

FN 211

Quiz 4 – Bond Valuation

1.	B	6.	A
2.	B	7.	B
3.	A	8.	C
4.	C	9.	C
5.	A	10.	A

1. Macaulay Duration is

- A. the elasticity of a security's value to small coupon changes.
- B. the weighted average time to maturity of the bond's cash flows
- C. the time until the investor recovers the price of the bond in today's dollars

2. A 10 year annual payment corporate bond has a market price of \$1,050 and par of \$1,000. It pays annual interest of \$100 and its required rate of return is 9%. By how much is the bond mispriced?

- A. Overpriced by \$14.18
- B. Underpriced by \$14.18
- C. Underpriced by \$9.32

$N = 10, I = 9, PMT = 100, FV = 1000, PV = 1064.18$

3. An 8 year corporate bond pays has a 7% coupon rate and par of \$1,000. What should be the bond's price if the required return is 6% and the bond pays interest semiannually?

- A. \$1,062.81
- B. \$1,053.45
- C. \$1,049.49

$N = 16, I = 3, PMT = 35, FV = 1000$

4. All of the following are one of the relationships between yield changes and bond prices except

- A. Bond prices move inversely to bond yields.
- B. Longer-maturity bonds experience larger price changes than shorter-maturity bonds.
- C. Bond price movements resulting from equal absolute increases or decreases in yield are symmetrical.

5. An 8 year annual payment 7% coupon Treasury bond has a price of \$1,075 and par of \$1,000. The bond's YTM must be

- A. 5.80%
- B. 7.00%
- C. 1.69%

$N=8, PV = -1075, PMT = 70, FV = 1000$

Name ID

6. An annual payment bond with a \$1,000 par has a 5% quoted coupon rate, a 6% promised ytm and 6 years to maturity. What is the bond's Macaulay Duration?

- A. 5.31 years
- B. 4.76 years
- C. 4.16 years

Macaulay Duration: Annual-pay coupon

Period	Cash Flow	PV of CF	t x PV
1	50.0	47.17	47.17
2	50.0	44.50	89.00
3	50.0	41.98	125.94
4	50.0	39.60	158.42
5	50.0	37.36	186.81
6	1,050.0	740.21	4,441.25
		950.83	5,048.60

Duration	5.3097	years
----------	--------	-------

7. A bond is selling for 982.0 Baht. It is estimated that the price will fall to 966.0 Baht if yields rise 30 bps and that the price will rise to 1,001.0 Baht if yields fall 30 bps. Based on these estimates, the Effective Duration of the bond is *closest to*:

- A. 1.78
- B. 5.94
- C. 11.88

$$\text{Effective Duration} = \frac{1001.0 - 966.0}{2(982)(0.003)}$$

$$= 5.94$$

8. The Modified Duration for a 10-year, 12% semi-annual pay coupon bond with a yield to maturity of 10 percent and a Macaulay duration of 7.2 years is *closest to*:

- A. 6.55 years
- B. 6.79 years
- C. 6.86 years

$$D_{\text{mod}} = 7.2 / (1 + 0.10/2) = 7.2 / 1.05 = 6.86 \text{ years}$$

9. A portfolio consists of 4 bonds with the following characteristics:

Bond	Market Value	Modified Duration
A	\$1.2 million	3.2
B	\$3.4 million	7.6
C	\$2.9 million	12.4
D	\$1.6 million	1.5

The duration of the portfolio is *closest to*:

- A. 5.40
- B. 6.18
- C. 7.48

Name ID

$w_{\text{bond}} = \text{Value}_{\text{bond}} / \text{Value}_{\text{portfolio}}$ and $\text{Duration}_{\text{portfolio}} = \sum w_{\text{bond}} \times \text{duration}_{\text{bond}}$. In this case, value of the portfolio is $1.2 + 3.4 + 2.9 + 1.6 = 9.1$ million and the portfolio duration equals $(1.2/9.1 \times 3.2) + (3.4/9.1 \times 7.6) + (2.9/9.1 \times 12.4) + (1.6/9.1 \times 1.5) = 0.4220 + 2.8396 + 3.9516 + 0.2637 = 7.48$.

10. If a Treasury bond has a modified duration of 10.27 and a convexity of 71.51. 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. -11.718%
- B. -13.956%
- C. -9.325%

$$[-(10.27)(1.25\%)] + [(71.51)(0.0125)^2] = -12.8375 + 1.120\% = -11.7175\%.$$