Chapter 02
Determinants of Interest Rates

True / False Questions

1. The real interest rate is the increment to purchasing power that the lender earns in order to induce him or her to forego current consumption.
True False

2. If you earn 0.5% a month in your bank account, this would be the same as earning a 6% annual interest rate with annual compounding.
True False

3. Simple interest calculations assume that interest earned is never reinvested.
True False

4. An investor earned a 5% nominal rate of return over the year. However, over the year, prices increased by 2%. The investor's real rate of return was less than his nominal rate of return.
True False

5. Earning a 5% interest rate with annual compounding is better than earning a 4.95% interest rate with semiannual compounding.
True False

6. For any positive interest rate the present value of a given annuity will be less than the sum of the cash flows and the future value of the same annuity will be greater than the sum of the cash flows.
True False

7. With a zero interest rate both the present value and the future value of an N payment annuity would equal N x payment.
True False

8. Households generally supply more funds to the markets as their income and wealth increase, ceteris paribus.
True False

9. An increase in the perceived riskiness of investments would cause a movement up along the supply curve.
True False

10. An increase in the marginal tax rates for all U.S. taxpayers would probably result in reduced supply of funds by households.
True False

11. When the quantity of a financial security supplied or demanded changes at every given interest rate in response to a change in a factor, this causes a shift in the supply or demand curve.
True False

12. An improvement in economic conditions would likely shift the supply curve down and to the right and shift the demand curve for funds up and to the right.
True False

13. The risk that a security cannot be sold at a predictable price with low transaction costs at short notice is called liquidity risk.
True False

14. Convertible bonds will normally have lower promised yields than straight bonds of similar terms and quality.
True False

15. We expect liquidity premiums to move inversely with interest rate volatility.
True False

16. Everything else equal, the interest rate required on a callable bond will be less than the interest rate on a convertible bond.
True False

17. The term structure of interest rates is the relationship between interest rates on bonds similar in terms except for maturity.
True False

18. The unbiased expectations hypothesis of the term structure posits that long-term interest rates are unrelated to expected future short-term rates.
True False

19. The traditional liquidity premium theory states that long-term interest rates are greater than the average of expected future interest rates.
True False

20. According to the market segmentation theory short-term investors will not normally switch to intermediate- or long-term investments.
True False

Multiple Choice Questions

21. An investment pays $400 in one year, X amount of dollars in two years, and $500 in 3 years. The total present value of all the cash flows (including X) is equal to $1500. If i is 6%, what is X?
A. $702.83
B. $822.41
C. $789.70
D. $749.67
E. $600.00

22. An insurance company is trying to sell you a retirement annuity. The annuity will give you 20 payments with the first payment in 12 years when you retire. The insurance firm is asking you to pay $50,000 today. If this is a fair deal, what must the payment amount be (to the dollar) if the interest rate is 8%?
A. $5,093
B. $12,824
C. $9,472
D. $11,874
E. $10,422

23. You borrow $95 today for six and a half weeks. You must repay $100 at loan maturity. What is the effective annual rate on this loan?
A. 50.73%
B. 40.00%
C. 32.33%
D. 27.95%
E. 37.93%

24. If M > 1 and you solve the following equation to find i: PV * (1 + (i/M))M*N= FV, the i you get will be
A. the bond equivalent yield
B. the EAR
C. the TOE
D. the EYE
E. the rate per compounding period

25. An annuity and an annuity due with the same number of payments have the same future value if r = 10%. Which one has the higher payment?
A. They both must have the same payment since the future values are the same
B. There is no way to tell which has the higher payment
C. An annuity and an annuity due cannot have the same future value
D. The annuity has the higher payment
E. The annuity due has the higher payment

26. You go to the *Wall Street Journal* and notice that yields on almost all corporate and Treasury bonds have decreased. The yield decreases may be explained by which one of the following:
A. a decrease in U.S. inflationary expectations
B. newly expected decline in the value of the dollar
C. an increase in current and expected future returns of real corporate investments
D. decreased Japanese purchases of U.S. Treasury Bills/Bonds
E. increases in the U.S. government budget deficit

Figure 2-1

YIELD CURVE FOR ZERO COUPON BONDS RATED AA

Maturity	YTM	Maturity	YTM	Maturity	YTM
1 year	8.00%	7 year	9.15%	13 year	10.45%
2 year	8.11%	8 year	9.25%	14 year	10.65%
3 year	8.20%	9 year	9.35%	15 year	10.75%
4 year	8.50%	10 year	9.47%	16 year	10.95%
5 year	8.75%	11 year	9.52%	17 year	11.00%
6 year	8.85%	12 year	9.77%	18 year	11.25%

Assume that there are no liquidity premiums.

