Chapter 13
Risk, Cost of Capital, and Capital Budgeting

Multiple Choice Questions

1. The weighted average of the firm's costs of equity, preferred stock, and after tax debt is the:
A. reward to risk ratio for the firm.
B. expected capital gains yield for the stock.
C. expected capital gains yield for the firm.
D. portfolio beta for the firm.
E. weighted average cost of capital (WACC).

2. If the CAPM is used to estimate the cost of equity capital, the expected excess market return is equal to the:
A. return on the stock minus the risk-free rate.
B. difference between the return on the market and the risk-free rate.
C. beta times the market risk premium.
D. beta times the risk-free rate.
E. market rate of return.

3. The best fit line of a pairwise plot of the returns of the security against the market index returns is called the:
A. Security Market Line.
B. Capital Market Line.
C. characteristic line.
D. risk line.
E. None of the above.

4. The use of debt is called:
A. operating leverage.
B. production leverage.
C. financial leverage.
D. total asset turnover risk.
E. business risk.

5. The weighted average cost of capital for a firm is the:
A. discount rate which the firm should apply to all of the projects it undertakes.
B. overall rate which the firm must earn on its existing assets to maintain the value of its stock.
C. rate the firm should expect to pay on its next bond issue.
D. maximum rate which the firm should require on any projects it undertakes.
E. rate of return that the firm's preferred stockholders should expect to earn over the long term.

6. The WACC is used to _______ the expected cash flows when the firm has ____________.
A. discount; debt and equity in the capital structure
B. discount; short term financing on the balance sheet
C. increase; debt and equity in the capital structure
D. decrease; short term financing on the balance sheet
E. None of the above.

7. Using the CAPM to calculate the cost of capital for a risky project assumes that:
A. using the firm's beta is the same measure of risk as the project.
B. the firm is all-equity financed.
C. the financial risk is equal to business risk.
D. Both A and B.
E. Both A and C.

8. The use of WACC to select investments is acceptable when the:
A. correlation of all new projects are equal.
B. NPV is positive when discounted by the WACC.
C. risk of the projects are equal to the risk of the firm.
D. firm is well diversified and the unsystematic risk is negligible.
E. None of the above.

9. If the risk of an investment project is different than the firm's risk then:
A. you must adjust the discount rate for the project based on the firm's risk.
B. you must adjust the discount rate for the project based on the project risk.
C. you must exercise risk aversion and use the market rate.
D. an average rate across prior projects is acceptable because estimates contain errors.
E. one must have the actual data to determine any differences in the calculations.

10. If the project beta and IRR coordinates plot above the SML the project should be:
A. accepted.
B. rejected.
C. It is impossible to tell.
D. It will depend on the NPV.
E. None of the above.

11. The beta of a security provides an:
A. estimate of the market risk premium.
B. estimate of the slope of the Capital Market Line.
C. estimate of the slope of the Security Market Line.
D. estimate of the systematic risk of the security.
E. None of the above.

12. Regression analysis can be used to estimate:
A. beta.
B. the risk-free rate.
C. standard deviation.
D. variance.
E. expected return.

13. Beta measures depend highly on the:
A. direction of the market variance.
B. overall cycle of the market.
C. variance of the market and asset, but not their co-movement.
D. covariance of the security with the market and how they are correlated.
E. All of the above.

14. The formula for calculating beta is given by the dividing the ___________ of the stock with the market portfolio by the ___________ of the market portfolio.
A. variance; covariance
B. covariance; variance
C. standard deviation; variance
D. expected return; variance
E. expected return; covariance

15. The slope of the characteristic line is the estimated:
A. intercept.
B. beta.
C. unsystematic risk.
D. market variance.
E. market risk premium.

16. Companies that have highly cyclical sales will have a:
A. low beta if sales are highly dependent on the market cycle.
B. high beta if sales are highly dependent on the market cycle.
C. high beta if sales are independent of the market cycle.
D. All of the above.
E. None of the above.

17. Betas may vary substantially across an industry. The decision to use the industry or firm beta to estimate the cost of capital depends on:
A. how small the estimation errors are of all betas across industries.
B. how similar the firm's operations are to the operations of all other firms in the industry.
C. whether the company is a leader or follower.
D. the size of the company's public float.
E. None of the above.

18. Beta is useful in the calculation of the:
A. company's variance.
B. company's discount rate.
C. company's standard deviation.
D. unsystematic risk.
E. company's market rate.

19. For a multi-product firm, if a project's beta is different from that of the overall firm, then the:
A. CAPM can no longer be used.
B. project should be discounted using the overall firm's beta.
C. project should be discounted at a rate commensurate with its own beta.
D. project should be discounted at the market rate.
E. project should be discounted at the T-bill rate.

20. The problem of using the overall firm's beta in discounting projects of different risk is the:
A. firm would accept too many high-risk projects.
B. firm would reject too many low risk projects.
C. firm would reject too many high-risk projects.
D. firm would accept too many low risk projects.
E. Both A and B.

21. The asset beta of a levered firm is generally:
A. equal to the equity beta.
B. different from the equity beta.
C. different from the debt beta.
D. the simple average of the equity beta and debt beta.
E. Both B and C.

