

Problem 4 (10 points)

Use the following information to answer the question

State	Probability	Return on A	Return on B
Boom	.3	12%	-2%
Normal	.6	8%	2%
Bust	.1	4%	6%

What is the expected return and standard deviation for asset A?

What is the expected return and standard deviation on a portfolio with weights of 60% in asset A and 40% in asset B?

9 Asset A

$$E(R) = 0.3(0.12) + 0.6(0.08) + 0.1(0.04) \\ = 0.088$$

$$\sigma^2 = 0.3(0.088 - 0.12)^2 + 0.6(0.088 - 0.08)^2 + 0.1(0.088 - 0.04)^2 \\ = 5.76 \times 10^{-4}$$

$$\sigma = 0.024$$

As: 60% A 40% B

$$\text{Boom: } 0.6(0.12) + 0.4(-0.02) = 0.064$$

$$\text{Normal: } 0.6(0.08) + 0.4(0.02) = 0.056$$

$$\text{Bust: } 0.6(0.04) + 0.4(0.06) = 0.048$$

$$ER_P = 0.3(0.064) + 0.6(0.056) + 0.1(0.048) \\ = 0.0576$$

$$\sigma^2 = 0.3(0.0576 - 0.064)^2 + 0.6(0.0576 - 0.056)^2 + 0.1(0.0576 - 0.048)^2 \\ = 2.304 \times 10^{-5}$$

3. There are no tax consequences.
4. The company would have to pay \$44,000 in taxes.
5. The company would have to pay \$100,000 in taxes.
6. The company would receive a tax credit of \$124,000.
7. The company would receive a tax credit of \$48,000.
8. Which of the following is not a cash flow that results from the decision to accept a project?
- Changes in net operating working capital
 - Shipping and installation costs.
 - Sunk costs.
 - Opportunity costs.
 - Externalities.
9. Which of the following statements is incorrect?
- Assuming a project has normal (conventional) cash flows, the NPV will be positive if the IRR is less than the cost of capital.
 - If the multiple IRR problem does not exist, any independent project acceptable by the NPV method will also be acceptable by the IRR method.
 - If IRR = the cost of capital, then NPV = 0.
 - NPV can be negative if the IRR is positive.
 - The NPV method is not affected by the multiple IRR problem.
10. Which of the following is not considered a capital component for the purpose of calculating the weighted average cost of capital (WACC) as it applies to capital budgeting?
- Long-term debt.
 - Common stock.
 - Accounts payable and accruals.
 - Preferred stock.
11. Laurier Inc. is a household products firm that is considering developing a new detergent. In evaluating whether to go ahead with the new detergent project, which of the following items should Laurier explicitly include in its cash flow analysis?
12. The company will produce the detergent in a vacant facility that they renovated five years ago at a cost of \$700,000.

Problem 2 (20 points)

x 4.5

Mills is considering a new project that is expected to boost its production capacity. The proposed project has the following features:

- An initial cost of \$500,000
- The depreciation applied is a 3 year MACRS with the following rates:

Year	1	2	3	4
Depreciation rate	28%	38%	25%	9%

- If the project is undertaken the company will have to initially increase its working capital by \$40,000. This net working capital will be recovered at the end of the project's life.
 - If the project is undertaken the company will realize an additional \$600,000 in sales over each of the next four years. The company's operating costs (excluding depreciation) will equal \$400,000 per year.
 - The project's economic life is 4 years and can be sold at the end of its economic life for \$50,000
 - The tax rate applicable to the company is 40%
 - The company currently has 20,000 common shares outstanding trading at \$35 per share. The company's beta is 1.2.
 - The company has 1000 bonds outstanding trading at 110% of par value. These bonds pay 10% coupon semi-annually, have 10 years left to maturity, and have a par value of \$1,000.
 - The company has 2000 shares of 10% preferred stock trading at 90%. These shares have a par value of \$100.
 - The risk free rate is 5% and the market risk premium is 6%
1. What is the company's cost of capital?
 2. Given the calculated cost of capital, should the company accept the project?

