Mini-case 1: Interest Rates, Bond Yields, and Duration

CONCEPTS IN THIS CASE

simple loans fixed-payment loans coupon bonds present value yield-to-maturity current yield nominal and real interest rates rate of return capital gain interest-rate and reinvestment risk duration

You have been hired to analyze the debt securities of your organization. The firm has outstanding loans and bonds. A quick review of the balance sheet shows the following:

Nominal Interest Liability (coupon)Years to Amount(\$) Rate Maturity

Selected Liabilities of th	ne Firm		
Simple Loans Fixed-Payment Loans Long-term Bonds #1 Long-term Bonds #2 1 Liabilities Total 1	800 5 000 500 000 080 000 585 800	5% 12% 10% 10%	1 19 4 10
Market Price for Bond # Market Price for Bond # Face Value of Each Bo	≠1 930.50 ≠2 859.50 nd1000.00		

Selected Current Assets of the firm

Marketable Securities: Treasury Bills 100 000

Note: Treasury Bills have a \$10 000 face value, which matures in one year. Each Treasury Bill has a cost of \$9,580.00

- 1. How much interest would the firm pay each year on the simple-interest loan?
- 2. How much would you write a cheque for to pay off the loan in one year?
- 3. What is the monthly payment needed to pay off the fixed-payment loans?
- 4. What is the current yield for each bond if the current price is: a. \$930.50 for Bond #1?
 - b. \$859.50 for Bond #2?
- 5. What is the expected yield to maturity for each bond?
 - a. Bond #1 selling for \$930.50?
 - b. Bond #2 selling for \$859.50
- 6. What is the rate of capital gain if both bonds sell for \$900 in one year?
 - a. Bond #1 selling for \$930.50 today?
 - b. Bond #2 selling for \$859.50 today?
- 7. If the Yield to Maturity expected by investors changes to 11%:
 - a. What will be the market price of Bond #1?
 - b. What will be the market price of Bond #2?
 - c. What will be the dollar change in price for Bond #1?
 - d. What will be the dollar change in price for Bond #2?

- e. What will be the percent change in price for Bond #1?
- f. What will be the percent change in price for Bond #2?

g. Since the change in expected yield to maturity is the same, why is the amount of change different between the bonds?

8. If investors holding our 4-year bonds (Bond #1) receive interest income annually for four years, plus the face value of the bonds at maturity,

a. What will be the total interest earned on the bond over the next four years?

b. What will be the face value received at maturity?

Given the following projected income stream for Bond #1:

Coupon	FaceProj	ected Reir	vestment Rates
YearInterest (\$	S)Value (\$)	10%	5%
1 100 2 100 3 100 4 <u>100</u> Total income	<u>1000</u>	10.00 21.00 <u>33.10</u>	5.00 10.25 <u>15.76</u>
ili yeai 4400	1000	<u>33.10</u>	15.70

c. What is the total cash available over the next four years to the bondholder earning

i. 10%

ii. 15%

d. What is the average annual rate of return for the bondholder earning (*Hint*: Use the market price of 930.50)
i. 10%

ii. 15%

e. Why does the reinvestment rate affect the annual rate of return for the same bond?

f. If the expected rate of return on our bonds is 10%, what is the duration of Bond #1?

9. What is the yield to maturity on the Treasury Bills (a discount bond)?

10. What is the real rate of interest if the nominal rate is 10% and the inflation rate is 3%?

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