ch15

Student: _____

1. The term structure of interest rates is:

   A. The relationship between the rates of interest on all securities.
   B. The relationship between the interest rate on a security and its time to maturity.
   C. The relationship between the yield on a bond and its default rate.
   D. All of the above.
   E. None of the above.

2. Treasury STRIPS are

   A. securities issued by the Treasury with very long maturities
   B. extremely risky securities
   C. created by selling each coupon or principal payment from a whole Treasury bond as a separate cash flow.
   D. created by pooling mortgage payments made to the Treasury.
   E. C and D

3. The value of a Treasury bond should

   A. be equal to the sum of the value of STRIPS created from it.
   B. be less than to the sum of the value of STRIPS created from it.
   C. be greater than the sum of the value of STRIPS created from it.
   D. A or B
   E. B or C

4. If the value of a Treasury bond was higher than the value of the sum of its part (STRIPPED cash flows) you could

   A. profit by buying the stripped cash flows and reconstituting the bond.
   B. not profit by buying the stripped cash flows and reconstituting the bond.
   C. profit by buying the bond and creating STRIPS.
   D. B and C
   E. none of the above

5. If the value of a Treasury bond was lower than the value of the sum of its part (STRIPPED cash flows) you could

   A. profit by buying the stripped cash flows and reconstituting the bond.
   B. not profit by buying the stripped cash flows and reconstituting the bond.
   C. profit by buying the bond and creating STRIPS.
   D. B and C
   E. none of the above

6. If the value of a Treasury bond was lower than the value of the sum of its part (STRIPPED cash flows)

   A. arbitrage would probably occur.
   B. arbitrage would probably not occur.
   C. the FED would adjust interest rates.
   D. B and C
   E. none of the above

7. If the value of a Treasury bond was higher than the value of the sum of its part (STRIPPED cash flows)

   A. arbitrage would probably occur.
   B. arbitrage would probably not occur.
   C. the FED would adjust interest rates.
   D. B and C
   E. none of the above

8. Bond stripping and bond reconstitution offer opportunities for _____, which can occur if the _____ is violated.

   A. arbitrage; Law of One Price
   B. arbitrage; restrictive covenants
   C. huge losses; Law of One Price
   D. huge losses; restrictive covenants
   E. B and D

9. _____ can occur if _____.

   A. arbitrage; the Law of One Price is not violated
   B. arbitrage; the Law of One Price is violated
   C. riskless economic profit; the Law of One Price is not violated
   D. riskless economic profit; the Law of One Price is violated
   E. B and D

10. The yield curve shows at any point in time:

    A. The relationship between the yield on a bond and the duration of the bond.
    B. The relationship between the coupon rate on a bond and time to maturity of the bond.
    C. The relationship between yield on a bond and the time to maturity on the bond.
    D. All of the above.
    E. None of the above.

11. An inverted yield curve implies that:

    A. Long-term interest rates are lower than short-term interest rates.
    B. Long-term interest rates are higher than short-term interest rates.
    C. Long-term interest rates are the same as short-term interest rates.
    D. Intermediate term interest rates are higher than either short- or long-term interest rates.
    E. none of the above.

12. An upward sloping yield curve is a(n) _____ yield curve.

    A. normal.
    B. humped.
    C. inverted.
    D. flat.
    E. none of the above.

13. According to the expectations hypothesis, a normal yield curve implies that

    A. interest rates are expected to remain stable in the future.
    B. interest rates are expected to decline in the future.
    C. interest rates are expected to increase in the future.
    D. interest rates are expected to decline first, then increase.
    E. interest rates are expected to increase first, then decrease.

14. Which of the following is not proposed as an explanation for the term structure of interest rates:

    A. The expectations theory.
    B. The liquidity preference theory.
    C. The market segmentation theory.
    D. Modern portfolio theory.
    E. A, B, and C.

15. The expectations theory of the term structure of interest rates states that

    A. forward rates are determined by investors' expectations of future interest rates.
    B. forward rates exceed the expected future interest rates.
    C. yields on long- and short-maturity bonds are determined by the supply and demand for the securities.
    D. all of the above.
    E. none of the above.

16. Which of the following theories state that the shape of the yield curve is essentially determined by the supply and demands for long-and short-maturity bonds?

    A. Liquidity preference theory.
    B. Expectations theory.
    C. Market segmentation theory.
    D. All of the above.
    E. None of the above.

17. According to the "liquidity preference" theory of the term structure of interest rates, the yield curve usually should be:

    A. inverted.
    B. normal.
    C. upward sloping
    D. A and B.
    E. B and C.

Suppose that all investors expect that interest rates for the 4 years will be as follows:

Year	Forward Interest Rate
0	(today)5%
1	7%
2	9%
3	10%

18. What is the price of 3-year zero coupon bond with a par value of $1,000?

A. $863.83
B. $816.58
C. $772.18
D. $765.55
E. none of the above

19. If you have just purchased a 4-year zero coupon bond, what would be the expected rate of return on your investment in the first year if the implied forward rates stay the same? (Par value of the bond = $1,000)

A. 5%
B. 7%
C. 9%
D. 10%
E. none of the above

20. What is the price of a 2-year maturity bond with a 10% coupon rate paid annually? (Par value = $1,000)

A. $1,092
B. $1,054
C. $1,000
D. $1,073
E. none of the above

21. What is the yield to maturity of a 3-year zero coupon bond?

A. 7.00%
B. 9.00%
C. 6.99%
D. 7.49%
E. none of the above

The following is a list of prices for zero coupon bonds with different maturities and par value of $1,000.

Maturity (Years)	Price
1	$943.40
2	$881.68
3	$808.88
4	$742.09

22. What is, according to the expectations theory, the expected forward rate in the **third** year?

A. 7.00%
B. 7.33%
C. 9.00%
D. 11.19%
E. none of the above

23. What is the yield to maturity on a 3-year zero coupon bond?

A. 6.37%
B. 9.00%
C. 7.33%
D. 10.00%
E. none of the above

24. What is the price of a 4-year maturity bond with a 12% coupon rate paid annually? (Par value = $1,000)

A. $742.09
B. $1,222.09
C. $1,000.00
D. $1,141.92
E. none of the above

25. The market segmentation theory of the term structure of interest rates

A. theoretically can explain all shapes of yield curves.
B. definitely holds in the "real world".
C. assumes that markets for different maturities are separate markets.
D. A and B.
E. A and C.

26. An upward sloping yield curve

A. may be an indication that interest rates are expected to increase.
B. may incorporate a liquidity premium.
C. may reflect the confounding of the liquidity premium with interest rate expectations.
D. all of the above.
E. none of the above.