Common Shares:

$$R_{\#} = 0.05 + 1.2(0.06) = 0.122 \quad (12.2\%)$$

$$M.V.: 20,000 \times 35 = \$700,000$$

Debt:

$$P.V. = -1100 \quad F.V.: 1000 \quad P.M.T.: \frac{100}{2} = 50 \quad N = 20$$

$$CPT \quad I/Y: 4.24\% \times 2$$

State	P_i	r_i
1	0.2	10%
2	0.6	15
3	0.2	20

- a. 15%; 6.50%
- b. 12%; 5.18%
- c. 15%; 3.16%
- d. 15%; 10.00%
- e. 20%; 5.00%

20. Butter & Jelly reduced its taxes last year by \$350 by increasing its interest expense by \$1,000. Which of the following terms is used to describe this tax savings?

- a. interest tax shield
- b. interest credit
- c. financing shield
- d. current tax yield
- e. tax-loss interest

A highly risk-averse investor is considering the addition of an asset to a 10-stock portfolio. The two securities under consideration both have an expected return, equal to 15 percent. However, the distribution of possible returns associated with Asset A has a standard deviation of 12 percent, while Asset B's standard deviation is 8 percent. Which asset should the risk-averse investor add to his/her portfolio?

- Asset A.
- Asset B.
- Both A and B.
- Neither A nor B.
- Cannot tell without more information.

12. Which of the following statements is likely to encourage a firm to increase its debt ratio in its capital structure?

- Its sales become less stable over time.
- Its corporate tax rate declines.
- Management believes that the firm's stock is overvalued.
- Statements a and b are correct.
- None of the statements above is correct.

13. Stock A has a beta of 1.5 and Stock B has a beta of 0.5. Which of the following statements must be true about these securities? (Assume the market is in equilibrium.)

- When held in isolation, Stock A has greater risk than Stock B.
- Stock B would be a more desirable addition to a portfolio than Stock A.
- Stock A would be a more desirable addition to a portfolio than Stock B.
- The expected return on Stock A will be greater than that on Stock B.
- The expected return on Stock B will be greater than that on Stock A.

14. Consider the following information for three stocks, Stock A, Stock B, and Stock C.

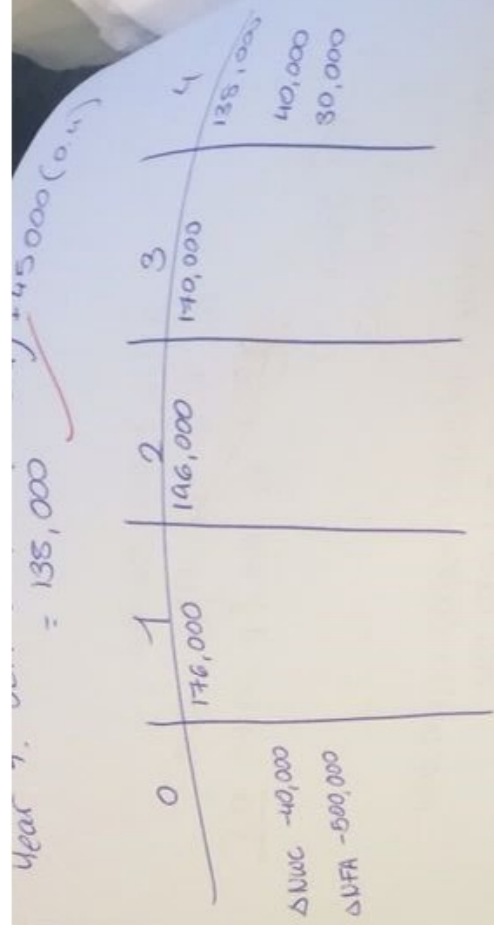
	Expected	Standard	
	Return	Deviation	Beta
Q ^{1/3} A { ^{0.5} Stock A	10%	20%	1.0
^{1/3} Stock B	10	20	1.0
^{1/3} Stock C	12	20	1.4

Portfolio P has half of its funds invested in Stock A and half invested in Stock B. Portfolio Q has one third of its funds invested in each of the three stocks. The risk-free rate is 5 percent, What is the market risk premium?

