

## Chapter 17

### Does Debt Policy Matter?

#### Multiple Choice Questions

1. When a firm has no debt, then such a firm is known as:

- (I) an unlevered firm
  - (II) a levered firm
  - (III) an all-equity firm
- A) I only
  - B) II only
  - C) III only
  - D) I and III only

Answer: D Type: Easy Page: 445

2. Capital structure of the firm can be defined as:

- (I) The firm's debt-equity ratio
  - (II) The firm's mix of different securities used to finance assets
  - (III) The market imperfection that the firm's manager can exploit
- A) I only
  - B) II only
  - C) III only
  - D) I, II, and III

Answer: B Type: Easy Page: 445

3. Under what conditions would a policy of maximizing the value of the firm not be the same as a policy of maximizing shareholders' wealth?

- A) If the issue of debt increases the probability of bankruptcy
- B) If the firm issues debt for the first time
- C) If the beta of equity is positive
- D) If an issue of debt affects the value of existing debt

Answer: D Type: Difficult Page: 446

4. A policy of maximizing the value of the firm is the same as a policy of maximizing the shareholders' wealth rests on two important assumptions. They are:

- (I) The firm can ignore dividend policy
  - (II) The debt equity ratio of the firm does not change
  - (III) An issue of new debt does not affect the value of existing debt
- A) I only
  - B) II only
  - C) III only
  - D) I and III only

Answer: D Type: Difficult Page: 446

5. Modigliani and Miller's Proposition I states that:
- A) The market value of any firm is independent of its capital structure
  - B) The market value of a firm's debt is independent of its capital structure
  - C) The market value of a firm's common stock is independent of its capital structure
  - D) None of the above
- Answer: A Type: Difficult Page: 447

6. An investor can create the effect of leverage on his/her account by:
- (I) buying equity of an unlevered firm
  - (II) by investing in risk-free debt like T-bills
  - (III) by borrowing on his/her own account
- A) I only
  - B) II only
  - C) III only
  - D) I and III only
- Answer: D Type: Medium Page: 448

7. The law of conservation of value implies that:
- A) The value of a firm's common stock is unchanged when debt is added to its capital structure
  - B) The value of any asset is preserved regardless of the nature of the claims against it
  - C) The value of a firm's debt is unchanged when common stock is added to its capital structure
  - D) None of the above
- Answer: B Type: Difficult Page: 448

8. An investor can undo the effect of leverage on his/her own account by:
- (I) investing in the equity of a levered firm
  - (II) by borrowing on his/her own account
  - (III) by investing in risk-free debt like T-bills
- A) I only
  - B) II only
  - C) III only
  - D) I and III above
- Answer: D Type: Medium Page: 448

9. If an individual wanted to borrow with limited liability he/she should
- A) Invest in the equity of an unlevered firm
  - B) Borrow on his/her own account
  - C) Invest in the equity of a levered firm
  - D) Invest in a risk-free asset like T-bills
- Answer: C Type: Difficult Page: 448

10. "Value additivity" works for:
- (I) Combining assets
  - (II) Splitting up of assets
  - (III) Mix of debt securities issued by the firm
- A) I only
  - B) II only
  - C) I and II only
  - D) I,II, and III
- Answer: D Type: Difficult Page: 448

11. The law of conservation of value implies that:
- (I) The mix of senior and subordinated debt does not affect the value of the firm
  - (II) The mix of convertible and non-convertible debt does not affect the value of the firm
  - (III) The mix of common stock and preferred stock does not affect the value of the firm
- A) I only
  - B) II only
  - C) III only
  - D) I, II, and III
- Answer: D Type: Medium Page: 448

12. The law of conservation of value implies that:
- (I) The mix of common stock and preferred stock does not affect the value of the firm
  - (II) The mix of long-term and short-term debt does not affect the value of the firm
  - (III) The mix of secured and unsecured debt does not affect the value of the firm
- A) I only
  - B) II only
  - C) III only
  - D) I, II, and III
- Answer: D Type: Medium Page: 448

13. For a levered firm,
- A) As earnings before interest and taxes (EBIT) increases, the earnings per share (EPS) increases by the same percent
  - B) As EBIT increases, the EPS increases by a larger percent
  - C) As EBIT increases, the EPS decreases
  - D) None of the above
- Answer: B Type: Medium Page: 451

