Business Finance (FIN 312)
Spring 2008

Assignment 3

Instructions: please read carefully

- You can either do the assignment by yourself or work in a group of no more than two.
- You should show your work how to get the answer for each calculation question to get full credit.
- You should make two copies. One copy to turn in for grading purposes, the other to study for the exam.
- The due date is Tuesday May 13, 2008. Late assignments will not be graded.

Name(s): Student ID
Chapter 12

1. One year ago, you purchased a stock at a price of $48.06 a share. You have received quarterly dividends of $.20 a share. Today, you sold this stock for $51.23 a share. What is your capital gains yield on this investment?
   a. 3.17 percent  b. 6.2 percent  c. 6.6 percent  d. 8.3 percent

1. c  \( \frac{($51.23 - $48.06)}{$48.06} = 6.6 \text{ percent} \)

2. Seven months ago, you purchased 300 shares of WAC, Inc. stock at a price of $23.80 a share. You have received dividends totaling $.60 a share. Today, you sold your shares at a price of $22.20 a share. What is your total percentage return on this investment?
   a. -6.7 percent  b. -4.2 percent  c. 7.2 percent  d. 9.9 percent

2. b  \( \frac{($22.20 - $23.80 + $.60)}{$23.80} = -4.2 \text{ percent} \)

3. A stock has produced average annual returns of 8 percent, 18 percent, -2 percent, and 3 percent over the past four years. What is the geometric average rate of return?
   a. 5.75 percent  b. 6.50 percent  c. 6.75 percent  d. 7.00 percent

3. b  \( (1.08 \times 1.18 \times .98 \times 1.03)^{\frac{1}{4}} - 1 = 6.50 \text{ percent} \)

4. You own 600 shares of Elder, Inc. stock. This stock has an expected capital gains yield of 4.3 percent, an expected total return of 8.5 percent, and a stock price of $32.40. How much dividend income do you expect to receive over the course of a year?
   a. $816.48  b. $835.92  c. $1,010.88  d. $1,652.40

4. a  Annual dividend income = 600 \times (.085 - .043) \times $32.40 = $816.48
DIVIDEND YIELD
5. One year ago, you purchased a stock at a price of $32 a share. Today, you sold the stock and realized a total return of 25 percent. Your capital gain was $6 a share. What was your dividend yield on this stock?
   a. 1.25 percent
   b. 3.75 percent
   c. 6.25 percent
   d. 18.75 percent
   e. 21.25 percent

5.c Capital gains yield = $6 ÷ $32 = 18.75 percent; Dividend yield = 25 percent – 18.75 percent = 6.25 percent

CAPITAL GAIN
6. Today, you sold 200 shares of SLG, Inc. stock. Your total return on these shares is 12.5 percent. You purchased the shares one year ago at a price of $28.50 a share. You have received a total of $280 in dividends over the course of the year. What is your capital gains yield on this investment?
   a. 4.80 percent
   b. 5.00 percent
   c. 6.67 percent
   d. 7.59 percent
   e. 11.67 percent

6.d Dividend yield = $280 ÷ (200 × $28.50) = 4.91 percent; Capital gains yield = 12.5 percent – 4.91 percent = 7.59 percent

TOTAL RETURN
7. Six months ago, you purchased 1,200 shares of ABC stock for $21.20 a share. You have received dividend payments equal to $.60 a share. Today, you sold all of your shares for $22.20 a share. What is your total dollar return on this investment?
   a. $720
   b. $1,200
   c. $1,440
   d. $1,920
   e. $3,840

7.d Total dollar return = ($22.20 – $21.20 + $.60) × 1,200 = $1,920

STANDARD DEVIATION
8. A stock had returns of 8 percent, -2 percent, 4 percent, and 16 percent over the past four years. What is the standard deviation of this stock for the past four years?
   a. 6.3 percent
   b. 6.6 percent
   c. 7.1 percent
   d. 7.5 percent
8.d Average return = (.08 – .02 + .04 + .16) ÷ 4 = .065; Total squared deviation = (.08 – .065)² + (-.02 – .065)² + (.04 – .065)² + (.16 – .065)² = .000225 + .007225 + .000625 + .009025 = .0171; Standard deviation = √(.0171 ÷ (4 – 1)) = √.0057 = .075498 = 7.5 percent

ARITHMETIC VS. GEOMETRIC AVERAGES
9. What are the arithmetic and geometric average returns for a stock with annual returns of 21 percent, 8 percent, -32 percent, 41 percent, and 5 percent?
   a. 5.6 percent; 8.6 percent
   b. 5.6 percent; 6.3 percent
   c. 8.6 percent; 5.6 percent
   d. 8.6 percent; 8.6 percent
   e. 8.6 percent; 6.3 percent