27. The "break-even" interest rate for year *n* that equates the return on an *n*-period zero-coupon bond to that of an *n-1*-period zero-coupon bond rolled over into a one-year bond in year *n* is defined as

A. the forward rate.
B. the short rate.
C. the yield to maturity.
D. the discount rate.
E. None of the above.

28. When computing yield to maturity, the implicit reinvestment assumption is that the interest payments are reinvested at the:

A. Coupon rate.
B. Current yield.
C. Yield to maturity at the time of the investment.
D. Prevailing yield to maturity at the time interest payments are received.
E. The average yield to maturity throughout the investment period.

29. Which one of the following statements is **true**?

A. The expectations hypothesis indicates a flat yield curve if anticipated future short-term rates exceed the current short-term rate.
B. The basic conclusion of the expectations hypothesis is that the long-term rate is equal to the anticipated long-term rate.
C. The liquidity preference hypothesis indicates that, all other things being equal, longer maturities will have lower yields.
D. The segmentation hypothesis contends that borrows and lenders are constrained to particular segments of the yield curve.
E. None of the above.

30. Which one of the following statements is **false**?

A. The expectations hypothesis indicates a flat yield curve if anticipated future short-term rates exceed the current short-term rate.
B. The basic conclusion of the expectations hypothesis is that the long-term rate is equal to the anticipated long-term rate.
C. The liquidity preference hypothesis indicates that, all other things being equal, longer maturities will have lower yields.
D. The segmentation hypothesis contends that borrows and lenders are constrained to particular segments of the yield curve.
E. A, B, and C.

31. The concepts of spot and forward rates are most closely associated with which one of the following explanations of the term structure of interest rates.

A. Segmented Market theory
B. Expectations Hypothesis
C. Preferred Habitat Hypothesis
D. Liquidity Premium theory
E. None of the above

Par Value	$1,000
Time to Maturity	20 years
Coupon	10% (paid annually)
Current Price	$850
Yield to Maturity	12%

32. Given the bond described above, if interest were paid semi-annually (rather than annually), and the bond continued to be priced at $850, the resulting effective annual yield to maturity would be:

A. Less than 12%
B. More than 12%
C. 12%
D. Cannot be determined
E. None of the above

33. Interest rates might decline

A. because real interest rates are expected to decline.
B. because the inflation rate is expected to decline.
C. because nominal interest rates are expected to increase.
D. A and B.
E. B and C.

34. Forward rates _____ future short rates because _____.

A. are equal to; they are both extracted from yields to maturity.
B. are equal to; they are perfect forecasts.
C. differ from; they are imperfect forecasts.
D. differ from; forward rates are estimated from dealer quotes while future short rates are extracted from yields to maturity.
E. are equal to; although they are estimated from different sources they both are used by traders to make purchase decisions.

35. The **pure yield curve** can be estimated

A. by using zero-coupon bonds.
B. by using coupon bonds if each coupon is treated as a separate "zero."
C. by using corporate bonds with different risk ratings.
D. by estimating liquidity premiums for different maturities.
E. A and B.

36. The **on the run yield curve** is

A. a plot of yield as a function of maturity for zero-coupon bonds.
B. a plot of yield as a function of maturity for recently issued coupon bonds trading at or near par.
C. a plot of yield as a function of maturity for corporate bonds with different risk ratings.
D. a plot of liquidity premiums for different maturities.
E. A and B.

37. The market segmentation and preferred habitat theories of term structure

A. are identical.
B. vary in that market segmentation is rarely accepted today.
C. vary in that market segmentation maintains that borrowers and lenders will not depart from their preferred maturities and preferred habitat maintains that market participants will depart from preferred maturities if yields on other maturities are attractive enough.
D. A and B.
E. B and C.

38. The yield curve

A. is a graphical depiction of term structure of interest rates.
B. is usually depicted for U.S. Treasuries in order to hold risk constant across maturities and yields.
C. is usually depicted for corporate bonds of different ratings.
D. A and B.
E. A and C.

Year	1-Year Forward Rate
1	5.8%
2	6.4%
3	7.1%
4	7.3%
5	7.4%

39. What should the purchase price of a 2-year zero coupon bond be if it is purchased at the beginning of year 2 and has face value of $1,000?

    A. $877.54
    B. $888.33
    C. $883.32
    D. $893.36
    E. $871.80

40. What would the yield to maturity be on a four-year zero coupon bond purchased today?

    A. 5.80%
    B. 7.30%
    C. 6.65%
    D. 7.25%
    E. none of the above.

41. Calculate the price at the beginning of year 1 of a 10% annual coupon bond with face value $1,000 and 5 years to maturity.

    A. $1,105
    B. $1,132
    C. $1,179
    D. $1,150
    E. $1,119

42. Given the yield on a 3 year zero-coupon bond is 7.2% and forward rates of 6.1% in year 1 and 6.9% in year 2, what must be the forward rate in year 3?

    A. 8.4%
    B. 8.6%
    C. 8.1%
    D. 8.9%
    E. none of the above.

43. An inverted yield curve is one

    A. with a hump in the middle.
    B. constructed by using convertible bonds.
    C. that is relatively flat.
    D. that plots the inverse relationship between bond prices and bond yields.
    E. that slopes downward.

44. Investors can use publicly available financial date to determine which of the following?
I) the shape of the yield curve
II) future short-term rates
III) the direction the Dow indexes are heading
IV) the actions to be taken by the Federal Reserve

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

45. Which of the following combinations will result in a sharply increasing yield curve?

A. increasing expected short rates and increasing liquidity premiums
B. decreasing expected short rates and increasing liquidity premiums
C. increasing expected short rates and decreasing liquidity premiums
D. increasing expected short rates and constant liquidity premiums
E. constant expected short rates and increasing liquidity premiums

46. The yield curve is a component of

A. the Dow Jones Industrial Average.
B. the consumer price index.
C. the index of leading economic indicators.
D. the producer price index.
E. the inflation index.

47. The most recently issued Treasury securities are called

A. on the run.
B. off the run.
C. on the market.
D. off the market.
E. none of the above.

Suppose that all investors expect that interest rates for the 4 years will be as follows:

Year	Forward Interest Rate
0	(today)3%
1	4%
2	5%
3	6%

48. What is the price of 3-year zero coupon bond with a par value of $1,000?

A. $889.08
B. $816.58
C. $772.18
D. $765.55
E. none of the above

49. If you have just purchased a 4-year zero coupon bond, what would be the expected rate of return on your investment in the first year if the implied forward rates stay the same? (Par value of the bond = $1,000)

A. 5%
B. 3%
C. 9%
D. 10%
E. none of the above

50. What is the price of a 2-year maturity bond with a 5% coupon rate paid annually? (Par value = $1,000)

A. $1,092.97
B. $1,054.24
C. $1,028.51
D. $1,073.34
E. none of the above

51. What is the yield to maturity of a 3-year zero coupon bond?

A. 7.00%
B. 9.00%
C. 6.99%
D. 4%
E. none of the above

The following is a list of prices for zero coupon bonds with different maturities and par value of $1,000.

