

Accounting for Financial and Managerial Decision and Control [AFMDC]

Unit 12

Cost Information for Pricing and Product Planning

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Contents

- Effect of product cost in pricing and product mix decisions
- Short-term product mix and pricing decisions
- Long-term product mix and pricing decisions

Learning Objectives

- Differentiate between product line and product mix
- Explain the effects of product cost in pricing and product mix
- Understand the concept of price setter firm and price taker firm
- Discuss the short-term product mix and pricing decisions
- Discuss the long-term product mix and pricing decisions

Concept of Product Line and Product Mix

- The total number of product lines that a company offers to its customers is referred as product mix.
 - Product assortment
- The product mix is an important part of the business model of a company.
- Product mix and product lines are not same.
 - The product line is a subset of the product mix.
 - A product line refers to a unique product category a company offers.
 - It is a group of related products manufactured or marketed by a single company.

Concept of Product Line and Product Mix (Contd.)

- Product line is a group of related products, differentiating by features and price.
- For example, if a company deals in different categories of products such as readymade dress and shoes.
 - Readymade dress - different product line
 - Shoes - different product line
 - These both are grouped together, they form the product mix of the company

Concept of Product Line and Product Mix (Contd.)

The product mix has four dimensions:

- Width
- Length
- Depth
- Consistency

Effect of Product Cost in Pricing and Product Mix Decision

- Manufacturing cost have a direct impact on both the decisions of pricing and product mix decision.
- $\text{Manufacturing cost} = \text{Product cost}$
- $\text{Product cost} = \text{Direct cost} + \text{Indirect cost}$.
- The direct cost of a product or service is the cost incurred in producing and supplying the product or service.
- The direct costs vary in direct proportion to the number of units produced.
- $\text{Direct cost} = \text{Variable cost} = \text{raw materials cost} + \text{carriage inwards,} + \text{directs wages}$ (examples of direct cost)
- $\text{Indirect expenses} = \text{Overhead}$
- $\text{Overhead} = \text{indirect material} + \text{indirect labour} + \text{indirect expenses}$
- Factory manager's salary, factory rent, depreciation of machinery and equipment, factory insurance, etc. is the examples of factory overhead.

Effect of Product Cost in Pricing and Product Mix Decision (Contd.)

- Pricing the product is the next activity of a manufacturer after the determination of total cost.
- To establish a selling price for a product is known as pricing
- Price must be higher than total costs
- The prices must cover all costs as well as profits
- Selling price must be:
 - Competitive with the competition price existing in the market
 - Acceptable to customer
 - Recoverable all the costs incurred for its products
 - Include return or profit

Effect of Product Cost in Pricing and Product Mix Decision (Contd.)

- Influential factors for pricing the product: internal and external
- Internal factors:
 - cost, desired return, quantity and quality of the products, production capacity, enterprise objectives
- External factors:
 - Demand for the product, need of the customer, market competition, customer's purchasing capacity, economic and political situation of the country

Effect of Product Cost in Pricing and Product Mix Decision (Contd.)

Price fixation and firms types

- Price Setter
- Price Taker

Effect of Product Cost in Pricing and Product Mix Decision (Contd.)

- **Price setter firm**
- Dominates in the market for the price as well as for the product mix
- Face relatively little competitions in the market
- Enjoy large market shares and exercise leadership in an industry
- The products of such firms are highly customized or otherwise differentiated from each other

Effect of Product Cost in Pricing and Product Mix Decision (Contd.)

- **Price taker firm**
- Produce its products at lower amount than their prices
- Consider only relevant cost among all cost items
- Little flexibility toward the capacity of the firm resources
- Have little or no influence over the prices of their products in market

Short-term Product Mix and Pricing Decision

- Small firm - a negligible market share in the industry
- Small firm fixes the price of their product as set by the big firms or leading firms.
- Small firm has to adjust their product mix in the short term when the market place has determined what prices it can charge for its product. For the fixation of changes in price only relevant costs should be taken into account.
- The relevant costs for the special product mix decisions are short run variable cost.
- If there is any opportunity cost or any incremental cost, then those costs also have to consider for the price fixation.

Short-term Product Mix and Pricing Decision (Contd.)

The following conditions must be fulfilled for short-term decision of one-time special order:

- Sufficient capacity is available for all resources that are required to fulfill the order
- The special order price would not affect the future selling price of the product.
- The special order price must cover any incremental cost.
- The order will utilize unused capacity for only a short period, and capacity would be freed up for better opportunities if and when they come.

