UNIT 8 COST CONCEPTS AND ANALYSIS I

Objectives
After going through this unit, you should be able to:
- **understand** some of the cost concepts that are frequently used in the managerial decision making process;
- **differentiate** between different cost concepts;
- **distinguish** between economic costs and accounting costs.

Structure
8.1 Introduction
8.2 Actual Costs and Opportunity Costs
8.3 Explicit and Implicit Costs
8.4 Accounting Costs and Economic Costs
8.5 Direct Costs and Indirect Costs
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8.1 **INTRODUCTION**

The analysis of cost is important in the study of managerial economics because it provides a basis for two important decisions made by managers: (a) whether to produce or not, and (b) how much to produce when a decision is taken to produce.

In this Unit, we shall discuss some important cost concepts that are relevant for managerial decisions. We analyse the basic differences between these cost concepts and also, examine how accountants and economists differ on treating different cost concepts. We will continue the discussion on cost concepts and analysis in Unit 9.

8.2 **ACTUAL COSTS AND OPPORTUNITY COSTS**

**Actual costs** are those costs, which a firm incurs while producing or acquiring a good or service like raw materials, labour, rent, etc. Suppose, we pay Rs. 150 per day to a worker whom we employ for 10 days, then the cost of labour is Rs. 1500. The economists called this cost as accounting costs because traditionally accountants have been primarily connected with collection of historical data (that is the costs actually incurred) in reporting a firm’s financial position and in calculating its taxes. Sometimes the actual costs are also called **acquisition costs** or **outlay costs**.

On the other hand, **opportunity cost** is defined as the value of a resource in its next best use. For example, Mr. Ram is currently working with a firm and earning Rs. 5 lakhs per year. He decides to quit his job and start his own small business. Although, the accounting cost of Mr. Ram’s labour to his own
The earnings Mr. Ram forgoes by working for his own firm is Rs. 5 lakhs per year. Therefore, the opportunity cost is the earnings he foregoes by working for his own firm. One may ask you that whether this opportunity cost is really meaningful in the decision making process. As we see that the opportunity cost is important simply because, if Mr. Ram cannot recover this cost from his new business, then he will probably return to his old job.

Opportunity cost can be similarly defined for other factors of production. For example, consider a firm that owns a building and therefore do not pay rent for office space. If the building was rented to others, the firm could have earned rent. The foregone rent is an opportunity cost of utilizing the office space and should be included as part of the cost of doing business. Some times these opportunity costs are called as *alternative costs*.

### 8.3 Explicit and Implicit Costs

**Explicit costs** are those costs that involve an actual payment to other parties. Therefore, an explicit cost is the monitory payment made by a firm for use of an input owned or controlled by others. Explicit costs are also referred to as accounting costs. For example, a firm pays Rs. 100 per day to a worker and engages 15 workers for 10 days, the explicit cost will be Rs. 15,000 incurred by the firm. Other types of explicit costs include purchase of raw materials, renting a building, amount spent on advertising etc.

On the other hand, **implicit costs** represent the value of foregone opportunities but do not involve an actual cash payment. Implicit costs are just as important as explicit costs but are sometimes neglected because they are not as obvious. For example, a manager who runs his own business foregoes the salary that could have been earned working for someone else as we have seen in our earlier example. This implicit cost generally is not reflected in accounting statements, but rational decision-making requires that it be considered. Therefore, an implicit cost is the opportunity cost of using resources that are owned or controlled by the owners of the firm. The implicit cost is the foregone return, the owner of the firm could have received had they used their own resources in their best alternative use rather than using the resources for their own firm’s production.

### 8.4 Accounting Costs and Economic Costs

For a long time, there has been a considerable disagreement among economists and accountants on how costs should be treated. The reason for the difference of opinion is that the two groups want to use the cost data for dissimilar purposes. Accountants always have been concerned with firms’ financial statements. Accountants tend to take a retrospective look at firms finances because they keep trace of assets and liabilities and evaluate past performance. The **accounting costs** are useful for managing taxation needs as well as to calculate profit or loss of the firm. On the other hand, economists take forward-looking view of the firm. They are concerned with what cost is expected to be in the future and how the firm might be able to rearrange its resources to lower its costs and improve its profitability. They must therefore be concerned with opportunity cost. Since the only cost that matters for business decisions are the future costs, it is the **economic costs** that are used for decision-making.

