

## Retailer's and Manufacturer's Cost Based Pricing Formula

Ted Mitchell

### Learning Objective #1

- Students should be able to use the Retailer's Method of setting a Price based on the invoice or variable cost per unit
- Price = (Variable or Invoice Cost per Unit) divided by (1- (the markup on price))
- Price =  $V/(1-Mp)$

### Learning Objective #2

- Students should be able to use the Manufacturer's Method of setting a Price based on the Firms' Return on Sales
- Price = (Average Total Cost per Unit or Breakeven Price) divided by (1- (the Return on Sales))
- Price = Average Cost per Unit / (1-ROS)
- Price = BEP / (1-ROS)

### Remember Cost-Based Pricing Assumes

- 1) you know all the key elements of the future operating statement except the price to charge
- 2) the price you set will not change the volume customers will purchase (Forecasted volume dictates the Selling Price)

They are very Stupid assumptions!

### Pricing Assumes

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- 2) the price you set will not change the volume customers will purchase (Forecasted volume dictates the Selling Price)

### General Equations

- The Basic Profit Equation
- $Z = PQ - VQ - F$
- converts to
- The Basic Cost Based Pricing Formula
- $P = V + F/Q + Z/Q$   
where
- $V + F/Q$  = average cost per unit or breakeven price
- $Z/Q$  = the desired profit per unit

### Typical Operating Statement & Profit

Revenue	\$200,000	
<b>\$\$?? per unit x 20,000</b>		
CoGS (total variable cost)	\$80,000	
<b>\$4 per unit x 20,000</b>		
Gross Profit	\$120,000	Markup = 60%
Fixed Costs	\$50,000	
<b>\$50,000/20,000 = \$2.5 per unit</b>		
Profit	\$70,000	ROS = 35%
<b>\$70,000/20,000 = \$3.5 per unit</b>		

### Expected, Normal Profits Targeted each Period Statement & Profit

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### Basic Pricing Formula

- $P = V + F/Q + Z/Q$
- **$P = \$4 + \$50,000/20,000 + \$70,000/20,000$**
- $P = \$4 \text{ per unit} + \$2.50 \text{ per unit} + \$3.50 \text{ per unit}$
- $P = \$10 \text{ per unit}$

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### Retailer's Use Inventory Cost

### You are the BOSS!

The Operating Statement and the Basic Profit Equation

- 1) gives your employees **TOO MUCH** information
- 2) is **TOO Complicated** for employees to use

## You Tell Them to Follow The Markup Pricing Rule

Tell them

- 1) What the invoice cost is and what the target markup is
- 2) To take the Invoice Cost per Unit and Divide it by One minus the Target Markup

$$P = V / (1 - \text{Markup})$$

## Operating Statement

Revenue \$10 per unit x 20,000	\$200,000	
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## Typical Operating Statement & Profit

Revenue \$?? per unit x	\$??	
CoGS (total variable cost) \$4 per unit x	\$??	
Gross Profit	\$??	Markup = 60%
Fixed Costs	\$??	
Profit	\$??	ROS = ??

## Retailers Often Use

- Their variable cost (i.e., invoice of cost of the goods sold, V) and a Desired Markup (TPM<sub>p</sub>) or a Target Profit Markup to determine their prices
  - $P = V / (1 - \text{TPM}_p)$
  - Price = Variable Cost ÷ (1-Target Profit Markup)
- where
- $(F + Z) / (\text{Target Revenue}) = \text{Target Markup}$  including the Desired Profit
  - Variable Cost per Unit = V

## For example

- The normal cost for our inventory is \$4 each
  - The normal and fair markup on price is 60%
  - What selling price must I set to get a normal profit
  - $P = V / (1 - \text{TPM}_p)$
  - Price = Variable Cost ÷ (1-Target Profit Markup)
- Where
- $$P = \$4 / (1 - 0.6)$$
- $$P = 4 / .4 = \$10 \text{ per unit}$$

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- Their variable cost (i.e., invoice of cost of the goods sold, V) and a Desired Markup (TPM<sub>p</sub>) or a Target Profit Markup to determine their prices
- $P = \$4 / (1 - 60\%)$
- Price = Variable Cost ÷ (1-Target Profit Markup)

### Retailers Often Use

- Their variable cost (i.e., invoice of cost of the goods sold, V) and a Desired Markup (TPM<sub>p</sub>) or a Target Profit Markup to determine their prices
- **$P = \$4 / (1 - 60\%)$**
- Price =  $\$4/0.04 = \mathbf{\$10}$

### Manufacturer's Use ROS

#### Operating Statement

Revenue \$10 per unit x 20,000	\$200,000	
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Profit \$70,000/20,000 = \$3.5 per unit	\$70,000	<b>ROS = 35%</b>

### Manufacturers Often Use

- Average Costs of Production and a Desired Return on Sales (ROS) as a target profit to determine their prices
  - **$P = (V + F/Q) / (1 - ROS)$**
  - Price = Average Cost per Unit ÷ (1- ROS)
- where
- Z = ROS (Sales Revenue) = Desired Profit
  - BEP = Average Cost per Unit = V + F/Q