Long-term Product Mix and Pricing Decision

- Price setter firm makes long-term pricing decision.
- Price setter collect total cost of the product from accounting department
- After the determination of total cost of the product, appropriate mark-ups are added with total cost to determine price. Thus, for long term contract with customer the full costing is used by the firm for long-term price decision.

Long-term Product Mix and Pricing Decision (Contd.)

- Decision to add a new product or to drop an existing product usually has significant long run implication for the cost structure of a firm.
- The selling price should exceed the total cost for adding a new product or continuing the current product.
- When prices are set by the market a firm has to decide which product mix will be better for the firm.
- A price setter should not ignore the availability of resources which are using by the firm.
- If the resources are available in limited quantity, that is referred as constraint.
- For example, if all the firm's products require the same type of man power, then the firm's output will be limited by the available man power.

Question 1

Short-term Product Mix Decision for Price Taker

Two companies Large Co. and Small co. produces a similar product. Both companies uses Cost plus pricing method and mark-up percentage is 25% on cost. The outputs and costs are as under:

	Large Co. Ltd.	Small Co. Ltd.
Normal and actual outputs in units	1,00,000	10,000
Cost per unit:		
Direct material	Rs. 35	Rs. 40
Direct labor	Rs. 15	Rs. 20
Variable manufacturing overhead	Rs. 5	Rs. 8
Total Fixed manufacturing overhead	Rs. 15,00,000	Rs. 1,60,000
Total Operating expenses	Rs. 5,00,000	Rs. 60,000

Required:

- Selling price per unit of the product of the price setter and the price taker company
- Operating profit of both companies for the period

Solution 1

Short-term Product Mix Decision for Price Taker

(a) Price setter company is Large co. Ltd. Selling price is determined by the company by applying cost plus pricing i.e. full costing pricing.

Fixed manufacturing overhead = Rs. 1,500,000 / 1,00,000 Units = Rs. 15 per unit

$$\begin{aligned}\text{Full cost per unit} &= \text{Direct material} + \text{Direct Labor} + \text{Variable manufacturing} \\ &\quad \text{Overhead} + \text{Fixed manufacturing overhead} \\ &= 35 + 15 + 5 + 15 \\ &= \text{Rs. 70 per unit}\end{aligned}$$

$$\begin{aligned}\text{Selling price per unit} &= \text{Full cost} + \text{mark-up \%} \\ &= 70 + 25\% \text{ on } 70 \\ &= 70 + 17.50 \\ &= \text{Rs. 87.50 per unit}\end{aligned}$$

Small co. Ltd.: Fixed manufacturing overhead per unit = 160,000/10,000 units = Rs. 16 per unit

$$\begin{aligned}\text{Product cost} &= 40 + 20 + 8 + 16 \\ &= \text{Rs. 84 per unit}\end{aligned}$$

Small Co. Ltd. is Price Taker Company in the industry. That's why it cannot fix the price and has to follow the price fixed by Large co. Ltd. i.e. Rs. 87.50 per unit

Solution 1

Short-term Product Mix Decision for Price Taker

(b) Operating Profit = Sales revenue – Manufacturing cost – Operating expenses

Large Co. Ltd. = $(1,00,000 \times 87.50) - (1,00,000 \times 70) - 5,00,000$
= $8,750,000 - 7,000,000 - 500,000$
= Rs. 1,250,000

Small Co. Ltd. = $(10,000 \times 87.50) - (10,000 \times 84) - 60,000$
= $875,000 - 840,000 - 60,000$
= Rs. 25,000 (Loss)

Problem 2 (Pricing Special Order)

Strong Co. Ltd. has enough capacity to produce goods to cover the demands of the customers. At present it is producing and selling 20,000 units and selling price per unit is Rs. 1,000 per unit. The cost information for the product is as under:

Direct material per unit	Rs. 300
Direct Labor per unit	Rs. 200
Variable manufacturing cost per unit	Rs. 100
Fixed overhead	Rs. 4,000,000

A special order has been received for 1,000 units at the rate of Rs. 700 per unit. The company fixes the price based on cost plus pricing.

Required:

- a) Total cost per unit for the regular sale
- b) Total cost per unit for the special offer
- c) Operating income from both regular and special offer
- d) Should the Company accept the offer?