Accountants and economists both include explicit costs in their calculations. For accountants, explicit costs are important because they involve direct
payments made by a firm. These explicit costs are also important for economists as well because the cost of wages and materials represent money that could be useful elsewhere.

We have already seen, while discussing actual costs and opportunity costs, how economic cost can differ from accounting cost. In that example we have seen how a person who owns business chooses not to consider his/her own salary. Although, no monitory transaction has occurred (and thus would not appear as an accounting cost), the business nonetheless incurs an opportunity cost because the owner could have earned a competitive salary by working elsewhere.

Accountants and economists use the term ‘profits’ differently. Accounting profits are the firm’s total revenue less its explicit costs. But economists define profits differently. Economic profits are total revenue less all costs (explicit and implicit costs). The economist takes into account the implicit costs (including a normal profit) in addition to explicit costs in order to retain resources in a given line of production. Therefore, when an economist says that a firm is just covering its costs, it is meant that all explicit and implicit costs are being met, and that, the entrepreneur is receiving a return just large enough to retain his/her talents in the present line of production. If a firm’s total receipts exceed all its economic costs, the residual accruing to the entrepreneur is called an economic profit, or pure profit.

**Example of Economic Profit and Accounting Profit**

Mr. Raj is a small storeowner. He has invested Rs. 2 lakhs as equity in the store and inventory. His annual turnover is Rs. 8 lakhs, from which he must deduct the cost of goods sold, salaries of hired staff, and depreciation of equipment and building to arrive at annual profit of the store. He asked help of a friend who is an accountant by profession to prepare annual income statement. The accountant reported the profit to be Rs. 1.5 lakhs. Mr. Raj could not believe this and asked the help of another friend who is an economist by profession. The economist told him that the actual profit was only Rs. 75,000 and not Rs. 1.5 lakhs. The economist found that the accountant had underestimated the costs by not including the implicit costs of time spent as Manager by Mr. Raj in the business and interest on owner’s equity. The two income statements are shown below:

<table>
<thead>
<tr>
<th>Income statement prepared by accountant</th>
<th>Income statement prepared by economist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Rs. 8,00,000</td>
<td>Sales Rs. 8,00,000</td>
</tr>
<tr>
<td><strong>Explicit costs</strong></td>
<td><strong>Explicit costs</strong></td>
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<tr>
<td>Cost of goods sold Rs. 6,00,000</td>
<td>Cost of goods sold Rs. 6,00,000</td>
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<tr>
<td>Salaries Rs. 40,000</td>
<td>Salaries Rs. 40,000</td>
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<td>Depreciation Rs. 10,000</td>
<td>Depreciation Rs. 10,000</td>
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<td>Depreciation Rs. 6,50,000</td>
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<td><strong>Implicit costs</strong></td>
<td><strong>Implicit costs</strong></td>
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<tr>
<td>Salary to owner Manager Rs. 50,000</td>
<td>Salary to owner Manager Rs. 50,000</td>
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<td>Interest on owners equity Rs. 25,000</td>
<td>Interest on owners equity Rs. 25,000</td>
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<td></td>
<td>Interest on owners equity Rs. 75,000</td>
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**Controllable and Non-Controllable costs**

Controllable costs are those which are capable of being controlled or regulated by executive vigilance and, therefore, can be used for assessing executive efficiency. Non-controllable costs are those, which cannot be subjected to administrative control and supervision. Most of the costs are controllable, except, of course, those due to obsolescence and depreciation. The
level at which such control can be exercised, however, differs: some costs (like, capital costs) are not controllable at factory’s shop level, but inventory costs can be controlled at the shop level.