- 4.0%
- 4.5%
- 5.0%

- d. 5.5%
- e. 6.0%

15. You have computed the break-even point between a levered and an unlevered capital structure. Assume there are no taxes. At the break-even level, the:
- a. firm is just earning enough to pay for the cost of the debt.
 - b. firm's earnings before interest and taxes are equal to zero.
 - c. earnings per share for the levered option are exactly equal to those of the unlevered option
 - d. advantages of leverage exceed the disadvantages of leverage.
 - e. firm has a debt-equity ratio of .50.
16. You hold a diversified portfolio consisting of a \$10,000 investment in each of 20 different common stocks (that is, your total investment is \$200,000). The portfolio beta is equal to 1.2. You have decided to sell one of your stocks that has a beta equal to 0.7 for \$10,000. You plan to use the proceeds to purchase another stock that has a beta equal to 1.4. What will be the beta of the new portfolio?
- a. 1.165
 - b. 1.235
 - c. 1.250
 - d. 1.284
 - e. 1.333
17. Which one of the following states that the value of a firm is unrelated to the firm's capital structure?
- a. Capital Asset Pricing Model
 - b. M&M Proposition I
 - c. M&M Proposition II
 - d. Law of One Price
 - e. Efficient Markets Hypothesis
18. Which of the following statements best describes what would be expected to happen as you randomly add stocks to your portfolio?
- a. Adding more stocks to your portfolio reduces the portfolio's company-specific risk.
 - b. Adding more stocks to your portfolio reduces the beta of your portfolio.
 - c. Adding more stocks to your portfolio increases the portfolio's expected return.
 - d. Statements a and c are correct.
 - e. All of the statements above are correct
19. Given the following probability distribution, what are the expected return and the



② $ATSV = MV - T(MV - BV)$
 $= 500,000 - 0.4(50,000)$
 $= 30,000$

$BV: 500,000 - 500,000 = 0$

- CF0: -540,000
- CF1: 176,000 F: 1
- CF2: 196,000 F: 2
- CF3: 170,000 F: 3
- CF4: 205,000 F: 4

DIR: 10%

5/CPT NPV: 51,773

Firm should accept project since it yields a positive NPV.

1. Twin Hills Inc. is considering a proposed project. Given available information, it is currently estimated that the proposed project is risky but has a positive net present value. Which of the following factors would make the company less likely to adopt the current project?
- It is revealed that if the company proceeds with the proposed project, the company will lose two other accounts, both of which have positive NPVs.
 - It is revealed that the company has an option to back out of the project 2 years from now, if it is discovered to be unprofitable.
 - It is revealed that if the company proceeds with the project, it will have an option to repeat the project 4 years from now.
 - Statements a and b are correct.
 - Statements b and c are correct.
2. Project A has an internal rate of return (IRR) of 15 percent. Project B has an IRR of 14 percent. Both projects have a cost of capital of 12 percent. Which of the following statements is most correct?
- Both projects have a positive net present value (NPV).
 - Project A must have a higher NPV than Project B.
 - If the cost of capital were less than 12 percent, Project B would have a higher IRR than Project A.
 - Statements a and c are correct.
 - All of the statements above are correct.
3. St. John's Paper is considering purchasing equipment today that has a depreciable cost of \$1 million. The equipment will be depreciated on a MACRS 5-year basis, which implies the following depreciation schedule:

<u>Year</u>	<u>MACRS Depreciation Rates</u>
1	0.20
2	0.32
<u>3</u>	0.19
4	0.12
5	0.11
6	0.06

Assume that the company sells the equipment after three years for \$400,000 and the company's tax rate is 40 percent. What would be the tax consequences resulting from the sale of the equipment?

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Assume that the company sells the equipment after three years for \$400,000 and the company's tax rate is 40 percent. What would be the tax consequences resulting from the sale of the equipment?

- a. There are no tax consequences.
b. The company would have to pay \$44,000 in taxes.
c. The company would have to pay \$160,000 in taxes.
d. The company would receive a tax credit of \$124,000.
e. The company would receive a tax credit of \$48,000.
4. Which of the following is not a cash flow that results from the decision to accept a project?
- a. Changes in net operating working capital.
b. Shipping and installation costs.
c. Sunk costs.
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e. Externalities.
5. Which of the following statements is incorrect?
- a. Assuming a project has normal (conventional) cash flows, the NPV will be positive if the IRR is less than the cost of capital.
b. If the multiple IRR problem does not exist, any independent project acceptable by the NPV method will also be acceptable by the IRR method.
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b. Common stock.
c. Accounts payable and accruals.
d. Preferred stock.
7. Laurier Inc. is a household products firm that is considering developing a new detergent. In evaluating whether to go ahead with the new detergent project, which of the following items should Laurier explicitly include in its cash flow analysis?
- a. The company will produce the detergent in a vacant facility that they renovated five years ago at a cost of \$700,000.

notes

26)