Solution 2 (Pricing Special Order)

- (a) Total cost per unit for the regular sale = Variable cost per unit + Fixed cost per unit
= $(300 + 200 + 100) + 4,000,000/20,000$ units
= Rs. 800 per unit
- (b) Cost per unit for the special offer = Variable cost per unit
= $300 + 200 + 100$
= Rs. 600 per unit
- (c) Operating profit from regular sale = Sales revenue – Variable cost – Fixed cost
= $(20,000 \times 1,000) - (20,000 \times 600) - 4,000,000$
= $20,000,000 - 12,000,000 - 4,000,000$
= Rs. 4,000,000
- Operating profit from special offer = Sales revenue – Variable cost
= $(1,000 \times 700) - (1,000 \times 600) = \text{Rs. } 100,000$
- (d) The company should accept the special offer, since profit increases by Rs. 100,000

Problem 3 (Setting Price for Expand Project)

A company is running at full capacity with 20,000 units of a product. The company is adopting full cost pricing approach for the formation of selling price with 50% mark-up. The cost information of the product is as under:

	Cost per unit
Raw material	Rs. 30
Labor	Rs. 20
Variable selling overhead	Rs. 10
Total Fixed overhead:	
Manufacturing overhead	Rs. 600,000
Administrative overhead	Rs. 200,000
Selling overhead	Rs. 100,000

The demand of the product is very high in the market and the company is planning to increase the product by 50%. For expanding its production units, company has to purchase a new machine costing Rs. 900,000 having useful life of 10 years. The company also has to pay more 50% per unit for direct material and labour cost.

Required: (i) Current selling price per unit and (ii) Selling price per unit after expansion

Solution 3 (Setting Price for Expand Project)

(i) Current selling price per unit:

$$\begin{aligned}\text{Fixed manufacturing overhead} &= \text{Rs. } 6,00,000 / 20,000 \text{ units} \\ &= \text{Rs. } 30 \text{ per unit}\end{aligned}$$

$$\begin{aligned}\text{Total cost} &= \text{Variable cost} + \text{Fixed manufacturing cost} \\ &= (30 + 20 + 10) + 30 \\ &= \text{Rs. } 90 \text{ per unit}\end{aligned}$$

$$\begin{aligned}\text{Selling price per unit} &= \text{Total cost} + \text{Mark-up \%} \\ &= 90 + (50\% \text{ of } 90) \\ &= 90 + 45 \\ &= \text{Rs. } 135 \text{ per unit}\end{aligned}$$

Solution 3 (Setting Price for Expand Project)

(ii) Selling price per unit after expansion:

$$\begin{aligned}\text{Annual depreciation of new machine} &= \text{Cost of Machine} / \text{Life} \\ &= \text{Rs. } 900,000 / 10 \text{ years} \\ &= \text{Rs. } 90,000\end{aligned}$$

$$\begin{aligned}\text{New Variable manufacturing cost per unit} &= (30 \times 1.5) + (20 \times 1.5) + 10 \\ &= \text{Rs. } 85 \text{ per unit}\end{aligned}$$

$$\begin{aligned}\text{New Fixed manufacturing overhead cost per unit} &= \text{Rs. } \frac{600,000 + \text{Rs. } 90,000}{30,000 \text{ units}} \\ &= \text{Rs. } 23\end{aligned}$$

$$\begin{aligned}\text{Total cost} &= \text{Variable cost} + \text{Fixed manufacturing cost} \\ &= 85 + 23 \\ &= \text{Rs. } 108 \text{ per unit}\end{aligned}$$

$$\begin{aligned}\text{New Selling price per unit} &= \text{Total cost} + \text{Mark-up \%} \\ &= 108 + (50\% \text{ of } 108) \\ &= 108 + 54 \\ &= \text{Rs. } 162 \text{ per unit}\end{aligned}$$

Question 4 (Long-term Product Mix Decision)

A leading manufacturing company is selling its product in the market Rs. 100 per unit. A small manufacturing company is surviving in the same market by selling the product at the same price because the product cost is Rs. 75 and operating expenses per unit is Rs. 15. But suddenly the leading manufacturing company cut-off the price by 20%.

Required: (a) current profit of small manufacturing company (b) Selling price per unit of small manufacturing company after the decision of leading company.

Solution 4 (Long-term Product Mix Decision)

(a) Current selling price per unit of small manufacturing company (As per the selling price setting by leading manufacturing company) = Rs. 100

$$\begin{aligned}\text{Total cost per unit} &= 75 + 15 \\ &= \text{Rs. } 90 \text{ per unit}\end{aligned}$$

$$\begin{aligned}\text{Current profit} &= 100 - 90 \\ &= \text{Rs. } 10 \text{ per unit}\end{aligned}$$

(b) New selling price per unit, after the decision of 20% cut-off the price by leading company

$$\begin{aligned}&= 100 - (100 \times 20\%) \\ &= \text{Rs. } 80 \text{ per unit}\end{aligned}$$

(As per the selling price setting by leading manufacturing company)

But Rs. 80 does not cover the total cost of small company. So the small company has to drop either its product or has to plan for the cost reduction.