27. To the nearest basis point, what is the expected interest rate on a four-year maturity AA zero coupon bond purchased six years from today?
A. 10.41%
B. 10.05%
C. 9.16%
D. 10.56%
E. 9.96%

28. You just bought a fifteen-year maturity Xerox corporate bond rated AA with a 0% coupon. You expect to sell the bond in eight years. Find the expected interest rate at the time of sale (watch out for rounding error).
A. 11.00%
B. 8.85%
C. 12.49%
D. 12.80%
E. 13.92%

29. According to the liquidity premium theory of interest rates,
A. long-term spot rates are higher than the average of current and expected future short-term rates
B. investors prefer certain maturities and will not normally switch out of those maturities
C. investors are indifferent between different maturities if the long-term spot rates are equal to the average of current and expected future short-term rates
D. the term structure must always be upward sloping
E. long-term spot rates are totally unrelated to expectations of future short-term rates

30. Of the following, the most likely effect of an increase in income tax rates would be to
A. decrease the savings rate
B. decrease the supply of loanable funds
C. increase interest rates
D. all of the above

31. Upon graduating from college this year you expect to earn $25,000 per year. If you get your MBA, in one year you can expect to start at $35,000 per year. Over the year, inflation is expected to be 5%. In today's dollars, how much additional (less) money will you make from getting your MBA (to the nearest dollar) in your first year?
A. -$2,462
B. $8,333
C. $8,750
D. $9,524
E. $10,000

32. Investment A pays 8% simple interest for 10 years. Investment B pays 7.75% compound interest for 10 years. Both require an initial $10,000 investment. The future value of A minus the future value of B is equal to _____ (to the nearest penny).
A. $2,500.00
B. -$2,500.00
C. $1,643.32
D. $3,094.67
E. -$3,094.67

33. You buy a car for $38,000. You agree to a 60-month loan with a monthly interest rate of 0.55%. What is your required monthly payment?
A. $634.24
B. $745.29
C. $605.54
D. $764.07
E. none of the above

34. You buy an investment today for $9,000. You sell the investment in 120 days for $9,500. The effective annual rate on this investment is
A. 13.76%
B. 14.35%
C. 15.56%
D. 16.90%
E. 17.87%

35. A bank manager lends a corporate client $1,000,000 for six months. The bank charges a $1,000 fee to set up the loan. The corporate borrower repays $1,050,000 in six months. What is the effective annual rate on the loan?
A. 5%
B. 5.1%
C. 10.25%
D. 10.47%
E. none of the above

36. You want to have $5 million when you retire in 40 years. You believe you can earn 9% per year on your investment. How much must you invest each year to achieve your goal when you retire? (Ignore all taxes)
A. $10,412
B. $11,619
C. $14,798
D. $15,295
E. none of the above

37. An investor wants to be able to buy 4% more goods and services in the future in order to induce her to invest today. During the investment period prices are expected to rise by 2%. Which statement(s) below is/are true?

I. 4% is the desired real rate of interest
II. 6% is the approximate nominal rate of interest required
III. 2% is the expected inflation rate over the period
A. I only
B. II only
C. III only
D. I and II only
E. I, II, and III are true

38. Classify each of the following in terms of their effect on interest rates (increase or decrease):

I. Perceived risk of financial securities increases
II. Near term spending needs decrease
III. Future profitability of real investments increases
A. I increases, II increases, III increases
B. I increases, II decreases, III decreases
C. I decreases, II increases, III increases
D. I decreases, II decreases, III decreases
E. none of the above

39. Classify each of the following in terms of their effect on interest rates (increase or decrease):

I. Covenants on borrowing become more restrictive
II. The Federal Reserve increases the money supply
III. Total household wealth increases
A. I increases; II increases; III increases
B. I increases; II decreases; III decreases
C. I decreases; II increases; III increases
D. I decreases; II decreases; III decreases
E. none of the above

40. Inflation causes the demand curve for loanable funds to shift to the _____ and causes the supply curve to shift to the _____.
A. right; right
B. right; left
C. left; left
D. left; right

41. An individual actually earned a 4% nominal return last year. Prices went up by 3% over the year. Given that the investment income was subject to a federal tax rate of 28% and a state and local tax rate of 6%, what was the investor's actual real after-tax rate of return?
A. -0.36%
B. 0.66%
C. 0.72%
D. 1.45%
E. 2.64%

42. A 15 payment annual annuity has its first payment in 9 years. If the payment amount is $1400 and the interest rate is 7%, what is the most you should be willing to pay today for this investment?
A. $5,825.11
B. $12,751.08
C. $6,416.67
D. $7,421.24
E. $6,935.74

43. Which of the following would normally be expected to result in an increase in the supply of funds, all else equal?

I. The perceived riskiness of all investments decreases.
II. Expected inflation increases.
III. Current income and wealth levels increase.
IV. Near term spending needs of households increase as energy costs rise.
A. I and III only
B. II and III only
C. II, III, and IV only
D. I and IV only
E. I, II, III, and IV

44. An investor requires a 3% increase in purchasing power in order to induce her to lend. She expects inflation to be 2% next year. The nominal rate she much charge is about
A. 3%
B. 2%
C. 1%
D. 5%
E. 7%

45. The term structure of interest rates is upward sloping for all bond types. A certain AAA rated non-callable 10-year corporate bond has been issued at a 6.15% promised yield. Which one of the following bonds probably has a higher promised yield?
A. A similar quality municipal bond.
B. A non-callable AAA rated corporate bond with a 5-year maturity.
C. A callable AAA rated corporate bond with a 15-year maturity.
D. A non-callable AAA rated convertible corporate bond with a 10-year maturity.
E. All of the above would have a higher promised yield.

