Old Exam Questions
Interest Rate Risk/Bond Portfolios

READ FIRST: The following questions are reproduced from my previous exams. Exam formats have differed over time, so you may notice some differences in formatting or question style. The intent is that these questions will help you to practice, but it is ***NOT*** intended to replace your own study habits.

1. You are considering investing in a bond with two years to maturity. The bond currently pays annual coupon payments at a 10% coupon rate. Its face value is $1,000, and the bond currently trades at par. What is the effective maturity of this bond?
    A. 0 years
    B. 1 year
    C. 1.64 years
    D. 1.91 years
    E. 2 years
    F. An infinite number of years

2. Which of the following is ***NOT*** a direct factor in determining a bond's interest rate risk?
    A. Coupon rate
    B. Maturity
    C. Number of bonds issued
    D. Yield to maturity
    E. All of these affect interest rate risk

3. Your retirement fund consists of a large amount of bonds. You have 40 years until retirement. Given today's low interest rates, you fear rates rising in the future, so you want to protect your portfolio from interest rate risk until you enter retirement. What strategy might you employ?
    A. Diversification
    B. Momentum strategy
    C. Net worth immunization
    D. Target date immunization

4. You have been offered a steady stream of one payment of $100 per year forever. Being a sophisticated investor, you want to know how exposed to interest rate risk this investment is. You know that the yield on this investment is currently 4%. What is the effective maturity of this security?
    A. 21 years
    B. 25 years
    C. 26 years
    D. A different value
    E. It doesn't have an effective maturity

5. You are managing an investment company that focuses on investing in bonds, annuities, and other interest rate securities. In addition, your firm needs to issue substantial amounts of debt to get off the ground. What strategy might you might you employ in order to protect the value of the firm against interest rate risk?
    A. Immunization
    B. Net worth immunization
    C. Target date immunization
    D. None of these

6. You are analyzing a bond investment. The bond pays 10% interest with semi-annual coupons. The bond has 1 year to maturity, and it is currently selling at par. What is the effective maturity of this investment? (HINT: Round intermediate calculations to 2 decimal places)
    A. 0.5 years
    B. 0.975 years
    C. 1 year
    D. 1.95 years
    E. A different value

7. You are concerned about the interest rate risk of your portfolio. In particular, you have a semi-annual coupon-paying bond that has 2 years to maturity you are curious about. The bond has a coupon rate of 10%, and it currently trades at par. What is the effective maturity of this bond? (HINT: Round to 2 decimal places for all calculations.)
    A. 1.86 years
    B. 1.93 years
    C. 3.63 years
    D. 3.71 years
    E. A different value

8. Which of the following does ***NOT*** imply a longer duration?
    A. Higher coupon rate
    B. Higher maturity
    C. Lower coupon rate
    D. Lower yield to maturity

9. What is a problem with using duration?
    A. Boring
    B. Changes with interest rates
    C. No clear interpretation
    D. Only works for zero coupon bonds

10. You calculated the duration of a perpetuity to be 24 years. What would the duration of this security be in 5 years? Assume there is no change in yields over that time.
    A. 19 years
    B. 23 years
    C. 24 years
    D. 29 years
    E. A different duration/it has no duration

11. You run a small savings and loan. Much like a bank, you pay interest on your liabilities (deposits) and receive interest on your assets (loans). What strategy might you employ in order to protect the value of the firm?
    A. Hope
    B. Net worth immunization
    C. Target date immunization
    D. None of these

Use the following information for the next two questions:

A bond issued by Cube-Ah Industries pays semi-annual interest. It has exactly 1 year until its maturity. The firm's underwriter believed the bond to be extremely risky, so it carries a 20.5% coupon rate, but investors appear to demand a 10% annual return on the bond.

12. Using the above information, what is the price of this bond?
    A. $963.71
    B. $1,000
    C. $1,097.62
    D. $1,136.89
    E. A different value

13. Using the above information, what is the duration of this bond?
    A. 0.87 years
    B. 0.96 years
    C. 1 year
    D. 1.91 years
    E. A different value

14. Which of the following is ***NOT*** an issue with using duration to predict price changes as a result of interest rate changes?
    A. Approximation formula is too complicated
    B. Duration changes when interest rates change
    C. Duration projects a straight line, while the actual price-yield relationship is curved
    D. Excel can calculate exact price changes much faster

Use the following information for the next two questions:

10 years ago, you invested in two securities. The first was a zero coupon bond with 30 years to maturity that you paid $57.31 for. The second was a series of $50 payments that continued forever. Its yield was 4%. Assume that both securities had a face value of $1,000, and that the yields of these securities have remained the same through time.

15. Using the information above, what is the duration of the second security today?
    A. 10 years
    B. 16 years
    C. 25 years
    D. 26 years
    E. A different value

16. Use the information above. Assume that your portfolio today consists of $250,000 in the zero and $750,000 in the perpetuity. What is the duration of your portfolio?
    A. 14.5 years
    B. 23 years
    C. 24.5 years
    D. 27 years
    E. A different value

17. You are measuring the interest rate risk of a junk bond. The bond has 1 year to maturity. It has a coupon rate of 42%, and it pays semi-annual coupons. If the yield to maturity on this bond is 20%, what is the duration of the bond?
    A. 0.92 years
    B. 0.96 years
    C. 1.84 years
    D. 1.92 years
    E. A different value

18. [Quantitative] You are analyzing the risk of a bond that matures in 4 years. The bond currently has a yield to maturity of 8%. If it offers a 10% coupon rate via annual coupon payments, what is the effective maturity of this bond?
    A. 3.5 years
    B. 3.62 years
    C. 3.74 years
    D. 4 years
    E. A different value

