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UNDERSTANDING FIXED-
INCOME RISK AND RETURN

1. A \$1,000 face, 10-year, 8.00% semi-annual coupon, option-free bond is issued at par (market rates are thus 8.00%). Given that the bond price decreased 10.03% when market rates increased 150 basis points (bp), if market yields decrease by 150 bp, the bond's price will:
 - (A) increase by more than 10.03%.
 - (B) increase by 10.03%.
 - (C) decrease by more than 10.03%.

2. The price value of a basis point (PVBP) for a bond is most accurately described as:
 - (A) an estimate of the curvature of the price-yield relationship for a small change in yield
 - (B) the product of a bond's value and its duration.
 - (C) the change in the price of the bond when its yield changes by 0.01%.

3. A bond's duration is 4.5 and its convexity is 87.2. If interest rates rise 100 basis points, the bond's percentage price change is closest to:
 - (A) -4.06%.
 - (B) -4.50%.
 - (C) -4.94%.

4. A bond has a modified duration of 7 and convexity of 100. If interest rates decrease by 1%, the price of the bond will most likely:
 - (A) decrease by 7.5%.
 - (B) increase by 6.5%.
 - (C) increase by 7.5%.

5. In comparing the price volatility of putable bonds to that of option-free bonds, a putable bond will have:
 - (A) less price volatility at higher yields.
 - (B) less price volatility at low yields.
 - (C) more price volatility at higher yields.

6. Which of the following bonds has the highest interest rate sensitivity? A:
- (A) five year, 5% coupon bond callable in one year.
 - (B) ten year, option-free 4% coupon bond.
 - (C) ten year, option-free 6% coupon bond.
7. A 9-year corporate bond with a 3.25% coupon is priced at 103.96. This bond's duration and convexity are 7.8 and 69.8. If the bond's yield increases by 100 basis points, the impact on the bondholder's return is closest to:
- (A) +8.15%.
 - (B) -7.45%.
 - (C) -7.80%.
8. The price of a bond is equal to \$101.76 if the term structure of interest rates is flat at 5%. The following bond prices are given for up and down shifts of the term structure of interest rates. Using the following information what is the approximate percentage price change of the bond using effective duration and assuming interest rates decrease by 0.5%?
- Bond price: \$98.46 if term structure of interest rates is flat at 6%
- Bond price: \$105.56 if term structure of interest rates is flat at 4%
- (A) 1.74%.
 - (B) 0.0087%.
 - (C) 0.174%.
9. Negative convexity is most likely to be observed in:
- (A) callable bonds.
 - (B) government bonds.
 - (C) zero coupon bonds.
10. If the term structure of yield volatility slopes upward:
- (A) long-term interest rates are more variable than short-term interest rates.
 - (B) short-term interest rates are less than long-term interest rates.
 - (C) forward interest rates are higher than spot interest rates.
11. Assume that the current price of an annual-pay bond is 102.50 per 100 of face value. If its YTM increases by 0.5% the value of the bond decreases to 100 and if its YTM decreases by 0.5% the price of the bond increases to 105.5. What is the approximate modified duration of the bond?
- (A) 5.37.
 - (B) 5.48.
 - (C) 5.50.

12. Annual Macaulay duration is least accurately interpreted as the:
- (A) investment horizon at which a bond's market price risk and reinvestment risk exactly offset.
 - (B) approximate percentage change in a bond's value for a 1% change in its yield to maturity.
 - (C) weighted average number of years until a bond's cash flows are scheduled to be paid.
13. The price value of a basis point (PVBP) for a 18 year, 8% annual pay bond with a par value of \$1,000 and yield of 9% is closest to:
- (A) \$0.44.
 - (B) \$0.80.
 - (C) \$0.82.
14. A bond has the following characteristics:
- Maturity of 30 years
 - Modified duration of 16.9 years
 - Yield to maturity of 6.5%
- If the yield to maturity decreases by 0.75%, what will be the percentage change in the bond's price?
- (A) -12.675%.
 - (B) +12.675%.
 - (C) 0.750%.
15. A callable bond trading at \$1,000 has an effective duration of 5 and modified duration of 6. If the market yield increases by 1% the bond's price will decrease by approximately:
- (A) \$50.
 - (B) \$55.
 - (C) \$60.
16. Which measure of duration should be matched to the bondholder's investment horizon so that reinvestment risk and market price risk offset each other?
- (A) Effective duration.
 - (B) Macaulay duration.
 - (C) Modified duration.

