

40. Company X has a current stock price of 55 and a book equity per share of 18. Investors expect earnings per share of 2.0 for the year and a 1.2 cash dividend per share at the end of the year. Assume the company's payout ratio and return on equity are constant.

What is the market capitalization rate for Company X?

- A. 4.6%
- B. 5.6%
- C. 6.6%
- D. 7.6%
- E. 8.6%

Sample Course 2.

41. Company X and Company Y each has the same cost of capital and identical asset portfolios with a market value of 1000.

$$r_{UX} = r_{UY}$$

Company X has zero debt. The expected return on equity for Company X is 15%.

$$D_X = 0$$

$$r_{EX} = 0.15 = r_{UX}$$

$\Rightarrow$

$$r_{UY} = 0.15$$

The firm value of Company Y is made up of 50% debt and 50% equity. The expected return on debt for Company Y is 9%.

$$r_{DY} = 0.09$$

$$D_Y = E_Y$$

Assuming no taxes, what is the expected return on equity in Company Y?

$$r_{EY} = ?$$

- A. 9%
- B. 15%
- C. 21%
- D. 27%
- E. 33%

$$\begin{aligned} r_{EY} &= r_{UY} + \frac{D_Y}{E_Y} (r_{UY} - r_{DY}) \\ &= 0.15 + 1 \cdot (0.15 - 0.09) = 0.15 + 0.06 = 0.21 \end{aligned}$$

42. Which of the following are valid reasons for a stock split, assuming the efficient market theory is correct?

- I. To give shareholders a hedge against inflation.
- II. To allow shareholders to participate in the increase in book value.
- III. To keep the share price in a desirable trading price range.

- A. I only
- B. III only
- C. I and II only
- D. I and III only
- E. II and III only

43. The market value of a company's liabilities consists of 40 of debt and 80 of equity,
for total liabilities of 120

$$D = 40 \quad E = 80$$

The β for the company's debt and equity are 0.3 and 1.65, respectively. The expected
return on the company's debt is 9%. The company has a weighted average cost of
capital of 14%.

$$\beta_D = 0.3$$

$$\beta_E = 1.65$$

$$r_D = 0.09$$

$$r_U = 0.14$$

Which of the following statements are true, ignoring the effect of taxes?

- ☒ I. If the proceeds from issuing additional equity of 10 are used to retire 10 of debt, the company's cost of capital will increase to 14.6%. *False, due to Miller-Modigliani II.*
- ☒ II. If a proposed new project has a β of 1.05, the project is riskier than the company's existing business.
- III. If the risk-free rate is 8% then the expected risk premium on the market is 5%.

$$\beta_U = \frac{40}{120} \cdot 0.3 + \frac{80}{120} \cdot 1.65 = 0.1 + 1.1 = 1.20$$

CAPM:

$$r_U = 0.14 = r_f + \beta_U (E[R_{Mkt}] - r_f)$$

$$E[R_{Mkt}] - r_f = \frac{0.14 - 0.08}{1.2} = \frac{0.06}{1.20}$$

$$= 0.05$$

- ☒ (A) I only
- ☒ (B) II only
- ☐ (C) III only
- ☒ (D) I and II only
- ☒ (E) I and III only

$$\frac{D}{D+E} = 0.4$$

$$\beta_D = 0.75$$

$$\beta_E = 1.50$$

39. A firm has a debt ratio of 0.4. The firm also has a debt beta of 0.75 and an equity beta of 1.50. The expected return on the market is currently 11% and the risk-free interest rate is 5%.

$$E[R_{Mkt}] = 0.11$$

$$r_f = 0.05$$

What is the required return on an investment project that expands the firm's existing operations while maintaining the current target capital structure? $r_I = ?$

(A) 10%

(B) 11%

(C) 12%

(D) 14%

(E) 15%

$$\beta_U = \frac{E}{E+D} \beta_E + \frac{D}{E+D} \beta_D$$

$$\beta_U = 0.6 (1.50) + 0.4 (0.75) = 1.2$$

$$r_I = r_f + \beta_U (E[R_{Mkt}] - r_f)$$

$$r_I = 0.05 + 1.2 (0.11 - 0.05) = 0.05 + 1.2 (0.06) = 0.122$$



The Effect of Taxes on Capital Structure.

Let τ_c be the corporate tax rate ;

i the interest rate on the debt ;

D the total amount of debt.

Let X denote the company's earnings.

- If there is no debt, the company would distribute

$$X(1-\tau_c) \star$$

to the shareholder (in total).

- With debt, the interest on the debt needs to be paid first. The amount of interest is:

$$Di$$

Taxes are paid on the remainder, i.e., on $X - Di$

The total amount left over to distribute to the shareholders:

$$(X - Di)(1 - \tau_c) = X(1 - \tau_c) - Di + Di\tau_c$$

$\Rightarrow$ The total amount to be distributed is :

$$X(1 - \tau_c) + Di\tau_c$$

$\star$

interest tax shield (ITS)

Since the two amounts to distribute are different, we realize that MM does not hold.

In fact:

$$V(\text{levered}) = V(\text{unlevered}) + \text{PV}(\text{ITS})$$

$\star$

i may be used here
 $\Rightarrow$ If the debt is held perpetually, then

$$\text{PV}(\text{ITS}) = \frac{Di\tau_c}{i} = D\tau_c$$

The after-tax weighted average cost of capital:

$$r_{wacc} = \frac{E}{E+D} r_E + \frac{D}{E+D} r_D (1 - \tau_c)$$

Remember:

$$r_{wacc} = r_U - \frac{D}{E+D} r_D \cdot \tau_c$$