

## PART III: TEST BANK AND SOLUTIONS

### 1-1: Accounting and Control

The controller of a small private college is complaining about the amount of work she is required to do at the beginning of each month. The president of the university requires the controller to submit a monthly report by the fifth day of the following month. The monthly report contains pages of financial data from operations. The controller was heard saying, "Why does the president need all this information? He probably doesn't read half of the report. He's an old English professor and probably doesn't know the difference between a cost and a revenue."

#### Required:

- a. What is the probable role of the monthly report?
- b. What is the controller's responsibility with respect to a president who doesn't know much accounting?

### 2-1: Fixed, Variable, and Average Costs

Midstate University is trying to decide whether to allow 100 more students into the university. Tuition is \$5000 per year. The controller has determined the following schedule of costs to educate students:

<u>Number of Students</u>	<u>Total Costs</u>
4000	\$30,000,000
4100	30,300,000
4200	30,600,000
4300	30,900,000

The current enrollment is 4200 students. The president of the university has calculated the cost per student in the following manner:  $\$30,600,000 / 4200 \text{ students} = \$7286$  per student. The president was wondering why the university should accept more students if the tuition is only \$5000.

**Required:**

- a. What is wrong with the president's calculation?
- b. What are the fixed and variable costs of operating the university?

**2-2: Opportunity Costs**

The First Church has been asked to operate a homeless shelter in part of the church. To operate a homeless shelter the church would have to hire a full time employee for \$1,200/month to manage the shelter. In addition, the church would have to purchase \$400 of supplies/month for the people using the shelter. The space that would be used by the shelter is rented for wedding parties. The church averages about 5 wedding parties a month that pay rent of \$200 per party. Utilities are normally \$1,000 per month. With the homeless shelter, the utilities will increase to \$1,300 per month.

What is the opportunity cost to the church of operating a homeless shelter in the church?

**2-3: Fixed and Variable Costs**

The university athletic department has been asked to host a professional basketball game at the campus sports center. The athletic director must estimate the opportunity cost of holding the event at the sports center. The only other event scheduled for the sports center that evening is a fencing match that would not have generated any additional costs or revenues. The fencing match can be held at the local high school, but the rental cost of the high school gym would be \$200. The athletic director estimates that the professional basketball game will require 20 hours of labor to prepare the building. Clean-up depends on the number of spectators. The athletic director estimates the time of clean-up to be equal to 2 minutes per spectator. The labor would be hired especially for the basketball game and would cost \$8 per hour. Utilities will be \$500 greater if the basketball game is held at the sports center. All other costs would be covered by the professional basketball team.

**Required:**

- a. What is the variable cost of having one more spectator?
- b. What is the opportunity cost of allowing the professional basketball team to use the sports center if 10,000 spectators are expected?
- c. What is the opportunity cost of allowing the professional basketball team to use the sports center if 12,000 spectators are expected?

## **2-4: Opportunity Cost of Attracting Industry**

The Itagi Computer Company From Japan is looking to build a factory for making CD-ROM's in the United States. The company is concerned about the safety and well-being of its employees and wants to locate in a community with good schools. The company also wants the factory to be profitable and is looking for subsidies from potential communities. Encouraging new business to create jobs for citizens is important for communities, especially communities with high unemployment.

Wellville has not been very well since the shoe factory left town. The city officials have been working on a deal with Itagi to get the company to locate in Wellville. Itagi officials have identified a 20 acre undeveloped site. The city has tentatively agreed to buy the site for \$50,000 for Itagi and not require any payment of property taxes on the factory by Itagi for the first five years of operation. The property tax deal will save Itagi \$3,000,000 in taxes over the five years. This deal was leaked to the local newspaper. The headlines the next day were: "Wellville Gives Away \$3,000,000+ to Japanese Company".

### **Required:**

- a. Do the headlines accurately describe the deal with Itagi?
- b. What are the relevant costs and benefits to the citizens of Wellville of making this deal?

