the risk-free asset is equal to
- A. 0.47
 - B. 0.80
 - C. 2.14
 - D. 0.40
 - E. Cannot be determined.

You invest \$1000 in a risky asset with an expected rate of return of 0.17 and a standard deviation of 0.40 and a T-bill with a rate of return of 0.04.

59. What percentages of your money must be invested in the risky asset and the risk-free asset, respectively, to form a portfolio with an expected return of 0.11?
- A. 53.8% and 46.2%
 - B. 75% and 25%
 - C. 62.5% and 37.5%
 - D. 46.1% and 53.8%
 - E. Cannot be determined.
60. What percentages of your money must be invested in the risk-free asset and the risky asset, respectively, to form a portfolio with a standard deviation of 0.20?
- A. 30% and 70%
 - B. 50% and 50%
 - C. 60% and 40%
 - D. 40% and 60%
 - E. Cannot be determined.
61. The slope of the Capital Allocation Line formed with the risky asset and the risk-free asset is equal to
- A. 0.325.
 - B. 0.675.
 - C. 0.912.
 - D. 0.407.
 - E. Cannot be determined.

You invest \$100 in a risky asset with an expected rate of return of 0.11 and a standard deviation of 0.21 and a T-bill with a rate of return of 0.045.

62. What percentages of your money must be invested in the risky asset and the risk-free asset, respectively, to form a portfolio with an expected return of 0.13?
- A. 130.77% and -30.77%
 - B. -30.77% and 130.77%
 - C. 67.67% and 33.33%
 - D. 57.75% and 42.25%
 - E. cannot be determined
63. What percentages of your money must be invested in the risk-free asset and the risky asset, respectively, to form a portfolio with a standard deviation of 0.08?
- A. 301% and 69.9%
 - B. 50.5% and 49.50%
 - C. 60.0% and 40.0%
 - D. 38.1% and 61.9%
 - E. cannot be determined
64. A portfolio that has an expected outcome of \$114 is formed by
- A. investing \$100 in the risky asset.
 - B. investing \$80 in the risky asset and \$20 in the risk-free asset.
 - C. borrowing \$46 at the risk-free rate and investing the total amount (\$146) in the risky asset.
 - D. investing \$43 in the risky asset and \$57 in the riskless asset.
 - E. Such a portfolio cannot be formed.
65. The slope of the Capital Allocation Line formed with the risky asset and the risk-free asset is equal to
- A. 0.4667.
 - B. 0.8000.
 - C. 0.3095.
 - D. 0.41667.
 - E. Cannot be determined.
66. Discuss the differences between investors who are **risk averse, risk neutral, and risk loving**.

67. In the utility function: $U = E(r) - 0.005As^2$, what is the significance of "A"?
68. What is a fair game? Explain how the term relates to a risk-averse investor's attitude toward speculation and risk and how the utility function reflects this attitude.
69. Draw graphs that represent indifference curves for the following investors: Harry, who is a risk-averse investor; Eddie, who is a risk-neutral investor; and Ozzie, who is a risk-loving investor. Discuss the nature of each curve and the reasons for its shape.
70. Toby and Hannah are two risk-averse investors. Toby is more risk-averse than Hannah. Draw one indifference curve for Toby and one indifference curve for Hannah on the same graph. Show how these curves illustrate their relative levels of risk aversion.

71. Discuss the characteristics of **indifference curves**, and the theoretical value of these curves in the portfolio building process
72. Describe how an investor may combine a risk-free asset and one risky asset in order to obtain the optimal portfolio for that investor.
73. The optimal proportion of the risky asset in the complete portfolio is given by the equation $y^* = [E(r_P) - r_f] / (.01A * \text{Variance of } P)$. For each of the variables on the right side of the equation, discuss the impact the variable's effect on y^* and why the nature of the relationship makes sense intuitively. Assume the investor is risk averse.

74. You are evaluating two investment alternatives. One is a passive market portfolio with an expected return of 10% and a standard deviation of 16%. The other is a fund that is actively managed by your broker. This fund has an expected return of 15% and a standard deviation of 20%. The risk-free rate is currently 7%. Answer the questions below based on this information.
- What is the slope of the Capital Market Line?
 - What is the slope of the Capital Allocation Line offered by your broker's fund?
 - Draw the CML and the CAL on one graph.
 - What is the maximum fee your broker could charge and still leave you as well off as if you had invested in the passive market fund? (Assume that the fee would be a percentage of the investment in the broker's fund, and would be deducted at the end of the year.)
 - How would it affect the graph if the broker were to charge the full amount of the fee?

ch6 Key

1. Which of the following statements regarding risk-averse investors is **true**?

- A. They only care about the rate of return.
- B. They accept investments that are fair games.
- C.** They only accept risky investments that offer risk premiums over the risk-free rate.
- D. They are willing to accept lower returns and high risk.
- E. A and B.

Risk-averse investors only accept risky investments that offer risk premiums over the risk-free rate.

*Bodie - Chapter 06 #1
Difficulty: Moderate*

2. Which of the following statements is (are) **true**?

- I) Risk-averse investors reject investments that are fair games.
- II) Risk-neutral investors judge risky investments only by the expected returns.
- III) Risk-averse investors judge investments only by their riskiness.
- IV) Risk-loving investors will not engage in fair games.

- A. I only
- B. II only
- C.** I and II only
- D. II and III only
- E. II, III, and IV only

Risk-averse investors consider a risky investment only if the investment offers a risk premium. Risk-neutral investors look only at expected returns when making an investment decision.

*Bodie - Chapter 06 #2
Difficulty: Moderate*

3. Which of the following statements is (are) **false**?
- I) Risk-averse investors reject investments that are fair games.
 - II) Risk-neutral investors judge risky investments only by the expected returns.
 - III) Risk-averse investors judge investments only by their riskiness.
 - IV) Risk-loving investors will not engage in fair games.
- A. I only
 - B. II only
 - C. I and II only
 - D. II and III only
 - E. III, and IV only**

Risk-averse investors consider a risky investment only if the investment offers a risk premium. Risk-neutral investors look only at expected returns when making an investment decision.

*Bodie - Chapter 06 #3
Difficulty: Moderate*

4. In the mean-standard deviation graph an indifference curve has a _____ slope.
- A. negative
 - B. zero
 - C. positive**
 - D. northeast
 - E. cannot be determined

The risk-return trade-off is one in which greater risk is taken if greater returns can be expected, resulting in a positive slope.