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17. An international bond investor has gathered the following information on a 10-year, annual-pay U.S. corporate bond:
- Currently trading at par value
 - Annual coupon of 10%
 - Estimated price if rates increase 50 basis points is 96.99%
 - Estimated price if rates decrease 50 basis points is 103.14%
- The bond's modified duration is closest to:
- (A) 3.14.
 (B) 6.15.
 (C) 6.58.
18. Compared to a bond's Macaulay duration, its modified duration:
- (A) is lower.
 (B) is higher.
 (C) may be lower or higher.
19. An investor purchases a 4-year, 6%, semiannual-pay Treasury note for \$9,485. The security has a par value of \$10,000. To realize a total return equal to 7.515% (its yield to maturity), all payments must be reinvested at a return of:
- (A) less than 7.515%.
 (B) 7.515%.
 (C) more than 7.515%.
20. A bond has a convexity of 51.44. What is the approximately percentage price change of the bond due to convexity if rates rise by 1500 basis points?
- (A) 0.26%.
 (B) 0.58%.
 (C) 0.71%.
21. When interest rates increase, the modified duration of a 30-year bond selling at a discount:
- (A) decreases.
 (B) does not change.
 (C) increases.
22. How does the price-yield relationship for a callable bond compare to the same relationship for an option-free bond? The price-yield relationship is best described as exhibiting:
- (A) negative convexity at low yields for the callable bond and positive convexity for the option-free bond.
 (B) negative convexity for the callable bond and positive convexity for an option-free bond.
 (C) the same convexity for both bond types.

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23. The appropriate measure of interest rate sensitivity for bonds with an embedded option is:
- (A) effective duration.
 - (B) Macaulay duration.
 - (C) modified duration.
24. Which of the following bonds has the shortest duration? A bond with a:
- (A) 10-year maturity, 10% coupon rate.
 - (B) 10-year maturity, 6% coupon rate.
 - (C) 20-year maturity, 6% coupon rate.
25. Which of the following bonds is most likely to exhibit the greatest volatility due to interest rate changes? A bond with a:
- (A) high coupon and a long maturity.
 - (B) low coupon and a long maturity.
 - (C) low coupon and a short maturity.
26. Sarah Metz buys a 10-year bond at a price below par. Three years later, she sells the bond. Her capital gain or loss is measured by comparing the price she received for the bond to its:
- (A) carrying value.
 - (B) original price less amortized discount.
 - (C) original purchase price.
27. A noncallable bond with seven years remaining to maturity is trading at 108.1 % of par value and has an 8.5% coupon. If interest rates rise 50 basis points, the bond's price will fall to 105.3% and if rates fall 50 basis points, the bond's price will rise to 111.0%. Which of the following is closest to the effective duration of the bond?
- (A) 5.27.
 - (B) 5.54.
 - (C) 6.12.
28. Which of the following is most accurate about a bond with positive convexity?
- (A) Positive changes in yield lead to positive changes in price.
 - (B) Price increases and decreases at a faster rate than the change in yield.
 - (C) Price increases when yields drop are greater than price decreases when yields rise by the same amount.
29. The approximate modified duration of an option-free 20-year 7% annual-pay par bond based on a 25 basis point change in yield is closest to:
- (A) 5.3.
 - (B) 10.6.
 - (C) 13.7.