   9.c Arithmetic average = (.21 + .08 – .32 + .41 + .05) ÷ 5 = 8.6 percent; Geometric return = (1.21 × 1.08 × .68 × 1.41 × 1.05)²⁰ – 1 = 5.6 percent

Chapter 13

EXPECTED RETURN
10. You recently purchased a stock that is expected to earn 12 percent in a booming economy, 8 percent in a normal economy and lose 5 percent in a recessionary economy. There is a 15 percent probability of a boom, a 75 percent chance of a normal economy, and a 10 percent chance of a recession. What is your expected rate of return on this stock?
   a. 5.00 percent
   b. 6.45 percent
   c. 7.30 percent
   d. 7.65 percent
   e. 8.30 percent

   10.c E(r) = (.15 × .12) + (.75 × .08) + (.10 × -.05) = .018 + .06 – .005 = .073 = 7.3 percent
STANDARD DEVIATION

11. Kurt’s Adventures, Inc. stock is quite cyclical. In a boom economy, the stock is expected to return 30 percent in comparison to 12 percent in a normal economy and a negative 20 percent in a recessionary period. The probability of a recession is 15 percent. There is a 30 percent chance of a boom economy. The remainder of the time the economy will be at normal levels. What is the standard deviation of the returns on Kurt’s Adventures, Inc. stock?

a. 10.05 percent  
b. 12.60 percent  
c. 15.83 percent  
d. 17.46 percent  
e. 25.04 percent

11.c  
\[
E(r) = (.30 \times .30) + (.55 \times .12) + (.15 \times -.20) = .09 + .066 - .03 = .126 \\
Var = .30 \times (.30 - .126)^2 + .55 \times (.12 - .126)^2 + .15 \times (-.20 - .126)^2 = .0090828 + .0000198 + .0159414 = .025044 \\
Std dev = \sqrt{.025044} = .15825 = 15.83 percent
\]

PORTFOLIO EXPECTED RETURN

12. What is the expected return on a portfolio which is invested 20 percent in stock A, 50 percent in stock B, and 30 percent in stock C?

<table>
<thead>
<tr>
<th>State of Economy</th>
<th>Probability of State of Economy</th>
<th>Returns if State Occurs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boom</td>
<td>20%</td>
<td>18% 9% 6%</td>
</tr>
<tr>
<td>Normal</td>
<td>70%</td>
<td>11% 7% 9%</td>
</tr>
<tr>
<td>Recession</td>
<td>10%</td>
<td>-10% 4% 13%</td>
</tr>
</tbody>
</table>

a. 7.40 percent  
b. 8.25 percent  
c. 8.33 percent  
d. 9.45 percent  
e. 9.50 percent

12.b  
\[
E(r)_{Boom} = (.20 \times .18) + (.50 \times .09) + (.30 \times .06) = .036 + .045 + .018 = .099 \\
E(r)_{Normal} = (.20 \times .11) + (.50 \times .07) + (.30 \times .09) = .022 + .035 + .027 = .084 \\
E(r)_{Bust} = (.20 \times -.10) + (.50 \times .04) + (.30 \times .13) = -.020 + .020 + .039 = .039 \\
E(r)_{Portfolio} = (.20 \times .099) + (.70 \times .084) + (.10 \times .039) = .02376 + .0588 + .0039 = .0825 = 8.25 percent
\]
PORTFOLIO BETA
13. Your portfolio is comprised of 30 percent of stock X, 50 percent of stock Y, and 20 percent of stock Z. Stock X has a beta of .64, stock Y has a beta of 1.48, and stock Z has a beta of 1.04. What is the beta of your portfolio?
   a. 1.01
   b. 1.05
   c. 1.09
   d. 1.14
   e. 1.18

13.d \[ \text{Beta}_{\text{Portfolio}} = (.30 \times .64) + (.50 \times 1.48) + (.20 \times 1.04) = .192 + .74 + .208 = 1.14 \]

CAPITAL ASSET PRICING MODEL (CAPM)
14. The common stock of Flavorful Teas has an expected return of 14.4 percent. The return on the market is 10 percent and the risk-free rate of return is 3.5 percent. What is the beta of this stock?
   a. .65
   b. 1.09
   c. 1.32
   d. 1.44
   e. 1.68

14.e \[ E(r) = .144 = .035 + \beta \times (.10 - .035); .109 = .065\beta; \beta 1.68 \]

Chapter 15

COST OF EQUITY
15. Neal Enterprises common stock is currently priced at $36.80 a share. The company is expected to pay $1.20 per share next month as their annual dividend. The dividends have been increasing by 2 percent annually and are expected to continue doing so. What is the cost of equity for Neal Enterprises?
   a. 5.18 percent
   b. 5.22 percent
   c. 5.26 percent
   d. 5.33 percent
   e. 5.67 percent