22. Comparing two otherwise equal firms, the beta of the common stock of a levered firm is ____________ than the beta of the common stock of an unlevered firm.
A. equal to
B. significantly less
C. slightly less
D. greater
E. None of the above.

23. The beta of a firm is determined by which of the following firm characteristics?
A. Cycles in revenues
B. Operating leverage
C. Financial leverage
D. All of the above.
E. None of the above.

24. The beta of a firm is more likely to be high under what two conditions?
A. High cyclical business activity and low operating leverage
B. High cyclical business activity and high operating leverage
C. Low cyclical business activity and low financial leverage
D. Low cyclical business activity and low operating leverage
E. None of the above.

25. A firm with cyclical earnings is characterized by:
A. revenue patterns that vary with the business cycle.
B. high levels of debt in its capital structure.
C. high fixed costs.
D. high price per unit.
E. low contribution margins.

26. A firm with high operating leverage has:
A. low fixed costs in its production process.
B. high variable costs in its production process.
C. high fixed costs in its production process.
D. high price per unit.
E. low price per unit.

27. If a firm has low fixed costs relative to all other firms in the same industry, a large change in sales volume (either up or down) would have:
A. a smaller change in EBIT for the firm versus the other firms.
B. no effect in any way on the firms as volume does not effect fixed costs.
C. a decreasing effect on the cyclical nature of the business.
D. a larger change in EBIT for the firm versus the other firms.
E. None of the above.

28. A firm with high operating leverage is characterized by __________ while one with high financial leverage is characterized by __________.
A. low fixed cost of production; low fixed financial costs
B. high variable cost of production; high variable financial costs
C. high fixed costs of production; high fixed financial costs
D. low costs of production; high fixed financial costs
E. high fixed costs of production; low variable financial costs

29. Firms whose revenues are strongly cyclical and whose operating leverage is high are likely to have:
A. low betas.
B. high betas.
C. zero betas.
D. negative betas.
E. None of the above.

30. An industry is likely to have a low beta if the:
A. stream of revenues is stable and less volatile than the market.
B. economy is in a recession.
C. market for its goods is unaffected by the market cycle.
D. Both A and B.
E. Both A and C.

31. For the levered firm the equity beta is __________ the asset beta.
A. greater than
B. less than
C. equal to
D. sometimes greater than and sometimes less than
E. None of the above.

32. All else equal, a more liquid stock will have a lower ________.
A. beta
B. market premium
C. cost of capital
D. Both A and B.
E. Both A and C.

33. Two stock market based costs of liquidity that affects the cost of capital are the:
A. bid-ask spread and the specialist spread.
B. market impact cost and the brokerage costs.
C. investor opportunity cost and the brokerage costs.
D. bid-ask spread and the market impact costs.
E. None of the above.

34. When a specialist is caught in the middle of a trade between informed and uniformed traders, which effectively eliminates the spread or causes a loss, is subject to:
A. market impact costs.
B. adverse selection.
C. broker's quotation bias.
D. increasing the number of uninformed traders.
E. None of the above.

35. All else equal, new shareholders will ____ the capital gains of existing shareholders.
A. dilute
B. hold constant
C. increase
D. All of the above.
E. It is impossible to tell.

36. The following are methods to estimate the market risk premium:
A. use historical data to estimate future risk premium.
B. use the dividend discount model to estimate risk premium.
C. use the bond valuation model to estimate growth in bond prices with different costs of capital.
D. A and B.
E. A and C.

37. Beta is the slope of the:
A. efficient frontier.
B. market portfolio.
C. security market line.
D. characteristic line.
E. None of the above.

38. Two stocks that have the same beta ____ have the same correlation because _______:
A. may; because correlation measures the sensitivity of the S&P to the market portfolio.
B. will; because correlation measures the tightness of fit around the regression line.
C. may not; because correlation measures the tightness of fit around the regression line.
D. may not; because correlation measures the sensitivity to change.
E. None of the above.

39. When using the cost of debt, the relevant number is the:
A. pre-tax cost of debt since most corporations pay taxes at the same tax rate.
B. pre-tax cost of debt since it is the actual rate the firm is paying bondholders.
C. post-tax cost of debt since dividends are tax deductible.
D. post-tax cost of debt since interest is tax deductible.
E. None of the above.

40. Jack's Construction Co. has 80,000 bonds outstanding that are selling at par value. Bonds with similar characteristics are yielding 8.5%. 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% and the market risk premium is 8%. Jack's tax rate is 35%. What is Jack's weighted average cost of capital?
A. 7.10%
B. 7.39%
C. 10.38%
D. 10.65%
E. 11.37%

41. Peter's Audio Shop has a cost of debt of 7%, a cost of equity of 11%, and a cost of preferred stock of 8%. The firm has 104,000 shares of common stock outstanding at a market price of $20 a share. There are 40,000 shares of preferred stock outstanding at a market price of $34 a share. The bond issue has a total face value of $500,000 and sells at 102% of face value. The tax rate is 34%. What is the weighted average cost of capital for Peter's Audio Shop?
A. 6.14%
B. 6.54%
C. 8.60%
D. 9.14%
E. 9.45%