**Out-of-pocket costs and Book costs**

*Out of pocket costs* are those costs that improve current cash payments to outsiders. For example, wages and salaries paid to the employees are out-of-pocket costs. Other examples of out-of-pocket costs are payment of rent, interest, transport charges, etc. On the other hand, *book costs* are those business costs, which do not involve any cash payments but for them a provision is made in the books of account to include them in profit and loss accounts and take tax advantages. For example, salary of owner manager, if not paid, is a book cost. The interest cost of owner’s own fund and depreciation cost are other examples of book cost.

The out-of-pocket costs are also called explicit costs and correspondingly book costs are called implicit or imputed costs. Book costs can be converted into out-of-pocket costs by selling assets and leasing them back from buyer. Thus, the difference between these two categories of cost is in terms of whether the company owns it or not. If a factor of production is owned, its cost is a book cost while if it is hired it is an out-of-pocket cost.

**Past and Future costs**

*Past costs* are actual costs incurred in the past and they are always contained in the income statements. Their measurement is essentially a record keeping activity. These costs can only be observed and evaluated in retrospect. If they are regarded as excessive, management can indulge in post-mortem checks just to find out the factors responsible for the excessive costs, if any, without being able to do anything about reducing them.

*Future costs* are those costs that are likely to be incurred in future periods. Since the future is uncertain, these costs have to be estimated and cannot be expected to be absolutely correct figures. Past costs serve as the basis for projecting future costs. In periods of inflation and deflation, the two cost concepts differ significantly.

Managerial decisions are always forward looking and therefore they require estimates of future costs and not past costs. Unlike past costs, future costs are subject to management control and they can be planned or avoided. If the future costs are considered too high, management can either plan to reduce them or find out ways and means to meet them. Management needs to estimate future costs for a variety of reasons such as expense control pricing, projecting future profits and capital budgeting decisions. When historical costs are used instead of explicit projections, the assumption is made that future costs will be the same as past costs. In periods of significant price variations, such an assumption may lead to wrong managerial decisions.

**Historical and Replacement costs**

The *historical cost* of an asset is the actual cost incurred at the time, the asset was originally acquired. In contrast to this, *replacement cost* is the cost, which will have to be incurred if that asset is purchased now. The difference between the historical and replacement costs results from price changes over time. Suppose a machine was acquired for Rs. 50,000 in the year 1995 and the same machine can be acquired for Rs. 1,20,000 in the year 2001. Here Rs. 50,000 is the historical or original cost of the machine and Rs. 1,20,000 is its replacement cost. The difference of Rs.70,000 between the two costs has resulted because of the price change of the machine during the
Historical costs and replacement costs represent two ways of reflecting the costs of assets in the balance sheet and establishing the costs that are used to determine net income. The assets are usually shown in the conventional accounts at their historical costs. These must be adjusted for price changes for a correct estimate of costs and profits. Managerial decisions must be based on replacement cost rather than historical costs. The historical cost of an asset is known, for it is actually incurred while acquiring that asset. Replacement cost relates to the current price of that asset and it will be known only if an enquiry is made in the market.

**Private Costs and Social Costs**

A further distinction that is useful to make - especially in the public sector - is between private and social costs. **Private costs** are those that accrue directly to the individuals or firms engaged in relevant activity. **Social costs,** on the other hand, are passed on to persons not involved in the activity in any direct way (i.e., they are passed on to society at large). Consider the case of a manufacturer located on the bank of a river who dumps the waste into water rather than disposing it of in some other manner. While the private cost to the firm of dumping is zero, it is definitely harmful to the society. It affects adversely the people located down current and incur higher costs in terms of treating the water for their use, or having to travel a great deal to fetch potable water. If these external costs were included in the production costs of a producing firm, a true picture of real, or social costs of the output would be obtained. Ignoring external costs may lead to an inefficient and undesirable allocation of resources in society.

**Relevant Costs and Irrelevant Costs**

The **relevant costs** for decision-making purposes are those costs, which are incurred as a result of the decision under consideration. The relevant costs are also referred to as the incremental costs. Costs that have been incurred already and costs that will be incurred in the future, regardless of the present decision are **irrelevant costs** as far as the current decision problem is concerned.

