

**MBA 8230**  
**Applications in Corporate Finance**  
**Take-Home Assignment**

**Instructors:**

**Richard Fendler, Charles Hodges,  
Alfred Mettler, Lalitha Naveen**

**Directions:**

This take-home assignment (THA) is due at the beginning of the regular class in week 7, and has to be turned in physically. Please do not send your answers via e-mail since any electronically turned in THA will not be graded.

**Although you may use your book, notes, etc., all work on this THA is to be yours alone - any discussion of either the questions on the assignment or your answers with anyone other than the instructor will be considered as cheating and, thus, as a violation of the GSU honor code. You have to confirm your adherence to those rules by signing the attached academic honesty statement.**

For the multiple choice questions (Part I), record the letter of the correct multiple choice answer directly on the answer sheet on the last page. You do not need to show any intermediate steps since no partial credit will be awarded on multiple choice questions. For the problems with no answer choices (Part II), record your final numeric answer including relevant calculations and intermediate steps on separate sheets of paper. Partial credit may be assigned at the instructor's discretion for these problems.

The grade on any assignment turned in after the beginning of class on the relevant date listed above will be reduced at a daily compounded rate of 10% per day (begin mode).

**Following:**

- Part I: Multiple choice questions (pp. 2-5)
- Part II: Problems and Calculations (pp. 5-6)
- Statement of academic honesty (p. 7) to be signed and turned in together with the solutions
- Cover sheet with answers to Part I (p. 8) to be turned in, along with solutions to Part II on separate sheet of paper

## Part I

### Multiple Choice Questions (each question is worth one point)

#### The following information pertains to questions 1-4

Roll Corporation is constructing its Cost of Capital schedule. The firm is at its target capital structure. Its bonds have a 9 percent coupon, paid semiannually, a current maturity of 15 years, and sell for \$1,057. Roll's beta is 1.2, the risk-free rate is 3.0 percent, and the market risk premium is 6.5 percent. Roll is a constant growth firm, which just paid a dividend of \$1.20, sells for \$25.00 per share, and has a growth rate of 5.8 percent. The firm's tax rate is 40%.

The firm's book value balance sheet is as follows:

Asset	\$27,400	Long Term Debt	\$15,000
		Equity (\$.50 par)	\$1,500
		Retained Earnings	\$10,900

1. The firm's leverage ratio (weight of debt or  $w_d$ ) that should be used when calculating the firm's WACC is closest to which of the below numbers?
  - a. 1000%
  - b. 23%
  - c. 55%
  - d. 18%
  - e. None of the above answers is within 1% of the correct weight of debt.
  
2. To the nearest .1%, what is Roll's before-tax cost of debt% ( $r_d$ )?
  - a. 105.7%
  - b. 9%
  - c. 8.3%
  - d. 5.0%
  - e. 4.2%
  
3. What is the cost of retained earnings using the constant dividend growth model?
  - a. 10.9%
  - b. 10.3%
  - c. 10.6%
  - d. 7.2%
  - e. 7.1%

4. Using the CAPM estimate of the cost of retained earnings, Roll's Weighted Average Cost of Capital is closest to:

- a. 10.8%
- b. 9.8%
- c. 7.6%
- d. 6.6%
- e. 5.6%

**The following information pertains to questions 5-8 and also for question 13.**

Smartdrive Inc. was an early adopter of the USB storage technology a couple of years ago and is currently one of the leading providers of USB storage drives and corresponding services. The company is evaluating an upgrade of an existing product group to a new USB standard, which would allow them to expand and improve their services considerably. Therefore the company is evaluating the replacement of one of its existing production lines with a new one. The existing production line has a current book value of \$1,100,000 and it is being depreciated over the next three years on a straight-line basis to a salvage value of \$200,000. The existing production line could be sold today "as is" to a competitor for \$1,300,000. If Smartdrive Inc. does not replace the existing production line, the company estimates that it would be worth \$250,000 three years from today.

