

61**CURVE-BASED &
EMPIRICAL FIXED-INCOME RISK
MEASURES**

1. 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) \$60.
 - (B) \$50.
 - (C) \$55.

2. 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.

3. A bond has a convexity of 51.44. What is the approximate percentage price change of the bond due to convexity if rates rise by 150 basis points?
 - (A) 0.26%.
 - (B) 0.58%.
 - (C) 0.71%.

4. 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%.

5. 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.

6. 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) £121.84.
 - (B) £112.72.
 - (C) £120.95.
7. 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) 0.750%.
 - (C) -12.675%.
8. 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%.
9. 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%.
10. 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%.

11. 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%.
12. 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) +8.0%.
 - (B) +11.0%.
 - (C) -8.0%.
13. 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.
14. 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%.
15. 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%.
16. The approach to estimating duration that relies on using historical relationships between benchmark yield changes and bond price changes is:
- (A) empirical duration.
 - (B) analytical duration.
 - (C) modified duration.

17. 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) 0.0087%.
(B) 1.74%.
(C) 0.174%.
18. 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.
19. 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) -0.018%.
(B) -1.820%.
(C) 1.820%.
20. 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.
21. 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.

22. 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%.
23. 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) \$958.75.
 - (B) \$1,041.25.
 - (C) \$875.00.
24. 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%.
25. 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%.
26. 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%.
27. The appropriate measure of interest rate sensitivity for bonds with an embedded option is:
- (A) effective duration.
 - (B) Macaulay duration.
 - (C) modified duration.

28. 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 |

29. For a portfolio consisting solely of short-term U.S. government bonds:

- (A) estimates of empirical and analytical durations should be similar.
- (B) empirical duration will be significantly lower than analytical duration.
- (C) analytical duration would be the preferable risk measure