Maturity (Years)	Price
1	$925.16
2	$862.57
3	$788.66
4	$711.00

52. What is, according to the expectations theory, the expected forward rate in the **third** year?

A. 7.23
B. 9.37%
C. 9.00%
D. 10.9%
E. none of the above

53. What is the yield to maturity on a 3-year zero coupon bond?

A. 6.37%
B. 9.00%
C. 7.33%
D. 8.24%
E. none of the above

54. What is the price of a 4-year maturity bond with a 10% coupon rate paid annually? (Par value = $1,000)

A. $742.09
B. $1,222.09
C. $1,035.66
D. $1,141.84
E. none of the above

55. You have purchased a 4-year maturity bond with a 9% coupon rate paid annually. The bond has a par value of $1,000. What would the price of the bond be one year from now if the implied forward rates stay the same?

A. $995.63
B. $1,108.88
C. $1,000.00
D. $1,042.78
E. none of the above

Par Value	$1,000
Time to Maturity	18 years
Coupon	9% (paid annually)
Current Price	$917.99
Yield to Maturity	10%

56. Given the bond described above, if interest were paid semi-annually (rather than annually), and the bond continued to be priced at $917.99, the resulting effective annual yield to maturity would be:

A. Less than 10%
B. More than 10%
C. 10%
D. Cannot be determined
E. None of the above

Year	1-Year Forward Rate
1	5%
2	5.5%
3	6.0%
4	6.5%
5	7.0%

57. What should the purchase price of a 2-year zero coupon bond be if it is purchased at the beginning of year 2 and has face value of $1,000?

A. $877.54
B. $888.33
C. $883.32
D. $894.21
E. $871.80

58. What would the yield to maturity be on a four-year zero coupon bond purchased today?

A. 5.75%
B. 6.30%
C. 5.65%
D. 5.25%
E. none of the above.

59. Calculate the price at the beginning of year 1 of an 8% annual coupon bond with face value $1,000 and 5 years to maturity.

A. $1,105.47
B. $1,131.91
C. $1,084.25
D. $1,150.01
E. $719.75

60. Given the yield on a 3 year zero-coupon bond is 7% and forward rates of 6% in year 1 and 6.5% in year 2, what must be the forward rate in year 3?

A. 7.2%
B. 8.6%
C. 8.5%
D. 6.9%
E. none of the above.

Year	1-Year Forward Rate
1	4.6%
2	4.9%
3	5.2%
4	5.5%
5	5.8%

61. What should the purchase price of a 1-year zero coupon bond be if it is purchased today and has face value of $1,000?

A. $966.37
B. $912.87
C. $950.21
D. $956.02
E. $945.51

62. What should the purchase price of a 2-year zero coupon bond be if it is purchased today and has face value of $1,000?

A. $966.87
B. $911.37
C. $950.21
D. $956.02
E. $945.51

63. What should the purchase price of a 3-year zero coupon bond be if it is purchased today and has face value of $1,000?

A. $887.42
B. $871.12
C. $879.54
D. $856.02
E. $866.32

64. What should the purchase price of a 4-year zero coupon bond be if it is purchased today and has face value of $1,000?

A. $887.42
B. $821.15
C. $879.54
D. $856.02
E. $866.32

65. What should the purchase price of a 5-year zero coupon bond be if it is purchased today and has face value of $1,000?

A. $776.14
B. $721.15
C. $779.54
D. $756.02
E. $766.32

66. What is the yield to maturity of a 1-year bond?

A. 4.6%
B. 4.9%
C. 5.2%
D. 5.5%
E. 5.8%

67. What is the yield to maturity of a 5-year bond?

A. 4.6%
B. 4.9%
C. 5.2%
D. 5.5%
E. 5.8%

68. What is the yield to maturity of a 4-year bond?

A. 4.69%
B. 4.95%
C. 5.02%
D. 5.05%
E. 5.08%

69. What is the yield to maturity of a 3-year bond?

    A. 4.6%
    B. 4.9%
    C. 5.2%
    D. 5.5%
    E. 5.8%

70. What is the yield to maturity of a 2-year bond?

    A. 4.6%
    B. 4.9%
    C. 5.2%
    D. 4.7%
    E. 5.8%

71. Discuss the three theories of the term structure of interest rates. Include in your discussion the differences in the theories, and the advantages/disadvantages of each.

72. Term structure of interest rates is the relationship between what variables? What is assumed about other variables? How is term structure of interest rates depicted graphically?

73. Although the expectations of increases in future interest rates can result in an upward sloping yield curve; an upward sloping yield curve does not in and of itself imply the expectations of higher future interest rates. Explain.

74. Explain what the following terms mean: spot rate, short rate, and forward rate. Which of these is (are) observable today?

75. Answer the following questions that relate to bonds.
    - A 2-year zero-coupon bond is selling for $890.00. What is the yield to maturity of this bond?
    - The price of a 1-year zero coupon bond is $931.97. What is the yield to maturity of this bond?
    - Calculate the forward rate for the second year.
    - How can you construct a synthetic one-year forward loan (you are agreeing now to loan in one year)? State the strategy and show the corresponding cash flows. Assume that you can purchase and sell fractional portions of bonds. Show all calculations and discuss the meaning of the transactions.

ch15 Key

1. The term structure of interest rates is:

A. The relationship between the rates of interest on all securities.
B. The relationship between the interest rate on a security and its time to maturity.
C. The relationship between the yield on a bond and its default rate.
D. All of the above.
E. None of the above.

The term structure of interest rates is the relationship between two variables, years and yield to maturity (holding all else constant).

Bodie - Chapter 15 #1
Difficulty: Easy

2. Treasury STRIPS are

A. securities issued by the Treasury with very long maturities
B. extremely risky securities
C. created by selling each coupon or principal payment from a whole Treasury bond as a separate cash flow.
D. created by pooling mortgage payments made to the Treasury.
E. C and D

Treasury STRIPS are created by selling each coupon or principal payment from a whole Treasury bond as a separate cash flow.

Bodie - Chapter 15 #2
Difficulty: Easy

3. The value of a Treasury bond should

A. be equal to the sum of the value of STRIPS created from it.
B. be less than to the sum of the value of STRIPS created from it.
C. be greater than the sum of the value of STRIPS created from it.
D. A or B
E. B or C

The value of a Treasury bond should be equal to the sum of the value of STRIPS created from it.

Bodie - Chapter 15 #3
Difficulty: Easy

4. If the value of a Treasury bond was higher than the value of the sum of its part (STRIPPED cash flows) you could

A. profit by buying the stripped cash flows and reconstituting the bond.
B. not profit by buying the stripped cash flows and reconstituting the bond.
C. profit by buying the bond and creating STRIPS.
D. B and C
E. none of the above

Only buying STRIPS and reconstituting the bond would be profitable.