15. c \[ R_e = \frac{$1.20}{$36.80} + .02 = 5.26 \text{ percent} \]
COST OF EQUITY
16. Ben’s Ice Cream just paid their annual dividend of $.75 a share. The stock has a market price of $32 and a beta of .90. The return on the U.S. Treasury bill is 4 percent and the market has a 12 percent rate of return. What is the cost of equity?
   a. 7.24 percent
   b. 8.67 percent
   c. 11.20 percent
   d. 12.92 percent
   e. 14.80 percent

16.c \[ R_e = .04 + .90 \times (.12 - .04) = 11.20 \text{ percent} \]

COST OF DEBT
17. Ernst’s Electrical has a bond issue outstanding with ten years to maturity. These bonds have a $1,000 face value, a 5 percent coupon, and pay interest semi-annually. The bonds are currently quoted at 96 percent of face value. What is Ernst’s pre-tax cost of debt?
   a. 4.47 percent
   b. 4.97 percent
   c. 5.33 percent
   d. 5.53 percent
   e. 5.94 percent

17.c Enter \( 10 \times 2 \) \( 2/ \) \( \pm 960 \) \( 50/2 \) \( 1000 \)
       \( \text{N I/Y PV PMT FV} \)
       Solve for 5.53

AFTER-TAX COST OF DEBT
18. Blackwater Adventures has a bond issue outstanding that matures in sixteen years. The bonds pay interest semi-annually. Currently, the bonds are quoted at 103 percent of face value and carry a 9 percent coupon. The firm’s tax rate is 34 percent. What is the firm’s after-tax cost of debt?
   a. 5.19 percent
   b. 5.71 percent
   c. 7.86 percent
   d. 8.65 percent
   e. 11.41 percent

18.b Enter \( 16 \times 2 \) \( 2/ \) \( \pm 1030 \) \( 90/2 \) \( 1000 \)
       \( \text{N I/Y PV PMT FV} \)
       Solve for 8.65
       After-tax \( R_d = 8.65 \text{ percent} \times (1 - .34) = 5.71 \text{ percent} \)
CAPITAL STRUCTURE WEIGHTS

19. The Auto Group has 1,200 bonds outstanding that are selling for $980 each. The company also has 7,500 shares of preferred stock at a market price of $40 each. The common stock is priced at $32 a share and there are 32,000 shares outstanding. What is the weight of the preferred stock as it relates to the firm’s weighted average cost of capital?
   a. 10 percent
   b. 12 percent
   c. 14 percent
   d. 16 percent
   e. 18 percent

19. b Debt: $1,200 \times 980 = $1,176,000
   Preferred: 7,500 \times 40 = $300,000
   Common: 32,000 \times 32 = $1,024,000
   Total = $1,176,000 + $300,000 + $1,024,000 = $2,500,000
   Weight_{Preferred} = \frac{300,000}{2,500,000} = 12\% 

WEIGHTED AVERAGE COST OF CAPITAL

20. Jack’s Construction Co. has 80,000 bonds outstanding that are selling at par value. Bonds with similar characteristics are yielding 8.5 percent. The company also has 4 million shares of common stock outstanding. The stock has a beta of 1.1 and sells for $40 a share. The U.S. Treasury bill is yielding 4 percent and the market risk premium is 8 percent. Jack’s tax rate is 35 percent. What is Jack’s weighted average cost of capital?
   a. 7.10 percent
   b. 7.39 percent
   c. 10.38 percent
   d. 10.65 percent
   e. 11.37 percent

20.c  \begin{align*}
   R_e &= .04 + (1.1 \times .08) = .128 \\
   \text{Debt:} & \quad 80,000 \times 1,000 = $80m \\
   \text{Common:} & \quad 4m \times 40 = $160m \\
   \text{Total} &= $80m + $160m = $240m \\
   WACC &= \left( \frac{160m}{240m} \times .128 \right) + \left( \frac{80m}{240m} \times .085 \times (1-.35) \right) = .085333 + .018417 = .10375 = 10.38\% 
\end{align*}
21. Your firm has a cost of equity of 12 percent and a pre-tax cost of debt of 8 percent. You maintain a debt-equity ratio of .60 and have a tax rate of 34 percent. What is your firm’s weighted average cost of capital?

   a. 6.93 percent   b. 7.41 percent   c. 9.48 percent   d. 10.50 percent

21. c

\[
\frac{W_d}{W_e} = 0.6 \\
\text{Solve for } W_d = \frac{0.6}{1.6} = 0.375 \\
W_e = \frac{1}{1.6} = 0.625
\]

\[
\text{WACC} = \left(\frac{1.0}{1.6} \times 0.12\right) + \left(\frac{0.6}{1.6} \times 0.08 \times (1 - 0.34)\right) = 0.075 + 0.0198 = 0.0948 = 9.48 \text{ percent}
\]