

EE431 Semester 2/2017

Assignment 4 (will not be graded)

Stock Valuation and CAPM (Revised solution for Q 6)

Question 1: Basic DCF model

Suppose that a company paid a recent dividend of \$2.40 per share, and shareholders expect that dividend will be growing at the rate of 6%. What is the fair price of the stock of company A if the required rate of return is 10.2%

Question 2 Basic CAPM

Suppose that the risk-free rate is now equal to 5%, and the average return of market portfolio is equal to 14% as well. Calculate the expected rate of return for the asset whose beta is equal to 0.5 and 0, respectively.

When beta is 0.5, required rate of return is equal to $5\% + 0.5(14\% - 5\%) = 9.5\%$.*

When beta is zero, required rate of return is equal to $5\% + 0(14\% - 5\%) = 5\%$*

Question 3: In the most recent meeting, company paid the dividend of \$4 per share. According to study, investors believe that dividend is supposed to grow at the rate of 3% per annual. Consider the following problems.

3.1) calculate the required rate of return of the stock if current price is equal to \$103

3.2) Following 3.1, if the risk-free rate is equal to 5% and the market portfolio return is equal to 10%, calculate the beta coefficient of this stock.

Question 4: XYZ corporations' stock recently paid a dividend of \$4 per share ($D_0 = \4). The company has a constant growth rate of $g = 6\%$ and a beta equal to 1.8. The required rate of return on the market is 8% and the risk-free rate is 4%. The company is considering a change of policy, which will increase its beta to 2. If market conditions remain unchanged, what new constant growth rate will cause the common stock price remain the same?

$D_0 = 4$; $g = 6\%$; $beta = 1.8$; $rf = 4\%$; and $rm = 8\%$

$$P = E(D1) / (rj - g) = (1+0.06)*4 / (rj - 0.06)$$

$$rj = rf + \text{beta}*(rm-rf) = 0.112 \text{ (11.2\%)}$$

$$P = 4.24 / 0.052 = \$81.53$$

Now, given that beta is changed to 2. The required rate of return is then 0.12 (12%). To fix the same price, g must be changed then to g' (new g). (Otherwise, price would have dropped.) Under new beta, g must solve for $81.53 = 4*(1+g') / (0.12 - g')$.

That is we must have $g' = 0.067$ (6.7%).

Question 5: A company paid a recent dividend of \$2 per share. ($D_0 = \2) and it had a beta of 1.8 before a reevaluation of company's risk. Before reevaluation, company's stock price was \$100. After the reevaluation, the stock price dropped to \$80 due to a change in its beta. The dividend growth rate "g" is constant and it remained the same after reevaluation. The market risk premium is 5% and the risk-free rate is 4%: What is the new beta of the company that caused the price increase?

Question 6: Read the question carefully.

IBM's year-end dividend is expected to be \$2.15, the growth rate will be 11.2% forever, and your required return is 15.2%

6.1) What is the intrinsic value now?

6.2) If the market is efficient, what's the next year's expected price?

6.3) If you buy it now and sell it after dividend payment, what's your expected capital gain, dividend yield, and holding period return?

$$a) P = E(D1) / (rj - g) = 2.15 / (0.152 - 0.112) = 2.15 / 0.04 = \$53.75$$

b) $Rj =$ required rate of return.

$$rj = \{ E(D1) + P(t+1) - P(t) \} / P(t)$$

We knew from "a" that $P(t) = \$53.75$, and the required rate of return is 0.152.

Given this, $P(t+1)$ must be set in the way makes the above equation consistent in the equilibrium.

$$0.152 = \{ 2.15 + P(t+1) - 53.75 \} / 53.75$$

$$P(t+1) = \$59.77$$

c) *Dividend yield is expected to be $\frac{2.15}{59.77} = 0.036$ (3.6%) $\frac{2.15}{53.75} = 0.04$ (4%) and capital gain is expected to be $\frac{0.116}{1.116} = 11.6\%$ $\frac{0.112}{1.112} = 11.2\%$. Holding period return is then equal to 15.2%, which is expected to be equal to required rate of return.*

Question 7: What will the dividend growth rate be if a company's ROE is 14%, and it retains 91% of its earnings (i.e., 9% dividend payout ratio.)

Question 8:* On the end of year 2015, the four-year-ahead forecasts for SAMSUNG's dividend are 0.17, 0.183, 0.197, and 0.21. After the fourth year, most analysts believe that SAMSUNG's dividend would grow at 12.74%. Suppose that the required return of SAMSUNG stock is 13.8%. Calculate the current fair price of SAMSUNG stock.

Question 9: Use the following information:

ART has come out with a new and improved product. As a result, the firm projects an ROE of 25%, and it will maintain a plowback (retention) ratio of 0.20. Its earnings this year will be \$3 per share. Investors expect a 12% rate of return on the stock.

9.1) At what price would you expect ART to sell now?

- A) \$25.00 B) \$34.29 C) \$42.86 D) none of the above

9.2) What price do you expect ART shares to sell for in 4 years?

- A) \$53.96 B) \$44.95 C) \$41.68 D) None of the above

Question 10: You are considering acquiring a common share of Sahali Shopping Center Corporation that you would like to hold for one year. You expect to receive both \$1.25 in dividends and \$35 from the sale of the share at the end of the year. The maximum price you would pay for a share today is _____ if you wanted to earn at least a 12% return.

- A) \$31.25 B) \$32.37 C) \$38.47 D) \$41.32

$$r_j = \{ E(D1) + P(t+1) - P(t) \} / P(t)$$

$$0.12 = \{ 1.25 + 35 - P(t) \} / P(t)$$

$$P(t) = 32.37$$

So, maximum price is then equal to \$32.37