Bodie - Chapter 15 #4
Difficulty: Moderate

5. If the value of a Treasury bond was lower than the value of the sum of its part (STRIPPED cash flows) you could

A. profit by buying the stripped cash flows and reconstituting the bond.
B. not profit by buying the stripped cash flows and reconstituting the bond.
C. profit by buying the bond and creating STRIPS.
D. B and C
E. none of the above

Only buying and stripping the bond would be profitable so answer D is correct.

Bodie - Chapter 15 #5
Difficulty: Moderate

6. If the value of a Treasury bond was lower than the value of the sum of its part (STRIPPED cash flows)

A. arbitrage would probably occur.
B. arbitrage would probably not occur.
C. the FED would adjust interest rates.
D. B and C
E. none of the above

If the value of a Treasury bond was lower than the value of the sum of its part (STRIPPED cash flows) arbitrage would probably occur.

Bodie - Chapter 15 #6
Difficulty: Moderate

7. If the value of a Treasury bond was higher than the value of the sum of its part (STRIPPED cash flows)

A. arbitrage would probably occur.
B. arbitrage would probably not occur.
C. the FED would adjust interest rates.
D. B and C
E. none of the above

If the value of a Treasury bond was higher than the value of the sum of its part (STRIPPED cash flows) arbitrage would probably occur.

Bodie - Chapter 15 #7
Difficulty: Moderate

8. Bond stripping and bond reconstitution offer opportunities for _____, which can occur if the _____ is violated.

A. arbitrage; Law of One Price
B. arbitrage; restrictive covenants
C. huge losses; Law of One Price
D. huge losses; restrictive covenants
E. B and D

Bond stripping and bond reconstitution offer opportunities for arbitrage, which can occur if the Law of One Price is violated.

Bodie - Chapter 15 #8
Difficulty: Moderate

9. _____ can occur if _____.

A. arbitrage; the Law of One Price is not violated
B. arbitrage; the Law of One Price is violated
C. riskless economic profit; the Law of One Price is not violated
D. riskless economic profit; the Law of One Price is violated
E. B and D

Arbitrage (also known as riskless economic profit) can occur is the Law of One Price is violated.

Bodie - Chapter 15 #9
Difficulty: Moderate

10. The yield curve shows at any point in time:

A. The relationship between the yield on a bond and the duration of the bond.
B. The relationship between the coupon rate on a bond and time to maturity of the bond.
C. The relationship between yield on a bond and the time to maturity on the bond.
D. All of the above.
E. None of the above.

The yield curve shows the relationship between yield on a bond and the time to maturity on the bond.

Bodie - Chapter 15 #10
Difficulty: Easy

11. An inverted yield curve implies that:

A. Long-term interest rates are lower than short-term interest rates.
B. Long-term interest rates are higher than short-term interest rates.
C. Long-term interest rates are the same as short-term interest rates.
D. Intermediate term interest rates are higher than either short- or long-term interest rates.
E. none of the above.

The inverted, or downward sloping, yield curve is one in which short-term rates are higher than long-term rates. The inverted yield curve has been observed frequently, although not as frequently as the upward sloping, or normal, yield curve.

Bodie - Chapter 15 #11
Difficulty: Easy

12. An upward sloping yield curve is a(n) _____ yield curve.

A. normal.
B. humped.
C. inverted.
D. flat.
E. none of the above.

The upward sloping yield curve is referred to as the normal yield curve, probably because, historically, the upward sloping yield curve is the shape that has been observed most frequently.

Bodie - Chapter 15 #12
Difficulty: Easy

13. According to the expectations hypothesis, a normal yield curve implies that

A. interest rates are expected to remain stable in the future.
B. interest rates are expected to decline in the future.
C. interest rates are expected to increase in the future.
D. interest rates are expected to decline first, then increase.
E. interest rates are expected to increase first, then decrease.

An upward sloping yield curve is based on the expectation that short-term interest rates will increase.

Bodie - Chapter 15 #13
Difficulty: Easy

14. Which of the following is not proposed as an explanation for the term structure of interest rates:

A. The expectations theory.
B. The liquidity preference theory.
C. The market segmentation theory.
D. Modern portfolio theory.
E. A, B, and C.

A, B, and C are all theories that have been proposed to explain the term structure.

Bodie - Chapter 15 #14
Difficulty: Easy

15. The expectations theory of the term structure of interest rates states that

A. forward rates are determined by investors' expectations of future interest rates.
B. forward rates exceed the expected future interest rates.
C. yields on long- and short-maturity bonds are determined by the supply and demand for the securities.
D. all of the above.
E. none of the above.

The forward rate equals the market consensus expectation of future short interest rates.

Bodie - Chapter 15 #15
Difficulty: Easy

16. Which of the following theories state that the shape of the yield curve is essentially determined by the supply and demands for long-and short-maturity bonds?

A. Liquidity preference theory.
B. Expectations theory.
C. Market segmentation theory.
D. All of the above.
E. None of the above.

Market segmentation theory states that the markets for different maturities are separate markets, and that interest rates at the different maturities are determined by the intersection of the respective supply and demand curves.

Bodie - Chapter 15 #16
Difficulty: Easy

17. According to the "liquidity preference" theory of the term structure of interest rates, the yield curve usually should be:

A. inverted.
B. normal.
C. upward sloping
D. A and B.
E. B and C.

According to the liquidity preference theory, investors would prefer to be liquid rather than illiquid. In order to accept a more illiquid investment, investors require a liquidity premium and the normal, or upward sloping, yield curve results.

Bodie - Chapter 15 #17
Difficulty: Easy

Suppose that all investors expect that interest rates for the 4 years will be as follows:

Year	Forward Interest Rate
0	(today)5%
1	7%
2	9%
3	10%

Bodie - Chapter 15

18. What is the price of 3-year zero coupon bond with a par value of $1,000?

A. $863.83
B. $816.58
C. $772.18
D. $765.55
E. none of the above

$1,000 / (1.05)(1.07)(1.09) = $816.58

Bodie - Chapter 15 #18
Difficulty: Moderate

19. If you have just purchased a 4-year zero coupon bond, what would be the expected rate of return on your investment in the first year if the implied forward rates stay the same? (Par value of the bond = $1,000)

A. 5%
B. 7%
C. 9%
D. 10%
E. none of the above

The forward interest rate given for the first year of the investment is given as 5% (see table above).