### Manufacturers Often Use

- You know the cost of making each pair is \$4
- You have total fixed costs of \$50,000
- Selling 20,000 units
- Your normal and fair return on sales, ROS = 35%
- **$P = (V + F/Q) / (1 - ROS)$**
- **$P = (\$4 + (\$50,000/20,000))/(1-0.35)$**

### Manufacturers Often Use

- Average Costs of Production and a Desired Return on Sales (ROS) as a target profit to determine their prices
- **$P = (\$4 + \$2.50) / (1 - 0.35)$**
- **$P = \$6.50/0.65 = \$10$**
- Price = Average Cost per Unit ÷ (1- ROS)
- Price = BEP/(1-ROS)

**All Use** Typical Operating Statement & Profit

Revenue <b>\$10 per unit</b> x 20,000	\$200,000	
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- Cost Based Pricing Equations Should Be Used **ONLY** as Benchmarks
- The actual price you set must reflect the customer's and competitor's expectations and perspective

Why are they so popular?

- 1) they are simple to use
- 2) they maintain price stability in the industry
- 3) they appear 'to guarantee a profit'
- 4) they appear to be a 'fair' way to pass along costs to customers

Exam Questions

Question #1

- A boy buys a wagon for \$4 and wants to sell it for a price that will earn him a 'fair and normal profit' of 60% markup on price. What is the selling price he should choose for the wagon?

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- A boy buys a wagon for \$4 and wants to sell it for a price that will earn him a 'fair and normal profit' of 60% markup on price. What is the selling price he should choose for the wagon?
- $P = V (1 - M_p)$
- $P = \$4 (1 - 0.6) = \$10$

### Question #2

- A boy buys a wagon for \$4 and spends several hours cleaning and polishing it. His dad gives him the materials to make a "For Sale Sign" and he buys a can of paint for \$1.25. He wants to sell the wagon for a price that cover his costs and earns him a fair profit. He believes that a fair price would give him a 60% markup on price. What is the selling price he should choose for the wagon?

### Question #2

- A boy buys a wagon for \$4 and spends several hours cleaning and polishing it. His dad gives him the materials to make a "For Sale Sign" and he buys a can of paint for \$1.25. He wants to sell the wagon for a price that cover his costs and earns him a fair profit. He believes that a fair price would give him a 60% markup on price. What is the selling price he should choose for the wagon?

- $P = V (1 - M_p)$
- $P = \$4 (1 - 0.6) = \$10$

- You do not have to know the details of the operating statement if the 'fair and normal profit' is presented as a percentage return on selling price or sales revenue.
- The 'normal and fair markup' is set knowing 'all the normal and fair' costs and return for owners.

Question #2 is **more realistic** than Question #1 because it contains more information.

However, the extra information is irrelevant to solving the pricing problem.

**In the real world we learn to disregard irrelevant information!**

We learn to identify the relevant information by understanding the problem.

If we just memorize the formula, then we will **NOT** understand the problem.

### Question #3

- A retailer buys wagons for \$4 each. He plans on selling 20,000 wagons next period and has total fixed costs of \$50,000. His target markup of 60% reflects a 'normal' profit. What is the selling price he should choose for the wagon?

### Question #3

- A retailer buys wagons for \$4 each. He plans on selling 20,000 wagons and has total fixed costs of \$50,000. His target markup is a 60%. What is the selling price he should choose for the wagon?
- $P = V (1 - M_p)$
- $P = \$4 (1 - 0.6) = \$10$

- A **retailer** with a target markup does **NOT** need to calculate the average cost per unit or the target profit.
- The target markup ( $M_p$ ) includes the 'normal' fixed costs (F), the 'normal revenue' (R), and the desired level of return (ROS).
- $M_p = (F+Z)/R$

- **Manufacturer's** think in terms of the average cost of producing each wagon and the target return on sales.
- **Manufacturer's** need to calculate the average cost per unit or the breakeven price (BEP)
- Average Cost per Unit =  $V + F/Q$
- $BEP = V + F/Q$

### Question #4

- A manufacturer makes wagons with a variable cost of \$4 each and wants to sell them at a price that will provide a normal 35% return on sales. He plans on selling 20,000 wagons and has total fixed costs of \$50,000. What is the selling price he should choose for the wagons?

### Question #4

- A manufacturer makes wagons with a variable cost of \$4 each and wants to sell them at a price that will provide a 35% return on sales. He plans on selling 20,000 wagons and has total fixed costs of \$50,000. What is the selling price he should choose for the wagons?
- $P = (V+F/Q) / (1 - ROS)$
- $P = (\$4 + \$50,000/20,000) / (1 - 0.35)$
- $P = (\$4 + \$2.5) / 0.65 = \$10$

- Both have the same \$10 price per wagon
- Because Both desire the same target profit of \$3.50 per wagon

- **Same Costs per Wagon**
- **Same Target Profit per Wagon**
- **Same Selling Price Wagon**

#### Operating Statement

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Questions?