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30. Which of the following statements about an embedded call feature in a bond is least accurate? The call feature:
- (A) exposes investors to additional reinvestment rate risk.
 - (B) increases the bond's duration, increasing price risk.
 - (C) reduces the bond's capital appreciation potential.
31. Holding other factors constant, the interest rate risk of a coupon bond is higher when the bond's:
- (A) coupon rate is higher.
 - (B) current yield is higher.
 - (C) yield to maturity is lower.
32. Consider a 25-year, \$1,000 par semiannual-pay bond with a 7.5% coupon and a 9.25% YTM. Based on a yield change of 50 basis points, the approximate modified duration of the bond is closest to:
- (A) 10.03.
 - (B) 12.50.
 - (C) 8.73.
33. A bond has an effective duration of 7.5. If the bond changes by 100 basis points, the price of the bond will change by:
- (A) exactly 0.75%
 - (B) approximately 0.75%
 - (C) approximately 7.5%.
34. The term structure of yield volatility illustrates the relationship between yield volatility and:
- (A) time to maturity.
 - (B) yield to maturity.
 - (C) Macaulay duration.
35. At relatively high yields, the effective duration for a putable bond, compared to the effective duration of an otherwise identical option-free bond, is most likely
- (A) the same
 - (B) lower.
 - (C) higher.

36. An investor gathered the following information on two U.S. corporate bonds:
- Bond J is callable with maturity of 5 years
 - Bond J has a par value of \$10,000
 - Bond M is option-free with a maturity of 5 years
 - Bond M has a par value of \$1,000 For each bond, which duration calculation should be applied?

| | Bond J | Bond M |
|-----|--------------------|---|
| (A) | Effective Duration | Effective Duration only |
| (B) | Effective Duration | Modified Duration or Effective Duration |
| (C) | Modified Duration | Effective Duration only |

37. Key rate duration is best described as a measure of price sensitivity to a:
- (A) change in a bond's cash flows.
 - (B) change in yield at a single maturity.
 - (C) parallel shift in the benchmark yield curve.
38. Which of the following five year bonds has the highest interest rate sensitivity?
- (A) Floating rate bond.
 - (B) Option-free 5% coupon bond.
 - (C) Zero-coupon bond.
39. A bond priced at par (\$1,000) has a modified duration of 8 and a convexity of 100. If interest rates fall 50 basis points, the new price will be closest to:
- (A) \$875.00.
 - (B) \$958.75.
 - (C) \$1,041.25.
40. If a Treasury bond has an annual modified duration of 10.27 and an annual convexity of 143, which of the following is closest to the estimated percentage price change in the bond for a 125 basis point increase in interest rates?
- (A) -11.72%.
 - (B) -13.96%.
 - (C) -9.33%.
41. When using duration and convexity to estimate the effect on a bond's value of changes in its credit spread, an analyst should most appropriately use:
- (A) a convexity measure that has been adjusted for the bond's credit risk.
 - (B) Macaulay duration rather than modified duration.
 - (C) the same method used when estimating the effect of changes in yield.

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42. Assume that a straight bond has a duration of 1.89 and a convexity of 32. If interest rates decline by 1% what is the total estimated percentage price change of the bond?
- (A) 1.56%.
 (B) 1.89%.
 (C) 2.05%.
43. Wendy Jones, CFA, is reviewing a current bond holding. The bond's duration is 10 and its convexity is 200. Jones believes that interest rates will decrease by 100 basis points. If Jones's forecast is accurate, the bond's price will change by approximately:
- (A) +11.0%.
 (B) +8.0%.
 (C) -8.0%.
44. Given a bond with a modified duration of 1.93, if required yields increase by 50 basis points, the price would be expected to decrease by:
- (A) 0.965%.
 (B) 1.930%.
 (C) 0.009%.
45. 30-year semi-annual coupon bond issued today with market rates at 6.75% pays a 6.75% coupon. If the market yield declines by 30 basis points, the price increases to \$1,039.59. If the market yield rises by 30 basis points, the price decreases to \$962.77. The bond's approximate modified duration is closest to:
- (A) 1.3%.
 (B) 12.8%.
 (C) 3.9%.
46. An option-free 5-year 6% annual-pay bond is selling \$979.22 per \$1,000 of par value and has a Macaulay duration of 4.4587. The bond's modified duration is closest to:
- (A) 4.187.
 (B) 4.206.
 (C) 4.246.
47. An investor buys a bond that has a Macaulay duration of 3.0 and a yield to maturity of 4.5%. The investor plans to sell the bond after three years. If the yield curve has a parallel downward shift of 100 basis points immediately after the investor buys the bond, her annualized horizon return is most likely to be:
- (A) approximately 4.5%.
 (B) greater than 4.5%.
 (C) less than 4.5%.

