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Lecture-12

Decisions Involving Alternative Choices

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Notes

CONTENTS

Objectives

After studying this Chapter, you will be able to:

- Explain the concept of decision making
- Illustrate the determination of sales mix
- Discuss make or buy decisions, own or hire and shut down or continue decisions

Introduction

The need for a decision arises in business because a manager is faced with a problem and alternative courses of action are available. A manager have to take different decisions like make or buy, continue or shut down, etc. to make the maximum profit. In deciding which option to choose he will need all the information which is relevant to his decision; and he must have some criterion on the basis of which he can choose the best alternative. Some of the factors affecting the decision may not be expressed in monetary value. Hence, the manager will have to make 'qualitative' judgements, e.g. in deciding which of two personnel should be promoted to a managerial position. A 'quantitative' decision, on the other hand, is possible when the various factors, and relationships between them, are measurable.

12.1 Concept of Decision-making

Marginal cost helps management to make decision involving consideration of cost and revenue. Basically, marginal costing furnishes information regarding additional costs to be incurred if an additional activity is to be taken up or the saving in costs which may be expected if an activity is given up. This can be compared with the benefit expected from the proposed course of action and thus the management will be able to take the appropriate decision.

Decision-making describes the process by which a course of action is selected as the way to deal with a specific problem. A decision involves the act of choice and the alternative chosen out of the available alternatives.

Notes

According to Heinz Weihrich and Horold Koontz, "Decision-making is defined as the selection of a course of action from among alternatives."

George R. Terry says, "Decision-making is the selection based on some criteria from two or more possible alternatives."

According to Haynes and Masie, "Decision-making is a course of action which is consciously chosen for achieving the desired results."

Following are the important areas of decision-making or applications of marginal costing:

1. Fixation of Price,
2. Decision to Make or Buy,
3. Selection of a Profitable Product Mix,
4. Decision to Accept a Bulk Order,
5. Closure of a Department or Discontinuing a Product,
6. Maintaining a Desired Level of Profit, and
7. Evaluation of Performance.

Self Assessment

Fill in the blanks:

1. Marginal cost helps management to make decision involving consideration of …………
2. A decision involves the act of choice and the ……………. chosen out of the available alternatives.
3. Marginal costing furnishes information regarding ……………. to be incurred if an additional activity is to be taken up or the saving in costs which may be expected if an activity is given up.

12.2 Determination of Sales Mix

In the market, dealership is offered by the various companies to the individual intermediaries in promoting the sale of products. Before reaching an agreement with the company to act as a dealer, normally every individual considers the profitability of the product mix offered by the firm. For example, There are two different companies brought forth their advertisements in offering the dealership to the individual trading firms *viz.* HCL and IBM.

The profitability under the dealership banner should be appropriately considered prior to take decision. To take rational decision, the firm should compare the profitability of both different dealerships of two different giant industrial brands. The greater the share of the profitability in volume will be selected and vice-versa.

Example: From the following information has been extracted of EXCEL Rubber Products Ltd:

Direct materials A	` 16
Direct Materials B	` 12
Direct wages A	24 Hrs at 50 paise per hour
Direct wages B	16 Hrs at 50 paise per hour
Variable overheads	150% of wages
Fixed overheads	` 1,500
Selling price A	` 50
Selling price B	` 40

Notes

The directors want to be acquainted with the desirability of adopting any one of the following alternative sales mixes in the budget for the next period:

1. 250 Chapters of A and 250 Chapters of B
2. 400 Chapters of B only
3. 400 Chapters of A and 100 Chapters of B
4. 150 Chapters of A and 350 Chapters of B

State which of the alternative sales mixes you would recommend to the management?

Solution:

The first step is to determine the contribution margin per Chapter of A and B.

The determination of the contribution of product A and B are through the preparation of Marginal costing statement.

Particulars	**Product A (`)**		**Product B (`)**	
Selling price		50		40
Less: Direct Materials	16		12	
Direct wages	12		8	
Variable overheads	18		12	
Variable cost		46		32
Contribution		4		8

The next step is to determine the profit level of every mix

4. 250 Chapters of A and 250 Chapters of B.

The first step is to determine the total contribution of the mix. Why the total contribution has to be found out?