14. For an all equity firm,
- A) As earnings before interest and taxes (EBIT) increases, the earnings per share (EPS) increases by the same percent
  - B) As EBIT increases, the EPS increases by a larger percent
  - C) As EBIT increases, the EPS decreases
  - D) None of the above
- Answer: A Type: Medium Page: 451

15. An EPS – Operating Income chart shows the trade-off between financing plans and:
- (I) Greater risk associated with debt financing, which is evidenced by the greater slope
  - (II) Their break-even point
  - (III) The minimum earnings needed to pay the debt financing for a given level of debt
- A) I only
  - B) II only
  - C) III only
  - D) I, II, and III only

Answer: D Type: Medium Page: 451

16. According to EPS- operating income graph, debt financing is preferred if the expected operating income is:

- A) less than the break-even income
- B) greater than the break-even income
- C) equal to the break-even income

Answer: B Type: Medium Page: 451

17. When comparing levered vs. unlevered capital structures, leverage works to increase EPS for high levels of operating income because:

- A) Interest payments on the debt vary with EBIT levels
- B) Interest payments on the debt stay fixed leaving less income to be distributed over less shares
- C) Interest payments on the debt stay fixed, leaving less income to be distributed over more shares
- D) Interest payments on the debt stay fixed, leaving more income to be distributed over less shares

Answer: D Type: Medium Page: 451

18. In an EPS – Operating Income graphical relationship, the slope of the debt line is steeper than the equity line. The debt line has a negative value for intercept because:

- A) The break-even point is higher with debt
- B) A fixed interest charge must be paid even at low earnings
- C) The amount of interest per share has only a positive effect on the intercept
- D) The higher the interest rate the greater the slope

Answer: B Type: Difficult Page: 451

19. The effect of financial leverage on the performance of the firm depends on:

- A) The rate of return on equity
- B) The firm's level of operating income
- C) The current market value of the debt
- D) The rate of dividend growth

Answer: B Type: Medium Page: 451

20. Health and Wealth Company is financed entirely by common stock which is priced to offer a 15% expected return. If the company repurchases 25% of the common stock and substitutes an equal value of debt yielding 6%, what is the expected return on the common stock after refinancing? (Ignore taxes.)

- A) 18%
- B) 21%
- C) 15%
- D) None of the above

Answer: A Type: Difficult Page: 452

Response:  $r_E = r_A + (D/E)(r_A - r_D) = 15 + (0.25 / 0.75)(15 - 6) = 18\%$

21. Learn and Earn Company is financed entirely by Common stock which is priced to offer a 20% expected return. If the company repurchases 50% of the stock and substitutes an equal value of debt yielding 8%, what is the expected return on the common stock after refinancing?

- A) 32%
- B) 28%
- C) 20%
- D) None of the above

Answer: A Type: Difficult Page: 452

Response:  $R_E = 0.2 + (0.5/0.5)[0.20 - 0.08] = 0.32 = 32\%$

22. Wealth and Health Company is financed entirely by common stock which is priced to offer a 15% expected return. The common stock price is \$40/share. The earnings per share is expected to be \$6. If the company repurchases 25% of the common stock and substitutes an equal value of debt yielding 6%, what is the expected value of earnings per share after refinancing? (Ignore taxes.)

- A) \$6.00
- B) \$7.52
- C) \$7.20
- D) None of the above

Answer: C Type: Difficult Page: 452

Response:  $I = (10)(0.06) = 0.60$ ; new EPS =  $(6 - 0.60)/0.75 = \$7.20/\text{share}$

Use the following to answer questions 23-24:

Learn and Earn Company is financed entirely by common stock, which is priced to offer a 20% expected rate of return. The stock price is \$60 and the earnings per share are \$12.

23. If the company repurchases 50% of the stock and substitutes an equal value of debt yielding 8%, what is the expected earnings per share value after refinancing?