*Bodie - Chapter 06 #4
Difficulty: Easy*

5. In the mean-standard deviation graph, which one of the following statements is **true** regarding the indifference curve of a risk-averse investor?
- A. It is the locus of portfolios that have the same expected rates of return and different standard deviations.
 - B. It is the locus of portfolios that have the same standard deviations and different rates of return.
 - C. It is the locus of portfolios that offer the same utility according to returns and standard deviations.**
 - D. It connects portfolios that offer increasing utilities according to returns and standard deviations.
 - E. none of the above.

Indifference curves plot trade-off alternatives that provide equal utility to the individual (in this case, the trade-offs are the risk-return characteristics of the portfolios).

*Bodie - Chapter 06 #5
Difficulty: Moderate*

6. In a return-standard deviation space, which of the following statements is (are) **true** for risk-averse investors? (The vertical and horizontal lines are referred to as the expected return-axis and the standard deviation-axis, respectively.)
- I) An investor's own indifference curves might intersect.
 - II) Indifference curves have negative slopes.
 - III) In a set of indifference curves, the highest offers the greatest utility.
 - IV) Indifference curves of two investors might intersect.
- A. I and II only
 - B. II and III only
 - C. I and IV only
 - D. III and IV only**
 - E. none of the above

An investor's indifference curves are parallel, and thus cannot intersect and have positive slopes. The highest indifference curve (the one in the most northwestern position) offers the greatest utility. Indifference curves of investors with similar risk-return trade-offs might intersect.

*Bodie - Chapter 06 #6
Difficulty: Moderate*

7. Elias is a risk-averse investor. David is a less risk-averse investor than Elias. Therefore,
- A. for the same risk, David requires a higher rate of return than Elias.
 - B. for the same return, Elias tolerates higher risk than David.
 - C. for the same risk, Elias requires a lower rate of return than David.
 - D. for the same return, David tolerates higher risk than Elias.**
 - E. cannot be determined.

The more risk averse the investor, the less risk that is tolerated, given a rate of return.

*Bodie - Chapter 06 #7
Difficulty: Moderate*

8. When an investment advisor attempts to determine an investor's risk tolerance, which factor would they be **least** likely to assess?
- A. the investor's prior investing experience
 - B. the investor's degree of financial security
 - C. the investor's tendency to make risky or conservative choices
 - D. the level of return the investor prefers**
 - E. the investor's feeling about loss

Investment advisors would be **least** likely to assess the level of return the investor prefers. The investors investing experience, financial security, feelings about loss, and disposition toward risky or conservative choices will impact risk tolerance.

*Bodie - Chapter 06 #8
Difficulty: Moderate*

Assume an investor with the following utility function: $U = E(r) - 3/2(s^2)$.

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9. To maximize her expected utility, she would choose the asset with an expected rate of return of _____ and a standard deviation of _____, respectively.
- A. 12%; 20%
 - B. 10%; 15%
 - C. 10%; 10%**
 - D. 8%; 10%
 - E. none of the above

$$U = 0.10 - 3/2(0.10)^2 = 8.5\%; \text{ highest utility of choices.}$$

*Bodie - Chapter 06 #9
Difficulty: Moderate*

10. To maximize her expected utility, which one of the following investment alternatives would she choose?
- A. A portfolio that pays 10 percent with a 60 percent probability or 5 percent with 40 percent probability.
 - B. A portfolio that pays 10 percent with 40 percent probability or 5 percent with a 60 percent probability.
 - C. A portfolio that pays 12 percent with 60 percent probability or 5 percent with 40 percent probability.**
 - D. A portfolio that pays 12 percent with 40 percent probability or 5 percent with 60 percent probability.
 - E. none of the above.

$$U(c) = 9.02\%; \text{ highest utility of possibilities.}$$

*Bodie - Chapter 06 #10
Difficulty: Difficult*

11. A portfolio has an expected rate of return of 0.15 and a standard deviation of 0.15. The risk-free rate is 6 percent. An investor has the following utility function: $U = E(r) - (A/2)s^2$. Which value of A makes this investor indifferent between the risky portfolio and the risk-free asset?
- A. 5
 - B. 6
 - C. 7
 - D. 8**
 - E. none of the above

$$0.06 = 0.15 - A/2(0.15)^2; 0.06 - 0.15 = -A/2(0.0225); -0.09 = -0.01125A; A = 8; U = 0.15 - 8/2(0.15)^2 = 6\%; U(R_f) = 6\%.$$

*Bodie - Chapter 06 #11
Difficulty: Difficult*

12. According to the mean-variance criterion, which one of the following investments dominates all others?

- A. $E(r) = 0.15$; Variance = 0.20
- B. $E(r) = 0.10$; Variance = 0.20
- C. $E(r) = 0.10$; Variance = 0.25
- D. $E(r) = 0.15$; Variance = 0.25
- E. none of these is dominates the other alternatives.

A gives the highest return with the least risk; return per unit of risk is .75, which dominates the reward-risk ratio for the other choices.

*Bodie - Chapter 06 #12
Difficulty: Difficult*

13. Consider a risky portfolio, A, with an expected rate of return of 0.15 and a standard deviation of 0.15, that lies on a given indifference curve. Which one of the following portfolios might lie on the same indifference curve?

- A. $E(r) = 0.15$; Standard deviation = 0.20
- B. $E(r) = 0.15$; Standard deviation = 0.10
- C. $E(r) = 0.10$; Standard deviation = 0.10
- D. $E(r) = 0.20$; Standard deviation = 0.15
- E. $E(r) = 0.10$; Standard deviation = 0.20

Portfolio A has a reward to risk ratio of 1.0; portfolio C is the only choice with the same risk-return tradeoff.

*Bodie - Chapter 06 #13
Difficulty: Difficult*

Investment	Expected Return $E(r)$	Standard Deviation
1	0.12	0.3
2	0.15	0.5
3	0.21	0.16
4	0.24	0.21

$$U = E(r) - (A/2)s^2, \text{ where } A = 4.0.$$

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14. Based on the utility function above, which investment would you select?