The main reason is to determine the profit level of the mix through the deduction of the fixed overheads

		(`)
Product of A	250 Chapters × 4	1,000
Product of B	250 Chapters × 8	2,000
Contribution		3,000
Fixed overheads		1,500
Profit		**1,500**

2. 400 Chapters of B only

Product B Contribution 400 Chapters × ` 8	3,200
Fixed overheads	1,500
Profit	**1,700**

3. 400 Chapters of A and 100 Chapters of B

Product of A	400 Chapters × `4	1,600
Product of B	100 Chapters × `8	800
Contribution		**2,400**
Fixed overheads		1,500
Profit		**900**

Notes

4. 150 Chapters of A and 350 Chapters of B

Product A	150Chapters × `4	600
Product B	350Chapters × `8	2,800
Contribution		3,400
Fixed overheads		1,500
Profit		1,900

Mix	A	B	C	D
Contribution	` 1,500	1,700	900	1,900

The profit level among the given various mixes, the mix (d) is able to generate highest volume of profit over the others.

Determining optimum level of operations: Under this method, the level has to be found out which is having lesser selling price, cost of operations and greater profits known as optimum level of operations

12.3 Make or Buy Decisions

The firms, which are routinely in need of spares, accessories are bought from the outsiders instead of any production or manufacturing, though the requirement is at regular intervals. Most of the automobile manufacturers are usually buying the components from outside instead of producing them on their own. The Maruti Udyog Ltd. had given a contract to the Nettur Technical Training Foundation, Bangalore to design the tool for the panel and to manufacture regularly to the tune of the orders.

The leading four wheeler manufacture in India is buying the panel from the NTTF on contract basis in stead of manufacturing.

Did u know? ***Why don't they manufacture in spite of buying them from the NTTF?***

The main reason of buying is cheaper than the production of an article.

Example: The management of a company finds that while the cost of making a component part is ` 20, the same is available in the market at ` 18 with an assurance of continuous supply.

Give a suggestion whether to make or buy this part. Give also your views in case the supplier reduces the price from ` 18 to ` 16

The cost information is as follows:

	(`)
Material	7.00
Direct Labour	8.00
Other variable expenses	2.00
Fixed expenses	3.00
Total	` 20.00

The first point to be found out that the contribution of the transaction. The cost of manufacturing should be compared with the price of the product which is available in the market.

To find out the worth of the transactions, first the cost of manufacturing should be found out

Notes

	(`)
Material	7.00
Direct Labour	8.00
Other variable expenses	2.00
Total	17.00

The cost of manufacturing a component is ` 17.00. While calculating the cost of manufacturing a component, the fixed expenses was not considered. The fixed expenses were not considered for computation. Why?

The costs will be incurred irrespective of the production status of the firm; for which the expenses should not be added.

If the company manufactures the product/component at ` 17 which will facilitate to book profit
5. 1 from the price of ` 18 which is available from the

market. The next stage is decision criteria.

Worth of Production: Cost of the production < Price of the product available in the market.

The firm is better advised to take the course of production rather than purchase of the product.

Worth of Purchase: Cost of the production > Price of the product available in the market

The product available in the market is dame cheaper than the manufacturing of a product. The firm is better advised to buy the product rather than the manufacturing of a product. If the product price comes down to the price of ` 16 facilitates the firm to save ` 1 from the cost of manufacturing.

Task A refrigerator manufacturer purchases a certain component @ `50 per Chapter. If he manufactures the same product he has to incur a fixed cost of `20,000 and variable cost per Chapter of `40. When can the manufacturer make on his own or when he can buy from outside?

Self Assessment

Fill in the blanks:

6. In the market, dealership is offered by the various companies to the individual intermediaries in promoting the ……………… of products.
7. The firms, which are routinely in need of spares, accessories are bought from the outsiders instead of any ………………, though the requirement is at regular intervals.
8. Under sales mix, the level has to be found out which is having lesser selling price, cost of operations and greater profits known as ……………… of operations.

12.4 Own or Hire

Marginal costing helps in taking the decisions regarding the capital investment. Marginal costing helps to take the decisions for owning the capital asset or hire the asset.

Notes

Example: If company X needs a machinery for a specific project and after that project there is no use of the machinery then company can decide to hire the machinery for that project.

A company has its own trucks for transporting raw materials and finished products from one place to another. It seeks to replace these trucks by keeping public carriers. In making this decision, of course, the depreciation of the trucks is not to be considered but the management should take into account the present expenditure on fuel, salary to drive and maintenance.

Self Assessment

Fill in the blanks:

9. Marginal costing helps in taking the decisions regarding the ………………
10. Marginal costing helps to take the decisions for owning the capital asset or ……………… the asset.

12.5 Shut Down or Continue

As discussed earlier, marginal costing technique helps in deciding the profitability of a product. It provides the information in a manner that tells us how much each product contributes towards fixed cost and profit; the product or department that gives least contribution should be discarded except for a short period. If the management is to choose some product out of the given ones, then the products giving the highest contribution should be chosen and those giving the least should be discontinued.