46. Which of the following bond types pays interest that is exempt from federal taxation?
A. Municipal bonds
B. Corporate bonds
C. Treasury bonds
D. Convertible bonds
E. Both A) and C)

47. The relationship between maturity and yield to maturity is called the _____.
A. loan covenant
B. term structure
C. bond indenture
D. Fisher effect
E. DRP structure

48. According to the unbiased expectations theory,
A. markets are segmented and buyers stay in their own segment
B. liquidity premiums are negative and time varying
C. the term structure will most often be upward sloping
D. the long-term spot rate is an average of the current and expected future short-term interest rates
E. forward rates are less than the expected future spot rates

Short Answer Questions

49. Suppose you borrow $15,000 and then repay the loan by making 12 monthly payments of $1,297.92 each. What rate will you be quoted on the loan? What is the effective annual rate you are paying?

50. What is the loanable funds theory of interest rates?

51. What is the difference between the expected real interest rate and the real rate of interest actually earned?

52. Can the actual real rate of interest be negative? When? Can the expected real rate be negative?

53. In October 1987 stock prices fell 22% in one day and bond rates fell also. Use the loanable funds theory to explain what happened.

54. A foreign investor placing money in dollar denominated assets desires a 4% real rate of return. Global inflation is running about 3% and the dollar is expected to decline against her home currency by 1.5% over the investment period. What is her minimum required rate of return? Explain

55. Would you expect the demand curve for businesses to be steeper than the demand curve for funds by the federal government? Explain.

56. Who are the major suppliers and demanders of funds in the United States and what is their typical position?

57. According to current projections, Social Security and other entitlement programs will soon be severely underfunded. If the government decides to cut social security benefits to future retirees and raise social security taxes on all workers, what will probably happen to the supply of funds available to the capital markets? What will be the effect on interest rates?

58. The one-year spot rate is currently 4%; the one-year spot rate one year from now will be 3%; and the one-year spot rate two years from now will be 6%. Under the unbiased expectations theory, what must today's three-year spot rate be? Suppose the three-year spot rate is actually 3.75%, how could you take advantage of this? Explain.

59. Explain the logic of the liquidity premium theory of the term structure.

60. Explain the market segmentation theory of the term structure.

Chapter 02 Determinants of Interest Rates Answer Key

True / False Questions

1. The real interest rate is the increment to purchasing power that the lender earns in order to induce him or her to forego current consumption.
TRUE

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 2 Medium
Learning Goal: 02-06 Know what specific factors determine interest rates.
Topic: Determinants of Interest Rates for Individual Securities

2. If you earn 0.5% a month in your bank account, this would be the same as earning a 6% annual interest rate with annual compounding.
FALSE

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 2 Medium
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
Topic: Time Value of Money and Interest Rates

3. Simple interest calculations assume that interest earned is never reinvested.
TRUE

AACSB: Reflective Thinking
Blooms: Remember
Difficulty: 1 Easy
Learning Goal: 02-06 Know what specific factors determine interest rates.
Topic: Determinants of Interest Rates for Individual Securities

4. An investor earned a 5% nominal rate of return over the year. However, over the year, prices increased by 2%. The investor's real rate of return was less than his nominal rate of return.
TRUE

AACSB: Analytic
AACSB: Reflective Thinking
Blooms: Analyze
Blooms: Apply
Difficulty: 1 Easy
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
Topic: Time Value of Money and Interest Rates

5. Earning a 5% interest rate with annual compounding is better than earning a 4.95% interest rate with semiannual compounding.
FALSE

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 3 Difficult
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
Topic: Time Value of Money and Interest Rates

6. For any positive interest rate the present value of a given annuity will be less than the sum of the cash flows and the future value of the same annuity will be greater than the sum of the cash flows.
TRUE

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 2 Medium
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
Topic: Time Value of Money and Interest Rates

7. With a zero interest rate both the present value and the future value of an N payment annuity would equal N x payment.
TRUE

AACSB: Reflective Thinking
Blooms: Remember
Difficulty: 2 Medium
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
Topic: Time Value of Money and Interest Rates

8. Households generally supply more funds to the markets as their income and wealth increase, ceteris paribus.
TRUE

AACSB: Reflective Thinking
Blooms: Remember
Blooms: Understand
Difficulty: 1 Easy
Learning Goal: 02-01 Know who the main suppliers of loanable funds are.
Topic: Loanable Funds Theory

9. An increase in the perceived riskiness of investments would cause a movement up along the supply curve.
FALSE

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 2 Medium
Learning Goal: 02-01 Know who the main suppliers of loanable funds are.
Learning Goal: 02-03 Understand how equilibrium interest rates are determined.
Learning Goal: 02-04 Examine factors that cause the supply and demand curves for loanable funds to shift.
Topic: Loanable Funds Theory