- A. 1
- B. 2
- C. 3
- D. 4
- E. cannot tell from the information given

$$U(c) = 0.21 - 4/2(0.16)^2 = 15.88 \text{ (highest utility of choices).}$$

*Bodie - Chapter 06 #14
Difficulty: Difficult*

15. Which investment would you select if you were risk neutral?

- A. 1
- B. 2
- C. 3
- D.** 4
- E. cannot tell from the information given

If you are risk neutral, your only concern is with return, not risk.

*Bodie - Chapter 06 #15
Difficulty: Difficult*

16. The variable (A) in the utility function represents the:

- A. investor's return requirement.
- B.** investor's aversion to risk.
- C. certainty-equivalent rate of the portfolio.
- D. minimum required utility of the portfolio.
- E. none of the above.

A is an arbitrary scale factor used to measure investor risk tolerance. The higher the value of A, the more risk averse the investor.

*Bodie - Chapter 06 #16
Difficulty: Moderate*

17. The exact indifference curves of different investors

- A. cannot be known with perfect certainty.
- B. can be calculated precisely with the use of advanced calculus.
- C. although not known with perfect certainty, do allow the advisor to create more suitable portfolios for the client.
- D.** A and C.
- E. none of the above.

Indifference curves cannot be calculated precisely, but the theory does allow for the creation of more suitable portfolios for investors of differing levels of risk tolerance.

*Bodie - Chapter 06 #17
Difficulty: Easy*

18. The riskiness of individual assets
- A. should be considered for the asset in isolation.
 - B. should be considered in the context of the effect on overall portfolio volatility.
 - C combined with the riskiness of other individual assets (in the proportions these assets constitute of the . entire portfolio) should be the relevant risk measure.
 - D.** B and C.
 - E. none of the above.

The relevant risk is portfolio risk; thus, the riskiness of an individual security should be considered in the context of the portfolio as a whole.

*Bodie - Chapter 06 #18
Difficulty: Easy*

19. A fair game
- A. will not be undertaken by a risk-averse investor.
 - B. is a risky investment with a zero risk premium.
 - C. is a riskless investment.
 - D.** Both A and B are true.
 - E. Both A and C are true.

A fair game is a risky investment with a payoff exactly equal to its expected value. Since it offers no risk premium, it will not be acceptable to a risk-averse investor.

*Bodie - Chapter 06 #19
Difficulty: Moderate*

20. The presence of risk means that
- A. investors will lose money.
 - B.** more than one outcome is possible.
 - C. the standard deviation of the payoff is larger than its expected value.
 - D. final wealth will be greater than initial wealth.
 - E. terminal wealth will be less than initial wealth.

The presence of risk means that more than one outcome is possible.

*Bodie - Chapter 06 #20
Difficulty: Easy*

21. The utility score an investor assigns to a particular portfolio, other things equal,
- A. will decrease as the rate of return increases.
 - B. will decrease as the standard deviation increases.
 - C. will decrease as the variance increases.
 - D. will increase as the variance increases.
 - E.** will increase as the rate of return increases.

Utility is enhanced by higher expected returns and diminished by higher risk.

*Bodie - Chapter 06 #21
Difficulty: Easy*

22. The certainty equivalent rate of a portfolio is
- A.** the rate that a risk-free investment would need to offer with certainty to be considered equally attractive as the risky portfolio.
 - B. the rate that the investor must earn for certain to give up the use of his money.
 - C. the minimum rate guaranteed by institutions such as banks.
 - D. the rate that equates "A" in the utility function with the average risk aversion coefficient for all risk-averse investors.
 - E. represented by the scaling factor "-.005" in the utility function.

The certainty equivalent rate of a portfolio is the rate that a risk-free investment would need to offer with certainty to be considered equally attractive as the risky portfolio.

*Bodie - Chapter 06 #22
Difficulty: Moderate*

23. According to the mean-variance criterion, which of the statements below is correct?

Investment	E(r)	Standard Deviation
A	10%	5%
B	21%	11%
C	18%	23%
D	24%	16%

- A. Investment B dominates Investment A.
- B.** Investment B dominates Investment C.
- C. Investment D dominates all of the other investments.
- D. Investment D dominates only Investment B.
- E. Investment C dominates investment A.

This question tests the student's understanding of how to apply the mean-variance criterion.

*Bodie - Chapter 06 #23
Difficulty: Moderate*

24. Steve is more risk-averse than Edie. On a graph that shows Steve and Edie's indifference curves, which of the following is true? Assume that the graph shows expected return on the vertical axis and standard deviation on the horizontal axis.
- I) Steve and Edie's indifference curves might intersect.
 - II) Steve's indifference curves will have flatter slopes than Edie's.
 - III) Steve's indifference curves will have steeper slopes than Edie's.
 - IV) Steve and Edie's indifference curves will not intersect.
 - V) Steve's indifference curves will be downward sloping and Edie's will be upward sloping.
- A. I and V
B. I and III
C. III and IV
D. I and II
E. II and IV

This question tests whether the student understands the graphical properties of indifference curves and how they relate to the degree of risk tolerance.

*Bodie - Chapter 06 #24
Difficulty: Moderate*

25. The Capital Allocation Line can be described as the
- A.** investment opportunity set formed with a risky asset and a risk-free asset.
 - B. investment opportunity set formed with two risky assets.
 - C. line on which lie all portfolios that offer the same utility to a particular investor.
 - D. line on which lie all portfolios with the same expected rate of return and different standard deviations.
 - E. none of the above.

The CAL has an intercept equal to the risk-free rate. It is a straight line through the point representing the risk-free asset and the risky portfolio, in expected-return/standard deviation space.

*Bodie - Chapter 06 #25
Difficulty: Moderate*

26. Which of the following statements regarding the Capital Allocation Line (CAL) is **false**?
- A. The CAL shows risk-return combinations.
 - B. The slope of the CAL equals the increase in the expected return of a risky portfolio per unit of additional standard deviation.
 - C. The slope of the CAL is also called the reward-to-volatility ratio.
 - D.** The CAL is also called the efficient frontier of risky assets in the absence of a risk-free asset.
 - E. Both A and D are true.

The CAL consists of combinations of a risky asset and a risk-free asset whose slope is the reward-to-volatility ratio; thus, all statements except d are true.

*Bodie - Chapter 06 #26
Difficulty: Moderate*

27. Given the capital allocation line, an investor's optimal portfolio is the portfolio that

- A. maximizes her expected profit.
- B. maximizes her risk.
- C. minimizes both her risk and return.
- D.** maximizes her expected utility.
- E. none of the above.