The purchase and installation of the new production line would cost \$3,000,000 immediately and would increase operating profits (before taxes) by \$800,000 per year. Smartdrive Inc. expects that the production line would be used for 3 years, and then be sold for 1/3 of the original purchase price. The new production line would be depreciated according to the 5-years MACRS schedule (20%, 32%, 19%, 12%, 11%, 6%). If the existing production line were going to be replaced, this would require an immediate \$500,000 increase in net working capital, which would revert to its previous level at the end of 3 years. The firm's marginal tax rate is relatively low at 20% and the project's cost of capital is 18%. Analyze this replacement project and answer the following questions:

5. What is the amount of the **initial cash flow** at **Year 0**?

- a. (\$1,700,000)
- b. (\$1,740,000)
- c. (\$2,200,000)
- d. (\$2,240,000)
- e. (\$3,280,000)

6. What incremental **operating cash flow** will occur at the **end of Year 1** as a result of replacing the old product line?
- a. \$1,000,000
  - b. \$940,000
  - c. \$866,000
  - d. \$800,000
  - e. \$700,000
7. What incremental **total cash flow** will occur at the **end of Year 3** if the new product line is being purchase/installed?
- a. \$1,428,000
  - b. \$1,928,000
  - c. \$2,050,000
  - d. \$2,088,000
  - e. \$2,128,000
8. The **IRR** of the project is closest to
- a. 14%
  - b. 16%
  - c. 18%
  - d. 20%
  - e. 22%
9. The sales of ABC Corp. are expected to grow by 10%. The firm has spontaneous liabilities of \$10,000. The increase in sales is expected to result in a \$5,000 increase in retained earnings. The firm currently has \$90,000 in total assets and these are being utilized at full capacity. Find the additional funds needed (AFN) to support the increase in sales.
- a. \$3,000
  - b. \$4,000
  - c. \$5,000
  - d. \$7,000
  - e. \$9,000

10. Suppose that a firm is operating at full capacity and plans to increase its sales by 10% next year. If the firm currently has \$15,000,000 in assets, \$4,000,000 in spontaneous liabilities, expects to earn \$800,000 next year, and maintains a payout ratio of 0.3, what is the forecasted Additional Funds Needed (i.e., 1<sup>st</sup> pass AFN) according to the proportional or "formula method"?
- \$540,000
  - \$860,000
  - \$300,000
  - No new additional funds are needed.
  - You cannot answer this question without knowing sales.

## Part II

11. Your company is considering a machine that will cost \$1,000 at Time 0 and which can be sold after 3 years for \$100. To operate the machine, \$200 must be invested at Time 0 in inventories; these funds will be recovered when the machine is retired at the end of Year 3. The machine will produce sales revenues of \$900/year for 3 years; operating costs (excluding depreciation) will be 50 percent of sales. Operating cash inflows will begin 1 year from today (at Time 1). The machine will have depreciation expenses of \$500, \$300, and \$200 in Years 1, 2, and 3, respectively. The company has a 40 percent tax rate, enough taxable income from other assets to enable it to get a tax refund from this project if the project's income is negative, and a 10 percent cost of capital. Inflation is zero. What is the project's NPV?

12. Snowball & Company has the following balance sheet:

Current assets	\$ 7,000	A/P & Accruals	\$ 1,500
Fixed assets	<u>3,000</u>	S-T Loans	2,000
Total Assets	\$10,000	Common Stock	1,500
		Ret. Earnings	<u>5,000</u>
		Total Claims	\$10,000

Snowball's after-tax profit margin is 11%, and the company pays out 60 percent of its earnings as dividends. Its sales last year were \$10,000; its assets were used to full capacity; no economies of scale exist in the use of assets; and the profit margin and payout ratio are expected to remain constant. The company uses the percentage-of-sales method to estimate funds requirements, and it plans to raise any required external capital as short-term bank loans. If sales grow by 50 percent, what will Snowball's current ratio be after it has raised the necessary expansion funds as determined by the first-pass of the usual AFN calculation?

