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## **Unit 8 □ Marginal Costing and Management Decisions**

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### **8.1 Introduction**

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While the concept and principles of marginal costing have been discussed in the earlier unit, this unit deals with the application of marginal costing technique for various decisions making of the management.

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### **8.2 Decision making using Marginal Costing**

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All the decision situations the management of a firm has to face may be divided into two categories—*Strategic and Tactical*. Strategic decisions are long term decisions. Long term decision making is usually included in the functions of top level management. Various types of Investment decisions, Product diversification decisions, etc. fall in the category of strategic decision. The concepts and techniques involving time value of money and return on investment *inter alia* do usually play the pivotal roll in those types of long term decision making. Tactical decisions, on the other hand, are short term decisions. The short term decisions are taken by the middle and lower level managers. Despite some of the limitations as mentioned in the earlier unit, marginal costing technique has been in effective use in such short term decision making situations. In fact, all its (marginal costing) supremacies center around its uniqueness in identifying and using the behaviour patterns or the variability characteristic

of the costs. Some of the many tactical decision making situations where marginal costing technique is effectively used are :

- i) Introduction of a new product,
- ii) Make or buy,
- iii) Problems of limiting factors,
- iv) Dropping of a product line,
- v) Fixation of selling prices,
- vi) Selection of a profitable product-mix,
- vii) Alternative Courses of action, and
- viii) Closing down or suspension of activities.

We, however, take up first four items only.

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### **8.3 Introduction of a New Product**

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There may be proposal for introduction of a new product to the existing product/s (product diversification). It may be thought of for utilizing the existing unused capacity or resources, capturing a new market or for any other similar purposes. Though such a situation involves a long term decision making, with the objective of temporary utilization of unused capacity and resources, decision making with the help of marginal costing may ease out the problem in the short run.

Decision on such an issue is based on whether the new product can make any contribution towards fixed cost and profit. It is, however, assumed that introduction of the new product does not involve any additional fixed cost. Anyway, if the new product can add to the existing contribution, the introduction is recommended. However, if the new product involves any specific additional fixed cost, the amount of specific fixed cost is also to be deducted from the expected contribution of the proposed new product to determine the additional profit.

#### **Problem 1**

You are given the following information in respect of product A produced by a company :

	Rs.
Sales	10,000
Direct materials	4,000
Direct labour	2,000
Variable overhead	1,000
Fixed Overheads	2,000

A new product, product B, is proposed to be introduced to increase sales by Rs. 2,000. The estimated costs are :

Direct materials	Rs. 1,000
Direct Labour	400
Variable Overheads	300

The fixed cost of the company will not change.

Advise management.

#### Profitability of Product B

Sales	Rs. 2,000	
Less : Marginal Costs :		
Direct materials	1,000	
Direct labour	<u>400</u>	
Prime cost	1,400	
Variable overhead	<u>300</u>	<u>1,700</u>
Contribution		<u>300</u>

Thus, addition of Product B will increase the profit position of the firm by Rs. 300.

## 8.4 Make or Buy Decision

This is another important decision making situation which management is often confronted with. If a company has idle capacity that can be used for making a product or a component part rather than buying it from the outside market, such a decision situation is called make or buy decision. It may also be referred to as outsourcing or insourcing decision. In such a decision, when variable costs are involved, variable or marginal costs of manufacture are compared with cost of buying it from outside to take a decision. If, however, it involves any additional fixed cost specific to this proposal of manufacturing, that is to be added to the marginal cost of manufacture for comparison with the quoted price. The decision rule is simple : accept the proposal of 'making' if the marginal cost (plus the specific fixed cost, if any) is lower than the quoted price for 'buying'.

### Problem 2

Ever Green Ltd. produces a product 'A'. The output in 2004 are 1,20,000 units. The cost sheet based on this product is as under :

	Rs.	Rs.
Selling Price		100
Direct materials	21	
Component 'X'	9	

Direct wages (@ Rs. 4 per hour)	20	
Factory Overheads (50% fixed)	24	
Selling & Dist. Overheads (75% variable)	12	
Administration Overheads (fixed)	<u>4</u>	<u>90</u>
Profit		<u>10</u>

The company at present manufactures component X, one unit for each unit of product A. The cost details for 10,000 units of component X are as under :

	Rs.
Direct materials	24,000
Direct labour	30,000
Variable Overheads	18,000
Fixed Overheads	<u>18,000</u>
Total	<u>90,000</u>

The fixed overheads specific for component X is fixed for any volume of its production. The component X is, however, available for purchase at the market at Rs. 8 each. The company is now considering a proposal to discontinue the manufacturing of component X and instead buy it from the market.

Shall the company make or buy the component? When :

- There is no alternative use of spare capacity;
- Spare capacity can be rented at Re. 1 per hour.