## **2-5: Cost, Volume, Profit Analysis**

With the possibility of the US Congress relaxing restrictions on cutting old growth, a local lumber company is considering an expansion of its facilities. The company believes it can sell lumber for \$0.18/board foot. A board foot is a measure of lumber. The tax rate for the company is 30 percent. The company has the following two opportunities:

- Build Factory A with annual fixed costs of \$20 million and variable costs of \$0.10/board foot. This factory has an annual capacity of 500 million board feet.
- Build Factory B with annual fixed costs of \$10 million and variable costs of \$0.12/board foot. This factory has an annual capacity of 300 million board feet.

### **Required:**

- a. What is the break-even point in board feet for Factory A?
- b. If the company wants to generate an after tax profit of \$2 million with Factory B, how many board feet would the company have to process and sell?

- c. If demand for lumber is uncertain, which factory is riskier?
- d. At what level of board feet would the after-tax profit of the two factories be the same?

## **2-6: Cost, Volume, Profit Analysis**

Leslie Mittelberg is considering the wholesaling of a leather handbag from Kenya. She must travel to Kenya to check on quality and transportation. The trip will cost \$3000. The cost of the handbag is \$10 and shipping to the United States can occur through the postal system for \$2 per handbag or through a freight company which will ship a container that can hold up to a 1000 handbags at a cost of \$1000. The freight company will charge \$1000 even if less than 1000 handbags are shipped. Leslie will try to sell the handbags to retailers for \$20. Assume there are no other costs and benefits.

### **Required:**

- a. What is the break-even point if shipping is through the postal system?
- b. How many units must be sold if Leslie uses the freight company and she wants to have a profit of \$1000?
- c. At what output level would the two shipping methods yield the same profit?
- d. Suppose a large discount store asks to buy an additional 1000 handbags beyond normal sales. Which shipping method should be used and what is the minimum sales price Leslie should consider in selling those 1000 handbags?

## **2-7: Cost, Volume, Profit Analysis**

Kalifo Company manufactures a line of electric garden tools that are sold in general hardware stores. The company's controller, Sylvia Harlow, has just received the sales forecast for the coming year for Kalifo's three products: weeders, hedge clippers, and leaf blowers. Kalifo has experienced considerable variations in sales volumes and variable costs over the past two years, and Harlow believes the forecast should be carefully evaluated from a cost-volume-profit viewpoint. The preliminary budget information for 1996 is presented below.

	Weeders	Hedge Clippers	Leaf Blowers
Unit sales	50,000	50,000	100,000
Unit selling price	\$28.00	\$36.00	\$48.00
Variable manufacturing cost per unit	13.00	12.00	25.00
Variable selling cost per unit	5.00	4.00	6.00

For 1996, Kalifo's fixed factory overhead is budgeted at \$2 million, and the company's fixed selling and administrative expenses are forecast to be \$600,000. Kalifo has a tax rate of 40 percent.

**Required:**

- Determine Kalifo Co.'s budgeted net income for 1996.
- Assuming that the sales mix remains as budgeted, determine how many units of each product Kalifo must sell in order to break even in 1996.
- Determine the total dollar sales Kalifo must sell in 1996 in order to earn an after-tax net income of \$450,000.
- After preparing the original estimates, Kalifo determines that its variable manufacturing cost of leaf blowers will increase 20 percent and the variable selling cost of hedge clippers can be expected to increase \$1 per unit. However, Kalifo has decided not to change the selling price of either product. In addition, Kalifo learns that its leaf blower is perceived as the best value on the market, and it can expect to sell three times as many leaf blowers as any other product. Under these circumstances, determine how many units of each product Kalifo will have to sell to break even in 1996.
- Explain the limitations of cost-volume-profit analysis that Sylvia Harlow should consider when evaluating Kalifo's 1996 budget.

Source: CMA adapted.