Question 5 (Special Order Pricing)

The Kathmandu Product Ltd; a company engaged in production of specialized goods called 'Kath Craft' has been utilizing its capacity only by 80% of its available capacity. The company received an special offer to supply 25,000 units of its product most similar to one the company at present is selling in the market, but under different brand name. The price offered is 100 per unit. The data relating to produce one unit of regular product are presented below:

• Direct Material Cost 4 units @ Rs. 10	Rs. 40.00
• Direct Labour Cost 3 hours @ Rs. 10	Rs. 30.00
• Manufacturing Overhead 3 hours @ Rs. 15 (Based on Direct Labour Hour)	<u>Rs. 45.00</u>
Total Cost per Unit	<u>Rs. 115.00</u>

The company at present is selling its product at Rs. 150 per unit. The company has adopted a policy of defining its capacity in direct labour hour. The annual normal budgeted hour is 3,00,000 hours and the budgeted fixed overhead for the period is Rs. 15,00,000. All manufacturing overheads are applied to production on the basis of direct labour hour at Rs. 15 per hour. The special offer will have no other cost than regular production cost.

Required: (a) Should the company accept this offer and also show how total profit of the company would change by accepting this offer?

(b) Would the company have any opportunity cost of the offer?

Solution 5 (Special Order Pricing)

1. Normal Capacity = 300,000 DLH / 3 DLH
= 100,000 units
2. Capacity Utilization = 100,000 units \times 80% = 80,000 units
3. Regular sales = 80,000 \rightarrow 75,000 (regular sales curtail = 5,000 units)
Special offer = 25,000 \rightarrow 25,000
Total need = 105,000 \rightarrow 100,000 (normal capacity = 100,000 units)
4. Fixed Manufacturing Overhead Rate = Total FMOH / Normal Capacity
= Rs. 1,500,000 / 100,000 units
= Rs. 15 per unit
5. Variable Manufacturing Overhead = Rs. 45 – Rs. 15 = Rs. 30 per unit.

Solution 5 (Special Order Pricing)

Income Statement (Using Variable Costing)

	Without Special Order	With Special Order	Difference
Sales Units	80,000	1,00,000	20,000
Sales Revenue (80,000 units @ Rs. 150/unit)	1,20,00,000		
(75,000 units @ Rs. 150/unit)		1,12,50,000	
(25,000 units @ Rs. 100/unit)		25,00,000	
Total Sales Revenue	1,20,00,000	1,37,50,000	17,50,000
Less: Variable Costs			
Direct Materials @ Rs. 40/unit	32,00,000	40,00,000	8,00,000
Direct Labour @ Rs. 30/unit	24,00,000	30,00,000	6,00,000
Variable Manufacturing Overhead @ 30/unit	24,00,000	30,00,000	6,00,000
Total Variable Cost	80,00,000	1,00,00,000	20,00,000
Contribution Margin	40,00,000	37,50,000	(2,50,000)
Less: Fixed Manufacturing Overhead	15,00,000	15,00,000	—
Net Income Before Tax	25,00,000	22,50,000	(2,50,000)

Decision: The profit is decreased by Rs. 250,000 when the special order is accept.
So it is recommended to reject it.

Solution 5 (Special Order Pricing)

(b) Opportunity Cost = Regular sales units sacrifice X Contribution Margin per unit on regular sales
= 5,000 units X (Rs. 150 – Rs. 100)
= Rs. 250,000

Solution 5 (Special Order Pricing)

Alternative Method

Increase in sales revenue	= 25,000 units X Rs. 100	= Rs. 25,00,000
Increase in variable cost	= 25,000 units X Rs. 100	= <u>(Rs. 2,500,000)</u>
Increase in Contribution Margin	=	0
Opportunity Cost	=	<u>(Rs. 2,50,000)</u>
Increase in Profit (Loss) of accepting special offer	=	<u>(Rs. 2,50,000)</u>

Decision: The profit is decreased by Rs. 250,000 when the special order is accepted.
So it is recommended to reject it.

Additional question

Find out minimum acceptable price for a special offer.

$$\begin{aligned}\text{Minimum acceptable price} &= \text{Offer price} + \text{Loss per unit (OR)} - \text{Profit per unit} \\ &= \text{Rs. } 100 + \text{Rs. } 250,000/25,000 \text{ units} \\ &= \text{Rs. } 100 + \text{Rs. } 10 \\ &= \text{Rs. } 110 \text{ per unit}\end{aligned}$$

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Thank You