

Variable Costing/ CVP Analysis

Cost–volume–profit (CVP) analysis is a tool that helps managers to understand the relationships among cost, volume, and profit. CVP focuses on how profits are affected by the following five elements:

1. Prices of products.
2. Volume or level of activity.
3. Per unit variable costs.
4. Total fixed costs.
5. Mix of products sold.

Variable Costing/ CVP Analysis - Example

Example:

Spu - Selling Price Per Unit - \$50

Vcu - Variable Cost Per Unit - \$30

FC - Fixed Costs - \$100

Variable Costing/ CVP Analysis - Example

Generic Company produces and sells Units. Variable cost is \$6/unit, and fixed costs for the year total \$75,000. The selling price is \$10 per Unit.

Required:

Calculate the following:

1. The breakeven point in units.
2. The breakeven point in sales dollars.
3. The units required to make a before-tax profit of \$40,000.
4. The sales dollars required to make a before-tax profit of \$35,000.
5. The sales, in units and in dollars, required to make an after-tax profit of \$25,000 given a tax rate of 30%.

Variable Costing/ CVP Analysis - Example

Generic Company distributes high-quality toys that sell for \$40 per unit. Variable costs are \$30 per unit, and fixed costs total \$360,000 annually.

Required:

1. What is the product's CM ratio?
2. The company estimates that sales will increase by \$70,000 during the coming year due to increased demand. By how much should operating income increase?
3. Assume that the operating results for last year were as follows:

Sales	\$ 1,800,000
Variable Costs	\$ 1,350,000
Contribution Margin	\$ 450,000
Fixed Costs	\$ 360,000
Operating Income	\$ 90,000

- a. Compute the degree of operating leverage
 - b. The president expects sales to increase by 15% next year. By how much should operating income increase?
4. Refer to the original data. Assume that the company sold 45,000 units. The sales manager is convinced that a 10% reduction in the selling price, combined with a \$10,000 increase in advertising expenditures, would cause annual sales in units to increase by 40%. Prepare two contribution format income statements, one showing the results of last year's operations and one showing what the results of operations would be if these changes were made. Would you recommend that the company do as the sales manager suggests?
 5. Refer to the original data. Assume again that the company sold 45,000 units last year. The president feels that it would be unwise to change the selling price. Instead, he wants to increase the sales commission by \$3 per unit. He thinks that this move, combined with some increase in advertising, would increase annual unit sales by 60%. By how much could advertising be increased with profits remaining unchanged? Do not prepare an income statement; use the incremental analysis approach.

Variable Costing/ CVP Analysis - Example

Generic Company manufactures a high-quality dog food that sells for \$30 per bag. Variable costs are \$12 per unit, and fixed costs total \$270,000 annually. The operating results for the most recent fiscal year were as follows:

Sales (20,000 bags)	\$600,000
Variable expenses	<u>240,000</u>
Contribution margin	360,000
Fixed expenses	<u>270,000</u>
Operating income	\$90,000

Required:

- Calculate the break-even point in units, and break-even point in dollar sales.
- Compute the operating leverage of the company, and explain its economic meaning. If the president expects sales to increase by 16% next year, by how much should operating income increase?
- What is the margin of safety? Calculate the company's margin of safety in units and margin of safety in dollars.
- The sales manager is convinced that a 12% reduction in the selling price, combined with a \$40,000 increase in advertising expenditures, would cause annual sales in units to increase by 30%. What is the impact of these changes on profit? Should the company adopt the salesman's suggestion?
- The president wants to increase the sales commission by \$4 per unit, combined with some increase in advertising, to increase annual unit sales by 50%. By how much could advertising be increased with profits remaining unchanged?

Variable Costing/ CVP Analysis - Example

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Bubba's Western Wear is a western hat retailer in Lubbock, Texas, Although bubba's carries numerous styles of western hats, each hat has approximately the same price and purchase cost, as shown in the following table.

Sales price	\$ 80.00
Per unit variable expenses	
Purchase cost	43.50
Sales commissions	11.50
Total per unit variable costs	\$ 55.00
Total annual fixed expenses	
Advertising	\$ 98,500
Rent	146,500
Salaries	255,000
Total fixed expenses	\$500,000

Sales Personnel receive a commission to encourage them to be more aggressive in their sales efforts. Currently, the Lubbock economy is really humming, and sales growth at Bubba's has been great. The business is very competitive, however, Bubba, the owner, has relied on his knowledge and courteous staff to attract and retain customers who otherwise might go to other western wear stores. Because of the rapid growth in sales, Bubba is also finding the management of certain aspects of the business more difficult, such as restocking inventory and hiring and training new salespeople.

Required:

- A. Calculate the annual breakeven point in units.
- B. Calculate the annual breakeven point in sales dollars.
- C. If Bubba's sells 22,000 hats, what is the before-tax income or loss?
- D. Bubba is considering elimination of sales commissions completely and increasing salaries by \$157,000 annually. What would be:
 - a. The new breakeven point in units with the new salary plan?
 - b. The new breakeven point in sales dollars with the new salary plan?
 - c. The before tax income or loss if 22,000 are sold with the new salary plan? Identify and discuss the strategic and ethical issues in the decision to eliminate sales commissions

Variable Costing/ CVP Analysis - Example

Sales Mix: Assume that the sales of Generic Company are as follows:

	Product X	Product Z
Units Sold	18,000	4,500
Selling Price Per Unit	\$80	\$140
Variable Cost Per Unit	65	100
Contribution Margin Per Unit	15	40

Fixed costs are \$400,000 per year. Assume that the sales mix, expressed in terms of relative physical units sold, is constant as sales volume changes.

Required:

- Determine the breakeven point in total units and for this breakeven point, calculate the number of units of X and Z that must be sold. Use the weighted-average contribution margin approach and round solution up to the next whole number.
- Determine the overall breakeven point in terms of sales dollars based on the weighted-average contribution margin ratio (CMR). Break down the total sales dollars breakeven point into sales dollars for product X and sales dollars for product Z.
- Determine the breakeven point total units and the breakdown of the total breakeven point into sales (in units) of each of the two products, X and Z. Use the sales basket approach. (Assume that each "basket" consists of four units in X and one unit of Z.)