Example: A company manufactures three products X, Y and Z. It has prepared the following budget for the year 2003:

	Total	**Product X**	**Product Y**	**Product Z**
Sales	4,20,000	80,000	2,50,000	90,000
Factory Cost				
Variable	2,90,500	40,000	1,74,000	76,500
Fixed	29,500	5,000	16,000	8,000
Production Cost	3,20,000	45,000	1,90,000	85,000
Selling and Administration Cost				
Variable	35,000	14,000	14,000	7,000
Fixed	8,000	3,500	3,200	1,300
Total Cost	3,63,000	62,500	2,07,200	93,300
Profit	57,000	17,500	42,800	– 3,300 (loss)

On the basis of above information, we understand that the company management is thinking to discontinue with the production of product Z which has shown loss. The management seeks your expert opinion on the issue before they take a final decision. You are required to comment on the relative profitability of the products.

Solution:

Notes

The information contained in the budget may be rearranged in the form of a marginal cost statement as shown given.

Marginal Cost Statement

Particulars	Total	Product X	Product Y	Product Z
Sales	4,20,000	80,000	2,50,000	90,000
Variable Costs:				
Factory Cost	2,90,500	40,000	1,74,000	76,500
Selling and Admn. Cost	35,000	14,000	14,000	7,000
Total Marginal Cost	3,25,500	54,000	1,88,000	83,500
Contribution	94,500	26,000	62,000	6,500
Fixed Costs	37,500	8,500	19,200	9,800
Profit	57,000	17,500	42,800	–3,300 (loss)
Profit-Volume Ratio	22.5%	32.5%	24.8%	7.2%

Profit-Volume (P/V) ratio is the ratio of contribution to sales. It is expressed in terms of percentage. After preparing the above statement and analysis, we can make the following recommendations:

As discussed in the marginal cost statement, the contribution of product Z is ` 6,500 which goes toward the recovery of fixed cost of ` 9,800. If the production of product Z is discontinued, the company will lose the marginal contribution of ` 6,500 while it will have to incur the fixed cost of

11. 9,800. The total profit of ` 57,000 will be reduced to ` 50,500 (57,000 - 6,500). Thus, it is advisable that the production of Z should not be discontinued. As regards the relative profitability, product X is more profitable than Y and Z as the P/V ratio in this case is highest. The production and sales of product X should, therefore, be encouraged.

Self Assessment

Fill in the blanks:

12. Marginal costing technique helps in deciding the ……………… of a product.
13. If the management is to choose some product out of the given ones, then the products giving the highest ……………… should be chosen and those giving the least should be discontinued.
14. ……………… is the ratio of contribution to sales.
15. A ……………… decision is possible when the various factors, and relationships between them, are measurable.
16. A ……………… involves the act of choice and the alternative chosen out of the available alternatives.
17. ……………… describes the process by which a course of action is selected as the way to deal with a specific problem.
18. If a machinery is required for a specific project and after that project there is no use of the machinery then company can decide to ……………… the machinery for that project.

Notes

12.6 Summary

Marginal costing technique helps in determining the most profitable relationship between costs, prices and volume of business.

Following are the important areas of decision-making or applications of marginal costing:

Fixation of Price,

Decision to Make or Buy,

Selection of a Profitable Product Mix,

Decision to Accept a Bulk Order,

Closure of a Department or Discontinuing a Product,

Maintaining a Desired Level of Profit, and

Evaluation of Performance

12.7 Keywords

Decision-making: Decision-making describes the process by which a course of action is selected as the way to deal with a specific problem.

Desired Profit: It is a profit level desired by the firm to earn at the given level of sales volume.

Fixed Cost: It is a cost which is fixed or remains the same for irrespective level of production.

Key Factor: Factor of influence on the component of contribution.

Marginal Cost: Change occurred in the cost of operations due to change in the level of production.

12.8 Review Questions

19. A refrigerator manufacturer purchases a certain component @ ` 50 per Chapter. If he manufactures the same product he has to incur a fixed cost of ` 20,000 and variable cost per Chapter is ` 40 when can the manufacturer make on his own or when he can buy from outside?

    When the requirements is ` 5,000 Chapters, will you advise to make or buy?

20. From the following data, which product would you recommend to be manufactured in a factory, time being the key factor?

Particulars	Per Chapter of Product A (`)	Per Chapter of Product B (`)
Direct Material	24	14
Direct Labour @ ` 1per hr	2	3
Variable overhead ` 2 per hr	4	6
Selling price	100	110
Standard time to produce	2 Hours	3 Hours

3. The following particulars are obtained from costing records of a factory:

Particulars	Per Chapter of Product A (`)	Per Chapter of Product B (`)
Direct Material ` 20 per Kg	80	320
Direct Labor @ ` 10 per hr	100	200
Variable overhead	40	80
Selling price	400	1,000
Total fixed overheads	` 30,000	

Notes

4. A factory engaged in manufacturing plastic buckets is working at 40% capacity and produces 10,000 buckets per annum.

The present cost break up for bucket is as under

Material	` 10
Labour	` 3
Overheads	` 5(60% fixed)

The selling price is ` 20 per bucket.