10. An increase in the marginal tax rates for all U.S. taxpayers would probably result in reduced supply of funds by households.
TRUE

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 1 Easy
Learning Goal: 02-01 Know who the main suppliers of loanable funds are.
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11. When the quantity of a financial security supplied or demanded changes at every given interest rate in response to a change in a factor, this causes a shift in the supply or demand curve.
TRUE

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 2 Medium
Learning Goal: 02-03 Understand how equilibrium interest rates are determined.
Learning Goal: 02-04 Examine factors that cause the supply and demand curves for loanable funds to shift.
Topic: Loanable Funds Theory

12. An improvement in economic conditions would likely shift the supply curve down and to the right and shift the demand curve for funds up and to the right.
TRUE

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 2 Medium
Learning Goal: 02-01 Know who the main suppliers of loanable funds are.
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Topic: Loanable Funds Theory

13. The risk that a security cannot be sold at a predictable price with low transaction costs at short notice is called liquidity risk.
TRUE

AACSB: Reflective Thinking
Blooms: Remember
Difficulty: 1 Easy
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
Topic: Time Value of Money and Interest Rates

14. Convertible bonds will normally have lower promised yields than straight bonds of similar terms and quality.
TRUE

AACSB: Reflective Thinking
Blooms: Evaluate
Difficulty: 2 Medium
Learning Goal: 02-06 Know what specific factors determine interest rates.
Topic: Determinants of Interest Rates for Individual Securities

15. We expect liquidity premiums to move inversely with interest rate volatility.
FALSE

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 3 Difficult
Learning Goal: 02-06 Know what specific factors determine interest rates.
Topic: Determinants of Interest Rates for Individual Securities

16. Everything else equal, the interest rate required on a callable bond will be less than the interest rate on a convertible bond.
FALSE

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 1 Easy
Learning Goal: 02-06 Know what specific factors determine interest rates.
Topic: Determinants of Interest Rates for Individual Securities

17. The term structure of interest rates is the relationship between interest rates on bonds similar in terms except for maturity.
TRUE

AACSB: Reflective Thinking
Blooms: Remember
Difficulty: 1 Easy
Learning Goal: 02-07 Examine the different theories explaining the term structure of interest rates.
Topic: Term Structure of Interest Rates

18. The unbiased expectations hypothesis of the term structure posits that long-term interest rates are unrelated to expected future short-term rates.
FALSE

AACSB: Reflective Thinking
Blooms: Remember
Difficulty: 2 Medium
Learning Goal: 02-07 Examine the different theories explaining the term structure of interest rates.
Topic: Term Structure of Interest Rates

19. The traditional liquidity premium theory states that long-term interest rates are greater than the average of expected future interest rates.
TRUE

AACSB: Reflective Thinking
Blooms: Remember
Difficulty: 2 Medium
Learning Goal: 02-07 Examine the different theories explaining the term structure of interest rates.
Topic: Term Structure of Interest Rates

20. According to the market segmentation theory short-term investors will not normally switch to intermediate- or long-term investments.
TRUE

AACSB: Reflective Thinking
Blooms: Remember
Difficulty: 1 Easy
Learning Goal: 02-07 Examine the different theories explaining the term structure of interest rates.
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Multiple Choice Questions

21. An investment pays $400 in one year, X amount of dollars in two years, and $500 in 3 years. The total present value of all the cash flows (including X) is equal to $1500. If i is 6%, what is X?
A. $702.83
B. $822.41
C. $789.70
D. $749.67
E. $600.00

$X = [1500 - (400/1.06) - (500/1.06^3)]*1.06^2$

AACSB: Analytic
Blooms: Analyze
Blooms: Apply
Difficulty: 3 Difficult
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
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$\$50{,}000 \times 1.08^{11} = \text{Pmt} \times \text{PVIFA}(8\%, 20 \text{ yrs})$

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Blooms: Apply
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$(100/95)^{(52/6.5)}$

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26. You go to the *Wall Street Journal* and notice that yields on almost all corporate and Treasury bonds have decreased. The yield decreases may be explained by which one of the following:
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C. an increase in current and expected future returns of real corporate investments
D. decreased Japanese purchases of U.S. Treasury Bills/Bonds
E. increases in the U.S. government budget deficit

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Blooms: Analyze
Blooms: Evaluate
Difficulty: 2 Medium
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Topic: Determinants of Interest Rates for Individual Securities

Figure 2-1

YIELD CURVE FOR ZERO COUPON BONDS RATED AA

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5 year	8.75%	11 year	9.52%	17 year	11.00%
6 year	8.85%	12 year	9.77%	18 year	11.25%

Assume that there are no liquidity premiums.

