



Managerial Accounting and Cost Concepts

Chapter 02

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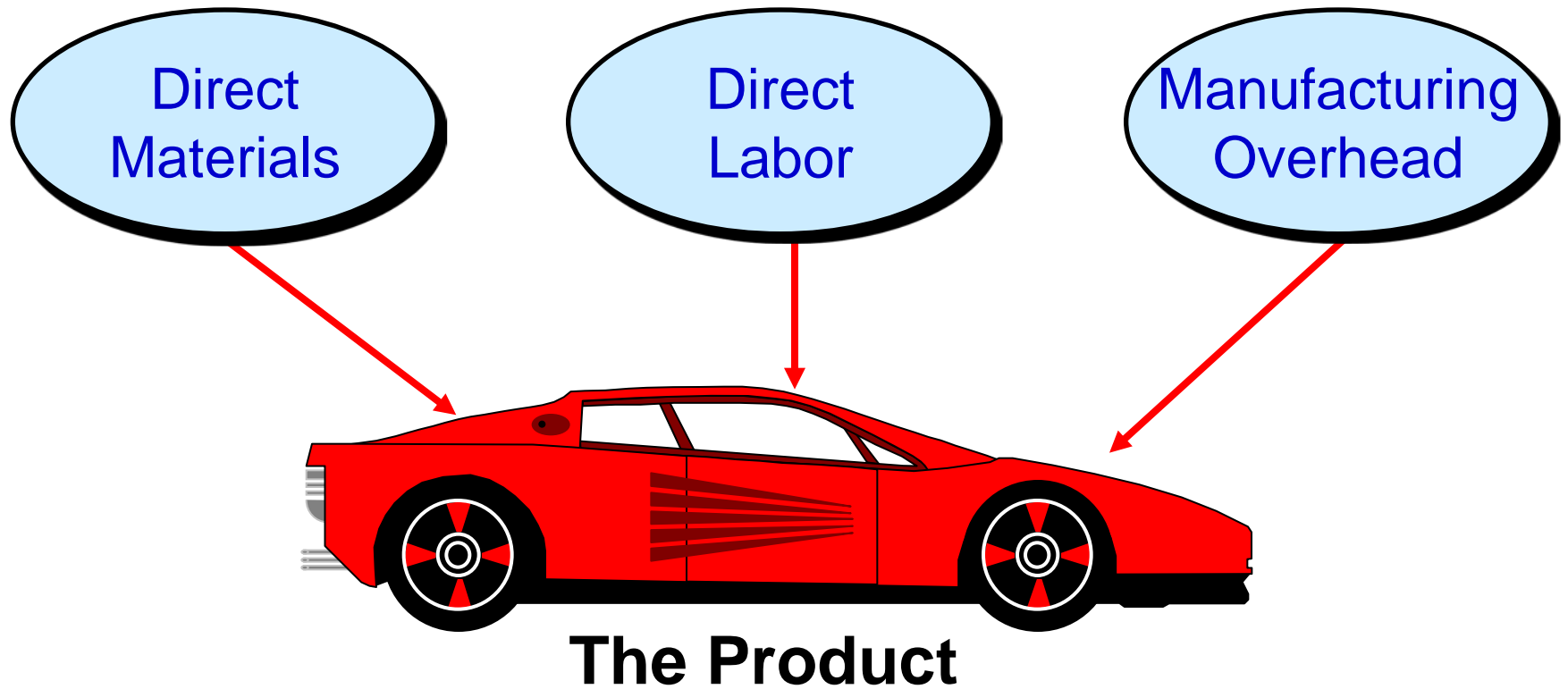
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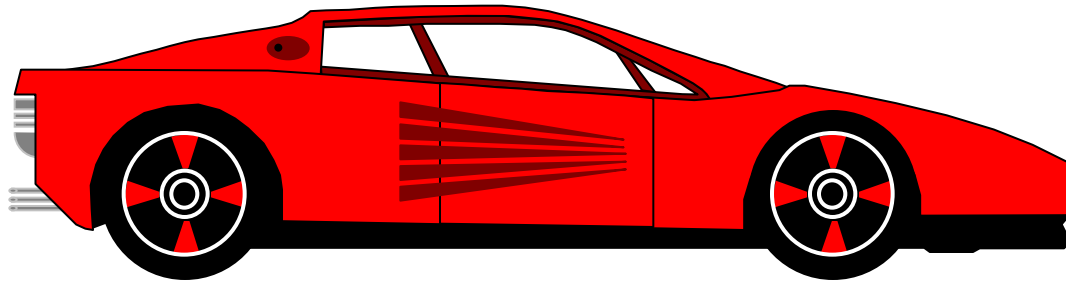
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Classifications of Manufacturing Costs