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48. If the yield to maturity on a bond decreases after purchase but before the first coupon date and the bond is held to maturity, reinvestment risk is:
- (A) less than price risk and the realized yield will be lower than the YTM at purchase.
 - (B) greater than price risk and the realized yield will be lower than the YTM at purchase.
 - (C) less than price risk and the realized yield will be higher than the YTM at purchase.
49. For a given change in yields, the difference between the actual change in a bond's price and that predicted using duration alone will be greater for:
- (A) a bond with greater convexity.
 - (B) a bond with less convexity.
 - (C) a short-term bond.
50. All else equal, which of the following is least likely to increase the interest rate risk of a bond?
- (A) A longer maturity.
 - (B) A decrease in the YTM.
 - (C) Inclusion of a call feature.
51. A bond is priced at 95.80. Using a pricing model, an analyst estimates that a 25 bp parallel upward shift in the yield curve would decrease the bond's price to 94.75, while a 25 bp parallel downward shift in the yield curve would increase its price to 96.75. The bond's effective convexity is closest to:
- (A) 4
 - (B) -167.
 - (C) 3,340.
52. An analyst has stated that, holding all else constant, an increase in the maturity of a coupon bond will typically increase its interest rate risk, and that a decrease in the coupon rate of a coupon bond will typically decrease its interest rate risk. The analyst is correct with respect to:
- (A) both of these effects.
 - (B) neither of these effects.
 - (C) only one of these effects.
53. Effective duration is more appropriate than modified duration as a measure of a bond's price sensitivity to yield changes when:
- (A) the bond contains embedded options.
 - (B) the bond has a low coupon rate and a long maturity.
 - (C) yield curve changes are not parallel.

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54. If the coupon payments are reinvested at the coupon rate during the life of a bond, then the yield to maturity:
- (A) is greater than the realized yield.
 - (B) is less than the realized yield.
 - (C) may be greater or less than the realized yield.
55. Vantana Inc. has a bond outstanding with a modified duration of 5.3 and approximate convexity of 110. If yields increase by 1 %, the bond price will:
- (A) decrease by less than 5.3%.
 - (B) decrease by more than 5.3%.
 - (C) increase by more than 5.3%.
56. For a given bond, the duration is 8 and the convexity is 100. For a 60 basis point decrease in yield, what is the approximate percentage price change of the bond?
- (A) 2.52%.
 - (B) 4.62%.
 - (C) 4.98%.
57. An investor who buys bonds that have a Macaulay duration less than his investment horizon:
- (A) has a negative duration gap.
 - (B) is minimizing reinvestment risk.
 - (C) will benefit from decreasing interest rates.
58. Which of the following is least likely an advantage of estimating the duration of a bond portfolio as a weighted average of the durations of the bonds in the portfolio?
- (A) It is theoretically more sound than the alternative.
 - (B) It is easier to calculate than the alternative.
 - (C) It can be used when the portfolio contains bonds with embedded options.
59. Which of the following is a limitation of the portfolio duration measure? Portfolio duration only considers:
- (A) a linear approximation of the actual price-yield function for the portfolio.
 - (B) a nonparallel shift in the yield curve.
 - (C) the market values of the bonds.
60. All other things being equal, which of the following bonds has the greatest duration?
- (A) 5-year, 8% coupon bond.
 - (B) 15-year, 8% coupon bond.
 - (C) 15-year, 12% coupon bond.