Bodie - Chapter 15 #19
Difficulty: Moderate

20. What is the price of a 2-year maturity bond with a 10% coupon rate paid annually? (Par value = $1,000)

A. $1,092
B. $1,054
C. $1,000
D. $1,073
E. none of the above

$[(1.05)(1.07)]^{1/2} - 1 = 6\%$; FV = 1000, n = 2, PMT = 100, i = 6, PV = $1,073.34

Bodie - Chapter 15 #20
Difficulty: Moderate

21. What is the yield to maturity of a 3-year zero coupon bond?

A. 7.00%
B. 9.00%
C. 6.99%
D. 7.49%
E. none of the above

$[(1.05)(1.07)(1.09)]^{1/3} - 1 = 6.99$.

Bodie - Chapter 15 #21
Difficulty: Moderate

The following is a list of prices for zero coupon bonds with different maturities and par value of $1,000.

Maturity (Years)	Price
1	$943.40
2	$881.68
3	$808.88
4	$742.09

22. What is, according to the expectations theory, the expected forward rate in the **third** year?

A. 7.00%
B. 7.33%
C. 9.00%
D. 11.19%
E. none of the above

881.68 / 808.88 - 1 = 9%

Bodie - Chapter 15 #22
Difficulty: Moderate

23. What is the yield to maturity on a 3-year zero coupon bond?

A. 6.37%
B. 9.00%
C. 7.33%
D. 10.00%
E. none of the above

$(1000 / 808.81)^{1/3} - 1 = 7.33\%$

Bodie - Chapter 15 #23
Difficulty: Moderate

24. What is the price of a 4-year maturity bond with a 12% coupon rate paid annually? (Par value = $1,000)

A. $742.09
B. $1,222.09
C. $1,000.00
D. $1,141.92
E. none of the above

$(1000 / 742.09)^{1/4} - 1 = 7.74\%$; FV = 1000, PMT = 120, n = 4, i = 7.74, PV = $1,141.92

Bodie - Chapter 15 #24
Difficulty: Difficult

25. The market segmentation theory of the term structure of interest rates

A. theoretically can explain all shapes of yield curves.
B. definitely holds in the "real world".
C. assumes that markets for different maturities are separate markets.
D. A and B.
E. A and C.

Although this theory is quite tidy theoretically, both investors and borrows will depart from their "preferred maturity habitats" if yields on alternative maturities are attractive enough.

Bodie - Chapter 15 #25
Difficulty: Easy

26. An upward sloping yield curve

A. may be an indication that interest rates are expected to increase.
B. may incorporate a liquidity premium.
C. may reflect the confounding of the liquidity premium with interest rate expectations.
D. all of the above.
E. none of the above.

One of the problems of the most commonly used explanation of term structure, the expectations hypothesis, is that it is difficult to separate out the liquidity premium from interest rate expectations.

Bodie - Chapter 15 #26
Difficulty: Easy

27. The "break-even" interest rate for year *n* that equates the return on an *n*-period zero-coupon bond to that of an *n-1*-period zero-coupon bond rolled over into a one-year bond in year *n* is defined as

A. the forward rate.
B. the short rate.
C. the yield to maturity.
D. the discount rate.
E. None of the above.

The forward rate for year n, fn, is the "break-even" interest rate for year n that equates the return on an n-period zero- coupon bond to that of an n-1-period zero-coupon bond rolled over into a one-year bond in year n.

Bodie - Chapter 15 #27
Difficulty: Easy

28. When computing yield to maturity, the implicit reinvestment assumption is that the interest payments are reinvested at the:

A. Coupon rate.
B. Current yield.
C. Yield to maturity at the time of the investment.
D. Prevailing yield to maturity at the time interest payments are received.
E. The average yield to maturity throughout the investment period.

In order to earn the yield to maturity quoted at the time of the investment, coupons must be reinvested at that rate.

Bodie - Chapter 15 #28
Difficulty: Moderate

29. Which one of the following statements is **true**?

A. The expectations hypothesis indicates a flat yield curve if anticipated future short-term rates exceed the current short-term rate.
B. The basic conclusion of the expectations hypothesis is that the long-term rate is equal to the anticipated long-term rate.
C. The liquidity preference hypothesis indicates that, all other things being equal, longer maturities will have lower yields.
D. The segmentation hypothesis contends that borrows and lenders are constrained to particular segments of the yield curve.
E. None of the above.

A flat yield curve indicates expectations of existing rates. Expectations hypothesis states that the forward rate equals the market consensus of expectations of future short interest rates. The reverse of C is true.

Bodie - Chapter 15 #29
Difficulty: Moderate

30. Which one of the following statements is **false**?

A. The expectations hypothesis indicates a flat yield curve if anticipated future short-term rates exceed the current short-term rate.
B. The basic conclusion of the expectations hypothesis is that the long-term rate is equal to the anticipated long-term rate.
C. The liquidity preference hypothesis indicates that, all other things being equal, longer maturities will have lower yields.
D. The segmentation hypothesis contends that borrows and lenders are constrained to particular segments of the yield curve.
E. A, B, and C.

A flat yield curve indicates expectations of existing rates. Expectations hypothesis states that the forward rate equals the market consensus of expectations of future short interest rates. The reverse of C is true.

Bodie - Chapter 15 #30
Difficulty: Moderate

31. The concepts of spot and forward rates are most closely associated with which one of the following explanations of the term structure of interest rates.

A. Segmented Market theory
B. Expectations Hypothesis
C. Preferred Habitat Hypothesis
D. Liquidity Premium theory
E. None of the above

Only the expectations hypothesis is based on spot and forward rates. A and C assume separate markets for different maturities; liquidity premium assumes higher yields for longer maturities.

Bodie - Chapter 15 #31
Difficulty: Moderate

Par Value	$1,000
Time to Maturity	20 years
Coupon	10% (paid annually)
Current Price	$850
Yield to Maturity	12%

Bodie - Chapter 15

32. Given the bond described above, if interest were paid semi-annually (rather than annually), and the bond continued to be priced at $850, the resulting effective annual yield to maturity would be:

A. Less than 12%
B. More than 12%
C. 12%
D. Cannot be determined
E. None of the above

FV = 1000, PV = -850, PMT = 50, n = 40, i = 5.9964 (semi-annual); (1.059964)2 - 1 = 12.35%.

Bodie - Chapter 15 #32
Difficulty: Moderate

33. Interest rates might decline

A. because real interest rates are expected to decline.
B. because the inflation rate is expected to decline.
C. because nominal interest rates are expected to increase.
D. A and B.
E. B and C.

The nominal rate is comprised of the real interest rate plus the expected inflation rate.

Bodie - Chapter 15 #33
Difficulty: Easy

34. Forward rates _____ future short rates because _____.

A. are equal to; they are both extracted from yields to maturity.
B. are equal to; they are perfect forecasts.
C. differ from; they are imperfect forecasts.
D. differ from; forward rates are estimated from dealer quotes while future short rates are extracted from yields to maturity.
E. are equal to; although they are estimated from different sources they both are used by traders to make purchase decisions.

