

Exercise A1

A hotel group prepares financial statements on a quarterly basis. The senior management is reviewing the performance of one hotel and making plans for next year. The managers have in front of them the results for this year (based on some actual results and some forecasts to the end of this year):

Quarter	Sales revenue	Profit/(Loss)
	£000	£000
1	400	(280)
2	1,200	360
3	1,600	680
4	800	40
Total	4,000	800

The total estimated number of visitors (guest nights) for this year is 50,000. The results follow a regular pattern; there are no unexpected cost fluctuations beyond the seasonal trading pattern shown above. For next year, management anticipates an increase in unit variable cost of 10 per cent and a profit target for the hotel of £1 million. These will be incorporated into its plans.

Required:

- Calculate the total variable and total fixed cost of the hotel for this year. Show the provisional annual results for this year in total, showing variable and fixed cost separately. Show also the revenue and cost per visitor.
- If there is no increase in visitors for next year, what will be the required revenue rate per hotel visitor to meet the profit target?
- If the required revenue rate per visitor is not raised above this year's level, how many visitors will be required to meet the profit target?
- Outline and briefly discuss the assumptions that are made in typical PV or break-even analysis, and assess whether they limit its usefulness.

Exercise A2

Motormusic Ltd makes a standard model of car radio, which it sells to car manufacturers for £60 each. Next year the business plans to make and sell 20,000 radios. The business's costs are as follows:

Manufacturing		
	Variable materials	£20 per radio
	Variable labour	£14 per radio
	Other variable costs	£12 per radio
	Fixed cost	£80,000 per year
Administration and selling		
	Variable	£3 per radio
	Fixed	£60,000 per year

Required:

- Calculate the break-even point for next year, expressed both in quantity of radios and sales value.
- Calculate the margin of safety for next year, expressed both in quantity of radios and sales value.

Exercise B1

Voltar Company manufactures and sells a specialized cordless telephone for high electromagnetic radiation environments. The company's contribution format income statement for the most recent year is given below:

Management is anxious to increase the company's profit and has asked for an analysis of a number of items.

	Total	Per Unit	Percent of Sales
Sales (20,000 units)	\$1,200,000	\$60	100%
Variable expenses	900,000	45	? %
Contribution margin	300,000	\$15	? %
Fixed expenses	240,000		
Net operating income	\$ 60,000		

Required:

1. Compute the company's CM ratio and variable expense ratio.
2. Compute the company's break-even point in both unit sales and dollar sales. Use the equation method.
3. Assume that sales increase by \$400,000 next year. If cost behavior patterns remain unchanged, by how much will the company's net operating income increase? Use the CM ratio to compute your answer.
4. Refer to the original data. Assume that next year management wants the company to earn a profit of at least \$90,000. How many units will have to be sold to meet this target profit?
5. Refer to the original data. Compute the company's margin of safety in both dollar and percentage form.

Exercise B2

Oslo Company prepared the following contribution format income statement based on a sales volume of 1,000 units (the relevant range of production is 500 units to 1,500 units):

Sales	\$20,000
Variable expenses	12,000
Contribution margin	8,000
Fixed expenses	6,000
Net operating income	\$ 2,000

Required:

(Answer each question independently and always refer to the original data unless instructed otherwise.)

1. What is the contribution margin per unit?
2. What is the contribution margin ratio?
3. What is the variable expense ratio?
4. If sales increase to 1,001 units, what would be the increase in net operating income?
5. If sales decline to 900 units, what would be the net operating income?

6. If the selling price increases by \$2 per unit and the sales volume decreases by 100 units, what would be the net operating income?
7. If the variable cost per unit increases by \$1, spending on advertising increases by \$1,500, and unit sales increase by 250 units, what would be the net operating income?
8. What is the break-even point in unit sales?
9. What is the break-even point in dollar sales?
10. How many units must be sold to achieve a target profit of \$5,000?
11. What is the margin of safety in dollars? What is the margin of safety percentage?
12. What is the degree of operating leverage?
13. Using the degree of operating leverage, what is the estimated percent increase in net operating income of a 5% increase in sales?
14. Assume that the amounts of the company's total variable expenses and total fixed expenses were reversed. In other words, assume that the total variable expenses are \$6,000 and the total fixed expenses are \$12,000. Under this scenario and assuming that total sales remain the same, what is the degree of operating leverage?
15. Using the degree of operating leverage that you computed in the previous question, what is the estimated percent increase in net operating income of a 5% increase in sales?

Exercise B3 - Using a Contribution Format Income Statement

Miller Company's most recent contribution format income statement is shown below:

	Total	Per Unit
Sales (20,000 units)	\$300,000	\$15.00
Variable expenses	180,000	9.00
Contribution margin	120,000	\$ 6.00
Fixed expenses		70,000
Net operating income		\$ 50,000

Required:

Prepare a new contribution format income statement under each of the following conditions (consider each case independently):

1. The number of units sold increases by 15%.
2. The selling price decreases by \$1.50 per unit, and the number of units sold increases by 25%.
3. The selling price increases by \$1.50 per unit, fixed expenses increase by \$20,000, and the number of units sold decreases by 5%.
4. The selling price increases by 12%, variable expenses increase by 60 cents per unit, and the number of units sold decreases by 10%.

Exercise B4- Operating Leverage

Magic Realm, Inc., has developed a new fantasy board game. The company sold 15,000 games last year at a selling price of \$20 per game. Fixed expenses associated with the game total \$182,000 per year, and variable expenses are \$6 per game. Production of the game is entrusted to a printing contractor. Variable expenses consist mostly of payments to this contractor.

