

Problem Set 3

Corporate Finance, Sections 001 and 002

Due Thursday, February 12th

Suggested problems:

RWJ Problems A.2, A.4, 5.17, 5.20, 5.23

(Use revised problems on <http://finance.wharton.upenn.edu/~jwachter/fnce100>. Problems A.2 and A.4 can be found at the link marked Chapter 5 Appendix Questions.)

Required problems:

1. Assume the government issues a semi-annual bond that matures in 5 years with a face value of \$1,000 and a coupon yield of 10 percent.
 - (a) What would be the price if the yield to maturity (semi-annual compounding) on similar government bonds were 8%?
 - (b) What price would you be willing to pay for such a bond if the yield to maturity (semiannual compounding) on similar 5-year government bonds were 12%?
 - (c) Suppose you held the bond in (a) for 6 months, at which time you received a coupon payment and then sold the bond for a price of 104 (per \$100 of face value). What would be the (annualized) holding period return?
2. Here are some data on bonds. Bond A is a zero-coupon bond paying \$100 one year from now (“year one”). Bond B is a zero-coupon bond paying \$100 two years from now (“year two”). Bond C is a 10% coupon bond that pays \$10 in year 1 and \$10 plus the \$100 principal in year 2. The yield to maturity on bond A is 10%, and the price of bond B is \$84.18. Assuming annual compounding, answer the following:
 - (a) What is the price of bond A?
 - (b) What is the yield to maturity on bond B?
 - (c) What is the implied forward rate $f_{1,1}$ between years one and two?
 - (d) What is the price of bond C?
 - (e) You are working for a large institutional investor. Another firm offers to lend your firm \$1 million between years one and two at a rate of 8.5%. Do you accept?
 - (f) Using the rates in (a) and (b), calculate the NPV of a project that pays out \$840 in year one and \$340 in year two, and costs \$1000 today. Assume the risk of these cash flows is the same as the risk of the bond. Using the NPV rule, do you accept this project?

3. Consider the following two bonds:

Bond	Price	Cash Flows	
		Yr1	Yr2
A	\$1059.19	100	1100
B	\$1041.02	90	1090

- (a) Find the prices of the one and two-year zero-coupon bonds (per \$1 of face value) implicit in the prices of these coupon bonds. That is find the price P_1 of a zero-coupon bond maturing in one year, and the price P_2 of a zero-coupon bond maturing in two years such that

$$\$1059.19 = \$100P_1 + \$1100P_2$$

$$\$1041.02 = \$90P_1 + \$1090P_2$$

- (b) Using your answers from part (a), compute the yields to maturity on the one and two-year zero coupon bonds (this is the zero-coupon yield curve).