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A. 10.41%
B. 10.05%
C. 9.16%
D. 10.56%
E. 9.96%

$((1.0947^{10}/1.0885^{6}))^{(1/4)} -1$

AACSB: Analytic
Blooms: Analyze
Blooms: Apply
Difficulty: 3 Difficult
Learning Goal: 02-08 Understand how forward rates of interest can be derived from the term structure of interest rates.
Topic: Forecasting Interest Rates

28. You just bought a fifteen-year maturity Xerox corporate bond rated AA with a 0% coupon. You expect to sell the bond in eight years. Find the expected interest rate at the time of sale (watch out for rounding error).
A. 11.00%
B. 8.85%
C. 12.49%
D. 12.80%
E. 13.92%

$((1.1075^{15}/1.0925^{8}))^{(1/7)} - 1$

AACSB: Analytic
Blooms: Analyze
Blooms: Apply
Difficulty: 3 Difficult
Learning Goal: 02-08 Understand how forward rates of interest can be derived from the term structure of interest rates.
Topic: Forecasting Interest Rates

29. According to the liquidity premium theory of interest rates,
A. long-term spot rates are higher than the average of current and expected future short-term rates
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C. investors are indifferent between different maturities if the long-term spot rates are equal to the average of current and expected future short-term rates
D. the term structure must always be upward sloping
E. long-term spot rates are totally unrelated to expectations of future short-term rates

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 3 Difficult
Learning Goal: 02-07 Examine the different theories explaining the term structure of interest rates.
Topic: Term Structure of Interest Rates

30. Of the following, the most likely effect of an increase in income tax rates would be to
A. decrease the savings rate
B. decrease the supply of loanable funds
C. increase interest rates
D. all of the above

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 2 Medium
Learning Goal: 02-04 Examine factors that cause the supply and demand curves for loanable funds to shift.
Topic: Loanable Funds Theory

31. Upon graduating from college this year you expect to earn $25,000 per year. If you get your MBA, in one year you can expect to start at $35,000 per year. Over the year, inflation is expected to be 5%. In today's dollars, how much additional (less) money will you make from getting your MBA (to the nearest dollar) in your first year?
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B. $8,333
C. $8,750
D. $9,524
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(35,000/1.05)-25,000

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AACSB: Reflective Thinking
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Difficulty: 3 Difficult
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
Topic: Time Value of Money and Interest Rates

32. Investment A pays 8% simple interest for 10 years. Investment B pays 7.75% compound interest for 10 years. Both require an initial $10,000 investment. The future value of A minus the future value of B is equal to _____ (to the nearest penny).
A. $2,500.00
B. -$2,500.00
C. $1,643.32
D. $3,094.67
E. -$3,094.67

$[10000 + (800 \times 10)] - [10000 \times 1.0775^{10}]$

AACSB: Analytic
Blooms: Analyze
Blooms: Apply
Difficulty: 3 Difficult
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
Topic: Time Value of Money and Interest Rates

33. You buy a car for $38,000. You agree to a 60-month loan with a monthly interest rate of 0.55%. What is your required monthly payment?
A. $634.24
B. $745.29
C. $605.54
D. $764.07
E. none of the above

Pmt = 38,000/PVIFA (i = 0.55%, n = 60)

AACSB: Analytic
Blooms: Analyze
Blooms: Apply
Difficulty: 2 Medium
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
Topic: Time Value of Money and Interest Rates

34. You buy an investment today for $9,000. You sell the investment in 120 days for $9,500. The effective annual rate on this investment is
A. 13.76%
B. 14.35%
C. 15.56%
D. 16.90%
E. 17.87%

$(9{,}500/9000)^{(365/120)} - 1$

AACSB: Analytic
Blooms: Analyze
Blooms: Apply
Difficulty: 2 Medium
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
Topic: Time Value of Money and Interest Rates

35. A bank manager lends a corporate client $1,000,000 for six months. The bank charges a $1,000 fee to set up the loan. The corporate borrower repays $1,050,000 in six months. What is the effective annual rate on the loan?
A. 5%
B. 5.1%
C. 10.25%
D. 10.47%
E. none of the above

$\{\$1{,}050{,}000/(\$1{,}000{,}000 - \$1{,}000)\}^2 - 1 = 10.47\%$

AACSB: Analytic
Blooms: Analyze
Blooms: Apply
Difficulty: 3 Difficult
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
Topic: Time Value of Money and Interest Rates

36. You want to have $5 million when you retire in 40 years. You believe you can earn 9% per year on your investment. How much must you invest each year to achieve your goal when you retire? (Ignore all taxes)
A. $10,412
B. $11,619
C. $14,798
D. $15,295
E. none of the above

$5 million/[((1.09)^{40} -1)/0.09]

AACSB: Analytic
AACSB: Reflective Thinking
Blooms: Analyze
Blooms: Apply
Difficulty: 1 Easy
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
Topic: Time Value of Money and Interest Rates

37. An investor wants to be able to buy 4% more goods and services in the future in order to induce her to invest today. During the investment period prices are expected to rise by 2%. Which statement(s) below is/are true?