- A) \$12.00
- B) \$19.20
- C) \$24.00
- D) None of the above

Answer: B Type: Difficult Page: 454

Response:  $I = 30(0.08) = \$2.40$ ; EPS =  $[12 - 2.4]/0.5 = \$19.20$

24. MM Proposition II states that:

- A) The expected return on equity is positively related to leverage
- B) The required return on equity is a linear function of the firm's debt to equity ratio
- C) The risk to equity increases with leverage
- D) All of the above
- E) None of the above

Answer: D Type: Medium Page: 454

25. Suppose that before refinancing, an investor owned 100 shares of Learn and Earn common stock. What should he do if he wishes to ensure that risk and expected return on his investment are unaffected by refinancing?

- A) Borrow \$3,000 and buy 50 more shares
- B) Continue to hold 100 shares
- C) Sell 50 shares and buy \$3,000 debt (bonds)
- D) None of the above

Answer: C Type: Difficult Page: 454

26. A firm has zero debt in its capital structure. Its overall cost of capital is 10%. The firm is considering a new capital structure with 60% debt. The interest rate on the debt would be 8%. Assuming there are no taxes its cost of equity capital with the new capital structure would be:

- A) 8%
- B) 16%
- C) 13%
- D) 10%
- E) None of the above

Answer: C Type: Medium Page: 454

Response:  $r_E = 10 + (60/40)(10-8) = 10 + 3 = 13$

27. The cost of capital for a firm,  $r_{WACC}$ , in a tax-free environment is:

- A) Equal to the expected EBIT divided by market value of the unlevered firm
- B) Equal to  $r_A$ , the rate of return for that business risk class
- C) Equal to the overall rate of return required on the levered firm
- D) All of the above

Answer: D Type: Medium Page: 454

28. A firm has a debt-to-equity ratio of 1.0. If it had no debt, its cost of equity would be 12%. Its cost of debt is 9%. What is its cost of equity if there are no taxes?

- A) 21%
- B) 18%
- C) 15%
- D) 16%

Answer: C Type: Medium Page: 454

Response:  $r_E = 12 + 1.0(12-9) = 15\%$

29. A firm has a debt-to-equity ratio of 0.50. Its cost of debt is 10%. Its overall cost of capital is 14%. What is its cost of equity if there are no taxes?

- A) 13%
- B) 16%
- C) 15%
- D) 18%

Answer: B Type: Medium Page: 454

Response:  $14 = [1/3](10) + (2/3)(X)$ ;  $42 = 10 + 2X$ ;  $X = 16\%$

30. If a firm is unlevered and has a cost of equity capital 9%, what would the cost of equity be if the firms became levered at a debt-equity ratio of 2? The expected cost of debt is 7%. (Assume no taxes.)

- A) 15.0%
- B) 16.0%
- C) 14.5%
- D) 13%

Answer: D Type: Medium Page: 454

Response:  $r_E = 9 + 2(9 - 7) = 13\%$

31. A firm has a debt-to-equity ratio of 1. Its (levered) cost of equity is 16%, and its cost of debt is 8%. If there are no taxes, what would be its cost of equity if the debt-to-equity ratio were zero?

- A) 8%
- B) 10%
- C) 12%
- D) 14%

Answer: C Type: Medium Page: 454

Response:  $16 = r + 1(r_A - 8)$ ;  $16 = 2r_A - 8$ ;  $24 = 2r_A$ ;  $r_A = 12\%$

32. For a levered firm, beta of equity ( $b_E$ ) is equal to:

- A)  $b_E = b_A$
- B)  $b_E = b_A + D/E[b_A - b_D]$
- C)  $b_E = b_A + D/(D+E) [br_A - b_D]$
- D) None of the above

Answer: B Type: Difficult Page: 455

33. For a levered firm, return on equity ( $r_E$ ) is equal to:

- A)  $r_E = r_A$
- B)  $r_E = r_A + D/E[r_A - r_B]$
- C)  $r_E = r_A + D/(D+E) [r_A - r_B]$
- D) None of the above

Answer: C Type: Difficult Page: 455

34. The beta of an all equity firm is 1.2. If the firm changes its capital structure to 50% debt and 50% equity using 8% debt financing, what will be the beta of the levered firm? The beta of debt is 0.2.

(Assume no taxes.)

- A) 1.2
- B) 2.2
- C) 2.4
- D) None of the above

Answer: B Type: Medium Page: 455

Response:  $b_E = 1.2 + (0.5/0.5)(1.2-0.2) = 2.2$

35. The equity beta of a levered firm is 1.2. The beta of debt is 0.2. The firm's market value debt to equity ratio is 0.5. What is the asset beta if the tax rate is zero?