19. [Conceptual] Based on our discussion, we're able to use duration to accurately approximate price changes for _____ changes in interest rates.
    A. Any
    B. Large
    C. No
    D. Small

20. [Conceptual] You are planning for retirement. You figure that you'll be able to retire in about 40 years. Which of the following strategies would you employ to protect your investments from interest rate risk?
    A. Convexity
    B. Duration
    C. Net worth immunization
    D. Target date immunization

21. [Quantitative] You are considering an investment in a bond that matures in 18 months. The bond pays 20% interest, with semi-annual coupon payments. Its yield to maturity is currently 16%. What is the effective maturity of this bond?
    A. 1.29 years
    B. 1.37 years
    C. 1.44 years
    D. 1.5 years
    E. A different value

22. [Quantitative] You are attempting to immunize a portfolio consisting of a perpetuity and a zero coupon bond. The zero has 20 years to maturity, and both bonds have a yield to maturity of 8%. What would the weight be on the perpetuity if your target date is 14.8 years from today?
    A. 20%
    B. 40%
    C. 60%
    D. 80%
    E. A different value

23. [Quantitative] A bond currently has a yield to maturity of 10%. Its coupon rate is 6%, and it pays annual coupons. If the bond has 2 years to maturity, what is its convexity? (If you are within +/- 0.05 of an answer choice, choose that answer.)
    A. 4.62
    B. 4.76
    C. 4.89
    D. 5.05
    E. A different value

24. [Quantitative] You just won the Clear Published House grand prize! The prize is $5,000,000 per year forever. You are interested in incorporating this cash flow stream into your portfolio, so you have estimated its yield at 20% per year based on the most similar securities you could find. What would you estimate its duration to be?
    A. 5 years
    B. 6 years
    C. 21 years
    D. 25 years
    E. A different value

25. [Quantitative] You are analyzing the risk of a bond. The bond has 2 years to maturity. It offers a 10% coupon rate, and it pays semi-annual coupon payments. If the market interest rate is 8%, what is the effective maturity of this bond?
    A. 1.79 years
    B. 1.86 years
    C. 1.94 years
    D. 2 years
    E. A different value

26. [Conceptual] Which of the following bonds would you expect to have the highest interest rate risk? Assume that the maturities are the same.
    A. A coupon-paying bond with a 5% coupon rate and a 6% yield to maturity
    B. A coupon-paying bond with a 5% coupon rate and an 8% yield to maturity
    C. A zero coupon bond with an 6% yield to maturity
    D. A zero coupon bond with an 8% yield to maturity
    E. They all have equivalent interest rate risk

27. [Conceptual] Which of the following ***INCREASES*** interest rate risk?
    A. Higher coupon rate
    B. Higher yield to maturity
    C. Shorter maturity
    D. All of these increase interest rate risk
    E. None of these increase interest rate risk

28. [Conceptual] According to our class discussion, we are unable to precisely immunize our portfolio because duration _____.
    A. Changes with interest rates
    B. Is an approximation
    C. Has no meaning
    D. Is not relevant for immunization
    E. Is only accurate in certain circumstances

29. [Quantitative] You are considering an investment in a perpetual bond. The bond would offer annual 10% interest payments on a par value of $1,000 forever. You figure that the market would price this security with a 12% yield. What would be the effective maturity of this bond?
    A. 9.33 years
    B. 9.5 years
    C. 11 years
    D. Forever
    E. A different value

30. [Quantitative] You are analyzing a bond. The bond has 3 years to maturity. It is a zero coupon bond, with a yield to maturity of 10%. What is its duration?
    A. 2.71 years
    B. 2.79 years
    C. 2.89 years
    D. 3 years
    E. A different value

31. [Conceptual] Which of the following is ***NOT*** a problem with approximating the price change of a bond when interest rates move using duration?
    A. Bad at modeling larger rate movements
    B. Only an approximation
    C. Takes as much time as exact answers
    D. Using a straight line to model a curved relationship
    E. All of these are problems

32. [Quantitative] You are analyzing a bond. It has 4 years to maturity and pays annual coupons. The bond pays an 11% coupon rate, and its yield to maturity is 12.5%. What is the effective maturity of this bond?
    A. 3.43 years
    B. 3.57 years
    C. 3.71 years
    D. 3.84 years
    E. A different value

33. [Conceptual) _____ is a bond strategy that relies on perfectly offsetting the interest rate risk of the portfolio with its reinvestment risk.
    A. Balancing
    B. Convexity Smoothing
    C. Duration management
    D. Net worth immunization
    E. Target date immunization

34. [Quantitative] A bond has 3 years to maturity. It pays semi-annual coupons, and it has a coupon rate of 6%. If its yield to maturity is 5%, what is the duration of this bond?
    A. 2.56 years
    B. 2.63 years
    C. 2.71 years
    D. 2.79 years
    E. A different value

35. [Quantitative] A bond has a 7% annual coupon payment. Its yield to maturity is 9% and it has 3 years to maturity. What is the convexity of this bond?
    A. 9.13
    B. 9.22
    C. 9.36
    D. 9.49
    E. A different value

36. [Quantitative] You are attempting to implement a net worth immunization strategy. You have outstanding liabilities with a duration of 12. You are able to invest in a zero coupon bond with a maturity of 4 years and a coupon-paying bond with a duration of 22. What would your portfolio weight in the coupon-paying bond be?
    A. 44.44%
    B. 46.24%
    C. 48.89%
    D. 50%
    E. A different value