By maximizing expected utility, the investor is obtaining the best risk-return relationships possible and acceptable for her.

*Bodie - Chapter 06 #27
Difficulty: Moderate*

28. An investor invests 30 percent of his wealth in a risky asset with an expected rate of return of 0.15 and a variance of 0.04 and 70 percent in a T-bill that pays 6 percent. His portfolio's expected return and standard deviation are _____ and _____, respectively.

- A. 0.114; 0.12
- B.** 0.087; 0.06
- C. 0.295; 0.12
- D. 0.087; 0.12
- E. none of the above

$$E(r_p) = 0.3(15\%) + 0.7(6\%) = 8.7\%; \quad s_p = 0.3(0.04)^{1/2} = 6\%.$$

*Bodie - Chapter 06 #28
Difficulty: Moderate*

29. An investor invests 30 percent of his wealth in a risky asset with an expected rate of return of 0.13 and a variance of 0.03 and 70 percent in a T-bill that pays 6 percent. His portfolio's expected return and standard deviation are _____ and _____, respectively.

- A. 0.114; 0.128
- B. 0.087; 0.063
- C. 0.295; 0.125
- D.** 0.081; 0.052
- E. none of the above

$$E(r_p) = 0.3(13\%) + 0.7(6\%) = 8.1\%; \quad s_p = 0.3(0.03)^{1/2} = 5.19\%.$$

*Bodie - Chapter 06 #29
Difficulty: Moderate*

30. An investor invests 40 percent of his wealth in a risky asset with an expected rate of return of 0.17 and a variance of 0.08 and 60 percent in a T-bill that pays 4.5 percent. His portfolio's expected return and standard deviation are _____ and _____, respectively.
- A. 0.114; 0.126
 B. 0.087; 0.068
C. 0.095; 0.113
 D. 0.087; 0.124
 E. none of the above

$$E(r_P) = 0.4(17\%) + 0.6(4.5\%) = 9.5\%; \quad s_P = 0.4(0.08)^{1/2} = 11.31\%.$$

*Bodie - Chapter 06 #30
 Difficulty: Moderate*

31. An investor invests 70 percent of his wealth in a risky asset with an expected rate of return of 0.15 and a variance of 0.04 and 30 percent in a T-bill that pays 5 percent. His portfolio's expected return and standard deviation are _____ and _____, respectively.
- A. 0.120; 0.14**
 B. 0.087; 0.06
 C. 0.295; 0.12
 D. 0.087; 0.12
 E. none of the above

$$E(r_P) = 0.7(15\%) + 0.3(5\%) = 12.0\%; \quad s_P = 0.7(0.04)^{1/2} = 14\%.$$

*Bodie - Chapter 06 #31
 Difficulty: Moderate*

You invest \$100 in a risky asset with an expected rate of return of 0.12 and a standard deviation of 0.15 and a T-bill with a rate of return of 0.05.

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32. What percentages of your money must be invested in the risky asset and the risk-free asset, respectively, to form a portfolio with an expected return of 0.09?
- A. 85% and 15%
 B. 75% and 25%
 C. 67% and 33%
D. 57% and 43%
 E. cannot be determined

$$9\% = w_1(12\%) + (1 - w_1)(5\%); \quad 9\% = 12\%w_1 + 5\% - 5\%w_1; \quad 4\% = 7\%w_1; \quad w_1 = 0.57; \quad 1 - w_1 = 0.43; \\ 0.57(12\%) + 0.43(5\%) = 8.99\%.$$

*Bodie - Chapter 06 #32
 Difficulty: Moderate*

33. What percentages of your money must be invested in the risk-free asset and the risky asset, respectively, to form a portfolio with a standard deviation of 0.06?
- A. 30% and 70%
 - B. 50% and 50%
 - C. 60% and 40%**
 - D. 40% and 60%
 - E. cannot be determined

$$0.06 = x(0.15); x = 40\% \text{ in risky asset.}$$

*Bodie - Chapter 06 #33
Difficulty: Moderate*

34. A portfolio that has an expected outcome of \$115 is formed by
- A. investing \$100 in the risky asset.
 - B. investing \$80 in the risky asset and \$20 in the risk-free asset.
 - C. borrowing \$43 at the risk-free rate and investing the total amount (\$143) in the risky asset.**
 - D. investing \$43 in the risky asset and \$57 in the riskless asset.
 - E. Such a portfolio cannot be formed.

$$\text{For } \$100, (115 - 100)/100 = 15\%; .15 = w_1(.12) + (1 - w_1)(.05); .15 = .12w_1 + .05 - .05w_1; 0.10 = 0.07w_1; w_1 = 1.43(\$100) = \$143; (1 - w_1)\$100 = -\$43.$$

*Bodie - Chapter 06 #34
Difficulty: Difficult*

35. The slope of the Capital Allocation Line formed with the risky asset and the risk-free asset is equal to
- A. 0.4667.**
 - B. 0.8000.
 - C. 2.14.
 - D. 0.41667.
 - E. Cannot be determined.

$$(0.12 - 0.05)/0.15 = 0.4667.$$

*Bodie - Chapter 06 #35
Difficulty: Moderate*

36. Consider a T-bill with a rate of return of 5 percent and the following risky securities:
 Security A: $E(r) = 0.15$; Variance = 0.04
 Security B: $E(r) = 0.10$; Variance = 0.0225
 Security C: $E(r) = 0.12$; Variance = 0.01
 Security D: $E(r) = 0.13$; Variance = 0.0625
 From which set of portfolios, formed with the T-bill and any one of the 4 risky securities, would a risk-averse investor always choose his portfolio?
- A. The set of portfolios formed with the T-bill and security A.
 B. The set of portfolios formed with the T-bill and security B.
C. The set of portfolios formed with the T-bill and security C.
 D. The set of portfolios formed with the T-bill and security D.
 E. Cannot be determined.

Security C has the highest reward-to-volatility ratio.

*Bodie - Chapter 06 #36
 Difficulty: Difficult*

You are considering investing \$1,000 in a T-bill that pays 0.05 and a risky portfolio, P, constructed with 2 risky securities, X and Y. The weights of X and Y in P are 0.60 and 0.40, respectively. X has an expected rate of return of 0.14 and variance of 0.01, and Y has an expected rate of return of 0.10 and a variance of 0.0081.