42. Phil's Carvings, Inc. wants to have a weighted average cost of capital of 9%. The firm has an after-tax cost of debt of 5% and a cost of equity of 11%. What debt-equity ratio is needed for the firm to achieve its targeted weighted average cost of capital?
A. .33
B. .40
C. .50
D. .60
E. .67

43. Jake's Sound Systems has 210,000 shares of common stock outstanding at a market price of $36 a share. Last month, Jake's paid an annual dividend in the amount of $1.593 per share. The dividend growth rate is 4%. Jake's also has 6,000 bonds outstanding with a face value of $1,000 per bond. The bonds carry a 7% coupon, pay interest annually, and mature in 4.89 years. The bonds are selling at 99% of face value. The company's tax rate is 34%. What is Jake's weighted average cost of capital?
A. 5.3%
B. 5.8%
C. 6.3%
D. 6.9%
E. 7.2%

44. The Consolidated Transfer Co. is an all-equity financed firm. The beta is .75, the market risk premium is 8% and the risk-free rate is 4%. What is the expected return of Consolidated?
A. 7%
B. 8%
C. 9%
D. 10%
E. 13%

45. Assuming the CAPM or one-factor model holds, what is the cost of equity for a firm if the firm's equity has a beta of 1.2, the risk-free rate of return is 2%, the expected return on the market is 9%, and the return to the company's debt is 7%?
A. 10.4%
B. 10.8%
C. 12.8%
D. 14.4%
E. None of the above.

46. The cost of equity for Ryan Corporation is 8.4%. If the expected return on the market is 10% and the risk-free rate is 5%, then the equity beta is ___.
A. 0.48
B. 0.68
C. 1.25
D. 1.68
E. Impossible to calculate with information given.

47. Suppose that the Simmons Corporation's common stock has a beta of 1.6. If the risk-free rate is 5% and the market risk premium is 4%, the expected return on Simmons' common stock is:
A. 4.0%.
B. 5.0%.
C. 5.6%.
D. 10.6%.
E. 11.4%.

48. Suppose the Barges Corporation's common stock has an expected return of 12%. Assume that the risk-free rate is 5%, and the market risk premium is 6%. If no unsystematic influence affected Barges' return, the beta for Barges is ______.
A. 1.00
B. 1.17
C. 1.20
D. 2.50
E. It is impossible to calculate with the information given.

49. Slippery Slope Roof Contracting has an equity beta of 1.2, capital structure with 2/3 debt, and a zero tax rate. What is its asset beta?
A. 0.40
B. 0.72
C. 1.20
D. 1.80
E. None of the above

50. The Template Corporation has an equity beta of 1.2 and a debt beta of .8. The firm's market value debt to equity ratio is .6. Template has a zero tax rate. What is the asset beta?
A. 0.70
B. 0.72
C. 0.96
D. 1.04
E. 1.05

51. The NuPress Valet Co. has an improved version of its hotel stand. The investment cost is expected to be $72 million and will return $13.5 million for 5 years in net cash flows. The ratio of debt to equity is 1 to 1. The cost of equity is 13%, the cost of debt is 9%, and the tax rate is 34%. The appropriate discount rate, assuming average risk, is:
A. 8.65%
B. 9%
C. 9.47%
D. 10.5%
E. 13%

Essay Questions

52. Given the sample of returns of the Top Black Asphalt Company and the S&P 500 index, calculate Top Black's covariance and beta.

Year	**Rs(Top Black)**	**Rm(Market)**
1	+15%	+8%
2	+ 6%	+2%
3	-10%	-7%
4	0%	3%
5	4%	2%

53. Given the sample of returns of the Top Black Asphalt Company and the S&P 500 index, calculate Top Black's correlation. What can be said about the relationship of Top Black and the market return behavior?

54. Eyes of the World Corporation has traditionally employed a firm wide discount rate for capital budgeting purposes. However, its two divisions - publishing and entertainment - have different degrees of risk given by ßP = 1.0, ßE = 2.0, and the beta for the overall firm is 1.3. The firm is considering the following capital expenditures:

	Proposed Project	Initial Investment	IRR
	P 1	$1M	.130
Publishing	P 2	$3M	.121
	P 3	$2M	.090
	E 1	$4M	.160
Entertainment	E 2	$6M	.170
	E 3	$5M	.140

Which projects would the firm accept if it uses the opportunity cost of capital for the entire company? Which projects would it accept if it estimates cost of capital separately for each division? Use 6% as the risk-free rate and 12% as the expected return on the market.

55. On-line Text Co. has four new text publishing products that it must decide on publishing to expand its services. The firm's WACC has been 17%. The projects are of equal risk, ßs of 1.6. The risk-free rate is 7% and the market rate is expected to be 12%. The projects are expected to earn as follows:

- **Project W: 14%**
- **Project X: 18%**
- **Project Y: 17%**
- **Project Z: 15%**

What projects should be selected and why?

56. Explain the factors that determine beta and how an asset beta can differ from equity betas.

57. The Neptune Company offers network communications systems to computer users. The company is planning a major investment expansion but is unsure of the correct measure of equity capital as it has no traded equity. Your job is to determine the basis of the equity cost. List and explain the steps you will need to take.