Direct Materials

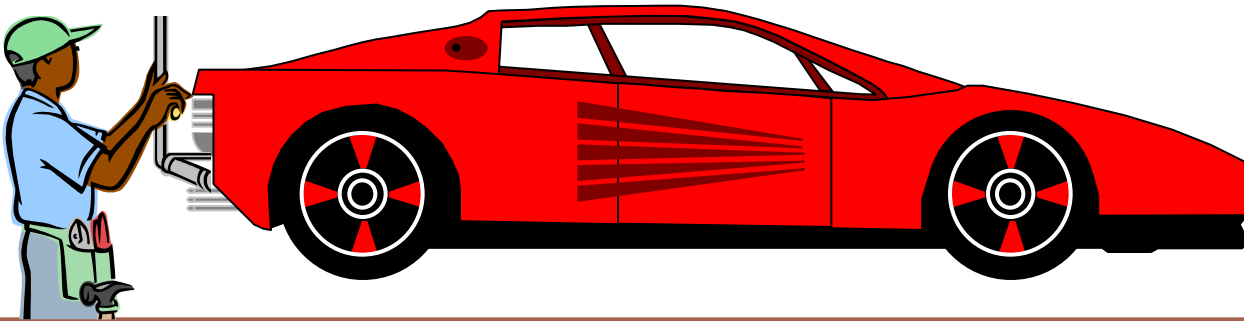
Raw materials that become an integral part of the product and that can be conveniently traced directly to it.



Example: A radio installed in an automobile

Direct Labor

Those labor costs that can be easily traced to individual units of product.



Example: Wages paid to automobile assembly workers

Manufacturing Overhead

Manufacturing costs that **cannot** be easily traced directly to specific units produced.

Examples: Indirect materials and indirect labor

Materials used to support the production process.

Examples: lubricants and cleaning supplies used in the automobile assembly plant.

Wages paid to employees who are not directly involved in production work.

Examples: maintenance workers, janitors, and security guards.

Nonmanufacturing Costs

Selling Costs



Costs necessary to secure the order and deliver the product.



Administrative Costs

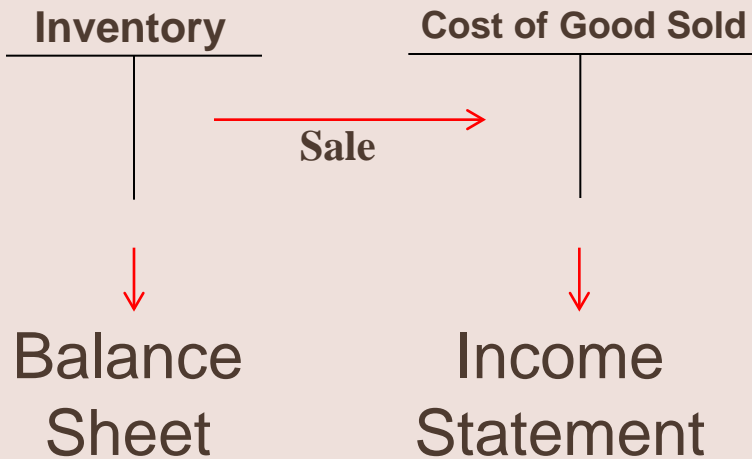


All executive, organizational, and clerical costs.

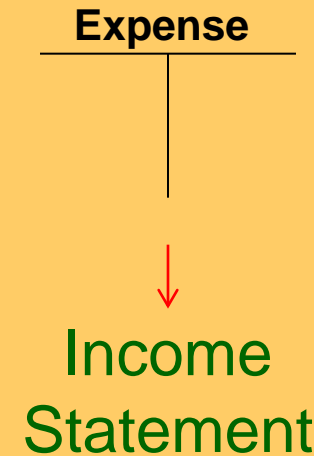


Product Costs Versus Period Costs

Product costs include direct materials, direct labor, and manufacturing overhead.