If it is decided to work the factory at 50% capacity, the selling price falls by 3%. At 90% capacity the selling price falls by 5% accompanied by a similar fall in the prices of material.

You are required to calculate the profit at 50% and 90% capacities and also calculate break even point for the same capacity productions.

21. Examine the various kinds of managerial decisions.

22. The management of a company is very much perturbed by the result of product O which is one of the three products. The cost and other data are given below:

Products →	M (`)	N (`)	O (`)	Total
Sales	1,20,000	60,000	90,000	2,70,000
Materials	15,000	7,500	15,000	37,500
Labour	6,000	7,500	24,000	37,500
Variable overheads	15,000	7,500	30,000	52,500
Fixed overheads	30,000	15,000	30,000	75,000
Total cost	66,000	37,500	99,000	2,02,500
Analysis of Fixed expenses: Identified	21,000	12,000	24,000	57,000
General	–	–	–	18,000

The product O has an assured market and no cost reduction is possible. Present these data in a suitable form and recommend whether or not product O should be discontinued?

(***Ans.*** Closure of product O will save ` 3,000)

7. A confectioner of sweets markets three products, all of which require sugar. His average monthly sales, cost of sales and sugar consumption are as follows:

Products →	X	Y	Z	Total
Sales (`)	10,000	12,000	8,000	30,000
Variable cost of sales (`)	6,000	8,000	5,600	19,600
Sugar needed (Kg.)	500	800	240	1,540

Due to government restrictions his sugar quota has been reduced to 1,405 Kg. per month. Suggest a suitable product mix.

(***Ans.*** Product X ` 10,000, Product Y ` 9,975 and Product Z ` 8,000)

8. Company manufacturing electric motors at a price of ` 6,900 each, made up as under:

	Cost in (`)
Direct material	3,200
Direct wages	400

Notes

Variable overheads	1,000
Fixed overheads	200
Depreciation	200
Variable selling overheads	100
Royalty	200
Profit	1,000
Central excise duty	600
Total	6,900

(a) A foreign buyer has offered to buy 200 such motors at ` 5,000 each. As a cost accountant of the company would you advise acceptance of the offer?

(b) What should the company quote for a motor to be purchased by a company under the same management if it would be at cost.

(*Ans.* (a) Accept it because incremental profit is ` 40,000 and (b) ` 5,200)

23. The management of a company finds that while the cost of making a component part is ` 10, the same is available in the market at ` 9 with an assurance of continuous supply.

Give a suggestion whether to make or buy this part. Also give your views in case the supplier reduces the price from ` 9 to ` 8.

The cost information is as follows:

	(`)
Material	3.50
Direct labour	4.00
Other variable expenses	1.00
Fixed expenses	1.50
Total	10.00

24. The following information has been made available from the cost records of Chaptered Automobiles Ltd. manufacturing spare parts.

Direct Materials	**Per Chapter**
X	` 8
Y	` 6
Direct wages	
X	24 hours at 25 paise per hour
Y	16 hours at 25 paise per hour
Variable overheads	150% of wages
Fixed overheads	` 750
Selling price	
X	` 25
Y	` 20

The directors want to be acquainted with the desirability of adopting any one of the following alternative sales mixes in the budget for the next period.

(a) 250 Chapters of X and 250 Chapters of Y

(b) 400 Chapters of Y only

(c) 400 Chapters of X and 100 Chapters of Y

(d) 150 Chapters of X and 350 Chapters of Y.

State which of the alternative sales mixes you would recommend to the management?

Answers: Self Assessment

1. cost and revenue
2. alternative
3. additional costs
4. sale
5. production or manufacturing
6. optimum level
7. capital investment
8. hire
9. profitability
10. contribution
11. Profit-Volume (P/V) Ratio
12. quantitative
13. decision
14. Decision-making

25. hire

12.9 Further Readings

Books

B.M. Lall Nigam and I.C. Jain, *Cost Accounting*, Prentice-Hall of India (P) Ltd.

Hilton, Maher and Selto, *Cost Management*, 2nd Edition, Tata McGraw-Hill Publishing Company Ltd.

M.N. Arora, *Cost and Management Accounting*, 8th Edition, Vikas Publishing House (P) Ltd.

M.P. Pandikumar, *Management Accounting*, Excel Books.

Online links

www.allbusiness.com

www.internalaccounting.com