Forward rates are the estimates of future short rates extracted from yields to maturity but they are not perfect forecasts because the future cannot be predicted with certainty; therefore they will usually differ.

Bodie - Chapter 15 #34
Difficulty: Easy

35. The **pure yield curve** can be estimated

A. by using zero-coupon bonds.
B. by using coupon bonds if each coupon is treated as a separate "zero."
C. by using corporate bonds with different risk ratings.
D. by estimating liquidity premiums for different maturities.
E. A and B.

The pure yield curve is calculated using zero coupon bonds, but coupon bonds may be used if each coupon is treated as a separate "zero."

Bodie - Chapter 15 #35
Difficulty: Moderate

36. The **on the run yield curve** is

A. a plot of yield as a function of maturity for zero-coupon bonds.
B. a plot of yield as a function of maturity for recently issued coupon bonds trading at or near par.
C. a plot of yield as a function of maturity for corporate bonds with different risk ratings.
D. a plot of liquidity premiums for different maturities.
E. A and B.

The on the run yield curve is a plot of yield as a function of maturity for recently issued coupon bonds trading at or near par.

Bodie - Chapter 15 #36
Difficulty: Moderate

37. The market segmentation and preferred habitat theories of term structure

A. are identical.
B. vary in that market segmentation is rarely accepted today.
C. vary in that market segmentation maintains that borrowers and lenders will not depart from their preferred maturities and preferred habitat maintains that market participants will depart from preferred maturities if yields on other maturities are attractive enough.
D. A and B.
E. B and C.

Borrowers and lenders will depart from their preferred maturity habitats if yields are attractive enough; thus, the market segmentation hypothesis is no longer readily accepted.

Bodie - Chapter 15 #37
Difficulty: Moderate

38. The yield curve

A. is a graphical depiction of term structure of interest rates.
B. is usually depicted for U.S. Treasuries in order to hold risk constant across maturities and yields.
C. is usually depicted for corporate bonds of different ratings.
D. A and B.
E. A and C.

The yield curve (yields vs. maturities, all else equal) is depicted for U.S. Treasuries more frequently than for corporate bonds, as the risk is constant across maturities for Treasuries.

Bodie - Chapter 15 #38
Difficulty: Easy

Year	1-Year Forward Rate
1	5.8%
2	6.4%
3	7.1%
4	7.3%
5	7.4%

Bodie - Chapter 15

39. What should the purchase price of a 2-year zero coupon bond be if it is purchased at the beginning of year 2 and has face value of $1,000?

A. $877.54
B. $888.33
C. $883.32
D. $893.36
E. $871.80

$1,000 / [(1.064)(1.071)] = $877.54

Bodie - Chapter 15 #39
Difficulty: Difficult

40. What would the yield to maturity be on a four-year zero coupon bond purchased today?

A. 5.80%
B. 7.30%
C. 6.65%
D. 7.25%
E. none of the above.

$[(1.058)\ (1.064)\ (1.071)\ (1.073)]^{1/4} - 1 = 6.65\%$

Bodie - Chapter 15 #40
Difficulty: Moderate

41. Calculate the price at the beginning of year 1 of a 10% annual coupon bond with face value $1,000 and 5 years to maturity.

A. $1,105
B. $1,132
C. $1,179
D. $1,150
E. $1,119

i = [(1.058) (1.064) (1.071) (1.073) (1.074)]$^{1/5}$ - 1 = 6.8%; FV = 1000, PMT = 100, n = 5, i = 6.8, PV = $1,131.91

Bodie - Chapter 15 #41
Difficulty: Difficult

42. Given the yield on a 3 year zero-coupon bond is 7.2% and forward rates of 6.1% in year 1 and 6.9% in year 2, what must be the forward rate in year 3?

A. 8.4%
B. 8.6%
C. 8.1%
D. 8.9%
E. none of the above.

f3 = (1.072)^3 / [(1.061) (1.069)] - 1 = 8.6%

Bodie - Chapter 15 #42
Difficulty: Moderate

43. An inverted yield curve is one

A. with a hump in the middle.
B. constructed by using convertible bonds.
C. that is relatively flat.
D. that plots the inverse relationship between bond prices and bond yields.
E. that slopes downward.

An inverted yield curve occurs when short-term rates are higher than long-term rates.

Bodie - Chapter 15 #43
Difficulty: Easy

44. Investors can use publicly available financial date to determine which of the following?
I) the shape of the yield curve
II) future short-term rates
III) the direction the Dow indexes are heading
IV) the actions to be taken by the Federal Reserve

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

Only the shape of the yield curve and future inferred rates can be determined. The movement of the Dow Indexes and Federal Reserve policy are influenced by term structure but are determined by many other variables also.

Bodie - Chapter 15 #44
Difficulty: Moderate

45. Which of the following combinations will result in a sharply increasing yield curve?

A. increasing expected short rates and increasing liquidity premiums
B. decreasing expected short rates and increasing liquidity premiums
C. increasing expected short rates and decreasing liquidity premiums
D. increasing expected short rates and constant liquidity premiums
E. constant expected short rates and increasing liquidity premiums

Both of the forces will act to increase the slope of the yield curve.

Bodie - Chapter 15 #45
Difficulty: Moderate

46. The yield curve is a component of

A. the Dow Jones Industrial Average.
B. the consumer price index.
C. the index of leading economic indicators.
D. the producer price index.
E. the inflation index.

Since the yield curve is often used to forecast the business cycle, it is used as one of the leading economic indicators.

Bodie - Chapter 15 #46
Difficulty: Easy

47. The most recently issued Treasury securities are called

A. on the run.
B. off the run.
C. on the market.
D. off the market.
E. none of the above.

The most recently issued Treasury securities are called on the run.

Bodie - Chapter 15 #47
Difficulty: Easy

Suppose that all investors expect that interest rates for the 4 years will be as follows:

Year	Forward Interest Rate
0	(today)3%
1	4%
2	5%
3	6%

Bodie - Chapter 15

48. What is the price of 3-year zero coupon bond with a par value of $1,000?

A. $889.08
B. $816.58
C. $772.18
D. $765.55
E. none of the above

$1,000 / (1.03)(1.04)(1.05) = $889.08

Bodie - Chapter 15 #48
Difficulty: Moderate

49. If you have just purchased a 4-year zero coupon bond, what would be the expected rate of return on your investment in the first year if the implied forward rates stay the same? (Par value of the bond = $1,000)

A. 5%
B. 3%
C. 9%
D. 10%
E. none of the above

The forward interest rate given for the first year of the investment is given as 3% (see table above).