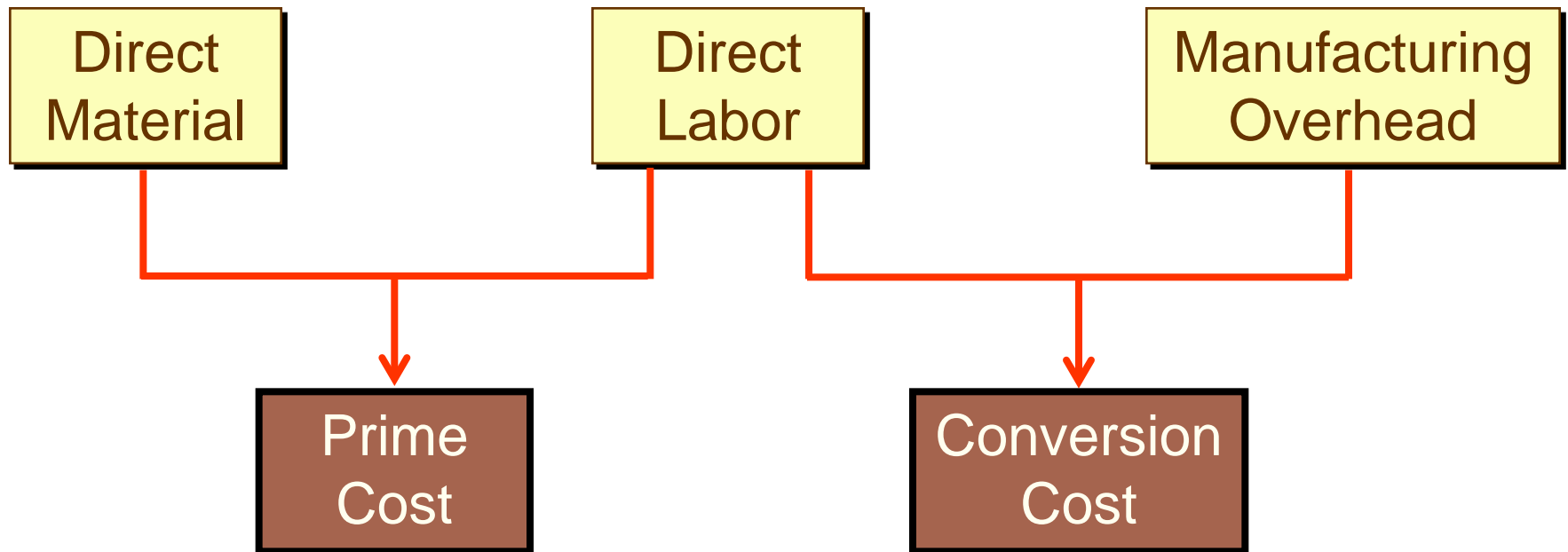


Period costs include all selling costs and administrative costs.



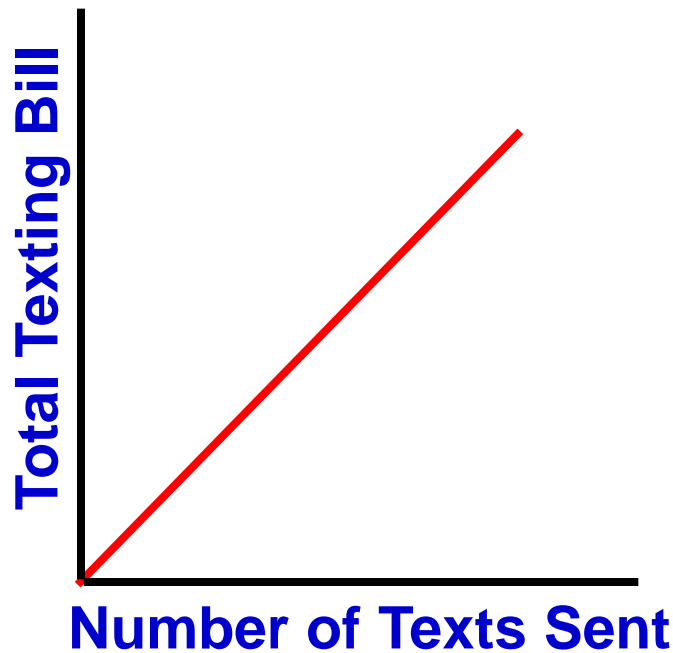
Classifications of Costs

Manufacturing costs are often classified as follows:



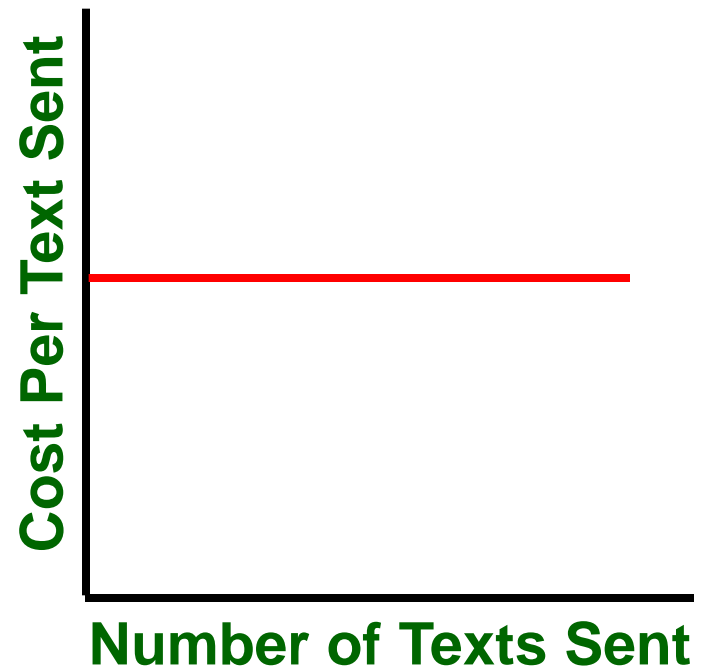
Variable Cost

Your **total texting bill** is based on how many texts you send.