I. 4% is the desired real rate of interest
II. 6% is the approximate nominal rate of interest required
III. 2% is the expected inflation rate over the period
A. I only
B. II only
C. III only
D. I and II only
E. I, II, and III are true

AACSB: Analytic
AACSB: Reflective Thinking
Blooms: Analyze
Blooms: Apply
Difficulty: 2 Medium
Learning Goal: 02-06 Know what specific factors determine interest rates.
Topic: Determinants of Interest Rates for Individual Securities

38. Classify each of the following in terms of their effect on interest rates (increase or decrease):

I. Perceived risk of financial securities increases
II. Near term spending needs decrease
III. Future profitability of real investments increases
A. I increases, II increases, III increases
B. I increases, II decreases, III decreases
C. I decreases, II increases, III increases
D. I decreases, II decreases, III decreases
E. none of the above

AACSB: Analytic
AACSB: Reflective Thinking
Blooms: Analyze
Blooms: Understand
Difficulty: 3 Difficult
Learning Goal: 02-02 Know who the main demanders of loanable funds are.
Learning Goal: 02-03 Understand how equilibrium interest rates are determined.
Learning Goal: 02-04 Examine factors that cause the supply and demand curves for loanable funds to shift.
Topic: Loanable Funds Theory

39. Classify each of the following in terms of their effect on interest rates (increase or decrease):

I. Covenants on borrowing become more restrictive
II. The Federal Reserve increases the money supply
III. Total household wealth increases
A. I increases; II increases; III increases
B. I increases; II decreases; III decreases
C. I decreases; II increases; III increases
D. I decreases; II decreases; III decreases
E. none of the above

AACSB: Analytic
AACSB: Reflective Thinking
Blooms: Analyze
Blooms: Understand
Difficulty: 3 Difficult
Learning Goal: 02-01 Know who the main suppliers of loanable funds are.
Learning Goal: 02-02 Know who the main demanders of loanable funds are.
Learning Goal: 02-03 Understand how equilibrium interest rates are determined.
Learning Goal: 02-04 Examine factors that cause the supply and demand curves for loanable funds to shift.
Topic: Loanable Funds Theory

40. Inflation causes the demand curve for loanable funds to shift to the _____ and causes the supply curve to shift to the _____.
A. right; right
B. right; left
C. left; left
D. left; right

AACSB: Analytic
AACSB: Reflective Thinking
Blooms: Analyze
Blooms: Understand
Difficulty: 3 Difficult
Learning Goal: 02-01 Know who the main suppliers of loanable funds are.
Learning Goal: 02-02 Know who the main demanders of loanable funds are.
Learning Goal: 02-03 Understand how equilibrium interest rates are determined.
Learning Goal: 02-04 Examine factors that cause the supply and demand curves for loanable funds to shift.
Topic: Loanable Funds Theory

41. An individual actually earned a 4% nominal return last year. Prices went up by 3% over the year. Given that the investment income was subject to a federal tax rate of 28% and a state and local tax rate of 6%, what was the investor's actual real after-tax rate of return?
A. -0.36%
B. 0.66%
C. 0.72%
D. 1.45%
E. 2.64%

{0.04 * [1 - (0.28 + 0.06)]}-0.03

AACSB: Analytic
Blooms: Analyze
Blooms: Apply
Difficulty: 3 Difficult
Learning Goal: 02-06 Know what specific factors determine interest rates.
Topic: Determinants of Interest Rates for Individual Securities

42. A 15 payment annual annuity has its first payment in 9 years. If the payment amount is $1400 and the interest rate is 7%, what is the most you should be willing to pay today for this investment?
A. $5,825.11
B. $12,751.08
C. $6,416.67
D. $7,421.24
E. $6,935.74

PV0 =$1,400* {[1 - 1.07^{-15}]/0.07}/1.07^{8}

AACSB: Analytic
Blooms: Analyze
Blooms: Apply
Difficulty: 3 Difficult
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
Topic: Time Value of Money and Interest Rates

43. Which of the following would normally be expected to result in an increase in the supply of funds, all else equal?

I. The perceived riskiness of all investments decreases.
II. Expected inflation increases.
III. Current income and wealth levels increase.
IV. Near term spending needs of households increase as energy costs rise.
A. I and III only
B. II and III only
C. II, III, and IV only
D. I and IV only
E. I, II, III, and IV

AACSB: Analytic
AACSB: Reflective Thinking
Blooms: Analyze
Blooms: Understand
Difficulty: 2 Medium
Learning Goal: 02-01 Know who the main suppliers of loanable funds are.
Learning Goal: 02-03 Understand how equilibrium interest rates are determined.
Learning Goal: 02-04 Examine factors that cause the supply and demand curves for loanable funds to shift.
Topic: Loanable Funds Theory

44. An investor requires a 3% increase in purchasing power in order to induce her to lend. She expects inflation to be 2% next year. The nominal rate she much charge is about
A. 3%
B. 2%
C. 1%
D. 5%
E. 7%

AACSB: Analytic
Blooms: Analyze
Blooms: Apply
Difficulty: 1 Easy
Learning Goal: 02-06 Know what specific factors determine interest rates.
Topic: Determinants of Interest Rates for Individual Securities

45. The term structure of interest rates is upward sloping for all bond types. A certain AAA rated non-callable 10-year corporate bond has been issued at a 6.15% promised yield. Which one of the following bonds probably has a higher promised yield?
A. A similar quality municipal bond.
B. A non-callable AAA rated corporate bond with a 5-year maturity.
C. A callable AAA rated corporate bond with a 15-year maturity.
D. A non-callable AAA rated convertible corporate bond with a 10-year maturity.
E. All of the above would have a higher promised yield.