Bodie - Chapter 15 #49
Difficulty: Moderate

50. What is the price of a 2-year maturity bond with a 5% coupon rate paid annually? (Par value = $1,000)

A. $1,092.97
B. $1,054.24
C. $1,028.51
D. $1,073.34
E. none of the above

$[(1.03)(1.04)]^{1/2} - 1 = 3.5\%$; FV = 1000, n = 2, PMT = 50, i = 3.5, PV = $1,028.51

Bodie - Chapter 15 #50
Difficulty: Moderate

51. What is the yield to maturity of a 3-year zero coupon bond?

A. 7.00%
B. 9.00%
C. 6.99%
D. 4%
E. none of the above

$[(1.03)(1.04)(1.05)]^{1/3} - 1 = 4\%$.

Bodie - Chapter 15 #51
Difficulty: Moderate

The following is a list of prices for zero coupon bonds with different maturities and par value of $1,000.

Maturity (Years)	Price
1	$925.16
2	$862.57
3	$788.66
4	$711.00

Bodie - Chapter 15

52. What is, according to the expectations theory, the expected forward rate in the **third** year?

A. 7.23
B. 9.37%
C. 9.00%
D. 10.9%
E. none of the above

862.57 / 788.66 - 1 = 9.37%

Bodie - Chapter 15 #52
Difficulty: Moderate

53. What is the yield to maturity on a 3-year zero coupon bond?

A. 6.37%
B. 9.00%
C. 7.33%
D. 8.24%
E. none of the above

$(1000 / 788.66)^{1/3} - 1 = 8.24\%$

Bodie - Chapter 15 #53
Difficulty: Moderate

54. What is the price of a 4-year maturity bond with a 10% coupon rate paid annually? (Par value = $1,000)

A. $742.09
B. $1,222.09
C. $1,035.66
D. $1,141.84
E. none of the above

$(1000 / 711.00)^{1/4} - 1 = 8.9\%$; FV = 1000, PMT = 100, n = 4, i = 8.9, PV = $1,035.66

Bodie - Chapter 15 #54
Difficulty: Difficult

55. You have purchased a 4-year maturity bond with a 9% coupon rate paid annually. The bond has a par value of $1,000. What would the price of the bond be one year from now if the implied forward rates stay the same?

A. $995.63
B. $1,108.88
C. $1,000.00
D. $1,042.78
E. none of the above

$(925.16 / 711.00)]^{1/3} - 1.0 = 9.17\%$; FV = 1000, PMT = 90, n = 3, i = 9.17, PV = $995.63

Bodie - Chapter 15 #55
Difficulty: Difficult

Par Value	$1,000
Time to Maturity	18 years
Coupon	9% (paid annually)
Current Price	$917.99
Yield to Maturity	10%

56. Given the bond described above, if interest were paid semi-annually (rather than annually), and the bond continued to be priced at $917.99, the resulting effective annual yield to maturity would be:

A. Less than 10%
B. More than 10%
C. 10%
D. Cannot be determined
E. None of the above

FV = 1000, PV = -917.99, PMT = 45, n = 36, i = 4.995325 (semi-annual); $(1.4995325)^2 - 1 = 10.24\%$.

Bodie - Chapter 15 #56
Difficulty: Moderate

Year	1-Year Forward Rate
1	5%
2	5.5%
3	6.0%
4	6.5%
5	7.0%

Bodie - Chapter 15

57. What should the purchase price of a 2-year zero coupon bond be if it is purchased at the beginning of year 2 and has face value of $1,000?

A. $877.54
B. $888.33
C. $883.32
D. $894.21
E. $871.80

$1,000 / [(1.055)(1.06)] = $894.21

Bodie - Chapter 15 #57
Difficulty: Difficult

58. What would the yield to maturity be on a four-year zero coupon bond purchased today?

A. 5.75%
B. 6.30%
C. 5.65%
D. 5.25%
E. none of the above.

$[(1.05)\ (1.055)\ (1.06)\ (1.065)]^{1/4} - 1 = 5.75\%$

Bodie - Chapter 15 #58
Difficulty: Moderate

59. Calculate the price at the beginning of year 1 of an 8% annual coupon bond with face value $1,000 and 5 years to maturity.

A. $1,105.47
B. $1,131.91
C. $1,084.25
D. $1,150.01
E. $719.75

i = $[(1.05)\ (1.055)\ (1.06)\ (1.065)\ (1.07)]^{1/5} - 1 = 6\%$; FV = 1000, PMT = 80, n = 5, i = 6, PV = $1084.25

Bodie - Chapter 15 #59
Difficulty: Difficult

60. Given the yield on a 3 year zero-coupon bond is 7% and forward rates of 6% in year 1 and 6.5% in year 2, what must be the forward rate in year 3?

A. 7.2%
B. 8.6%
C. 8.5%
D. 6.9%
E. none of the above.

$f3 = (1.07)^3 / [(1.06)\ (1.065)] - 1 = 8.5\%$

Bodie - Chapter 15 #60
Difficulty: Moderate

Year	1-Year Forward Rate
1	4.6%
2	4.9%
3	5.2%
4	5.5%
5	5.8%

Bodie - Chapter 15

61. What should the purchase price of a 1-year zero coupon bond be if it is purchased today and has face value of $1,000?

A. $966.37
B. $912.87
C. $950.21
D. $956.02
E. $945.51

$1,000 / (1.046) = $956.02

Bodie - Chapter 15 #61
Difficulty: Difficult

62. What should the purchase price of a 2-year zero coupon bond be if it is purchased today and has face value of $1,000?

A. $966.87
B. $911.37
C. $950.21
D. $956.02
E. $945.51

$1,000 / [(1.046)(1.049)] = $911.37

Bodie - Chapter 15 #62
Difficulty: Difficult

63. What should the purchase price of a 3-year zero coupon bond be if it is purchased today and has face value of $1,000?

A. $887.42
B. $871.12
C. $879.54
D. $856.02
E. $866.32

$1,000 / [(1.046)(1.049)(1.052)] = $866.32

Bodie - Chapter 15 #63
Difficulty: Difficult

64. What should the purchase price of a 4-year zero coupon bond be if it is purchased today and has face value of $1,000?

A. $887.42
B. $821.15
C. $879.54
D. $856.02
E. $866.32

$1,000 / [(1.046)(1.049)(1.052)(1.055)] = $821.15

Bodie - Chapter 15 #64
Difficulty: Difficult

65. What should the purchase price of a 5-year zero coupon bond be if it is purchased today and has face value of $1,000?