Chapter 13 Risk, Cost of Capital, and Capital Budgeting Answer Key

Multiple Choice Questions

1. The weighted average of the firm's costs of equity, preferred stock, and after tax debt is the:
A. reward to risk ratio for the firm.
B. expected capital gains yield for the stock.
C. expected capital gains yield for the firm.
D. portfolio beta for the firm.
E. weighted average cost of capital (WACC).

Difficulty level: Easy
Topic: WACC
Type: DEFINITIONS

2. If the CAPM is used to estimate the cost of equity capital, the expected excess market return is equal to the:
A. return on the stock minus the risk-free rate.
B. difference between the return on the market and the risk-free rate.
C. beta times the market risk premium.
D. beta times the risk-free rate.
E. market rate of return.

Difficulty level: Easy
Topic: CAPM
Type: DEFINITIONS

3. The best fit line of a pairwise plot of the returns of the security against the market index returns is called the:
A. Security Market Line.
B. Capital Market Line.
C. characteristic line.
D. risk line.
E. None of the above.

Difficulty level: Medium
Topic: CHARACTERISTIC LINE
Type: DEFINITIONS

4. The use of debt is called:
A. operating leverage.
B. production leverage.
C. financial leverage.
D. total asset turnover risk.
E. business risk.

Difficulty level: Medium
Topic: USE OF DEBT
Type: DEFINITIONS

5. The weighted average cost of capital for a firm is the:
A. discount rate which the firm should apply to all of the projects it undertakes.
B. overall rate which the firm must earn on its existing assets to maintain the value of its stock.
C. rate the firm should expect to pay on its next bond issue.
D. maximum rate which the firm should require on any projects it undertakes.
E. rate of return that the firm's preferred stockholders should expect to earn over the long term.

Difficulty level: Medium
Topic: WEIGHTED AVERAGE COST OF CAPITAL
Type: DEFINITIONS

6. The WACC is used to _______ the expected cash flows when the firm has ____________.
A. discount; debt and equity in the capital structure
B. discount; short term financing on the balance sheet
C. increase; debt and equity in the capital structure
D. decrease; short term financing on the balance sheet
E. None of the above.

Difficulty level: Medium
Topic: WACC
Type: CONCEPTS

7. Using the CAPM to calculate the cost of capital for a risky project assumes that:
A. using the firm's beta is the same measure of risk as the project.
B. the firm is all-equity financed.
C. the financial risk is equal to business risk.
D. Both A and B.
E. Both A and C.

Difficulty level: Medium
Topic: CAPM
Type: CONCEPTS

8. The use of WACC to select investments is acceptable when the:
A. correlation of all new projects are equal.
B. NPV is positive when discounted by the WACC.
C. risk of the projects are equal to the risk of the firm.
D. firm is well diversified and the unsystematic risk is negligible.
E. None of the above.

Difficulty level: Easy
Topic: WACC
Type: CONCEPTS

9. If the risk of an investment project is different than the firm's risk then:
A. you must adjust the discount rate for the project based on the firm's risk.
B. you must adjust the discount rate for the project based on the project risk.
C. you must exercise risk aversion and use the market rate.
D. an average rate across prior projects is acceptable because estimates contain errors.
E. one must have the actual data to determine any differences in the calculations.

Difficulty level: Easy
Topic: DISCOUNT RATE
Type: CONCEPTS

10. If the project beta and IRR coordinates plot above the SML the project should be:
A. accepted.
B. rejected.
C. It is impossible to tell.
D. It will depend on the NPV.
E. None of the above.

Difficulty level: Medium
Topic: SECURITY MARKET LINE
Type: CONCEPTS

11. The beta of a security provides an:
A. estimate of the market risk premium.
B. estimate of the slope of the Capital Market Line.
C. estimate of the slope of the Security Market Line.
D. estimate of the systematic risk of the security.
E. None of the above.

Difficulty level: Easy
Topic: BETA
Type: CONCEPTS

12. Regression analysis can be used to estimate:
A. beta.
B. the risk-free rate.
C. standard deviation.
D. variance.
E. expected return.

Difficulty level: Easy
Topic: BETA ESTIMATION
Type: CONCEPTS

13. Beta measures depend highly on the:
A. direction of the market variance.
B. overall cycle of the market.
C. variance of the market and asset, but not their co-movement.
D. covariance of the security with the market and how they are correlated.
E. All of the above.

Difficulty level: Medium
Topic: BETA
Type: CONCEPTS

14. The formula for calculating beta is given by the dividing the ___________ of the stock with the market portfolio by the ___________ of the market portfolio.
A. variance; covariance
B. covariance; variance
C. standard deviation; variance
D. expected return; variance
E. expected return; covariance

Difficulty level: Medium
Topic: BETA
Type: CONCEPTS

15. The slope of the characteristic line is the estimated:
A. intercept.
B. beta.
C. unsystematic risk.
D. market variance.
E. market risk premium.

Difficulty level: Medium
Topic: BETA AND CHARACTERISTIC LINE
Type: CONCEPTS

16. Companies that have highly cyclical sales will have a:
A. low beta if sales are highly dependent on the market cycle.
B. high beta if sales are highly dependent on the market cycle.
C. high beta if sales are independent of the market cycle.
D. All of the above.
E. None of the above.