(0.1/0

1	a ✓
2	a ✓
3	b ✓
4	c ✓
5	e ✗
6	c ✓
7	d ✓
8	e ✓
9	b ✗
10	c ✓
11	b ✓
12	d ✗
13	d ✓
14	d ✗
15	c ✓
16	d ✓
17	b ✓
18	d ✗
19	c ✓
20	d ✓

30

- b. The company will need to use some equipment that it could have leased to another company. This equipment lease could have generated \$200,000 per year in after-tax income.
- c. The new detergent is likely to significantly reduce the sales of the other detergent products the company currently sells.
- d. Statements b and c are correct.
- e. All of the statements above are correct.
8. A major disadvantage of the payback period is that it
- a. Uses an arbitrary cutoff.
- b. Ignores cash flows beyond the payback period.
- c. Does not directly account for the time value of money.
- d. Statements b and c are correct.
- e. All of the statements above are correct.
9. As a general rule, the capital structure that
- a. Maximizes expected EPS also maximizes the price per share of common stock.
- b. Minimizes the interest rate on debt also maximizes the expected EPS.
- c. Minimizes the required rate on equity also maximizes the stock price.
- d. Maximizes the price per share of common stock also minimizes the weighted average cost of capital.
- e. None of the statements above is correct.
10. Which of the following statements is most correct? (Assume that the risk-free rate remains constant.)
- a. If the market risk premium increases by 1 percentage point, then the required return on all stocks will rise by 1 percentage point.
- b. If the market risk premium increases by 1 percentage point, then the required return will increase for stocks that have a beta greater than 1.0, but it will decrease for stocks that have a beta less than 1.0.
- c. If the market risk premium increases by 1 percentage point, then the required return will increase by 1 percentage point for a stock that has a beta equal to 1.0.
- d. Statements a and c are correct.
- e. None of the statements above is correct.

Problem 3 (10 points)

The following cash flows are estimated for two mutually exclusive projects:

Time	Project A	Project B
0	-\$100,000	-\$110,000
1	60,000	20,000
2	40,000	40,000
3	20,000	40,000
4	10,000	50,000

1. Which project would you choose if you rely on the NPV at a cost of capital of 5%? What if you decide to use the IRR as your decision criteria?
2. Which project would you choose if you rely on the NPV at a cost of capital of 10%? What if you decide to use the IRR as your decision criteria?
3. How do you interpret your answers to the above questions? **Show your computations for this question**

1.

- CPT NPV of project A: \$15,927.81 ✓

NPV of project B: \$21,017.14 ✓

Using NPV, I would choose project B since it has a higher NPV.

- CPT IRR Project A: 15.86% ✓

CPT IRR Project B: 11.996 ≈ 12% ✓

Using IRR I would choose project A.

2. - CPT NPV of project A: \$9,459.73 ✓

NPV of project B: 5,442.93 ✓

I would choose A since it has a higher NPV

CPT IRR project A: 15.86% ✓

SHOW ALL YOUR WORK

x 0.15

Problem 1 (20 points)

Flood motors is an all equity firm with 200,000 shares outstanding. The company's EBIT is \$2,000,000 and is expected to remain constant overtime. The company will distribute all its earnings as dividends to its shareholders. The company is subject to a 40% tax rate.

The company is considering issuing \$2,000,000 worth of bonds and using the proceeds for a stock repurchase. If issued the bonds would have an estimated yield to maturity of 10 percent. The risk free rate in the economy is 6.6% and the market risk premium is 6%. The company's beta is currently 0.9, but its investment bankers estimate that the company's beta would rise to 1.1 if they proceed with the repurchase and the change in the capital structure.

1. What is the stock price before the change in the capital structure?
2. What would the price be following the change in the capital structure?
3. What is the effect of the change in the capital structure on the company's ROE? Should the company go ahead with the change?

1) Before Δ in capital structure

EBIT	2,000,000
u	-
Net Y	2,000,000
EPS	200,000
Shares Outst.	200,000
EPS:	10

$$\text{Stock price} = \frac{MV}{\text{Outstanding Share}}$$

~~Stock price: \$10 / share~~

$$E(R_A) = r_f + \beta(E_{R_m} - r_f)$$

$$= 0.066 + 0.9(0.06)$$

$$= 0.12$$

2)

EBIT	2,000,000
u	200,000
Net Y	180,000

~~Stock price:~~

$$E(R_A) = 0.066 + 1.1(0.06)$$

$$= 0.132$$

Shares
Outst.