

59**YIELD-BASED BOND
DURATION MEASURES &
PROPERTIES**

- Given the three bonds listed here, which bond has the most interest rate risk?
 - 24-year maturity, 5.0% coupon.
 - 8-year maturity, 12.0% coupon.
 - 8-year maturity, 5.5% coupon.
- Which of the following bonds is most likely to exhibit the greatest volatility due to interest rate changes? A bond with a:
 - high coupon and a long maturity.
 - low coupon and a long maturity.
 - low coupon and a short maturity.
- Which of the following is most likely to be the money duration of newly issued 360-day eurocommercial paper?
 - 360 days.
 - 4.3%.
 - €25 million.
- 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:
 - \$0.44.
 - \$0.80.
 - \$0.82.
- Which of the following five year bonds has the highest interest rate sensitivity?
 - Floating rate bond.
 - Zero-coupon bond.
 - Option-free 5% coupon bond.

6. When interest rates increase, the modified duration of a 30-year bond selling at a discount:
- (A) decreases.
 - (B) does not change.
 - (C) increases.
7. A 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%.
8. 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.
9. 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.
10. 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.
11. 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.

12. 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.
13. 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 N is closest to:
- (A) 10.03.
 - (B) 12.50.
 - (C) 8.73.
14. 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) -\$5.68.
 - (B) -\$47.34.
 - (C) -\$61.10.
15. 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) \$0.64.
 - (C) \$0.92.
16. 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) neither of these effects.
 - (B) only one of these effects.
 - (C) both of these effects.
17. 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) \$4.20.
 - (B) \$5.01.
 - (C) \$0.50.

18. 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.
19. 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.
20. 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.
21. 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) \$606.
 - (B) \$645.
 - (C) \$6.06.
22. What happens to bond durations when coupon rates increase and maturities increase?
- | | As coupon rates increase, | As maturities increase, |
|-----|----------------------------------|--------------------------------|
| | duration: | duration: |
| (A) | decreases | decreases |
| (B) | decreases | increases |
| (C) | increases | increases |

23. All else equal, which of the following is least likely to increase the interest rate risk of a bond?
- (A) A longer maturity.
 - (B) Inclusion of a call feature.
 - (C) A decrease in the YTM.
24. In comparing the price volatility of put able bonds to that of option-free bonds, a put able bond will have:
- (A) less price volatility at higher yields.
 - (B) less price volatility at low yields.
 - (C) more price volatility at higher yields.
25. On Monday, the yield curve is upward sloping with yields of 3%, 4%, and 5.5% on 1-year, 5- year, and 10-year government bonds, respectively. The following day, the yield curve experiences an upward parallel shift equal to 50 basis points. Other things equal, which of the following noncallable 6% coupon bonds is likely to experience the smallest percent change in price as a result of the yield curve shift?
- (A) Zero coupon government bond maturing in five years.
 - (B) Par value government bond maturing in five years.
 - (C) Par value government bond maturing in ten years.
26. Which of the following statements about an embedded call feature in a bond is least accurate? The call feature:
- (A) reduces the bond's capital appreciation potential.
 - (B) increases the bond's duration, increasing price risk.
 - (C) exposes investors to additional reinvestment rate risk.
27. 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.
28. Compared to a bond's Macaulay duration, its modified duration:
- (A) is lower.
 - (B) is higher.
 - (C) may be lower or higher.

29. Which of the following bonds has the shortest duration? A bond with a:
- (A) 20-year maturity, 6% coupon rate.
 - (B) 10-year maturity, 10% coupon rate.
 - (C) 10-year maturity, 6% coupon rate.
30. 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) 4.34.
 - (B) 7.66.
 - (C) 2.75.
31. 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.
32. 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