A. $776.14
B. $721.15
C. $779.54
D. $756.02
E. $766.32

$1,000 / [(1.046)(1.049)(1.052)(1.055)(1.058)] = $776.14

Bodie - Chapter 15 #65
Difficulty: Difficult

66. What is the yield to maturity of a 1-year bond?

A. 4.6%
B. 4.9%
C. 5.2%
D. 5.5%
E. 5.8%

4.6% (given in table)

Bodie - Chapter 15 #66
Difficulty: Moderate

67. What is the yield to maturity of a 5-year bond?

A. 4.6%
B. 4.9%
C. 5.2%
D. 5.5%
E. 5.8%

$[(1.046)(1.049)(1.052)(1.055)(1.058)]^{1/5} - 1 = 5.2\%$

Bodie - Chapter 15 #67
Difficulty: Moderate

68. What is the yield to maturity of a 4-year bond?

A. 4.69%
B. 4.95%
C. 5.02%
D. 5.05%
E. 5.08%

$[(1.046)(1.049)(1.052)(1.055)]^{1/4} - 1 = 5.05\%$

Bodie - Chapter 15 #68
Difficulty: Moderate

69. What is the yield to maturity of a 3-year bond?

A. 4.6%
B. 4.9%
C. 5.2%
D. 5.5%
E. 5.8%

$[(1.046)(1.049)(1.052)]^{1/3} - 1 = 4.9\%$

Bodie - Chapter 15 #69
Difficulty: Moderate

70. What is the yield to maturity of a 2-year bond?

A. 4.6%
B. 4.9%
C. 5.2%
D. 4.7%
E. 5.8%

$[(1.046)(1.049)]^{1/2} - 1 = 4.7\%$

Bodie - Chapter 15 #70
Difficulty: Moderate

71. Discuss the three theories of the term structure of interest rates. Include in your discussion the differences in the theories, and the advantages/disadvantages of each.

The expectations hypothesis is the most commonly accepted theory of term structure. The theory states that the forward rate equals the market consensus expectation of future short-term rates. Thus, yield to maturity is determined solely by current and expected future one-period interest rates. An upward sloping, or normal, yield curve would indicate that investors anticipate an increase in interest rates. An inverted, or downward sloping, yield curve would indicate an expectation of decreased interest rates. A horizontal yield curve would indicate an expectation of no interest rate changes.
The liquidity preference theory of term structure maintains that short-term investors dominate the market; thus, in general, the forward rate exceeds the expected short-term rate. In other words, investors prefer to be liquid to illiquid, all else equal, and will demand a liquidity premium in order to go long term. Thus, liquidity preference readily explains the upward sloping, or normal, yield curve. However, liquidity preference does not readily explain other yield curve shapes.
Market segmentation and preferred habitat theories indicate that the markets for different maturity debt instruments are segmented. Market segmentation maintains that the rates for the different maturities are determined by the intersection of the supply and demand curves for the different maturity instruments. Market segmentation readily explains all shapes of yield curves. However, market segmentation is not observed in the real world. Investors and issuers will leave their preferred maturity habitats if yields are attractive enough on other maturities.
Feedback: The purpose of this question is to ascertain that students understand the various explanations (and deficiencies of these explanations) of term structure.

Bodie - Chapter 15 #71
Difficulty: Moderate

72. Term structure of interest rates is the relationship between what variables? What is assumed about other variables? How is term structure of interest rates depicted graphically?

Term structure of interest rates is the relationship between yield to maturity and term to maturity, all else equal. The "all else equal" refers to risk class. Term structure of interest rates is depicted graphically by the yield curve, which is usually a graph of U.S. governments of different yields and different terms to maturity. The use of U.S. governments allows one to examine the relationship between yield and maturity, holding risk constant. The yield curve depicts this relationship at one point in time only.
Feedback: This question is designed to ascertain that students understand the relationships involved in term structure, the restrictions on the relationships, and how the relationships are depicted graphically.

Bodie - Chapter 15 #72
Difficulty: Moderate

73. Although the expectations of increases in future interest rates can result in an upward sloping yield curve; an upward sloping yield curve does not in and of itself imply the expectations of higher future interest rates. Explain.

The effects of possible liquidity premiums confound any simple attempt to extract expectation from the term structure. That is, the upward sloping yield curve may be due to expectations of interest rate increases, or due to the requirement of a liquidity premium, or both. The liquidity premium could more than offset expectations of decreased interest rates, and an upward sloping yield would result.
Feedback: The purpose of this question is to assure that the student understands the confounding of the liquidity premium with the expectations hypothesis, and that the interpretations of term structure are not clear-cut.

Bodie - Chapter 15 #73
Difficulty: Moderate

74. Explain what the following terms mean: spot rate, short rate, and forward rate. Which of these is (are) observable today?

From the answer to Concept Check 2, on page 516: "The n-period spot rate is the yield to maturity on a zero-coupon bond with a maturity of n periods. The short rate for period n is the one-period interest rate that will prevail in period n. The forward rate for period n is the short rate that would satisfy a "break-even condition" equating the total returns on two n-period investment strategies. The first strategy is an investment in an n-period zero-coupon bond. The second is an investment in an n-1 period zero-coupon bond "rolled over" into an investment in a one-period zero. Spot rates and forward rates are observable today, but because interest rates evolve with uncertainty, future short rates are not. In the special case in which there is no uncertainty in future interest rates, the forward rate calculated from the yield curve would equal the short rate that will prevail in that period."
Feedback: This question checks whether the student understands the difference between each kind of rate.

Bodie - Chapter 15 #74
Difficulty: Moderate

75. Answer the following questions that relate to bonds.
- A 2-year zero-coupon bond is selling for $890.00. What is the yield to maturity of this bond?
- The price of a 1-year zero coupon bond is $931.97. What is the yield to maturity of this bond?
- Calculate the forward rate for the second year.
- How can you construct a synthetic one-year forward loan (you are agreeing now to loan in one year)? State the strategy and show the corresponding cash flows. Assume that you can purchase and sell fractional portions of bonds. Show all calculations and discuss the meaning of the transactions.

Calculations are shown in the table below.
- Calculations for YTM of the 2-year zero: N=2, PV=-890.00, PMT=0, FV=1000, CPT IÞ6.0.
- Calculations for YTM of the 1-year zero: N=1, PV=-931.97, PMT=0, FV=1000, CPT IÞ7.3.
- Calculations for f_2: $(1.06)^2/(1.073) - 1 = .047157502$, $f_2 = 4.7157502\%$
- As shown by the calculations below, you purchase enough 2-year zeros to offset the cost of the 1-year zero. At time 1 the 1-year zero matures and you get $1,000. At time 2 the 2-year zeros mature and you have to pay 1.047157502 * $1,000 = $1,047.16. You are effectively borrowing $1,000 a year from now and paying $1,047.16 a year from then. The rate on this forward loan is $1,047.16/$1,000 - 1 = .04716, which equals the forward rate for the second year (f_2).

Strategy	Cash Flow
Buy a 1-year zero-coupon bond	-$931.97
Sell 1.047157502 2-year zeros	$890.00 * 1.047157502 = $931.97
Net Cash Flow	$0.00

Feedback: This questions tests the students understanding of the relationship between the prices of zero-coupon bonds and the yield curve.

Bodie - Chapter 15 #75
Difficulty: Difficult

ch15 Summary

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