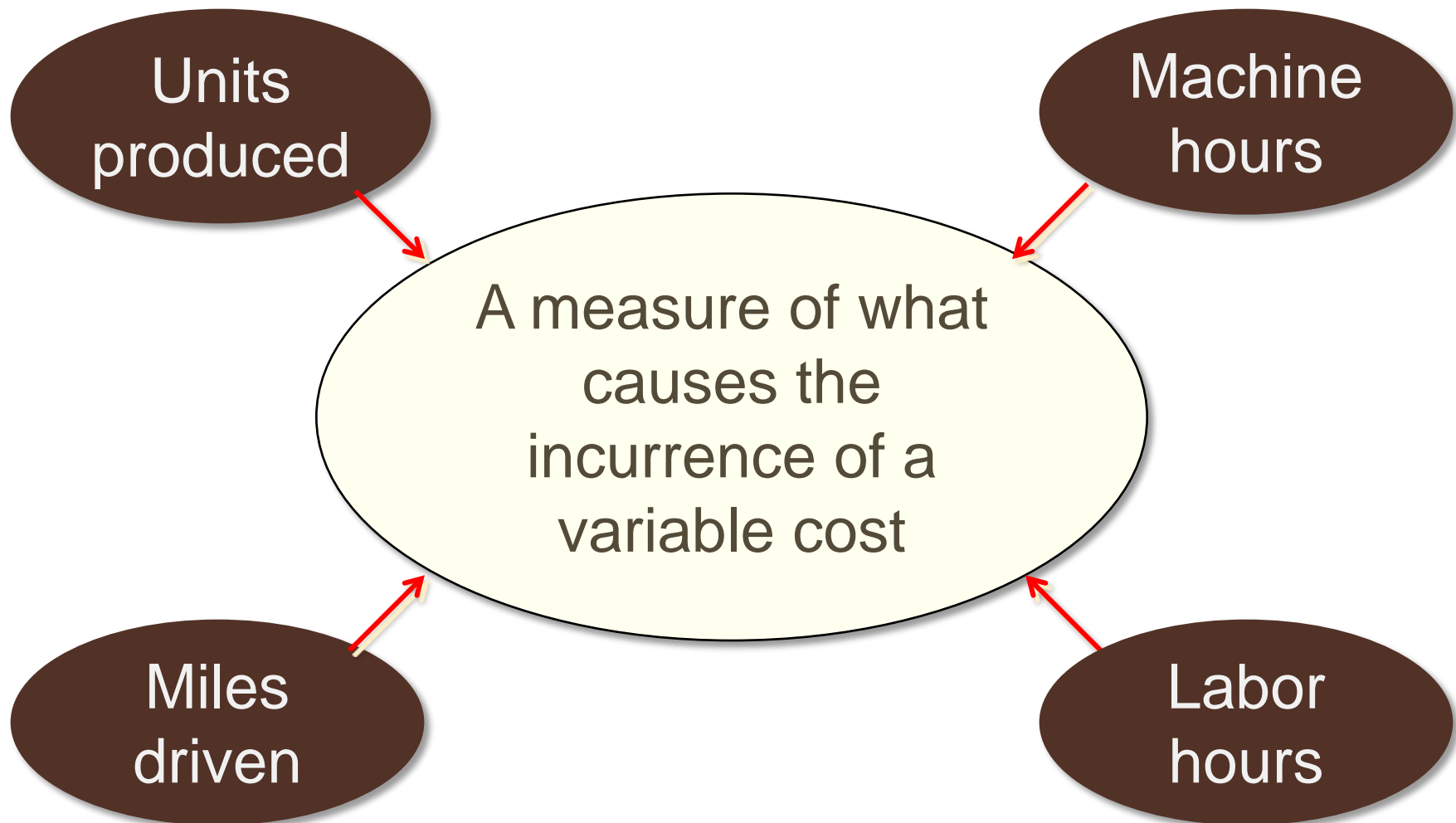


Variable Cost Per Unit

The **cost per text** sent is constant at 5 cents per text message.

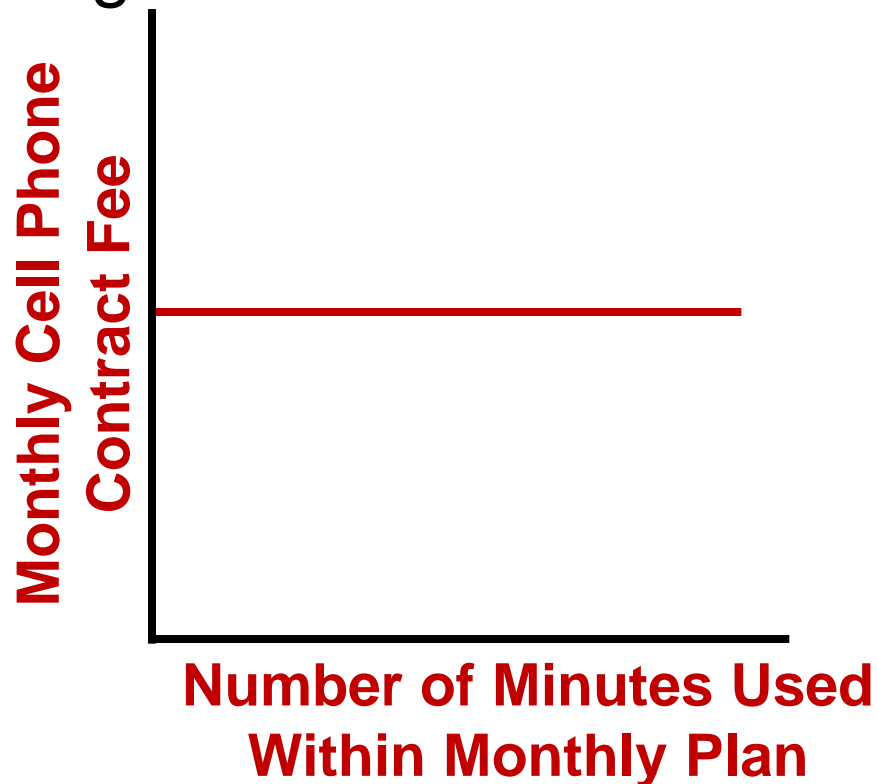


The Activity Base (Cost Driver)



