

Solution key HW CH 14

CHAPTER 14: BOND PRICES AND YIELDS

PROBLEM SETS

4. A bond's coupon interest payments and principal repayment are not affected by changes in market rates. Consequently, if market rates increase, bond investors in the secondary markets are not willing to pay as much for a claim on a given bond's fixed interest and principal payments as they would if market rates were lower. This relationship is apparent from the inverse relationship between interest rates and present value. An increase in the discount rate (i.e., the market rate) decreases the present value of the future cash flows.

5. Annual Coupon Rate: 4.80% → \$48 Coupon Payments

Current Yield:

$$\left(\frac{\$48}{\$970} \right) = 4.95\%$$

6. a. Effective annual rate for 3-month T-bill:

$$\left(\frac{100,000}{97,645} \right)^4 - 1 = 1.02412^4 - 1 = 0.100 = 10.0\%$$

- b. Effective annual interest rate for coupon bond paying 5% semiannually:

$$(1.05)^2 - 1 = 0.1025 \text{ or } 10.25\%$$

Therefore the coupon bond has the higher effective annual interest rate.

7. The effective annual yield on the semiannual coupon bonds is 8.16%. If the annual coupon bonds are to sell at par they must offer the same yield, which requires an annual coupon rate of 8.16%.

11. a. On a financial calculator, enter the following:

$$n = 40; FV = 1000; PV = -950; PMT = 40$$

You will find that the yield to maturity on a semi-annual basis is 4.26%. This implies a bond equivalent yield to maturity equal to: $4.26\% * 2 = 8.52\%$

$$\text{Effective annual yield to maturity} = (1.0426)^2 - 1 = 0.0870 = 8.70\%$$

b. Since the bond is selling at par, the yield to maturity on a semi-annual basis is the same as the semi-annual coupon rate, i.e., 4%. The bond equivalent yield to maturity is 8%.

$$\text{Effective annual yield to maturity} = (1.04)^2 - 1 = 0.0816 = 8.16\%$$

c. Keeping other inputs unchanged but setting $PV = -1050$, we find a bond equivalent yield to maturity of 7.52%, or 3.76% on a semi-annual basis.

$$\text{Effective annual yield to maturity} = (1.0376)^2 - 1 = 0.0766 = 7.66\%$$

15. The reported bond price is: $100 \frac{2}{32}$ percent of par = \$1,000.625

However, 15 days have passed since the last semiannual coupon was paid, so:

$$\text{accrued interest} = \$35 * (15/182) = \$2.885$$

The invoice price is the reported price plus accrued interest: \$1,003.51

16. If the yield to maturity is greater than the current yield, then the bond offers the prospect of price appreciation as it approaches its maturity date. Therefore, the bond must be selling below par value.

17. The coupon rate is less than 9%. If coupon divided by price equals 9%, and price is less than par, then price divided by par is less than 9%.