Difficulty level: Medium
Topic: CYCLICAL BUSINESS AND BETA
Type: CONCEPTS

17. Betas may vary substantially across an industry. The decision to use the industry or firm beta to estimate the cost of capital depends on:
A. how small the estimation errors are of all betas across industries.
B. how similar the firm's operations are to the operations of all other firms in the industry.
C. whether the company is a leader or follower.
D. the size of the company's public float.
E. None of the above.

Difficulty level: Medium
Topic: INDUSTRY OR FIRM BETA
Type: CONCEPTS

18. Beta is useful in the calculation of the:
A. company's variance.
B. company's discount rate.
C. company's standard deviation.
D. unsystematic risk.
E. company's market rate.

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Topic: BETA
Type: CONCEPTS

19. For a multi-product firm, if a project's beta is different from that of the overall firm, then the:
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C. project should be discounted at a rate commensurate with its own beta.
D. project should be discounted at the market rate.
E. project should be discounted at the T-bill rate.

Difficulty level: Medium
Topic: PROJECT AND FIRM BETA
Type: CONCEPTS

20. The problem of using the overall firm's beta in discounting projects of different risk is the:
A. firm would accept too many high-risk projects.
B. firm would reject too many low risk projects.
C. firm would reject too many high-risk projects.
D. firm would accept too many low risk projects.
E. Both A and B.

Difficulty level: Medium
Topic: FIRM'S BETA
Type: CONCEPTS

21. The asset beta of a levered firm is generally:
A. equal to the equity beta.
B. different from the equity beta.
C. different from the debt beta.
D. the simple average of the equity beta and debt beta.
E. Both B and C.

Difficulty level: Medium
Topic: ASSET BETA
Type: CONCEPTS

22. Comparing two otherwise equal firms, the beta of the common stock of a levered firm is ____________ than the beta of the common stock of an unlevered firm.
A. equal to
B. significantly less
C. slightly less
D. greater
E. None of the above.

Difficulty level: Medium
Topic: LEVERED VS. UNLEVERED BETA
Type: CONCEPTS

23. The beta of a firm is determined by which of the following firm characteristics?
A. Cycles in revenues
B. Operating leverage
C. Financial leverage
D. All of the above.
E. None of the above.

Difficulty level: Medium
Topic: DETERMINANTS OF BETA
Type: CONCEPTS

24. The beta of a firm is more likely to be high under what two conditions?
A. High cyclical business activity and low operating leverage
B. High cyclical business activity and high operating leverage
C. Low cyclical business activity and low financial leverage
D. Low cyclical business activity and low operating leverage
E. None of the above.

Difficulty level: Medium
Topic: FACTORS AFFECTING BETA
Type: CONCEPTS

25. A firm with cyclical earnings is characterized by:
A. revenue patterns that vary with the business cycle.
B. high levels of debt in its capital structure.
C. high fixed costs.
D. high price per unit.
E. low contribution margins.

Difficulty level: Medium
Topic: CYCLICAL EARNINGS
Type: CONCEPTS

26. A firm with high operating leverage has:
A. low fixed costs in its production process.
B. high variable costs in its production process.
C. high fixed costs in its production process.
D. high price per unit.
E. low price per unit.

Difficulty level: Medium
Topic: OPERATING LEVERAGE
Type: CONCEPTS

27. If a firm has low fixed costs relative to all other firms in the same industry, a large change in sales volume (either up or down) would have:
A. a smaller change in EBIT for the firm versus the other firms.
B. no effect in any way on the firms as volume does not effect fixed costs.
C. a decreasing effect on the cyclical nature of the business.
D. a larger change in EBIT for the firm versus the other firms.
E. None of the above.

Difficulty level: Medium
Topic: OPERATING LEVERAGE
Type: CONCEPTS

28. A firm with high operating leverage is characterized by __________ while one with high financial leverage is characterized by __________.
A. low fixed cost of production; low fixed financial costs
B. high variable cost of production; high variable financial costs
C. high fixed costs of production; high fixed financial costs
D. low costs of production; high fixed financial costs
E. high fixed costs of production; low variable financial costs

Difficulty level: Medium
Topic: OPERATING AND FINANCIAL LEVERAGE
Type: CONCEPTS

29. Firms whose revenues are strongly cyclical and whose operating leverage is high are likely to have:
A. low betas.
B. high betas.
C. zero betas.
D. negative betas.
E. None of the above.

Difficulty level: Medium
Topic: DETERMINANTS OF BETA
Type: CONCEPTS

30. An industry is likely to have a low beta if the:
A. stream of revenues is stable and less volatile than the market.
B. economy is in a recession.
C. market for its goods is unaffected by the market cycle.
D. Both A and B.
E. Both A and C.

Difficulty level: Medium
Topic: DETERMINANTS OF BETA
Type: CONCEPTS

31. For the levered firm the equity beta is __________ the asset beta.
A. greater than
B. less than
C. equal to
D. sometimes greater than and sometimes less than
E. None of the above.

Difficulty level: Medium
Topic: ASSET AND EQUITY BETAS
Type: CONCEPTS

32. All else equal, a more liquid stock will have a lower ________.
A. beta
B. market premium
C. cost of capital
D. Both A and B.
E. Both A and C.

