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Fall 2002 IS 230

Final Examination

This take-home examination is due 4:00 p.m., Friday, December 6. It can either be handed to me in my office or placed in my mailbox in South Hall, Room 102. You may use books, notes, calculators, or computers (including software), but you may not obtain help from or give help to any individual other than me. If you have questions, call or see me. (REMINDERS: I shall have additional office hours Wednesday, December 4, 2:00 - 4:00 pm. Also, indicate how you wish to be informed of your grade or have the exam returned after it is graded.)

INSTRUCTIONS: Answer all questions, clearly indicating the question numbers and your answers. If you wish to attach computer output to support your answer you may, but it is not necessary. But if you worry that you may have gotten an incorrect answer and want partial credit, show your approach, intermediate steps, etc.

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1. The South Succotash, Iowa, is plagued by traffic accidents at four intersections controlled by 4-way stop signs. The Roads Committee recommends installing traffic lights at all four of these intersections at a cost of $50,000 per intersection. The lights have a 12-year life and maintenance costs of $4,400 per year per intersection. The state mandates use of a cost estimate of $4,500 per accident per year, and records indicate that, on average, 15 accidents occur annually at each of these intersections. Should the lights be installed if they can reduce the number of accidents by 20 percent? (HINTS: Put your answer in terms of the cost of the funds required. You can use an internal-rate-of-return cost-benefit model.)

2. TSI is considering a project that will cost $70 million and will generate expected cash flows of $30 million per year for 3 years. The cost of capital for this type of project is 10% and the risk-free rate is 6%. (See the discussion on page 584 of the text as to why it is useful to know the risk-free rate.) You estimate there is a 30% chance of high demand, with future cash flows of $45 million per year. There is a 40% chance of average demand, with cash flows of $30 million per year. If demand is low (a 30% chance), cash flows will be $15 million per year.

   a. What is the expected NPV for this project as described?
   b. Now suppose this project has an investment timing option—it can be delayed for one year. The cost will still be $70 million after the delay, and the cash flows still last 3 years. However, if it delays, TSI will know more about the level of demand and would not implement the project if the low demand scenario were to occur. Calculate the NPV of the project with the delay option. Does it make sense to delay the project?

3. Several investment funds have asked you to meet with the management of Otter Rescue, Inc., to discuss the desirability of Otter Rescue's increasing its long-term debt and using the proceeds to buy back some of its outstanding common stock. You find the current situation to be:

Earnings before interest and taxes	$5 million
Tax rate	40 %
Existing long-term debt	$5 million
Number of common shares outstanding	500,000
Book value per share	$10.00
Dividend pay out rate	100 %
Current cost of debt (k_d)	10 %
Current cost of equity (k_s)	15 %
Expected annual growth rate of the firm	3 % (constant)

You are to compare three options:

(1) Do nothing.

(2) Increase debt by $5 million, using the new debt to buy back and retire some of the shares at the current price.

(3) Increase debt by $10 million, using the new debt to buy back and retire some of the shares at the current price.

IMPORTANT NOTE: If either options (2) or (3) are chosen, Otter Rescue is obligated to call and refund the existing debt at the new interest rate.

You are to determine whether Otter Rescue should change its capital structure. To assist you in this, you have consulted investment bankers and obtained information on the expected new costs of funds under options (2) and (3). This information is provided in the table below.

a. Fill in the remaining cells in the table below. (Show your work to get full or partial credit. Remember tax issues.)

b. Briefly, assuming you wish to maximize the value of the stock to the shareholders, which option would you recommend to management and why?

Option	#1	#2	#3
Increase in debt	0	$5 mil.	$10 mil.
k_d	10%	11%	13%
k_s	15%	16%	18%
WACC = k_a			
Debt/Asset ratio			
Earnings per share (EPS)			
Price per share (P_o)			

4. Vermont Gourmet Ice Cream, Inc., (VGIC) buys on terms of 1/10, net 30, but it has not been taking the discounts and has actually been paying in 60 days rather than in 30 days. VGIC's balance sheet is as follows (in $1000's.)

Cash	$ 300	Accounts payable*	$3000
Accounts receivable	2700	Notes payable	300
Inventories	4500	Accruals	400
Current assets	7500	Current liabilities	3700
		Long-term debt	800
Fixed assets	4000	Common equity	7000
Total assets	11500	Total claims	11500

(* Stated net of discounts)

Now VGIC's suppliers are threatening to stop shipments unless the company begins making prompt payments (that is, pays in 30 days or less). The firm can borrow on a one-year note (call this a current liability) from its bank at a rate of 15%, discount interest, with a 20% compensating balance requirement. (All the cash now on hand is needed for transactions; it cannot be used as part of the compensating balance.)

a. Determine what action VGIC should take by calculating (1) the cost of non-free trade credit, and (2) the cost of the bank loan.
b. Based on your decision on Part (a), construct a pro forma balance sheet for VGIC. (Hint: You may need to include an account entitled "prepaid interest" under current assets.)