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 3 Difficult
Learning Goal: 02-07 Examine the different theories explaining the term structure of interest rates.
Topic: Term Structure of Interest Rates

46. Which of the following bond types pays interest that is exempt from federal taxation?
A. Municipal bonds
B. Corporate bonds
C. Treasury bonds
D. Convertible bonds
E. Both A) and C)

AACSB: Reflective Thinking
Blooms: Remember
Difficulty: 2 Medium
Learning Goal: 02-06 Know what specific factors determine interest rates.
Topic: Determinants of Interest Rates for Individual Securities

47. The relationship between maturity and yield to maturity is called the _____.
A. loan covenant
B. term structure
C. bond indenture
D. Fisher effect
E. DRP structure

AACSB: Reflective Thinking
Blooms: Remember
Difficulty: 1 Easy
Learning Goal: 02-06 Know what specific factors determine interest rates.
Topic: Determinants of Interest Rates for Individual Securities

48. According to the unbiased expectations theory,
A. markets are segmented and buyers stay in their own segment
B. liquidity premiums are negative and time varying
C. the term structure will most often be upward sloping
D. the long-term spot rate is an average of the current and expected future short-term interest rates
E. forward rates are less than the expected future spot rates

AACSB: Reflective Thinking
Blooms: Remember
Difficulty: 1 Easy
Learning Goal: 02-07 Examine the different theories explaining the term structure of interest rates.
Topic: Term Structure of Interest Rates

Short Answer Questions

49. Suppose you borrow $15,000 and then repay the loan by making 12 monthly payments of $1,297.92 each. What rate will you be quoted on the loan? What is the effective annual rate you are paying?

The interest rate is the solution to the following:
PV = PMT * [(1 - (1+r)$^{-N}$))/r] or $15,000=$1,297.92 * [(1 - (1+r)$^{-12}$))/r]
r = 0.5836% per month
You will be quoted the monthly rate times 12 or 0.5836% *12 = 7.00%. The effective annual rate is then found as 1.005836^{12}-1 = 7.23%.

AACSB: Analytic
Blooms: Analyze
Blooms: Apply
Difficulty: 2 Medium
Learning Goal: 02-09 Understand how interest rates are used to determine present and future values.
Topic: Time Value of Money and Interest Rates

50. What is the loanable funds theory of interest rates?

The level of interest rates in the economy is set by economic agents' willingness to make funds available to capital markets and borrowers' demand for funds in the capital markets at various interest rates. The interest rate where the supply of funds matches demand for funds is the equilibrium interest rate.

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 1 Easy
Learning Goal: 02-07 Examine the different theories explaining the term structure of interest rates.
Topic: Term Structure of Interest Rates

51. What is the difference between the expected real interest rate and the real rate of interest actually earned?

The expected real rate of interest is the nominal rate minus the expected inflation rate. The actual (or realized) real rate is the nominal rate of interest (absent default) minus the actual rate of inflation.

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 1 Easy
Learning Goal: 02-06 Know what specific factors determine interest rates.
Topic: Determinants of Interest Rates for Individual Securities

52. Can the actual real rate of interest be negative? When? Can the expected real rate be negative?

The actual real rate can be negative when actual inflation is greater than the nominal rate of interest. The expected real rate normally must be positive because investors build into the nominal rate a premium for expected inflation. However, recently in Japan, expected real rates have been negative on bank accounts and have still attracted funds. Investors in this case are willing to pay a (small) storage premium to banks for the convenience and safe keeping that bank accounts provide.

AACSB: Analytic
AACSB: Reflective Thinking
Blooms: Analyze
Blooms: Evaluate
Difficulty: 2 Medium
Learning Goal: 02-06 Know what specific factors determine interest rates.
Topic: Determinants of Interest Rates for Individual Securities

53. In October 1987 stock prices fell 22% in one day and bond rates fell also. Use the loanable funds theory to explain what happened.

The worsening of perceived future economic conditions and a likely increase in risk premiums on equities caused a so-called "flight to quality." Reduced supply of funds in stock markets caused falling prices and, as the money moved into bonds, the increased supply of funds available for borrowing pushed bond rates down.

AACSB: Analytic
AACSB: Reflective Thinking
Blooms: Analyze
Blooms: Evaluate
Difficulty: 1 Easy
Learning Goal: 02-01 Know who the main suppliers of loanable funds are.
Learning Goal: 02-03 Understand how equilibrium interest rates are determined.
Learning Goal: 02-04 Examine factors that cause the supply and demand curves for loanable funds to shift.
Topic: Loanable Funds Theory

54. A foreign investor placing money in dollar denominated assets desires a 4% real rate of return. Global inflation is running about 3% and the dollar is expected to decline against her home currency by 1.5% over the investment period. What is her minimum required rate of return? Explain

Approximately 4% + 3% + 1.5% = 8.5%
She would have to earn an additional 3% to cover the rising cost of goods and services and an additional 1.5% to cover the loss in value of her dollars since the dollars she will get back will buy fewer units of her home currency. All this is needed in order to preserve a 4% increase in real purchasing power in her home country.