- A) 1.2
- B) 0.73
- C) 0.2
- D) None of the above

Answer: B Type: Medium Page: 455

Response:  $1.2 = b_A + (0.5)(b_A - 0.2); b_A = 0.73$

36. The asset beta of a levered firm is 1.1. The beta of debt is 0.3. If the debt equity ratio is 0.5, what is the equity beta? (Assume zero taxes.)

- A) 1.5
- B) 1.1
- C) 0.3
- D) None of the above

Answer: A Type: Medium Page: 455

Response:  $b_E = 1.1 + 0.5(1.1 - 0.3) = 1.5$

37. Generally, which of the following is true?

- A)  $r_D > r_A > r_E$
- B)  $r_E > r_D > r_A$
- C)  $r_E > r_A > r_D$
- D) None of the above are true

Answer: C Type: Medium Page: 457

38. Which of the following is true?

- A)  $b_D < b_A < b_E$
- B)  $b_E < b_A < b_D$
- C)  $b_A < b_E < b_D$
- D) None of the above are true

Answer: A Type: Medium Page: 457



39. Which of the following is true?

- A)  $r_D < r_A < r_E$
- B)  $r_E < r_D < r_A$
- C)  $r_E < r_A < r_D$
- D) None of the above are true

Answer: A Type: Medium Page: 457

40. Which of the following is true?

- A)  $b_D > b_A > b_E$
- B)  $b_E > b_A > b_D$
- C)  $b_A > b_E > b_D$
- D) None of the above are true

Answer: B Type: Medium Page: 457

41. The M&M Company is financed by \$4 million (market value) in debt and \$6 million (market value) in equity. The cost of debt is 5% and the cost of equity is 10%. Calculate the weighted average cost of capital. (Assume no taxes.)

- A) 10%
- B) 15%
- C) 8%
- D) None of the above

Answer: C Type: Medium Page: 457

Response: Weighted average cost of capital (WACC) =  $(4/10)(5) + (6/10)(10) = 2 + 6 = 8\%$

42. The M & M Company is financed by \$10 million in debt (market value) and \$40 million in equity (market value). The cost of debt is 10% and the cost of equity is 20%. Calculate the weighted average cost of capital assuming no taxes.

- A) 18%
- B) 20%
- C) 10%
- D) None of the above

Answer: A Type: Medium Page: 457

Response:  $WACC = (1/5)(10) + (4/5)(20) = 2 + 16 = 18\%$

43. If beta of debt is zero, then the relationship between equity beta and asset beta is given by:

- A) equity beta =  $1 + [(\text{Beta of assets}) / (\text{debt-equity ratio})]$
- B) equity beta =  $(1 - \text{Debt-equity ratio})(\text{beta of assets})$
- C) equity beta =  $(1 + \text{Debt-equity ratio})(\text{beta of assets})$
- D) None of the above

Answer: C Type: Medium Page: 457

44. Minimizing the weighted average cost of capital (WACC) is the same as:

- A) Maximizing the market value of the firm
- B) Maximizing the book value of the firm
- C) Maximizing the profits of the firm
- D) Maximizing the liquidating value of the firm

Answer: A Type: Medium Page: 458

45. The after-tax weighted average cost of capital (WACC) is given by:

- A)  $WACC = r_D (1 - T_C) (D/V) + r_E (E/V)$
- B)  $WACC = r_D (D/V) + [r_E (E/V) / (1 - T_C)]$
- C)  $WACC = [r_D (D/V) + r_E (E/V)] / (1 - T_C)$
- D)  $WACC = r_D (D/V) + r_E (E/V)$

Answer: A Type: Medium Page: 461

46. Given the following data for U&P Company: Debt (D) = \$100 million; Equity (E) = \$300 Million;  $r_D = 6%$ ;  $r_E = 12%$  and  $T_C = 30%$ .

Calculate the after-tax weighted average cost of capital (WACC):

- A) 10.5%
- B) 15%
- C) 10.05%
- D) 9.45%

Answer: C Type: Difficult Page: 461

Response: After-tax WACC =  $(1/4)(1-0.3)(6) + (3/4)(12) = 10.05%$

### True/False Questions

T F 47. The firm's mix of long-term securities used to finance its assets is called the firm's capital structure.