Required:

1. Prepare a contribution format income statement for the game last year and compute the degree of operating leverage.

2. Management is confident that the company can sell 18,000 games next year (an increase of 3,000 games, or 20%, over last year). Compute:
 - a) The expected percentage increase in net operating income for next year.
 - b) The expected total dollar net operating income for next year. (Do not prepare an income statement; use the degree of operating leverage to compute your answer.)

From Charles T. Horngren, Srikant M. Datar, Madhav V. Rajan, "Cost Accounting. A Managerial Emphasis"

Exercise C1

Wembley Travel Agency specializes in flights between Los Angeles and London. It books passengers on United Airlines at \$900 per round-trip ticket. Until last month, United paid Wembley a commission of 10% of the ticket price paid by each passenger. This commission was Wembley's only source of revenues. Wembley's fixed costs are \$14,000 per month (for salaries, rent, and so on), and its variable costs are \$20 per ticket purchased for a passenger. This \$20 includes a \$15 per ticket delivery fee paid to Federal Express.

(To keep the analysis simple, we assume each round-trip ticket purchased is delivered in a separate package. Thus, the \$15 delivery fee applies to each ticket.)

United Airlines has just announced a revised payment schedule for all travel agents. It will now pay travel agents a 10% commission per ticket up to a maximum of \$50. Any ticket costing more than \$500 generates only a \$50 commission, regardless of the ticket price.

Required

1. Under the old 10% commission structure, how many round-trip tickets must Wembley sell each month
 - a) to break even and
 - b) to earn an operating income of \$7,000?
2. How does United's revised payment schedule affect your answers to (a) and (b) in requirement 1?

Exercise C2 – CVP analysis, income taxes.

Brooke Motors is a small car dealership. On average, it sells a car for \$27,000, which it purchases from the manufacturer for \$23,000. Each month, Brooke Motors pays \$48,200 in rent and utilities and \$68,000 for salespeople's salaries. In addition to their salaries, salespeople are paid a commission of \$600 for each car they sell. Brooke Motors also spends \$13,000 each month for local advertisements.

Its tax rate is 40%.

Required

How many cars must Brooke Motors sell each month to break even?

1. Brooke Motors has a target monthly net income of \$51,000. What is its target monthly operating income?
2. How many cars must be sold each month to reach the target monthly net income of \$51,000?

Exercise C3 – CVP analysis, income taxes.

The Express Banquet has two restaurants that are open 24-hours a day. Fixed costs for the two restaurants together total \$459,000 per year. Service varies from a cup of coffee to full meals. The average sales check per customer is \$8.50. The average cost of food and other variable costs for each customer is \$3.40. The income tax rate is 30%. Target net income is \$107,100.

Required

1. Compute the revenues needed to earn the target net income.
2. How many customers are needed to break even? To earn net income of \$107,100?
3. Compute net income if the number of customers is 170,000.

Exercise C4 – CVP analysis, sensitivity analysis.

Hoot Washington is the newly elected leader of the Republican Party. Media Publishers is negotiating to publish Hoot's Manifesto, a new book that promises to be an instant best-seller. The fixed costs of producing and marketing the book will be \$500,000. The variable costs of producing and marketing will be \$4.00 per copy sold. These costs are before any payments to Hoot. Hoot negotiates an up-front payment of \$3 million, plus a 15% royalty rate on the net sales price of each book. The net sales price is the listed bookstore price of \$30, minus the margin paid to the bookstore to sell the book. The normal bookstore margin of 30% of the listed bookstore price is expected to apply.

Required

1. Prepare a PV graph for Media Publishers.
2. How many copies must Media Publishers sell to (a) break even and (b) earn a target operating income of \$2 million?
3. Examine the sensitivity of the breakeven point to the following changes:
 - a) Decreasing the normal bookstore margin to 20% of the listed bookstore price of \$30
 - b) Increasing the listed bookstore price to \$40 while keeping the bookstore margin at 30%
 - c) Comment on the results

Exercise C5 – CVP analysis, shoe stores.

The WalkRite Shoe Company operates a chain of shoe stores that sell 10 different styles of inexpensive men's shoes with identical unit costs and selling prices. A unit is defined as a pair of shoes. Each store has a store manager who is paid a fixed salary. Individual salespeople receive a fixed salary and a sales commission. WalkRite is considering opening another store that is expected to have the revenue and cost relationships shown here:

Unit Variable Data (per pair of shoes)		Annual Fixed Costs	
Selling price	\$30.00	Rent	\$ 60,000
Cost of shoes	\$19.50	Salaries	200,000
Sales commission	1.50	Advertising	80,000
Variable cost per unit	\$21.00	Other fixed costs	20,000
		Total fixed costs	\$360,000

Required

Consider each question independently:

What is the annual breakeven point in (a) units sold and (b) revenues?

1. If 35,000 units are sold, what will be the store's operating income (loss)?
2. If sales commissions are discontinued and fixed salaries are raised by a total of \$81,000, what would be the annual breakeven point in (a) units sold and (b) revenues?
3. Refer to the original data. If, in addition to his fixed salary, the store manager is paid a commission of \$0.30 per unit sold, what would be the annual breakeven point in
 - a) units sold and
 - b) revenues?
4. Refer to the original data. If, in addition to his fixed salary, the store manager is paid a commission of \$0.30 per unit in excess of the breakeven point, what would be the store's operating income if 50,000 units were sold?