Cost-Volume-Profit Analysis

** All vocab can be found on page 415.*

Breakeven Point

- The sales level at which operating income is zero: Total Revenues = Total Expenses
- 3 Ways to calculate: The Income Statement Approach, the shortcut approach using *unit* contribution margin, and the shortcut approach using the contribution margin *ratio.*
- Operating Income = 0

Breakeven Point (Income Statement Approach)

- (Sales Revenue) - (Variable Expenses) - (Fixed Expenses) = Operating Income
- Sales Revenue = (Sales Price per Unit) x (Units Sold)
- Variable Expenses = (Variable Cost per Unit) x (Units Sold)

Breakeven Point (Unit Contribution Margin Shortcut)

- (Contribution Margin) - (Fixed Expenses) = Operating Income
- Contribution Margin = (Sales Revenue) - (Variable Expenses)
- Contribution Margin = (Contribution Margin per Unit) x (Units Sold)

Breakeven Point (Contribution Margin Ratio Shortcut)

- Sales in Dollars = [(Fixed Expenses) + (Operating Income)] divided by (Contribution Margin Ratio)
- This method is typically used more than the unit method when a company has a ton of different products that are sold.

Contribution Margin

- (Sales Revenue) - (Variable Expenses) = Contribution Margin
- Tells how much revenue is left before fixed expenses.

Contribution Margin Income Statement

- An income statement that groups costs by behavior rather than function; it can be used only by internal management.
- The same data is used as the traditional Income Statement; however, the purpose of this statement is to separate the variable costs from the fixed costs.

Contribution Margin Per Unit

- The excess of the unit sales price over the variable cost per unit; also called unit contribution margin.
- (Excess of the Unit Sales Price) divided by (Variable Cost per Unit) = Contribution Margin Per Unit
- Tells us how much more money we'll have to spend on fixed expenses and potentially put towards operating income if we were to increase the quantity of units sold.

Contribution Margin Ratio

- (Contribution Margin per Unit) divided by (Sales Price per Unit) = Contribution Margin Ratio (with regards to units)
- This tells us how much a specific unit (often expressed as a percentage) contributes to the contribution margin.
- (Contribution Margin per Unit) divided by (Sales Revenue) = Contribution Margin Ratio (with regards to revenue)
- This tells us how much money (typically expressed as a percentage) is left over after variable costs are covered (the Contribution Margin amount, expressed as a percentage, with regards to revenue). We would use this leftover money to pay for fixed expenses and anything left after is used as operating income.

Cost Structure

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Cost-Volume-Profit (CVP) Analysis

- Expresses the relationships among costs, volume, and profit or loss.

Cost-Volume-Profit Graph

- The Revenue Line starts at the origin (this is because if there is nothing sold, there is no profit)
- The intersection of the Revenue Line and the Cost-Volume line represents the Breakeven Point.
- The area to the left of the Breakeven Point is known as the Operating Loss Area
- The area to the right of the Breakeven Point is known as the Operating Income Area

Indifference Point

- The volume of sales at which a company would be indifferent between alternative cost structures because they would result in the same total cost.

Margin of Safety

- Excess of expected sales over breakeven sales; the drop in sales a company can absorb without incurring an operating loss.
- (Expected or Actual Sales) - (Breakeven Sales) = Margin of Safety

Margin of Safety (in units)

- (Expected or Actual Sales in Units) - (Breakeven Sales in Units) = Margin of Safety (in units)

Margin of Safety (in dollars)

- (Expected or actual Sales in Dollars) - (Breakeven Sales in Dollars) = Margin of Safety (in dollars)

Margin of Safety (as a percentage)

- (Margin of Safety) divided by (Expected or Actual Sales in Units/Dollars) = Margin of Safety as a Percentage

Operating Leverage

- The relative amount of fixed and variable costs that make up a firm's total costs.
- High operating leverage means that more of the revenue can be put towards fixed costs and operating income. Additionally, it means that the company has few to no variable costs per unit of volume.

Operating Leverage Factor

- At a given level of sales, the contribution margin divided by operating income; the operating leverage factor indicates the percentage change in operating income that will occur from a 1% change in sales volume.
- (Contribution Margin) divided by (Operating Income) = Operating Leverage Factor

Relevant Range

- The amount of Volume that is typically expected for the month based on prior data analysis.

Sales Level

- An estimated value of a desired / projected revenue.

Sales Mix

- The combination of products that make up total sales.
- A “basket of products” sold by the company (it’s all grouped into one).

Sensitivity Analysis

- A “what-if” technique that asks what results will be if actual prices or costs change or if an underlying assumption changes.

Target Sales

- [(Operating Income) + (Fixed Expenses)] divided by (Contribution Margin Units/Ratio) = Target Sales

Unit Contribution Margin

- The excess of the unit sales price over the variable cost per unit: also called contribution margin per unit.
- (Excess of Unit Sales Price) divided by (Variable Cost per Unit) = Unit Contribution Margin

Weighted Average Contribution per Unit

- [(Fixed Expenses) + (Operating Income)] divided by (Weighted Avg. CM per unit)

CVP Analysis Components

- Sales Price
- Volume
- Variable Costs
- Fixed Costs
- Profit or Loss

CVP must have these following assumptions

- Sales price remains constant throughout the relevant range of volume, resulting in revenue that is linear.
- Managers can classify each cost (or the components of mixed costs) as either variable or fixed. These costs are linear throughout the relevant range of volume.
- Inventory levels will not change.
- The mix of products offered for sale remains constant. **Sales Mix** is the combination of products that make up total sales. *For example, Art.com may sell 15% posters, 25% unframed photographs, and 60% framed prints. If profits differ across products, changes in sales mix will affect CVP analysis.*