Difficulty level: Challenge
Topic: LIQUIDITY
Type: CONCEPTS

33. Two stock market based costs of liquidity that affects the cost of capital are the:
A. bid-ask spread and the specialist spread.
B. market impact cost and the brokerage costs.
C. investor opportunity cost and the brokerage costs.
D. bid-ask spread and the market impact costs.
E. None of the above.

Difficulty level: Medium
Topic: LIQUIDITY
Type: CONCEPTS

34. When a specialist is caught in the middle of a trade between informed and uniformed traders, which effectively eliminates the spread or causes a loss, is subject to:
A. market impact costs.
B. adverse selection.
C. broker's quotation bias.
D. increasing the number of uninformed traders.
E. None of the above.

Difficulty level: Challenge
Topic: ADVERSE SELECTION
Type: CONCEPTS

35. All else equal, new shareholders will ____ the capital gains of existing shareholders.
A. dilute
B. hold constant
C. increase
D. All of the above
E. It is impossible to tell.

Difficulty level: Medium
Topic: CAPITAL GAINS
Type: CONCEPTS

36. The following are methods to estimate the market risk premium:
A. use historical data to estimate future risk premium.
B. use the dividend discount model to estimate risk premium.
C. use the bond valuation model to estimate growth in bond prices with different costs of capital.
D. A and B.
E. A and C.

Difficulty level: Medium
Topic: MARKET RISK PREMIUM
Type: CONCEPTS

37. Beta is the slope of the:
A. efficient frontier.
B. market portfolio.
C. security market line.
D. characteristic line.
E. None of the above.

Difficulty level: Medium
Topic: BETA
Type: CONCEPTS

38. Two stocks that have the same beta ____ have the same correlation because _______:
A. may; because correlation measures the sensitivity of the S&P to the market portfolio.
B. will; because correlation measures the tightness of fit around the regression line.
C. may not; because correlation measures the tightness of fit around the regression line.
D. may not; because correlation measures the sensitivity to change.
E. None of the above.

Difficulty level: Medium
Topic: BETA AND CORRELATION
Type: CONCEPTS

39. When using the cost of debt, the relevant number is the:
A. pre-tax cost of debt since most corporations pay taxes at the same tax rate.
B. pre-tax cost of debt since it is the actual rate the firm is paying bondholders.
C. post-tax cost of debt since dividends are tax deductible.
D. post-tax cost of debt since interest is tax deductible.
E. None of the above.

Difficulty level: Medium
Topic: COST OF DEBT
Type: CONCEPTS

40. Jack's Construction Co. has 80,000 bonds outstanding that are selling at par value. Bonds with similar characteristics are yielding 8.5%. 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% and the market risk premium is 8%. Jack's tax rate is 35%. What is Jack's weighted average cost of capital?
A. 7.10%
B. 7.39%
C. 10.38%
D. 10.65%
E. 11.37%

$R_e = .04 + (1.1 \times .08) = .128$
Debt: 80,000 × $1,000 = $80m
Common: 4m × $40 = $160m
Total = $80m + $160m = $240m

$$\text{WACC} = \left(\frac{\$160\text{m}}{\$240\text{m}} \times .128\right) + \left(\frac{\$80\text{m}}{\$240\text{m}} \times .085 \times (1 - .35)\right) = .085333 + .018417 = .10375 = 10.38\%$$

Difficulty level: Medium
Topic: WEIGHTED AVERAGE COST OF CAPITAL
Type: PROBLEMS

41. Peter's Audio Shop has a cost of debt of 7%, a cost of equity of 11%, and a cost of preferred stock of 8%. The firm has 104,000 shares of common stock outstanding at a market price of $20 a share. There are 40,000 shares of preferred stock outstanding at a market price of $34 a share. The bond issue has a total face value of $500,000 and sells at 102% of face value. The tax rate is 34%. What is the weighted average cost of capital for Peter's Audio Shop?
A. 6.14%
B. 6.54%
C. 8.60%
D. 9.14%
E. 9.45%

Debt: $500,000 × 1.02 = $.51m
Preferred: 40,000 × $34 = $1.36m
Common: 104,000 × $20 = $2.08m
Total = $.51m + $1.36m + $2.08m = $3.95m

$$\text{WACC} = \left(\frac{\$2.08\text{m}}{\$3.95\text{m}} \times .11\right) + \left(\frac{\$1.36\text{m}}{\$3.95\text{m}} \times .08\right) + \left(\frac{\$.51\text{m}}{\$3.95\text{m}} \times .07 \times (1 - .34)\right) = .057924 + .027544 + .005965 = .091433 = 9.14 \text{ percent}$$

Difficulty level: Medium
Topic: WEIGHTED AVERAGE COST OF CAPITAL
Type: PROBLEMS

42. Phil's Carvings, Inc. wants to have a weighted average cost of capital of 9%. The firm has an after-tax cost of debt of 5% and a cost of equity of 11%. What debt-equity ratio is needed for the firm to achieve its targeted weighted average cost of capital?
A. .33
B. .40
C. .50
D. .60
E. .67

$.09 = [W_e \times .11] + [(1 - W_e) \times .05) = .11W_e + .05 - .05W_e$; $.04 = .06W_e$; $W_e = 66.67\%$; $W_d = 1 - W_e = 100\% - 66.67\% = 33.33\%$; Debt - equity ratio = 33.33% ÷ 66.67% = .50

Difficulty level: Medium
Topic: WEIGHTED AVERAGE COST OF CAPITAL
Type: PROBLEMS

43. Jake's Sound Systems has 210,000 shares of common stock outstanding at a market price of $36 a share. Last month, Jake's paid an annual dividend in the amount of $1.593 per share. The dividend growth rate is 4%. Jake's also has 6,000 bonds outstanding with a face value of $1,000 per bond. The bonds carry a 7% coupon, pay interest annually, and mature in 4.89 years. The bonds are selling at 99% of face value. The company's tax rate is 34%. What is Jake's weighted average cost of capital?