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37. If you want to form a portfolio with an expected rate of return of 0.11, what percentages of your money must you invest in the T-bill and P, respectively?
- A. 0.25; 0.75
B. 0.19; 0.81
 C. 0.65; 0.35
 D. 0.50; 0.50
 E. cannot be determined

$E(r_p) = 0.6(14\%) + 0.4(10\%) = 12.4\%$; $11\% = 5x + 12.4(1 - x)$; $x = 0.189$ (T-bills) $(1-x) = 0.811$ (risky asset).

*Bodie - Chapter 06 #37
 Difficulty: Moderate*

38. If you want to form a portfolio with an expected rate of return of 0.10, what percentages of your money must you invest in the T-bill, X, and Y, respectively if you keep X and Y in the same proportions to each other as in portfolio P?
- A. 0.25; 0.45; 0.30
 B. 0.19; 0.49; 0.32
C. 0.32; 0.41; 0.27
 D. 0.50; 0.30; 0.20
 E. cannot be determined

$E(r_p) = .10 = 5w + 12.4(1 - w)$; $w = 0.32$ (weight of T-bills); As composition of X and Y are .6 and .4 of P, respectively, then for 0.68 weight in P, the respective weights must be 0.41 and 0.27; $.6(.68) = 41\%$; $.4(.68) = 27\%$

*Bodie - Chapter 06 #38
 Difficulty: Difficult*

39. What would be the dollar values of your positions in X and Y, respectively, if you decide to hold 40% percent of your money in the risky portfolio and 60% in T-bills?
- A. \$240; \$360
 B. \$360; \$240
 C. \$100; \$240
D. \$240; \$160
 E. Cannot be determined

$\$400(0.6) = \240 in X; $\$400(0.4) = \160 in Y.

*Bodie - Chapter 06 #39
 Difficulty: Moderate*

40. What would be the dollar value of your positions in X, Y, and the T-bills, respectively, if you decide to hold a portfolio that has an expected outcome of \$1,200?
- A. Cannot be determined
B. \$54; \$568; \$378
 C. \$568; \$54; \$378
 D. \$378; \$54; \$568
 E. \$108; \$514; \$378

$(\$1,200 - \$1,000)/\$1,000 = 12\%$; $(0.6)14\% + (0.4)10\% = 12.4\%$; $12\% = w5\% + 12.4\%(1 - w)$; $w = .054$; $1 - w = .946$; $w = 0.054(\$1,000) = \54 (T-bills); $1 - w = 1 - 0.054 = 0.946(\$1,000) = \$946$; $\$946 \times 0.6 = \568 in X; $\$946 \times 0.4 = \378 in Y.

*Bodie - Chapter 06 #40
 Difficulty: Difficult*

41. A reward-to-volatility ratio is useful in:
- A. measuring the standard deviation of returns.
 - B.** understanding how returns increase relative to risk increases.
 - C. analyzing returns on variable rate bonds.
 - D. assessing the effects of inflation.
 - E. none of the above.

B is the only choice relevant to the reward-to-volatility ratio (risk and return).

*Bodie - Chapter 06 #41
Difficulty: Moderate*

42. The change from a straight to a kinked capital allocation line is a result of:
- A. reward-to-volatility ratio increasing.
 - B.** borrowing rate exceeding lending rate.
 - C. an investor's risk tolerance decreasing.
 - D. increase in the portfolio proportion of the risk-free asset.
 - E. none of the above.

The linear capital allocation line assumes that the investor may borrow and lend at the same rate (the risk-free rate), which obviously is not true. Relaxing this assumption and incorporating the higher borrowing rates into the model results in the kinked capital allocation line.

*Bodie - Chapter 06 #42
Difficulty: Difficult*

43. The first major step in asset allocation is:
- A.** assessing risk tolerance.
 - B. analyzing financial statements.
 - C. estimating security betas.
 - D. identifying market anomalies.
 - E. none of the above.

A should be the first consideration in asset allocation. B, C, and D refer to security selection.

*Bodie - Chapter 06 #43
Difficulty: Moderate*

44. Based on their relative degrees of risk tolerance
- A. investors will hold varying amounts of the risky asset in their portfolios.
 - B. all investors will have the same portfolio asset allocations.
 - C. investors will hold varying amounts of the risk-free asset in their portfolios.
 - D.** A and C.
 - E. none of the above.

By determining levels of risk tolerance, investors can select the optimum portfolio for their own needs; these asset allocations will vary between amounts of risk-free and risky assets based on risk tolerance.

*Bodie - Chapter 06 #44
Difficulty: Easy*

45. Asset allocation
- A. may involve the decision as to the allocation between a risk-free asset and a risky asset.
 - B. may involve the decision as to the allocation among different risky assets.
 - C. may involve considerable security analysis.
 - D.** A and B.
 - E. A and C.

A and B are possible steps in asset allocation. C is related to security selection.

*Bodie - Chapter 06 #45
Difficulty: Easy*

46. In the mean-standard deviation graph, the line that connects the risk-free rate and the optimal risky portfolio, P, is called _____.
- A. the Security Market Line
 - B.** the Capital Allocation Line
 - C. the Indifference Curve
 - D. the investor's utility line
 - E. none of the above

The Capital Allocation Line (CAL) illustrates the possible combinations of a risk-free asset and a risky asset available to the investor.

*Bodie - Chapter 06 #46
Difficulty: Moderate*

47. Treasury bills are commonly viewed as risk-free assets because

- A. their short-term nature makes their values insensitive to interest rate fluctuations.
- B. the inflation uncertainty over their time to maturity is negligible.
- C. their term to maturity is identical to most investors' desired holding periods.
- D. Both A and B are true.**
- E. Both B and C are true.

Treasury bills do not exactly match most investor's desired holding periods, but because they mature in only a few weeks or months they are relatively free of interest rate sensitivity and inflation uncertainty.

*Bodie - Chapter 06 #47
Difficulty: Easy*

Your client, Bo Regard, holds a complete portfolio that consists of a portfolio of risky assets (P) and T-Bills. The information below refers to these assets.

$E(R_p)$	12.00%
Standard Deviation of P	7.20%
T-Bill rate	3.60%
Proportion of Complete Portfolio in P	80%
Proportion of Complete Portfolio in T-Bills	20%
Composition of P:	
Stock A	40.00%
Stock B	25.00%
Stock C	35.00%
Total	100.00%

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48. What is the expected return on Bo's complete portfolio?