AACSB: Analytic
AACSB: Reflective Thinking
Blooms: Analyze
Blooms: Apply
Blooms: Evaluate
Difficulty: 2 Medium
Learning Goal: 02-06 Know what specific factors determine interest rates.
Topic: Determinants of Interest Rates for Individual Securities

55. Would you expect the demand curve for businesses to be steeper than the demand curve for funds by the federal government? Explain.

Because businesses have a profit motive and the federal government does not, we would expect business demand for funds to be more sensitive to the interest rate than the federal government. Hence, the demand for funds by businesses would exhibit a flatter curve (more elastic) than the government (less elastic).

AACSB: Reflective Thinking
Blooms: Evaluate
Difficulty: 2 Medium
Learning Goal: 02-02 Know who the main demanders of loanable funds are.
Topic: Loanable Funds Theory

56. Who are the major suppliers and demanders of funds in the United States and what is their typical position?

Households; suppliers
Business; demander
Government; demander
Foreign; supplier

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 1 Easy
Learning Goal: 02-01 Know who the main suppliers of loanable funds are.
Learning Goal: 02-02 Know who the main demanders of loanable funds are.
Topic: Loanable Funds Theory

57. According to current projections, Social Security and other entitlement programs will soon be severely underfunded. If the government decides to cut social security benefits to future retirees and raise social security taxes on all workers, what will probably happen to the supply of funds available to the capital markets? What will be the effect on interest rates?

Cutting future benefits should encourage additional savings by the working public to fund their retirement. This should lead to an increase in the supply of funds available. Raising taxes on the other hand may curtail savings because of the reduction of income. This would reduce the supply of funds available. The net effect on interest rates is indeterminate.

AACSB: Reflective Thinking
Blooms: Create
Blooms: Evaluate
Difficulty: 1 Easy
Learning Goal: 02-01 Know who the main suppliers of loanable funds are.
Learning Goal: 02-03 Understand how equilibrium interest rates are determined.
Learning Goal: 02-04 Examine factors that cause the supply and demand curves for loanable funds to shift.
Topic: Loanable Funds Theory

58. The one-year spot rate is currently 4%; the one-year spot rate one year from now will be 3%; and the one-year spot rate two years from now will be 6%. Under the unbiased expectations theory, what must today's three-year spot rate be? Suppose the three-year spot rate is actually 3.75%, how could you take advantage of this? Explain.

Under the unbiased expectations theory, the three-year spot rate should equal the geometric average of the three one-year rates to prevent arbitrage $[(1.04 \times 1.03 \times 1.06)^{1/3} - 1] = 4.3259\%$. If the three-year spot is actually 3.75%, one should borrow any given amount, say $1,000, for the full three years at the three-year rate of 3.75% and simultaneously invest the money for one year at 4%, and then roll the investment over in one year and earn 3% in the second year and then finally roll the investment over one final time and earn 6% in year 3. Your average annual investment return is 4.3259% and the annual borrowing rate is 3.75%. You net the difference without using any of your own money.

AACSB: Analytic
AACSB: Reflective Thinking
Blooms: Analyze
Blooms: Apply
Blooms: Evaluate
Difficulty: 2 Medium
Learning Goal: 02-07 Examine the different theories explaining the term structure of interest rates.
Topic: Term Structure of Interest Rates

59. Explain the logic of the liquidity premium theory of the term structure.

Securities with different maturities are not perfect substitutes so the unbiased expectations theory does not strictly hold. In particular, there is a preference for shorter-term holdings. Thus, to induce investors to invest long-term, a premium interest rate over what could be earned by investing short-term and rolling the investment over must be offered.

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 2 Medium
Learning Goal: 02-07 Examine the different theories explaining the term structure of interest rates.
Topic: Term Structure of Interest Rates

60. Explain the market segmentation theory of the term structure.

This argument is actually a more extreme version of the liquidity premium argument. Not only are different maturity securities not perfect substitutes, broadly speaking they are not substitutes at all, and one cannot imply that supply and demand conditions in one maturity segment affect supply and demand conditions in another segment. Banks are usually hypothesized as short-term investors and pension funds and life insurers are cast in the role of long-term investors. Both are myopic in that they ignore yields outside of their normal sector. No explanation of why other less myopic investors do not enter the market to exploit un-arbitraged advantages among rate differentials is put forth. Presumably, in innovative capital markets, participants would not leave profit opportunities unexploited.

AACSB: Reflective Thinking
Blooms: Understand
Difficulty: 2 Medium
Learning Goal: 02-07 Examine the different theories explaining the term structure of interest rates.
Topic: Term Structure of Interest Rates