S. Lovo, E. Ors **Financial Markets / November .-December 2009**

Problem set 1 (due 18/11/09)

Problem 1:

Company ABC's stock just paid a dividend of €2 yesterday. The next dividend will be paid in a year from now. The dividends on company's stock are expected to grow at 5% per year forever. The required rate of return on the stock is 15% per year.

a) What must be company ABC's stock price today (t=0)?

b) Yesterday, company ABC's earnings were announced as 5 € per share. What must be company ABC's return on equity (ROE) on new projects?

c) What could company ABC's management do to increase value to its stock for the shareholders? What is the maximum stock price that could be reached under the new policy?

Problem 2:

The term structure on risk free Treasury bonds is flat at *r(t)=3%*. Stock XYZ return has a beta of *0.8* and the expected return on the market portfolio is *28%*.

a) What is the expected return *k* that investors require to hold shares of XYZ in their portfolios?

In 6 month XYZ will pay 100% of its earning to shareholders. This will consist of a dividend D = €1 per share. Suppose that XYZ is expected to pay a constant dividend with a frequency of one year (i.e. €1 in 6 months, €1 in one and an half year, €1 in 2.5 years, and so on and so forth.)

b) What is today's spot price of one share of XYZ?

Suppose now that XYZ reinvests 30% of its earnings into projects that pay an expected return on equity *roe* = 30%. Thus, in 6 months XYZ will only pay €0.7 dividend per share and dividends will be paid with a frequency of one year.

c) What is *g*, the expected rate of growth of dividends?

d) What is in this case today's spot price of one share of XYZ?

Answer key

Problem 1:

a) $S(0) = 2*(1+0.05) / (0.15 – 0.05) = 21.00$

b) Pay-out ratio = $1 – b = D_0/EPS_0 = 2/5 = 0.40$ ➔ plow-back ratio = $b = 1 – 0.40 = 0.60$
$g = ROE^{New} * b$ ➔ $ROE^{New} = g / b = 0.05 / 0.60 = 0.0833 = 8.33\%$

c) $ROE^{New} < k$ ➔ payout all earnings: $V_0 = 5 / 0.15 = 33.33$

Problem 2:

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a) $k=r + \beta(E[r_m] – r) = 3\% + 0.8\ (28\% - 3\%) = 23\%$

b) $S(0) = \frac{(1.23)^{0.5}}{0.23} = €\ 4.822$

c) $g = (1-b)roe = 0.3*30\% = 9\%$

d) $S(0) = \frac{0.7}{0.23 – 0.09} 1.23^{0.5} = €\ 5.545$