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61. Assuming the issuer does not default, can capital gains or losses be a component of the holding period return on a zero-coupon bond that is sold prior to maturity?
- (A) No, because amortization of the discount is interest income.
 - (B) Yes, because the bond's yield to maturity may have changed.
 - (C) Yes, because the purchase price is less than the bond's value at maturity.
62. Tony Horn, CFA, is evaluating two bonds. The first bond, issued by Kano Corp., pays a 7.5% annual coupon and is priced to yield 7.0%. The second bond, issued by Samuel Corp., pays a 7.0% annual coupon and is priced to yield 8.0%. Both bonds mature in ten years. If Horn can reinvest the annual coupon payments from either bond at 7.5%, and holds both bonds to maturity, his return will be:
- (A) greater than 7.0% on the Kano bonds and greater than 8.0% on the Samuel bonds.
 - (B) greater than 7.0% on the Kano bonds and less than 8.0% on the Samuel bonds.
 - (C) less than 7.0% on the Kano bonds and less than 8.0% on the Samuel bonds.
63. Which of the following duration measures is most appropriate if an analyst expects a non-parallel shift in the yield curve?
- (A) Effective duration.
 - (B) Key rate duration.
 - (C) Modified duration.
64. An investor finds that for a 1% increase in yield to maturity, a bond's price will decrease by 4.21% compared to a 4.45% increase in value for a 1% decline in YTM. If the bond is currently trading at par value, the bond's approximate modified duration is closest to:
- (A) 43.30.
 - (B) 4.33.
 - (C) 8.66.
65. Consider a bond with modified duration of 5.61 and convexity of 43.84. Which of the following is closest to the estimated percentage price change in the bond for a 75 basis point decrease in interest rates?
- (A) 4.12%
 - (B) 4.21 %.
 - (C) 4.33%.
66. A UK 12-year corporate bond with a 4.25% coupon is priced at £107.30. This bond's duration and convexity are 9.5 and 107.2. If the bond's yield decreases by 125 basis points, the estimated price of the bond is closest to:
- (A) £112.72.
 - (B) £120.95.
 - (C) £121.84.

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67. An investor gathered the following information about an option-free U.S. corporate bond:
- Par Value of \$10 million
 - Convexity of 90
 - Duration of 7
- If interest rates increase 2% (200 basis points), the bond's percentage price change is closest to:
- (A) -12.2%
- (B) -14.0%
- (C) -15.8%
68. All else being equal, which of the following bond characteristics most likely results in less reinvestment risk?
- (A) A higher coupon.
- (B) A lower Macaulay duration.
- (C) A shorter maturity.
69. Which of the following is most likely to be the money duration of newly issued 360-day eurocommercial paper?
- (A) 360 days.
- (B) 4.3%.
- (C) €25 million.
70. Negative effective convexity will most likely be exhibited by a:
- (A) callable bond at high yields.
- (B) callable bond at low yields.
- (C) puttable bond at high yields.
71. Suppose the term structure of interest rates makes an instantaneous parallel upward shift of 100 basis points. Which of the following securities experiences the largest change in value? A five-year:
- (A) coupon bond with a coupon rate of 5%.
- (B) floating rate bond.
- (C) zero-coupon bond.
72. Jane Walker has set a 7% yield as the goal for the bond portion of her portfolio. To achieve this goal, she has purchased a 7%, 15-year corporate bond at a discount price of 93.50. What amount of reinvestment income will she need to earn over this 15-year period to achieve a compound return of 7% on a semiannual basis?
- (A) \$624.
- (B) \$459.
- (C) \$574.