A. 5.3%
B. 5.8%
C. 6.3%
D. 6.9%
E. 7.2%

Debt: 6,000 × $1,000 × .99 = $5.94m
Common: 210,000 × $36 = $7.56m
Total = $5.94m + $7.56m = $13.50m
R_e = [($1.593 × 1.04) ÷ $36] + .04 = .08602

Enter	**4.89**		**±990**	**70**	**1000**
	N	**I/Y**	**PV**	**PMT**	**FV**
Solve for		**7.250**			

$$\text{WACC} = \left(\frac{\$7.56\text{m}}{\$13.50\text{m}} \times .08602\right) + \left(\frac{\$5.94\text{m}}{\$13.50\text{m}} \times .07250 \times (1 - .34)\right) = .04817 + .02105 = .06922 = \mathbf{6.9\%}$$

Difficulty level: Medium
Topic: WEIGHTED AVERAGE COST OF CAPITAL
Type: PROBLEMS

44. The Consolidated Transfer Co. is an all-equity financed firm. The beta is .75, the market risk premium is 8% and the risk-free rate is 4%. What is the expected return of Consolidated?

A. 7%
B. 8%
C. 9%
D. 10%
E. 13%

.04 + 0.75(.08) = .10 = 10%

Difficulty level: Easy
Topic: CAPM
Type: PROBLEMS

45. Assuming the CAPM or one-factor model holds, what is the cost of equity for a firm if the firm's equity has a beta of 1.2, the risk-free rate of return is 2%, the expected return on the market is 9%, and the return to the company's debt is 7%?
A. 10.4%
B. 10.8%
C. 12.8%
D. 14.4%
E. None of the above.

Rs = Rf + β(Rm - Rf) = .02 + 1.2(.09 - .02) = .104 = 10.4%

Difficulty level: Medium
Topic: CAPM
Type: PROBLEMS

46. The cost of equity for Ryan Corporation is 8.4%. If the expected return on the market is 10% and the risk-free rate is 5%, then the equity beta is ___.
A. 0.48
B. 0.68
C. 1.25
D. 1.68
E. Impossible to calculate with information given.

Rs = Rf + β (Rm - Rf); .084 = .05 + β (.10 - .05); β = .68

Difficulty level: Medium
Topic: EQUITY BETA
Type: PROBLEMS

47. Suppose that the Simmons Corporation's common stock has a beta of 1.6. If the risk-free rate is 5% and the market risk premium is 4%, the expected return on Simmons' common stock is:
A. 4.0%.
B. 5.0%.
C. 5.6%.
D. 10.6%.
E. 11.4%.

$Rs = Rf + \beta(Rm - Rf) = .05 + 1.6(.04) = .114 = 11.4\%$

Difficulty level: Easy
Topic: CAPM
Type: PROBLEMS

48. Suppose the Barges Corporation's common stock has an expected return of 12%. Assume that the risk-free rate is 5%, and the market risk premium is 6%. If no unsystematic influence affected Barges' return, the beta for Barges is ______.
A. 1.00
B. 1.17
C. 1.20
D. 2.50
E. It is impossible to calculate with the information given.

$Rs = Rf + \beta(Rm - Rf)$; $.12 = .05 + \beta(.06)$; $\beta = .07/.06 = 1.17$

Difficulty level: Medium
Topic: CALCULATING BETA
Type: PROBLEMS

49. Slippery Slope Roof Contracting has an equity beta of 1.2, capital structure with 2/3 debt, and a zero tax rate. What is its asset beta?
A. 0.40
B. 0.72
C. 1.20
D. 1.80
E. None of the above

$\beta A = (E/(D + E.)\ \beta E = (1/3)(1.2) = .40$

Difficulty level: Medium
Topic: ASSET BETA
Type: PROBLEMS

50. The Template Corporation has an equity beta of 1.2 and a debt beta of .8. The firm's market value debt to equity ratio is .6. Template has a zero tax rate. What is the asset beta?
A. 0.70
B. 0.72
C. 0.96
D. 1.04
E. 1.05

$.8(.6/1.6) + 1.2(1/1.6) = 1.05$

Difficulty level: Medium
Topic: ASSET BETA
Type: PROBLEMS

51. The NuPress Valet Co. has an improved version of its hotel stand. The investment cost is expected to be $72 million and will return $13.5 million for 5 years in net cash flows. The ratio of debt to equity is 1 to 1. The cost of equity is 13%, the cost of debt is 9%, and the tax rate is 34%. The appropriate discount rate, assuming average risk, is:

A. 8.65%
B. 9%
C. 9.47%
D. 10.5%
E. 13%

WACC = .09(1 - .34)(.5) + .13(.5) = .0297 + .065 = .0947 = 9.47%

Difficulty level: Easy
Topic: WACC
Type: PROBLEMS

Essay Questions

52. Given the sample of returns of the Top Black Asphalt Company and the S&P 500 index, calculate Top Black's covariance and beta.