- A. 10.32%**
- B. 5.28%
- C. 9.62%
- D. 8.44%
- E. 7.58%

$$E(r_C) = .8 * 12.00\% + .2 * 3.6\% = 10.32\%$$

*Bodie - Chapter 06 #48
Difficulty: Easy*

49. What is the standard deviation of Bo's complete portfolio?

- A. 7.20%
- B. 5.40%
- C. 6.92%
- D. 4.98%
- E. 5.76%**

$$\text{Std. Dev. of C} = .8 * 7.20\% = 5.76\%$$

*Bodie - Chapter 06 #49
Difficulty: Easy*

50. What is the equation of Bo's Capital Allocation Line?

- A. $E(r_C) = 7.2 + 3.6 * \text{Standard Deviation of C}$
- B. $E(r_C) = 3.6 + 1.167 * \text{Standard Deviation of C}$**
- C. $E(r_C) = 3.6 + 12.0 * \text{Standard Deviation of C}$
- D. $E(r_C) = 0.2 + 1.167 * \text{Standard Deviation of C}$
- E. $E(r_C) = 3.6 + 0.857 * \text{Standard Deviation of C}$

The intercept is the risk-free rate (3.60%) and the slope is $(12.00\% - 3.60\%) / 7.20\% = 1.167$.

*Bodie - Chapter 06 #50
Difficulty: Moderate*

51. What are the proportions of Stocks A, B, and C, respectively in Bo's complete portfolio?

- A. 40%, 25%, 35%
- B. 8%, 5%, 7%
- C. 32%, 20%, 28%**
- D. 16%, 10%, 14%
- E. 20%, 12.5%, 17.5%

Proportion in A = $.8 * 40\% = 32\%$; proportion in B = $.8 * 25\% = 20\%$; proportion in C = $.8 * 35\% = 28\%$.

*Bodie - Chapter 06 #51
Difficulty: Moderate*

52. To build an indifference curve we can first find the utility of a portfolio with 100% in the risk-free asset, then
- A. find the utility of a portfolio with 0% in the risk-free asset.
 - B. change the expected return of the portfolio and equate the utility to the standard deviation.
 - C. find another utility level with 0% risk.
 - D** change the standard deviation of the portfolio and find the expected return the investor would require to maintain the same utility level.
 - E. change the risk-free rate and find the utility level that results in the same standard deviation.

This references the procedure described on page 207-208 of the text. The authors describe how to trace out indifference curves using a spreadsheet.

*Bodie - Chapter 06 #52
Difficulty: Difficult*

53. The Capital Market Line
- I) is a special case of the Capital Allocation Line.
 - II) represents the opportunity set of a passive investment strategy.
 - III) has the one-month T-Bill rate as its intercept.
 - IV) uses a broad index of common stocks as its risky portfolio.
- A. I, III, and IV
 - B. II, III, and IV
 - C. III and IV
 - D. I, II, and III
 - E.** I, II, III, and IV

‘The Capital Market Line is the Capital Allocation Line based on the one-month T-Bill rate and a broad index of common stocks. It applies to an investor pursuing a passive management strategy.

*Bodie - Chapter 06 #53
Difficulty: Moderate*

54. An investor invests 40 percent of his wealth in a risky asset with an expected rate of return of 0.18 and a variance of 0.10 and 60 percent in a T-bill that pays 4 percent. His portfolio's expected return and standard deviation are _____ and _____, respectively.
- A. 0.114; 0.112
 - B. 0.087; 0.063
 - C.** 0.096; 0.126
 - D. 0.087; 0.144
 - E. none of the above

$$E(r_p) = 0.4(18\%) + 0.6(4\%) = 9.6\%; \quad s_p = 0.4(0.10)^{1/2} = 12.6\%.$$

*Bodie - Chapter 06 #54
Difficulty: Moderate*

55. An investor invests 70 percent of his wealth in a risky asset with an expected rate of return of 0.11 and a variance of 0.12 and 30 percent in a T-bill that pays 3 percent. His portfolio's expected return and standard deviation are _____ and _____, respectively.

- A. 0.086; 0.242
- B. 0.087; 0.267
- C. 0.295; 0.123
- D. 0.087; 0.182
- E. none of the above

$$E(r_P) = 0.7(11\%) + 0.3(3\%) = 8.6\%; \quad s_P = 0.7(0.12)^{1/2} = 24.2\%.$$

*Bodie - Chapter 06 #55
Difficulty: Moderate*

You invest \$100 in a risky asset with an expected rate of return of 0.11 and a standard deviation of 0.20 and a T-bill with a rate of return of 0.03.

Bodie - Chapter 06

56. What percentages of your money must be invested in the risky asset and the risk-free asset, respectively, to form a portfolio with an expected return of 0.08?

- A. 85% and 15%
- B. 75% and 25%
- C. 62.5% and 37.5%
- D. 57% and 43%
- E. cannot be determined

$$8\% = w_1(11\%) + (1 - w_1)(3\%); \quad 8\% = 11\%w_1 + 3\% - 3\%w_1; \quad 5\% = 8\%w_1; \quad w_1 = 0.625; \quad 1 - w_1 = 0.375; \\ 0.625(11\%) + 0.375(3\%) = 8.0\%.$$

*Bodie - Chapter 06 #56
Difficulty: Moderate*

57. What percentages of your money must be invested in the risk-free asset and the risky asset, respectively, to form a portfolio with a standard deviation of 0.08?

- A. 30% and 70%
- B. 50% and 50%
- C. 60% and 40%
- D. 40% and 60%
- E. Cannot be determined.

$$0.08 = x(0.20); \quad x = 40\% \text{ in risky asset.}$$

*Bodie - Chapter 06 #57
Difficulty: Moderate*

58. The slope of the Capital Allocation Line formed with the risky asset and the risk-free asset is equal to
- A. 0.47
 - B. 0.80
 - C. 2.14
 - D. 0.40**
 - E. Cannot be determined.

$$(0.11 - 0.03)/0.20 = 0.40.$$

*Bodie - Chapter 06 #58
Difficulty: Moderate*

You invest \$1000 in a risky asset with an expected rate of return of 0.17 and a standard deviation of 0.40 and a T-bill with a rate of return of 0.04.