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73. An annual-pay bond is priced at 101.50. If its yield to maturity decreases 100 basis points, its price will increase to 105.90. If its yield to maturity increases 100 basis points, its price will decrease to 97.30. The bond's approximate modified convexity is closest to:
- (A) 0.2.
 - (B) 19.7.
 - (C) 4.2.
74. Martina Whittaker runs a fixed-income portfolio that contains a \$12 million full price position in the corporate bonds of Dewey Treadmills. Whittaker is concerned that interest rates are likely to rise and has calculated an annual modified duration of 8.0 for the Dewey bonds. The money duration of the position in Dewey bonds is closest to:
- (A) \$9.6 million.
 - (B) \$48.0 million.
 - (C) \$96.0 million.
75. The price value of a basis point (PVBP) for a 7-year, 10% semiannual pay bond with a par value of \$1,000 and yield of 6% is closest to:
- (A) \$0.28.
 - (B) \$0.92.
 - (C) \$0.64.
76. For large changes in yield, which of the following statements about using duration to estimate price changes is most accurate? Duration alone:
- (A) overestimates the increase in price for decreases in yield.
 - (B) overestimates the increase in price for increases in yield.
 - (C) underestimates the increase in price for decreases in yield.
77. Sensitivity of a bond's price to a change in yield at a specific maturity is least appropriately estimated by using:
- (A) effective duration.
 - (B) key rate duration.
 - (C) partial duration.
78. The price of a bond is equal to \$101.76 if the term structure of interest rates is flat at 5%. The following bond prices are given for up and down shifts of the term structure of interest rates. Using the following information what is the effective duration of the bond?
- Bond price: \$98.46 if term structure of interest rates is flat at 6%
- Bond price: \$105.56 if term structure of interest rates is flat at 4%
- (A) 3.49.
 - (B) 1.74.
 - (C) 1.56.

79. Calculate the effective duration for a 7-year bond with the following characteristics:
- Current price of \$660
 - A price of \$639 when the yield curve shifts up 50 basis points
 - A price of \$684 when the yield curve shifts down by 50 basis points
- (A) 3.1.
(B) 6.8.
(C) 6.5.
80. A bond with a yield to maturity of 8.0% is priced at 96.00. If its yield increases to 8.3% its price will decrease to 94.06. If its yield decreases to 7.7% its price will increase to 98.47. The modified duration of the bond is closest to:
- (A) 2.75.
(B) 7.66.
(C) 4.34.
81. An investor purchases a fixed coupon bond with a Macaulay duration of 5.3. The bond's yield to maturity decreases before the first coupon payment. If the YTM then remains constant and the investor sells the bond after three years, the realized yield will be:
- (A) equal to the YTM at the date of purchase.
(B) higher than the YTM at the date of purchase.
(C) lower than the YTM at the date of purchase.
82. Which of the following is least likely to increase a bond's yield spread to the benchmark yield curve?
- (A) Credit rating downgrade.
(B) Decrease in liquidity.
(C) Increase in expected inflation.
83. Jayce Arnold, a CFA candidate, considers a \$1,000 face value, option-free bond issued at par. Which of the following statements about the bond's dollar price behavior is most likely accurate when yields rise and fall by 200 basis points, respectively? Price will:
- (A) decrease by \$124, price will increase by \$149.
(B) decrease by \$149, price will increase by \$124.
(C) increase by \$149, price will decrease by \$124.
84. The current price of a \$1,000 par value, 6-year, 4.2% semiannual coupon bond is \$958.97. The bond's price value of a basis point is closest to:
- (A) \$0.50.
(B) \$4.20.
(C) \$5.01.