## **2-8: Breakeven and Cost-Volume-Profit with Taxes**

DisKing Company is a retailer for video disks. The projected after-tax net income for the current year is \$120,000 based on a sales volume of 200,000 video disks. DisKing has been selling the disks at \$16 each. The variable costs consist of the \$10 unit purchase price of the disks and a handling cost of \$2 per disk. DisKing's annual fixed costs are \$600,000 and DisKing is subject to a 40 percent income tax rate.

Management is planning for the coming year, when it expects that the unit purchase price of the video disks will increase 30 percent.

**Required:**

- a. Calculate DisKing Company's break-even point for the current year in number of video disks.
- b. Calculate the increased after-tax income for the current year from an increase of 10 percent in projected unit sales volume.
- c. If the unit selling price remains at \$16, calculate the volume of sales in dollars that DisKing Company must achieve in the coming year to maintain the same after-tax net income as projected for the current year.

Source: CMA adapted

**2-9: Cost-volume-profit of a Make/buy Decision**

Elly Industries is a multiproduct company that currently manufactures 30,000 units of Part MR24 each month for use in production. The facilities now being used to produce Part MR24 have affixed monthly cost of \$150,000 and a capacity to produce 84,000 units per month. If Elly were to buy Part MR24 from an outside supplier, the facilities would be idle, but its fixed costs would continue at 40 percent of its present amount. The variable production costs of Part MR24 are \$11 per unit.

**Required:**

- a. If Elly Industries continues to use 30,000 units of Part MR24 each month, it would realize a net benefit by purchasing Part MR24 from an outside supplier only if the supplier's unit price is less than how much?
- b. If Elly Industries can obtain Part MR24 from an outside supplier at a unit purchase price of \$12.875, what is the monthly usage at which it will be indifferent between purchasing and making Part MR24?

Source: CMA adapted

**2-10: Opportunity Cost of Purchase Discounts and Lost Sales**

Winter Company is a medium-size manufacturer of disk drives that are sold to computer manufacturers. At the beginning of 2010, Winter began shipping a much-improved disk drive, Model W899. The W899 was an immediate success and accounted for \$5 million in revenues for Winter in 2010.

While the W899 was in the development stage, Winter planned to price it at \$130. In preliminary discussions with customers about the W899 design, no resistance was

detected to suggestions that the price might be \$130. The \$130 price was considerably higher than the estimated variable cost of \$70 per unit to produce the W899, and it would provide Winter with ample profits.

Shortly before setting the price of the W899, Winter discovered that a competitor was reading a product very similar to the W899 and was no more than 60 days behind Winter's own schedule. No information could be obtained on the competitor's planned price, although it had a reputation for aggressive pricing. Worried about the competitor, and unsure of the market size, Winter lowered the price of the W899 to \$100. It maintained the price although, to Winter's surprise, the competitor announced a price of \$130 for its product.

After reviewing the 2010 sales of the W899, Winter's management concluded that unit sales would have been the same if the product had been marketed at the original price of \$130 each. Management has predicted that 2011 sales of the W899 would be either 85,000 units at \$100 each or 60,000 units at \$130 each. Winter has decided to raise the price of the disk drive to \$130 effective immediately.

Having supported the higher price from the beginning, Sharon Daley, Winter's marketing director, believes that the opportunity cost of selling the W899 for \$100 during 2010 should be reflected in the company's internal records and reports. In support of her recommendation, Daley explained that the company has booked these types of costs on other occasions when purchase discounts not taken for early payment have been recorded.

**Required:**

- a. Define *opportunity cost* and explain why opportunity costs are not usually recorded.
- b. Winter Company's management is considering Sharon Daley's recommendation to book the opportunity costs and have them reflected in its internal records and reports. If one were to record a nonzero opportunity cost, calculate the dollar amount of the opportunity cost that would be recorded by Winter Company for 2010 and explain how this cost might be reflected on its internal reports.
- c. Explain the impact of Winter Company's selection of the \$130 selling price for the W899 on 2011 operating income. Support your answer with appropriate calculations.

Source: CMA adapted