Bodie - Chapter 06

59. What percentages of your money must be invested in the risky asset and the risk-free asset, respectively, to form a portfolio with an expected return of 0.11?
- A. 53.8% and 46.2%**
 - B. 75% and 25%
 - C. 62.5% and 37.5%
 - D. 46.1% and 53.8%
 - E. Cannot be determined.

$$11\% = w_1(17\%) + (1 - w_1)(4\%); 11\% = 17\%w_1 + 4\% - 4\%w_1; 7\% = 13\%w_1; w_1 = 0.538; 1 - w_1 = 0.461; 0.538(17\%) + 0.462(4\%) = 11.0\%.$$

*Bodie - Chapter 06 #59
Difficulty: Moderate*

60. What percentages of your money must be invested in the risk-free asset and the risky asset, respectively, to form a portfolio with a standard deviation of 0.20?
- A. 30% and 70%
 - B. 50% and 50%**
 - C. 60% and 40%
 - D. 40% and 60%
 - E. Cannot be determined.

$$0.20 = x(0.40); x = 50\% \text{ in risky asset.}$$

*Bodie - Chapter 06 #60
Difficulty: Moderate*

61. The slope of the Capital Allocation Line formed with the risky asset and the risk-free asset is equal to

- A.** 0.325.
- B. 0.675.
- C. 0.912.
- D. 0.407.
- E. Cannot be determined.

$$(0.17 - 0.04)/0.40 = 0.325.$$

*Bodie - Chapter 06 #61
Difficulty: Moderate*

You invest \$100 in a risky asset with an expected rate of return of 0.11 and a standard deviation of 0.21 and a T-bill with a rate of return of 0.045.

Bodie - Chapter 06

62. What percentages of your money must be invested in the risky asset and the risk-free asset, respectively, to form a portfolio with an expected return of 0.13?

- A.** 130.77% and -30.77%
- B. -30.77% and 130.77%
- C. 67.67% and 33.33%
- D. 57.75% and 42.25%
- E. cannot be determined

$$13\% = w_1(11\%) + (1 - w_1)(4.5\%); 13\% = 11\%w_1 + 4.5\% - 4.5\%w_1; 8.5\% = 6.5\%w_1; w_1 = 1.3077; 1 - w_1 = -0.3077; 0.308(1\%) + (-0.3077)(4.5\%) = 13.00\%.$$

*Bodie - Chapter 06 #62
Difficulty: Moderate*

63. What percentages of your money must be invested in the risk-free asset and the risky asset, respectively, to form a portfolio with a standard deviation of 0.08?

- A. 301% and 69.9%
- B. 50.5% and 49.50%
- C. 60.0% and 40.0%
- D.** 38.1% and 61.9%
- E. cannot be determined

$$0.08 = x(0.21); x = 38.1\% \text{ in risky asset.}$$

*Bodie - Chapter 06 #63
Difficulty: Moderate*

64. A portfolio that has an expected outcome of \$114 is formed by
- A. investing \$100 in the risky asset.
 - B. investing \$80 in the risky asset and \$20 in the risk-free asset.
 - C.** borrowing \$46 at the risk-free rate and investing the total amount (\$146) in the risky asset.
 - D. investing \$43 in the risky asset and \$57 in the riskless asset.
 - E. Such a portfolio cannot be formed.

For \$100, $(114-100)/100 = 14\%$; $.14 = w_1(.11) + (1 - w_1)(.045)$; $.14 = .11w_1 + .045 - .045w_1$; $0.095 = 0.065w_1$; $w_1 = 1.46(\$100) = \146 ; $(1 - w_1)\$100 = -\46 .

*Bodie - Chapter 06 #64
Difficulty: Difficult*

65. The slope of the Capital Allocation Line formed with the risky asset and the risk-free asset is equal to
- A. 0.4667.
 - B. 0.8000.
 - C.** 0.3095.
 - D. 0.41667.
 - E. Cannot be determined.

$(0.11 - 0.045)/0.21 = 0.3095$.

*Bodie - Chapter 06 #65
Difficulty: Moderate*

66. Discuss the differences between investors who are **risk averse**, **risk neutral**, and **risk loving**.

The investor who is **risk averse** will take additional risk only if that risk-taking is likely to be rewarded with a risk premium. This investor examines the potential risk-return trade-offs of investment alternatives. The investor who is **risk neutral** looks only at the expected returns of the investment alternative and does not consider risk; this investor will select the investment alternative with the highest expected rate of return. The **risk lover** will engage in fair games and gambles; this investor adjusts the expected return upward to take into account the "fun" of confronting risk.

Feedback: The purpose of this question is to ascertain that the student understands the different attitudes toward risk exhibited by different individuals.

*Bodie - Chapter 06 #66
Difficulty: Easy*

67. In the utility function: $U = E(r) - 0.005As^2$, what is the significance of "A"?

A is simply a scale factor indicating the investor's degree of risk aversion. The higher the value of A, the more risk averse the investor. Of course, the investment advisor must spend some time with client, either via personal conversation or the administration of a "risk tolerance quiz" in order to assign the appropriate value of A to a given investor.

Feedback: The rationale for this question is to ascertain whether the student understands the meaning of the variable, A. This variable, as such, is not presented in most investments texts and it is important that the student understands how the investment advisor assigns a value to A.

*Bodie - Chapter 06 #67
Difficulty: Easy*

68. What is a fair game? Explain how the term relates to a risk-averse investor's attitude toward speculation and risk and how the utility function reflects this attitude.

A fair game is a prospect that has a zero risk premium. Investors who are risk averse reject investment portfolios that are fair games or worse. They will consider risk-free investments and risky investments with positive risk premiums. The risk-averse investor "penalizes" the expected rate of return of a risky portfolio by a certain percent to account for the risk involved. The risk-averse investor's utility function favors expected return and disfavors risk, as measured by variance of returns. In the utility function $U = E(R) - .005A * \text{Variance}$, the risk-averse investor has a positive "A" value so that the second term reduces the level of utility as the variance increases.

Feedback: This question tests whether the student understands the interrelationships between the terms risk, risk premium, speculation, and fair game, and how these terms are quantified by a utility function.