Answer: True Type: Medium Page: 445

T F 48. Value additivity does not hold good when assets are split up.

Answer: False Type: Difficult Page: 448

T F 49. Modigliani and Miller Proposition I states that the market value of any firm is independent of its capital structure

Answer: True Type: Medium Page: 449

T F 50. According to Modigliani and Miller Proposition II, the rate of return required by the debt holders increases as the firm's debt-equity ratio increases.

Answer: False Type: Difficult Page: 453

T F 51. Modigliani and Miller Proposition II states that the rate of return required by the shareholders increases as the firm's debt-equity ratio increases.

Answer: True Type: Medium Page: 453

T F 52. According to Proposition II, the cost of equity increases as more debt is issued, but the weighted average cost of capital remains unchanged.

Answer: True Type: Medium Page: 453

T F 53. Financial leverage increases the expected return and risk of the shareholder.

Answer: True Type: Medium Page: 453

T F 54. Expected return on assets depends on several factors including the firm's capital structure.

Answer: False Type: Medium Page: 453

T F 55. The beta of the firm is equal to the weighted average of the betas on its debt and equity.

Answer: True Type: Medium Page: 456

T F 56. Since the expected rate of return on debt is less than the expected rate of return on equity, the weighted average cost of capital declines as more debt is issued.

Answer: False Type: Medium Page: 458

### Essay Questions

57. Explain the concept of arbitrage.

Type: Difficult Page: 447

Answer:

In well functioning markets two investments that offer the same payoff must have the same cost.

Otherwise, investors can buy an asset in one market and simultaneously sell an identical asset in another market at a higher price and make a profit at no cost or risk.

58. State the law of conservation of value.

Type: Medium Page: 448

Answer:

The law of conservation of value states that the value of an asset is preserved regardless of the nature of claims against it.

59. Explain the concept of "value additivity."

Type: Medium Page: 448

Answer:

If we have two streams of cash flow, A and B, the present value of A + B is equal to the present value of A plus the present value of B. The same idea holds good when assets are split up.

60. Briefly explain how EPS-Operating Income analysis helps determine the capital structure of a firm?

Type: Medium Page: 451

Answer:

The plot of EPS – operating income at a specified amount of debt will provide the break-even income above which debt financing is preferred and below which equity financing is preferred. In this method expected level of operating income will determine whether debt financing should be used or equity financing be used.

61. State and explain MM's Proposition II.

Type: Medium Page: 453

Answer:

The expected rate of return on the common stock of a levered firm increases in proportion to the debt-equity ratio, stated in market values.  $r_E = r_A + (D/E)(r_A - r_D)$

As the debt-equity ratio increases the cost of equity increases; the cost of debt and the weighted average cost of capital remain constant. This also implies that the beta of the firm's equity also increases in the same manner.

62. Briefly explain how changes in debt-equity ratio impacts on the beta of the firm's equity?

Type: Difficult Page: 455

Answer:

There is a linear relationship between the equity beta of a firm and the debt-equity ratio.

It is obtained by combining Modigliani-Miller proposition II with the capital asset pricing model (CAPM).

The relationship is given by:  $b_E = b_A + (D/E)(b_A - b_D)$ . Many times  $b_D$  (beta of debt) is zero. Then the relationship is written as:  $b_E = [1 + (D/E)](b_A)$ .

63. Briefly explain the traditional position on capital structure.

Type: Medium Page: 457

Answer:

The traditional view of the debt policy states that moderate amounts of debt increase the expected return on equity, but when the firm borrows too much the expected return on equity declines.

64. Discuss a successful example of corporations trying to add value through financing.

Type: Medium Page: 460

Answer:

Citicorp was the first to issue floating rate notes whose interest payments changed with changes in short term interest rates. The success of the issue suggests that Citicorp was able to add value through financing, by meeting an unmet need of the investors.

65. State the generalized version of Modigliani-Miller proposition I

Type: Medium Page: 462

Answer:

Modigliani-Miller proposition I states that changes in capital structure does not affect the value of a firm. Modigliani-Miller proposition I is an extremely general result. It applies equally to trade-offs of any choice of financial instruments. For example, the choice between long-term debt and short-term debt would also not affect the value of the firm.