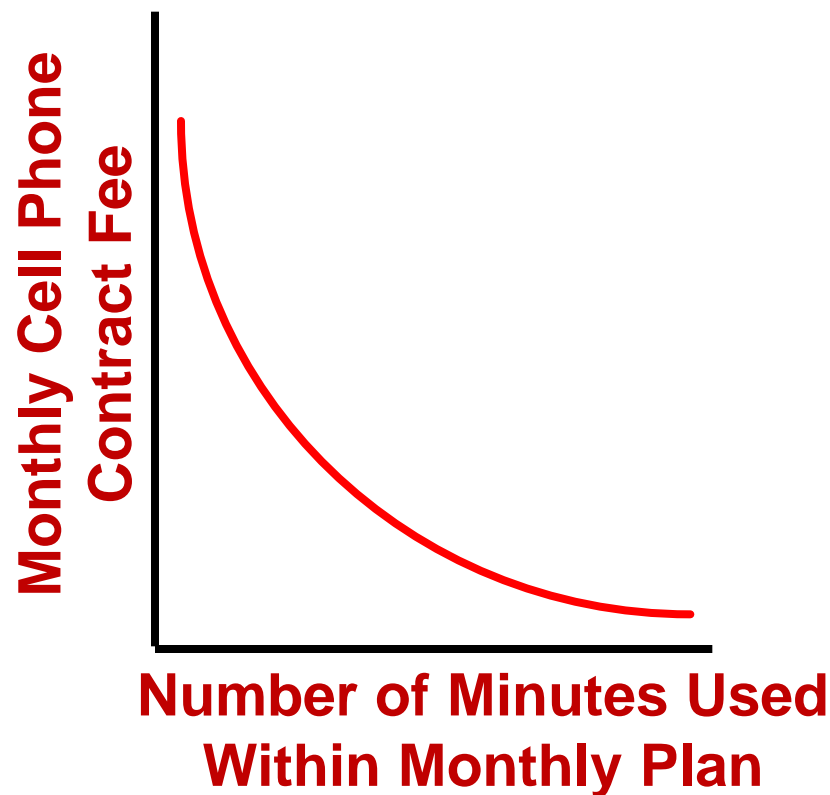
Fixed Cost

Your monthly contract fee for your cell phone is fixed for the number of monthly minutes in your contract. The monthly contract fee does not change based on the number of calls you make.



Fixed Cost Per Unit

Within the monthly contract allotment, the average fixed cost **per cell phone call made** decreases as more calls are made.



Types of Fixed Costs

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graph TD; A[Types of Fixed Costs] --> B[Committed]; A --> C[Discretionary]; B --> D[Examples]; C --> E[Examples];
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Committed

Long-term, cannot be significantly reduced in the short term.

