PRINCIPLES OF FINANCE
FIN 3403
Valuation

1. Hour Glass Spa has a bond outstanding that has a face value equal to $1,000. The bond, which matures in nine years, has a coupon rate of interest equal to 6 percent, and interest is paid semiannually.

   a. Assume that the current market rate for similar bonds is 8 percent.

      i. Will the bond be selling for a premium, a discount, or par value? You should not have to compute the value of the bond to answer this question. Explain why the bond will sell at the price—that is, premium, discount, or par—that you selected.

      Because $r_d > C$, the bond will be selling for a discount. The price of the bond has to be discounted to the point where the interest payment of $60 each year and the $1,000 repayment of the principal value in nine years provides a return to investors equal to 8 percent. If the price is too high, investors would not buy the bond because they would earn less than 8 percent if they did. If the price of the bond is too low, then all investors would want to buy the bond because they would earn greater than 8 percent, which couldn't be found by purchasing any other similar-risk bond.

      ii. Compute the actual value of the bond.

      $$V_d = P_0 = \$30 \left[\frac{1 - \frac{1}{(1.04)^{18}}}{0.04} \right] + \$1,000 \left[\frac{1}{(1.04)^{18}} \right] = \$379.78 + \$493.63 = \$873.41$$

      N = 9 x 2 =18, I/Y = 4.0, PMT = 60/2 = 30, FV = 1,000, PV = ? = -873.41

      iii. Compute the current yield and capital gains yield for the bond.

      Current yield = $60/$873.41 = 0.0687 = 6.87%

      iv. What should be the price of the bond in one year if everything else remains constant?

      $$V_d = P_0 = \$30 \left[\frac{1 - \frac{1}{(1.04)^{16}}}{0.04} \right] + \$1,000 \left[\frac{1}{(1.04)^{16}} \right] = \$349.57 + \$533.91 = \$883.48$$

      N = 6 x 2 =16, I/Y = 4.0, PMT = 60/2 = 30, FV = 1,000, PV = ? = -883.48

      Using the value of the bond in one year, compute the capital gains yield for investors who buy the bond today and sell it in one year.

      $$\frac{\text{Capital}}{\text{gain}} = \frac{\$883.48 - \$873.41}{\$873.41} = \frac{\$10.07}{\$873.41} = 0.0115 = 1.15\%$$

   b. Assume that a bond that has the same characteristics as Hour Glass Spa's bond sells for $1,025. What is the yield to maturity (YTM) for this bond? Compute the YTM using both the approximation equation and your financial calculator.

N = 18, PV = -1,025, PMT = 30, FV = 1,000, I/Y = ? = 2.821 per six months
Annual YTM = 2.821% x 2 = 5.642%

2. April is examining the following investments:

	Payoffs	
Probability	Investment X	Investment Y
0.5	14.0%	-2.0%
0.3	10.0	30.0
0.2	0.0	40.0

Solutions to part a and part b.

	Payoffs					
Probability	Investment X	Investment Y	$Pr \times r_X$	$Pr(r_X-\hat{r}_X)^2$	$Pr \times r_Y$	$Pr(r_X-\hat{r}_X)^2$
0.5	14.0%	-2.0%	7.0%	8.0	-1.0%	162.0
0.3	10.0	30.0	3.0	0.0	9.0	58.8
0.2	0.0	40.0	0.0	20.0	8.0	115.2
			10.0%	28.0	16.0%	336.0

$\sigma_X = \sqrt{28.0} = 5.29$ $CV_X = 5.29/10.0 = 0.529$ (Based on risk and return, this is the better investment.)

$\sigma_Y = \sqrt{336.0} = 18.33$ $CV_Y = 18.33/16.0 = 1.15$

a. Compute the expected return and standard deviation for each investment. Interpret the results of your computations—that is, explain what your number mean.

b. Which investment is better based on the risk/return relationship?

c. Would it be a good idea to hold these two investments together? Explain your answer. Computations are not needed.

It would be a good idea to hold these investments together because they appear to be negatively correlated.

d. What would be the expected return of a portfolio that consists of 70 percent of Investment X and 30 percent of Investment Y?

Expected return = 0.7(10%) + 0.3(16%) = 11.8%