Year	**Rs(Top Black)**	**Rm(Market)**
1	+15%	+8%
2	+ 6%	+2%
3	-10%	-7%
4	0%	3%
5	4%	2%

Year	*Rs(Top Black)*	*Rm –(Market)*	*Rs–S*	*Rm–m*	*(Rs–S)(Rm–m)*
1	*+15%*	*+ 8%*	*12%*	*6.4%*	*.00768*
2	*+ 6%*	*+ 2%*	*3%*	*0.4%*	*.00012*
3	*-10%*	*- 7%*	*-13%*	*-8.6%*	*.00118*
4	*0%*	*3%*	*- 3%*	*1.4%*	*-.00042*
5	*4%*	*2%*	*1%*	*0.4%*	*-.00004*
					.00860

Step 1: Calculate the average return for each stock: Rs = 3%, Rm = 1.6%
Step 2: Calculate the deviation of each monthly return from the average.
Step 3: Calculate the cross product of the deviations and sum, .00860. Covariance = .0086/4 = .00215.
Step 4: Calculate the squared deviations of Rm (NOTE: Not Given Above)
Step 5: Sum the product of the deviations and the squared deviations of Rm (which is equal to .01172, VAR = .00293 and STD = .05413; for Top Black VAR = .0083 and STD = .091104)
Step 6: Divide the sum of the cross-products of the deviations by the sum of the squared market deviations: .0086/.01172 = .73378 = .74; Cov/Var(m) = .00215/.00293 = .73378 = .74

Topic: BETA AND COVARIANCE
Type: ESSAYS

53. Given the sample of returns of the Top Black Asphalt Company and the S&P 500 index, calculate Top Black's correlation. What can be said about the relationship of Top Black and the market return behavior?

*Refer to 47 for Covariance = .00215. Correlation, r = Cov/(Std t * Std m) = .00215/(.091104)(.05413) = .44. Correlation is positive and the returns of Top Black generally move in the same direction as the market.*

Topic: CORRELATION
Type: ESSAYS

54. Eyes of the World Corporation has traditionally employed a firm wide discount rate for capital budgeting purposes. However, its two divisions - publishing and entertainment - have different degrees of risk given by ßP = 1.0, ßE = 2.0, and the beta for the overall firm is 1.3. The firm is considering the following capital expenditures:

	Proposed Project	Initial Investment	IRR
	P 1	$1M	.130
Publishing	P 2	$3M	.121
	P 3	$2M	.090
	E 1	$4M	.160
Entertainment	E 2	$6M	.170
	E 3	$5M	.140

Which projects would the firm accept if it uses the opportunity cost of capital for the entire company? Which projects would it accept if it estimates cost of capital separately for each division? Use 6% as the risk-free rate and 12% as the expected return on the market.

Overall firm cost of capital: 6% + (12% - 6%)1.3 = 13.8%
Accept projects E1, E2, and E3.
Publishing cost of capital: 6% + (12% - 6%)1.0 = 12%
Accept projects P1 and P2.
Entertainment cost of capital: 6% + (12% - 6%)2.0 = 18%
Accept no projects in this division. Results in contrast to
Overall cost of capital when own risk is considered.

Topic: BETA
Type: ESSAYS

55. On-line Text Co. has four new text publishing products that it must decide on publishing to expand its services. The firm's WACC has been 17%. The projects are of equal risk, ßs of 1.6. The risk-free rate is 7% and the market rate is expected to be 12%. The projects are expected to earn as follows:

- **Project W: 14%**
- **Project X: 18%**
- **Project Y: 17%**
- **Project Z: 15%**

What projects should be selected and why?

Required Rate of Return: = .07 + 1.6(.12 - .07) = .07 + 1.6(.05) = .07 + .08 = .15 = 15%
Projects X, Y > 15% Accept, NPV > 0
Project Z = 15% Indifferent, NPV = 0
Project W < 15% Reject
WACC rate of 17% is irrelevant. The risk of the projects must be different than risk of company.

Topic: PROJECT SELECTION
Type: ESSAYS

56. Explain the factors that determine beta and how an asset beta can differ from equity betas.

Operating leverage
Cyclicality of revenues
Financial leverage
Asset beta = equity beta with no financial leverage
Equity beta > asset beta with financial leverage

Topic: BETA
Type: ESSAYS

57. The Neptune Company offers network communications systems to computer users. The company is planning a major investment expansion but is unsure of the correct measure of equity capital as it has no traded equity. Your job is to determine the basis of the equity cost. List and explain the steps you will need to take.

Collect estimates of beta for firms in the same business.
Collect market value D/E ratio and tax rate for each company.
Delever and estimate an average asset beta.
Relever to D/E ratio desired.
RF rate and market risk premium, calculate (estimate) equity cost of capital.

Topic: COST OF CAPITAL
Type: ESSAYS