Examples

Depreciation on Buildings and Equipment and Real Estate Taxes

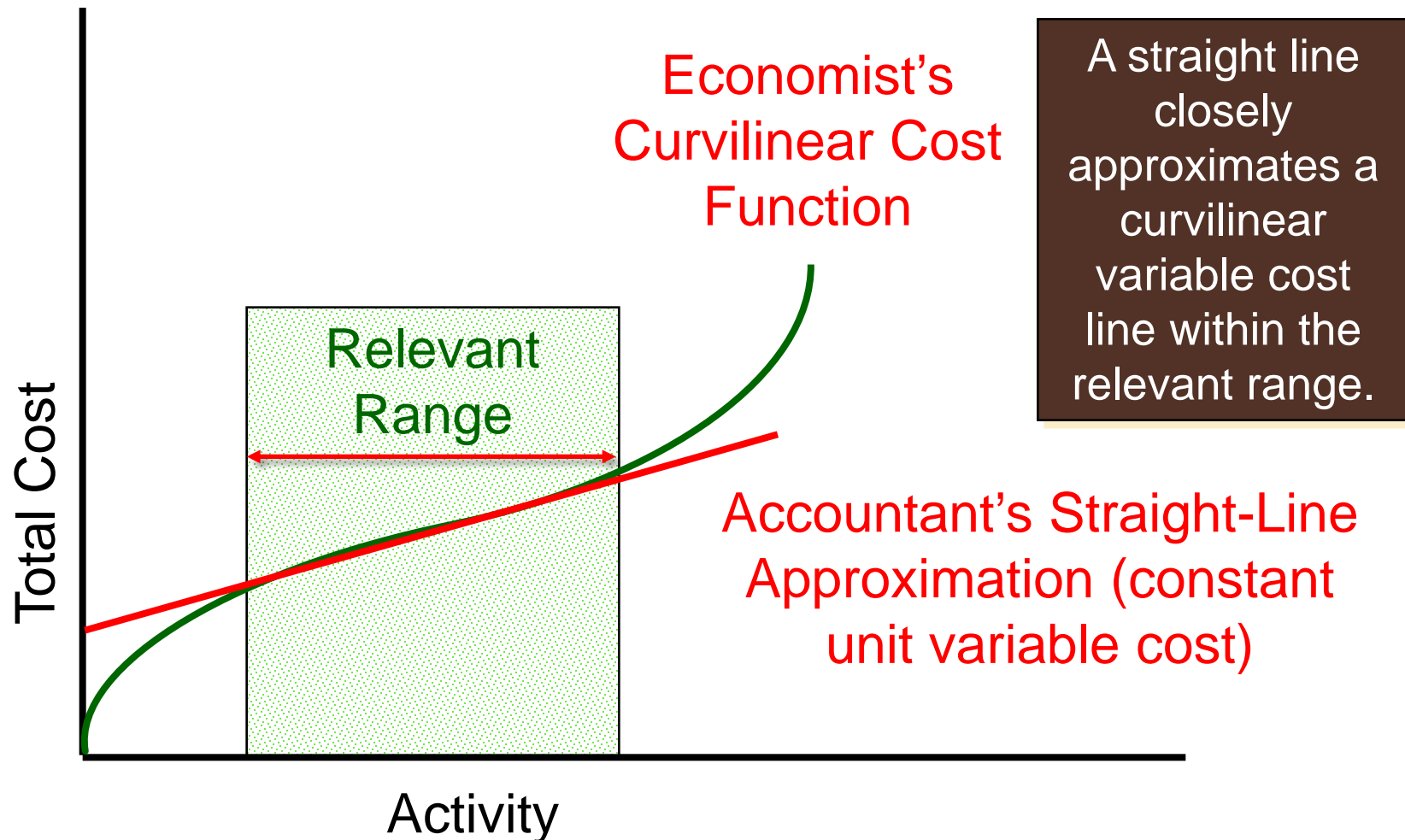
Discretionary

May be altered in the short-term by current managerial decisions

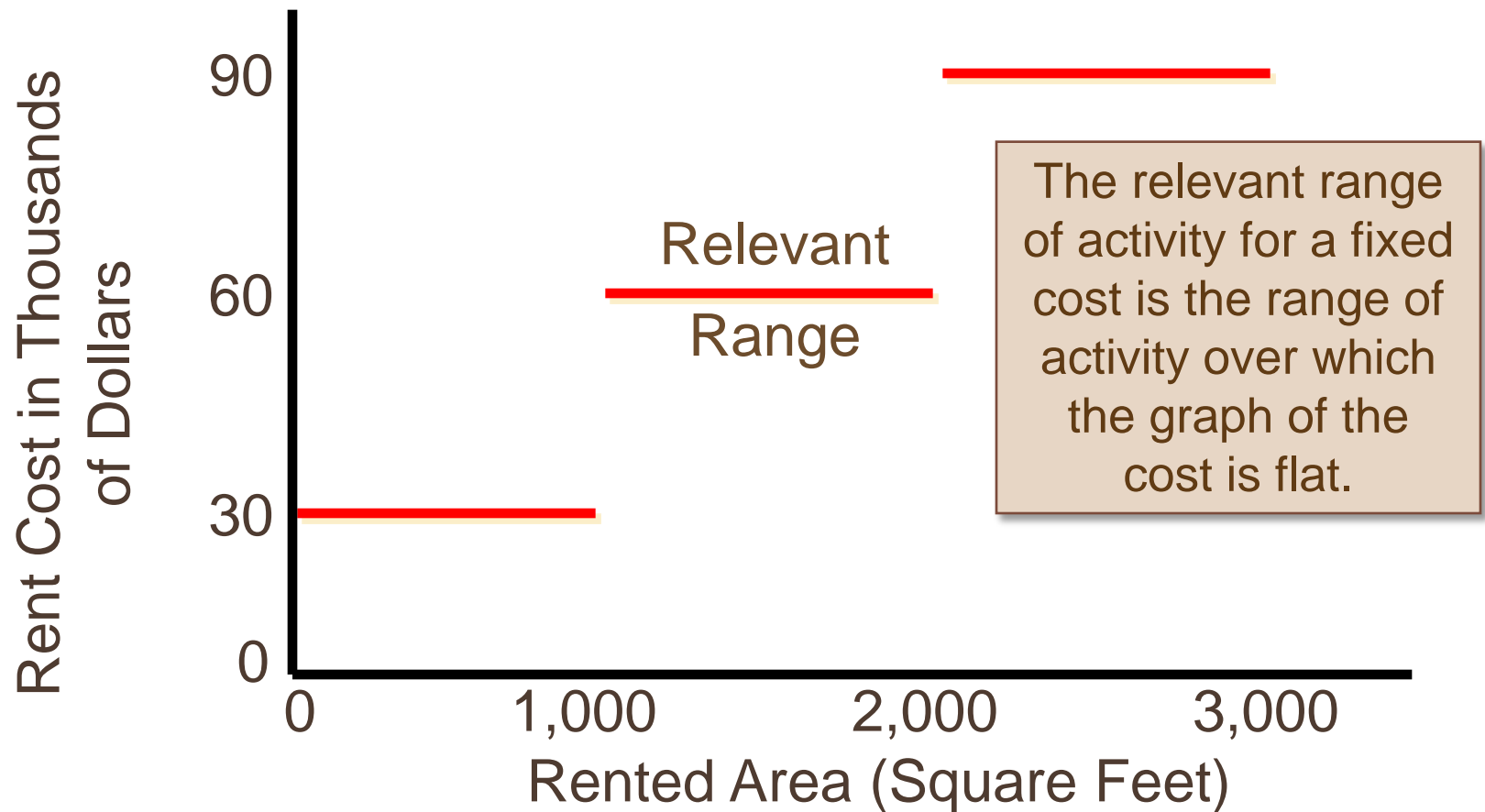
Examples

Advertising and Research and Development

The Linearity Assumption and the Relevant Range



Fixed Costs and the Relevant Range

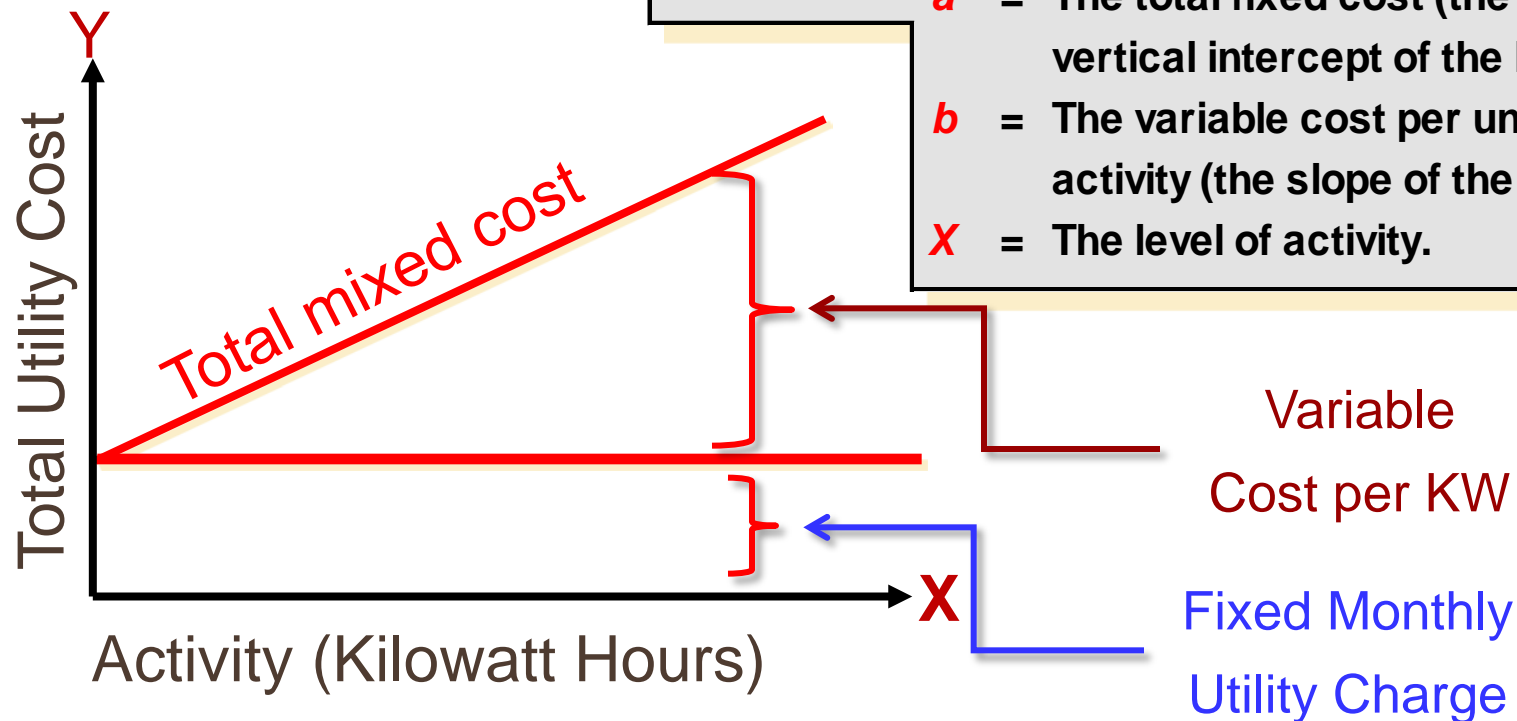


Mixed Costs

The total mixed cost line can be expressed as an equation: $Y = a + bX$

Where:

- Y = The total mixed cost.
- a = The total fixed cost (the vertical intercept of the line).
- b = The variable cost per unit of activity (the slope of the line).
- X = The level of activity.



End of Chapter 02



Cost-Volume-Profit Relationships

Chapter 05

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Basics of Cost-Volume-Profit Analysis

The contribution income statement is helpful to managers in judging the impact on profits of changes in selling price, cost, or volume. The emphasis is on cost behavior.

Racing Bicycle Company Contribution Income Statement For the Month of June		
Sales (500 bicycles)	\$	250,000
Less: Variable expenses		150,000
Contribution margin		100,000
Less: Fixed expenses		80,000
Net operating income	\$	20,000

Contribution Margin (CM) is the amount remaining from sales revenue after variable expenses have been deducted.



Contribution Margin Ratio (CM Ratio)

The CM ratio is calculated by dividing the total contribution margin by total sales.