85. Which of the following statements concerning the price volatility of bonds is most accurate?
- (A) As the yield on callable bonds approaches the coupon rate, the bond's price will approach a "floor" value.
 - (B) Bonds with longer maturities have lower interest rate risk.
 - (C) Bonds with higher coupons have lower interest rate risk.
86. An investment advisor states, "An investor's annualized holding period return from investing in a bond consists of three parts: the coupon interest payments, the return of principal, and any capital gain or loss that the investor realizes on the bond." The advisor is:
- (A) correct.
 - (B) incorrect, because these are not the only sources of return from investing in a bond.
 - (C) incorrect, because an investor who holds a bond to maturity will not realize a capital gain or loss.
87. An analyst gathered the following information about a 15-year bond:
- 10% semiannual coupon.
 - Modified duration of 7.6 years.
- If the market yield rises 75 basis points, the bond's approximate price change is a:
- (A) 5.4% decrease.
 - (B) 5.4% increase.
 - (C) 5.7% decrease.
88. Which of the following statements regarding the risks inherent in bonds is most accurate?
- (A) Default risk deals with the likelihood that the issuer will fail to meet its obligations as specified in the indenture.
 - (B) The reinvestment rate assumption in calculating bond yields is generally not significant to the bond's yield.
 - (C) Interest rate risk is the risk that the coupon rate will be adjusted downward if market rates decline.
89. A bond's yield to maturity decreases from 8% to 7% and its price increases by 6%, from \$675.00 to \$715.50. The bond's effective duration is closest to:
- (A) 5.0.
 - (B) 6.0.
 - (C) 7.0.

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90. A bond portfolio consists of a AAA bond, a AA bond, and an A bond. The prices of the bonds are \$1,050, \$1,000, and \$950 respectively. The durations are 8, 6, and 4 respectively. What is the duration of the portfolio?
- (A) 6.00.
 (B) 6.07.
 (C) 6.67.
91. A non-callable bond has a modified duration of 7.26. Which of the following is the closest to the approximate price change of the bond with a 25 basis point increase in rates?
- (A) 1.820%.
 (B) -0.018%.
 (C) -1.820%.
92. Price risk will dominate reinvestment risk when the investor's:
- (A) duration gap is negative.
 (B) duration gap is positive.
 (C) investment horizon is less than the bond's tenor.
93. Donald McKay, CFA, is analyzing a client's fixed income portfolio. As of the end of the last quarter, the portfolio had a market value of \$7,545,000 and a portfolio duration of 6.24. McKay is predicting that the yield for all of the securities in the portfolio will decline by 25 basis points next quarter. If McKay's prediction is accurate, the market value of the portfolio:
- (A) at the end of the next quarter will be approximately \$7,427,300.
 (B) will increase by approximately \$117,700.
 (C) will increase by approximately 6.24%.
94. A non-callable bond with 4 years remaining maturity has an annual coupon of 12% and a \$1,000 par value. The current price of the bond is \$1,063.40. Given a parallel shift in the yield curve of 50 basis points, which of the following is closest to the effective duration of the bond?
- (A) 2.94.
 (B) 3.11.
 (C) 3.27.
95. If interest rates decrease by 50 basis points, a 10-year, 6% coupon, option-free bond will increase in price by \$36. If instead interest rates increase by 50 basis points, this bond's price will decrease by:
- (A) \$36.
 (B) less than \$36.
 (C) more than \$36.

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102. A bond has a duration of 10.62 and a convexity of 182.92. For a 200 basis point increase in yield, what is the approximate percentage price change of the bond?
- (A) -1.62%.
 - (B) -17.58%.
 - (C) -24.90%.
103. A \$100,000 par value bond has a full price of \$99,300, a Macaulay duration of 6.5, and an annual modified duration of 6.1. The bond's money duration per \$100 par value is closest to:
- (A) \$6.06.
 - (B) \$645.
 - (C) \$606.
104. A non-callable bond with 10 years remaining maturity has an annual coupon of 5.5% and a \$1,000 par value. The yield to maturity on the bond is 4.7%. Which of the following is closest to the estimated price change of the bond using duration if rates rise by 75 basis points?
- (A) -\$61.10.
 - (B) -\$5.68.
 - (C) -\$47.34.