### **Solution 2**

#### **a) When there is no alternative use of spare capacity**

1. Cost of buying component X :	Rs.
(1,20,000 units @ Rs. 8)	<u>9,60,000</u>
2. Cost of making component X :	
Variable costs	
(1,20,000 units @ Rs. 7.20)	8,64,000
Fixed Costs	<u>18,000</u>
	<u>8,82,000</u>

Cost of buying is higher than the cost of making by Rs. (9,60,000 – 8,82,000) or Rs. 78,000. So, making the component in the own factory of the company is recommended.

#### **b) When spare capacity can be rented**

1. Relevant cost of buying :	Rs.
Cost of buying component X (as above)	9,60,000
<u>Less</u> Savings in specific fixed cost	<u>18,000</u>
	9,42,000

<u>Less</u> Income from rent of spare capacity	
[Released labour hour × Hourly rent	
= 90,000 hours @ Re. 1 per hour]	90,000
	8,52,000
2. Net or effective cost of making component X (as above)	8,82,000

Relevant cost of buying is lower than the effective cost of making by Rs. 30,000. So, buying the component X from the market is recommended.

**Note :** Released labour hour from spare capacity :

Labour hour for making 10,000 units of X  
= (Rs. 30,000 / Rs. 4 per hour) = 7,500

Therefore, released labour hour for not making 1,20,000 units of X  
= (7,500 hrs. / 10,000 units) × 1,20,000 units = 90,000 hours.

## **8.5 Problems of Limiting Factor**

Limiting factor is any factor that limits the activities of an entity. This is also known as the *key factor*. Examples of limiting factor are :

- i) Low market demand of a product (in terms of quantities and/or value),
- ii) Shortage of raw material,
- iii) Shortage of the required grade of labour,
- iv) Shortage of machine hours etc.

Under normal condition *product selection* decision is guided by the P/V ratio; the guiding principle is—the higher the P/V ratio, the more profitable is the product and vice versa.

But in case of existence of a limiting factor, the firm has to optimise the use of resources which are in short supply to maximise profit or minimise loss. So, the decision regarding the selection of product amongst the alternatives should be guided by the amount of contribution per unit of limiting factor the higher the contribution per unit of limiting factor, the more profitable is the product and vice versa.

When a number of limiting factors becomes operative simultaneously, we have to take the help of linear programming technique to decide on the optimum product- or sales-mix.

### **Problem 1**

Super Quality Ltd. seeks your advice to decide on the most profitable product-mix with their three products : Good, Better and Best. You are supplied with the following information :

Products :	Good	Better	Best
1. Unit Cost data :			
Direct materials (Rs.)	320	240	160
Variable overhead (Rs.)	16	40	24
2. Information on direct labour :			
Dept. A (@ Rs. 8 per hour)	6 hrs.	10 hrs.	5 hrs.
Dept. B (@ Rs. 16 per hour)	6 hrs.	15 hrs.	11 hrs.
3. Annual budget data :			
Annual production (units)	5,000	6,000	10,000
Selling price per unit (Rs.)	624	800	525
Fixed overheads	Rs. 16,00,000		
4. Sales Department's estimate of the maximum possible sales in the coming year (units)	6,000	8,000	10,000

Given that there is a constraint on the supply of labour in Department A and its manpower cannot be increased beyond its present level.

- i) Suggest the most profitable production and sales mix.
- ii) Prepare a statement of profitability on the basis of the product-mix suggested by you.

### **Solution 3**

#### **(i) Determination of the most profitable product mix**

Products	Good	Better	Best	Total
1. Labour hours available at present in Dept. A (Production units x Hours p.u.)	30	60	50	140
2. Contribution as above (Rs. '000)	720	1,200	1,250	3,170
3. Contribution per labour hour (Rs.)	24	20	25	---
4. Rank on the basis of Contribution per labour hour (Key factor)	II	III	I	---

To optimise the use of labour hours, available labour hours would be distributed based on the above rank subject, of course, to the overall constraint of market demand. This is shown in the statement that follows.

Products (Rankwise)	Maximum Possible Sales (Units)	Labour Hours in Dept. A			Maximum Production Suggested (Units)
		Balance Available	Required		
			Per Unit	For units in Col. (2)	
(1)	(2)	(3)	(4)	(5)	(6)
Best	10,000	1,40,000	5	50,000	10,000
Good	6,000	90,000 <sup>1</sup>	6	36,000	6,000
Better	8,000	54,000 <sup>1</sup>	10	80,000	5,400 <sup>2</sup>

**Notes :** 1. Balance of Dept. A labour hours available for production of :

Good = (1,40,000 – 50,000) = 90,000 hours

Better = (90,000 – 36,000) = 54,000 hours

2. Maximum Possible Production of Better

= Available hours / Required hours p.u.

= 54,000 / 10 = 5,400 units.