*Bodie - Chapter 06 #68
Difficulty: Moderate*

69. Draw graphs that represent indifference curves for the following investors: Harry, who is a risk-averse investor; Eddie, who is a risk-neutral investor; and Ozzie, who is a risk-loving investor. Discuss the nature of each curve and the reasons for its shape.

The graph for Harry should show upward-sloping curves because he needs to be compensated with additional expected return to maintain a certain level of satisfaction when he takes on more risk. Eddie should have horizontal indifference curves, parallel to the X axis. Since he is risk-neutral, he only cares about expected return. The higher the expected return, the higher his utility. Ozzie's curves will be downward sloping. The fact that he likes risk means that he is willing to forego some expected return to have the opportunity to take on more risk.

Feedback: This question allows the student to review the concepts of attitude toward risk and utility as they related to the resulting indifference curves.

*Bodie - Chapter 06 #69
Difficulty: Moderate*

70. Toby and Hannah are two risk-averse investors. Toby is more risk-averse than Hannah. Draw one indifference curve for Toby and one indifference curve for Hannah on the same graph. Show how these curves illustrate their relative levels of risk aversion.

The curves may or may not intersect within the range of the graph. Toby's curve will have a steeper slope than Hannah's. The levels of risk aversion can be illustrated by examining the curves' slopes over a fixed range. Because Toby's curve is steeper than Hannah's, for a fixed change in standard deviation on the horizontal axis, he will have a greater change in expected return on the vertical axis. It takes more compensation in the form of expected return to allow Toby to maintain his level of utility than it takes for Hannah.

Feedback: This question tests whether the student understands the nature of indifference curves and how the risk-return tradeoff is related to the level of risk aversion.

*Bodie - Chapter 06 #70
Difficulty: Moderate*

71. Discuss the characteristics of **indifference curves**, and the theoretical value of these curves in the portfolio building process

Indifference curves represent the trade-off between two variables. In portfolio building, the choice is between risk and return. The investor is indifferent between all possible portfolios lying on one indifference curve. However, indifference curves are contour maps, with all curves parallel to each other. The curve plotting in the most northwest position is the curve offering the greatest utility to the investor. However, this most desirable curve may not be attainable in the market place. The point of tangency between an indifference curve (representing what is desirable) and the capital allocation line (representing what is possible). is the optimum portfolio for that investor.

Feedback: This question is designed to ascertain that the student understands the concepts of utility, what is desirable by the investor, what is possible in the market place, and how to optimize an investor's portfolio, theoretically.

*Bodie - Chapter 06 #71
Difficulty: Moderate*

72. Describe how an investor may combine a risk-free asset and one risky asset in order to obtain the optimal portfolio for that investor.

The investor may combine a risk-free asset (U.S. T-bills or a money market mutual fund) and a risky asset, such as an indexed mutual fund, in the proper portions to obtain the desired risk-return relationship for that investor. The investor must realize that the risk-return relationship is a linear one, and that in order to earn a higher return, the investor must be willing to assume more risk. The investor must first determine the amount of risk that he or she can tolerate (in terms of the standard deviation of the total portfolio, which is the product of the proportion of total assets invested in the risky asset and the standard deviation of the risky asset). One minus this weight is the proportion of total assets to be invested in the risk-free asset. The portfolio return is the weighted average of the returns on the two respective assets. Such an asset allocation plan is probably the easiest, most efficient, and least expensive for the individual investor to build an optimal portfolio.

Feedback: This question is designed to insure that the student understands how, using the simple strategy of combining two mutual funds, the investor can build an optimal portfolio, based on the investor's risk tolerance.

*Bodie - Chapter 06 #72
Difficulty: Moderate*

73. The optimal proportion of the risky asset in the complete portfolio is given by the equation $y^* = [E(r_P) - r_f] / (.01A * \text{Variance of } P)$. For each of the variables on the right side of the equation, discuss the impact the variable's effect on y^* and why the nature of the relationship makes sense intuitively. Assume the investor is risk averse.

The optimal proportion in y is the one that maximizes the investor's utility. Utility is positively related to the risk premium $[E(r_P) - r_f]$. This makes sense because the more expected return an investor gets, the happier he is. The variable "A" represents the degree of risk aversion. As risk aversion increases, "A" increases. This causes y^* to decrease because we are dividing by a higher number. It makes sense that a more risk-averse investor would hold a smaller proportion of his complete portfolio in the risky asset and a higher proportion in the risk-free asset. Finally, the standard deviation of the risky portfolio is inversely related to y^* . As P 's risk increases, we are again dividing by a larger number, making y^* smaller. This corresponds with the risk-averse investor's dislike of risk as measured by standard deviation.

Feedback: This allows the students to explore the nature of the equation that was derived by maximizing the investor's expected utility. The student can illustrate an understanding of the variables that supersedes the application of the equation in calculating the optimal proportion in P .

*Bodie - Chapter 06 #73
Difficulty: Difficult*

74. You are evaluating two investment alternatives. One is a passive market portfolio with an expected return of 10% and a standard deviation of 16%. The other is a fund that is actively managed by your broker. This fund has an expected return of 15% and a standard deviation of 20%. The risk-free rate is currently 7%. Answer the questions below based on this information.

- What is the slope of the Capital Market Line?
- What is the slope of the Capital Allocation Line offered by your broker's fund?
- Draw the CML and the CAL on one graph.
- What is the maximum fee your broker could charge and still leave you as well off as if you had invested in the passive market fund? (Assume that the fee would be a percentage of the investment in the broker's fund, and would be deducted at the end of the year.)
- How would it affect the graph if the broker were to charge the full amount of the fee?

- The slope of the CML is $(10 - 7)/16 = 0.1875$.
- The slope of the CAL is $(15 - 7)/20 = 0.40$.
- On the graph, both the CML and the CAL have an intercept equal to the risk-free rate (7%). The CAL, with a slope of 0.40, is steeper than the CML, with a slope of 0.1875.
- To find the maximum fee the broker can charge, the equation $(15 - 7 - \text{fee})/20 = 0.1875$ is solved for "fee". The resulting fee is 4.25%.
- If the broker charges the full amount of the fee, the CAL's slope would also be 0.1875, so it would rotate down and be identical to the CML.

Feedback: This question tests both the application of CAL/CML calculations and the concepts involved.

*Bodie - Chapter 06 #74
Difficulty: Difficult*

ch6 Summary

<u>Category</u>	<u># of Questions</u>
Bodie - Chapter 06	82
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