13. Smartdrive Inc (same information as in problems 6-8) wants to know how different cost of capital levels would affect the NPV of the project. Therefore you have to perform a sensitivity analysis and develop a matrix that shows the NPV's if the cost of capital are 14%, 16%, 18%, 20%, 22%, respectively.

WACC	14%	16%	18%	20%	22%
NPV					

14. Nebraska Instruments (NI) is considering a project that has an up-front cost at  $t = 0$  of \$1,500,000. The project's subsequent cash flows critically depend on whether its products become the industry standard. There is a 75 percent chance that the products will become the industry standard, in which case the project's expected cash flows will be \$500,000 at the end of each of the next seven years ( $t = 1 \dots 7$ ). There is a 25 percent chance that the products will not become the industry standard, in which case the expected cash flows from the project will be \$50,000 at the end of each of the next seven years ( $t = 1 \dots 7$ ). NI will know for sure one year from today whether its products will have become the industry standard. It is considering whether to make the investment today or to wait a year until after it finds out if the products have become the industry standard. If it waits a year, the project's up-front cost at  $t = 1$  will remain at \$1,500,000. If it chooses to wait, the subsequent cash flows will remain at \$500,000 per year if the product becomes the industry standard, and \$50,000 per year if the product does not become the industry standard. However, if it decides to wait, the subsequent cash flows will be received only for six years ( $t = 1 \dots 7$ ). Assume that all cash flows are discounted at 10 percent. If NI chooses to wait a year before proceeding, how much will this increase or decrease the project's expected NPV in today's dollars ( $t = 0$ ), relative to the project's NPV if it proceeds today?

15. Consider the following project data:

- A \$500 feasibility study will be conducted at  $t = 0$ .
- If the study indicates potential, the firm will spend \$1,000 at  $t = 1$  to build a prototype. The best estimate now is that there is an 80 percent chance that the study will indicate potential, and a 20 percent chance that it will not.
- If reaction to the prototype is good, the firm will spend \$10,000 to build a production plant at  $t = 2$ . The best estimate now is that there is a 60 percent chance that the reaction to the prototype will be good, and a 40 percent chance that it will be poor.
- If the plant is built, there is a 50 percent chance of a  $t = 3$  cash inflow of \$16,000 and a 50 percent chance of a \$13,000 cash inflow.

If the appropriate cost of capital is 10 percent, what is the project's expected NPV?

**Statement of Academic Honesty**

(to be turned in together with the answer sheet)

**I understand that**

a) the GSU Graduate Catalog (available online at <http://www.gsu.edu/images/Downloadables/GraduateCatalog04-05.pdf>) contains the policy on "Academic Honesty" on pages 45-49, which contains, among other things, statements regarding unauthorized collaboration, falsification, and multiple submissions.

b) the instructions for this Take-Home-Assignment (THA) read, in part:

Although you may use your book, notes, etc., all work on this THA is to be **yours alone** - any discussion of either the questions on the assignment or your answers with anyone other than the instructor will be considered as cheating and, thus, as a violation of the GSU honor code.

**I acknowledge that I have read and that I understand the above statements and I confirm my adherence to those rules.**

Student Name (please print): .....

SSN: .....

Instructor: .....

-----  
Signature of Student

-----  
Date

**MBA 8230**  
**Applications in Corporate Finance**  
**Take-Home Assignment: Answer Sheet**  
**Instructors:**  
**Richard Fendler, Charles Hodges,**  
**Alfred Mettler, Lalitha Naveen**

**Name:** .....

**Total:** ..... /20

**Grade:** ..... of 100

**Multiple Choice Answers**

1)	2)	3)	4)
5)	6)	7)	8)
9)	10)		