Most profitable production and sales-mix :

Good            6,000 units

Better         5,400 units

Best            10,000 units

**(ii) Profitability Statement for suggested production and sales mix**

Products	Good	Better	Best	Total
Production/ Sales (units)	6,000	5,400	10,000	21,400
Contribution for present production-mix as computed above (Rs. '000)	720	1,200	1,200	3,170
Present Production-mix (Rs. '000)	5	6	10	21
Contribution per unit (Rs.)	144	200	125	---
Contribution for suggested Production-mix (Rs. '000)	864	1,080	1,250	3,194
Fixed Overheads (Rs. '000)				1,600
Profit (Rs. '000)				1,594

## 8.6 Dropping a Product

Such a decision based on apparent profitability of the products following absorption costing principle may be misleading. Hence decision should be based on product profitability following contribution concept under marginal costing. A product

remains profitable so long as it has positive contribution. Drop out decision is justified only when a product has negative contribution or when it can be replaced by a more profitable one.

**Problem 4**

The following is the budget estimate of a company for the year 2004-05 :

Products	A	B
Sales	6,000	16,000
	Rs./Unit	Rs./Unit
Selling price	<u>30</u>	<u>64</u>
Direct materials	12	18
Direct wages @ Re. 1 per hour	8	16
Variable overheads	4	6
Fixed overheads :		
Attributable to the product	2	6
Apportioned General fixed cost	<u>6</u>	<u>6</u>
Total Cost	<u>32</u>	<u>52</u>
Profit/Loss	<u>(-) 2</u>	<u>12</u>

Do you recommend dropping of Product A ? Justify your answer.

	<u>Product A</u>	
	Rs.	Rs. 30
Selling Price		
Less : Managerial costs :		
Direct materials	12	
Direct wages	8	
Variable overheads	<u>4</u>	<u>24</u>
Contribution per unit		<u>6</u>
Loss of contribution if product		

A is dropped (Rs. 6 × 6,000) = Rs. 36,000

There will be a savings of specific fixed cost of Rs. 12,000 (6,000 @ Rs. 2). But if product A is dropped, then the entire general fixed cost will have to be borne by product B. Therefore, discontinuing product A will lead to reduction in overall position by Rs. 24,000 (i.e. Rs. 36,000 – 12,000). In other words, the position will be as follows :

Present Position :

Product B : 16,000 × Rs. 12	=	1,92,000
Product A : 6,000 × (-)2	= (-)	<u>12,000</u>
		1,80,000

Less : Net loss 24,000

If product A is dropped

Position from product B 1,56,000

The above statement can be verified from the following :

	Rs.
Contribution from Product B	
(Rs. 64 – 40) × 16,000 =	3,84,000
Less : Specific Fixed cost : 16,000 @ Rs. 6 = 96,000	
General Fixed cost :	
6,000 @ Rs. 6 = 36,000	
16,000 @ Rs. 6 = <u>96,000</u>	1,32,000
Profit	Rs. <u>1,56,000</u>

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## 8.7 Select Readings

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Banerjee, B., *Cost Accounting*, World Press Pvt. Ltd.

Lal, Jawahar, *Cost Accounting*, Tata Mc Graw Hill Publishing Co.Ltd.

Hornigren, Foster and Datar, *Cost Accounting, A Managerial Emphasis*, Prentice Hall

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## 8.8 Sample Questions

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**a) Long answer type**

1. What are the most important areas of management decisions where marginal costing can be applied more suitably and effectively? Mention the basic points in each of the cases.
2. i) What factors will have to be considered in taking decisions for 'Make or Buy' ?  
ii) For product-mix decisions, what criteria can be used to select products that will maximize net income?

**b) Short answer type**

1. i) Under what circumstances a decision to drop a product from the product lines is necessary ?  
ii) Is 'making' a product preferable to 'buying' it from the market when cost is the same in both the cases ?
2. i) Briefly explain the importance of contribution approach in CVP analysis.  
ii) Write a note on 'Key factor'.

**c) Objective type**

**1. Answer the following :**

- i) Can there be more than one limiting factor at a time?
- ii) Can the problem with dual limiting factors be tackled by marginal costing technique?
- iii) Is P/V ratio a suitable criterion for comparing product profitability in the presence of machine capacity as limiting factor?
- iv) Is fixed cost traceable to a product a relevant cost while taking decision to drop that product?
- v) Is it so that a product-mix denotes the ratio in which various products are produced and/or sold?

**2. Fill in the blanks :**

- i) Under total cost method, a loss making or less profitable product may appear to be more-profitable owing to arbitrary apportionment of \_\_\_\_\_ costs.
- ii) In case one of the resources is in short supply, selection of profitable product should be based on \_\_\_\_\_ per unit of that resource.
- iii) Limiting factor is also known as \_\_\_\_\_ factor.
- iv) Loss of \_\_\_\_\_ from displaced work is the opportunity cost of making a component in the factory.
- v) Tactical decisions are usually \_\_\_\_\_ term decisions.

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**8.9 Hints for Solution (for objective type questions only)**

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- (c) 1. (i) and (ii) Yes, (iii) No, (iv) Yes, (v) Yes.  
2. (i) fixed, (ii) contribution, (iii) key, (iv) contribution, (v) short.