Racing Bicycle Company Contribution Income Statement For the Month of June

	<u>Total</u>	<u>Per Unit</u>	<u>CM Ratio</u>
Sales (500 bicycles)	\$ 250,000	\$ 500	100%
Less: Variable expenses	150,000	300	60%
Contribution margin	100,000	\$ 200	40%
Less: Fixed expenses	80,000		
Net operating income	\$ 20,000		

$$\$100,000 \div \$250,000 = 40\%$$



Contribution Margin Ratio (CM Ratio)

The contribution margin ratio at Racing Bicycle is:

$$\text{CM Ratio} = \frac{\text{CM per unit}}{\text{SP per unit}} = \frac{\$200}{\$500} = 40\%$$

The CM ratio can also be calculated by dividing the contribution margin per unit by the selling price per unit.

Contribution Margin Ratio (CM Ratio)



If Racing Bicycle increases sales from 400 to 500 bikes (\$50,000), contribution margin will increase by \$20,000 ($\$50,000 \times 40\%$).

Here is the proof:

	<u>400 Units</u>	<u>500 Units</u>
Sales	\$ 200,000	\$ 250,000
Less: variable expenses	120,000	150,000
Contribution margin	80,000	100,000
Less: fixed expenses	80,000	80,000
Net operating income	\$ -	\$ 20,000

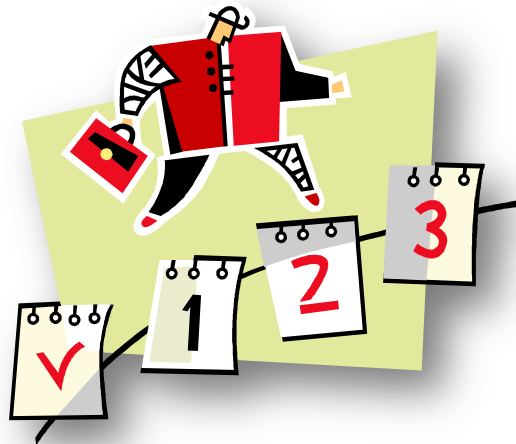
A \$50,000 increase in sales revenue results in a \$20,000 increase in CM ($\$50,000 \times 40\% = \$20,000$).



Equation Method

$$\text{Profit} = \text{Unit CM} \times Q - \text{Fixed expenses}$$

Our goal is to solve for the unknown “Q” which represents the quantity of units that must be sold to attain the target profit.





Target Profit Analysis

Suppose RBC's management wants to know how many bikes must be sold to earn a target profit of \$100,000.

$$\text{Profit} = \text{Unit CM} \times Q - \text{Fixed expenses}$$

$$\$100,000 = \$200 \times Q - \$80,000$$

$$\$200 \times Q = \$100,000 + \$80,000$$

$$Q = (\$100,000 + \$80,000) \div \$200$$

$$Q = 900$$



The Formula Method

The formula uses the following equation.

$$\text{Unit sales to attain the target profit} = \frac{\text{Target profit} + \text{Fixed expenses}}{\text{CM per unit}}$$





Target Profit Analysis in Terms of Unit Sales

Suppose Racing Bicycle Company wants to know how many bikes must be sold to earn a profit of \$100,000.

$$\text{Unit sales to attain the target profit} = \frac{\text{Target profit} + \text{Fixed expenses}}{\text{CM per unit}}$$

$$\text{Unit sales} = \frac{\$100,000 + \$80,000}{\$200}$$

$$\text{Unit sales} = 900$$



Break-even in Dollar Sales: Equation Method

Suppose Racing Bicycle wants to compute the sales dollars required to break-even (earn a target profit of \$0). Let's use the equation method to solve this problem.

$$\text{Profit} = \text{CM ratio} \times \text{Sales} - \text{Fixed expenses}$$

Solve for the unknown "Sales."



Break-even in Dollar Sales: Equation Method

$$\text{Profit} = \text{CM ratio} \times \text{Sales} - \text{Fixed expenses}$$

$$\$ 0 = 40\% \times \text{Sales} - \$80,000$$

$$40\% \times \text{Sales} = \$80,000$$

$$\text{Sales} = \$80,000 \div 40\%$$

$$\text{Sales} = \mathbf{\$200,000}$$



Break-even in Dollar Sales: Formula Method

Now, let's use the formula method to calculate the dollar sales at the break-even point.

$$\text{Dollar sales to break even} = \frac{\text{Fixed expenses}}{\text{CM ratio}}$$

$$\text{Dollar sales} = \frac{\$80,000}{40\%}$$

$$\text{Dollar sales} = \$200,000$$



Cost Structure and Profit Stability

There are advantages and disadvantages to high fixed cost (or low variable cost) and low fixed cost (or high variable cost) structures.

An advantage of a high fixed cost structure is that income will be higher in good years compared to companies with lower proportion of fixed costs.

A disadvantage of a high fixed cost structure is that income will be lower in bad years compared to companies with lower proportion of fixed costs.

Companies with low fixed cost structures enjoy greater stability in income across good and bad years.

Key Assumptions of CVP Analysis

- ① Selling price is constant.
- ② Costs are linear and can be accurately divided into variable (constant per unit) and fixed (constant in total) elements.
- ③ In multiproduct companies, the sales mix is constant.
- ④ In manufacturing companies, inventories do not change (units produced = units sold).

End of Chapter 05