There are three main categories of relevant or incremental costs. These are the **present-period explicit costs,** the opportunity costs implicitly involved in the decision, and the future cost implications that flow from the decision. For example, direct labour and material costs, and changes in the variable overhead costs are the natural consequences of a decision to increase the output level. Also, if there is any expenditure on capital equipments incurred as a result of such a decision, it should be included in full, not withstanding that the equipment may have a useful life remaining after the present decision has been carried out. Thus, the incremental costs of a decision to increase output level will include all present-period explicit costs, which will be incurred as a consequence of this decision. It will exclude any present-period explicit cost that will be incurred regardless of the present decision.

The opportunity cost of a resource under use, as discussed earlier, becomes a relevant cost while arriving at the economic profit of the firm. Many decisions will have implications for future costs, both explicit and implicit. If a firm expects
Production and Cost Analysis

Sunk Costs and Incremental Costs

Sunk costs are expenditures that have been made in the past or must be paid in the future as part of contractual agreement or previous decision. For example, the money already paid for machinery, equipment, inventory and future rental payments on a warehouse that must be paid as part of a long term lease agreement are sunk costs. In general, sunk costs are not relevant to economic decisions. For example, the purchase of specialized equipment designed to order for a plant. We assume that the equipment can be used to do only what it was originally designed for and cannot be converted for alternative use. The expenditure on this equipment is a sunk cost. Also, because this equipment has no alternative use its opportunity cost is zero and, hence, sunk costs are not relevant to economic decisions. Sometimes the sunk costs are also called as non-avoidable or non-escapable costs.

On the other hand, incremental cost refers to total additional cost of implementing a managerial decision. Change in product line, change in output level, adding or replacing a machine, changing distribution channels etc. are examples of incremental costs. Sometimes incremental costs are also called as avoidable or escapable costs. Moreover, since incremental costs may also be regarded as the difference in total costs resulting from a contemplated change, they are also called differential costs.

As stated earlier sunk costs are irrelevant for decision making, as they do not vary with the changes contemplated for future by the management. It is the incremental costs, which are important for decision-making purpose.

Activity 1

1. A graduate from a business school decides to open business and devote his full time to its management. What cost would you assign to his time? Is this implicit or explicit?

2. Why is the historic cost of inventory or capital equipment irrelevant for managerial decision making?

3. Comment on the nature of costs involved in depreciation from both economic and accounting approaches.
8.5 DIRECT COSTS AND INDIRECT COSTS

There are some costs, which can be directly attributed to production of a given product. The use of raw material, labour input, and machine time involved in the production of each unit can usually be determined. On the other hand, there are certain costs like stationery and other office and administrative expenses, electricity charges, depreciation of plant and buildings, and other such expenses that cannot easily and accurately be separated and attributed to individual units of production, except on arbitrary basis. When referring to the separable costs of first category accountants call them the direct, or prime costs per unit. The accountants refer to the joint costs of the second category as indirect or overhead costs. Direct and indirect costs are not exactly synonymous to what economists refer to as variable costs and fixed costs. The criterion used by the economist to divide cost into either fixed or variable is whether or not the cost varies with the level of output, whereas the accountant divides the cost on the basis of whether or not the cost is separable with respect to the production of individual output units. The accounting statements often divide overhead expenses into ‘variable overhead’ and ‘fixed overhead’ categories. If the variable overhead expenses per unit are added to the direct cost per unit, we arrive at what economists call as average variable cost.

Separable Costs and Common Costs

Costs can also be classified on the basis of their traceability. The costs that can be easily attributed to a product, a division, or a process are called separable costs. On the other hand, common costs are those, which cannot be traced to any one unit of operation. For example, in a multiple product firm the cost of raw material may be separable (traceable) product-wise but electricity charges may not be separable product-wise. In a university the salary of a Vice-Chancellor is not separable department-wise but the salary of teachers can be separable department-wise. The separable and common costs are also referred to as direct and indirect costs respectively. The distinction between direct and indirect costs is of particular significance in a multi-product firm for setting up economic prices for different products.

8.6 TOTAL COST, AVERAGE COST AND MARGINAL COST

Total cost (TC) of a firm is the sum-total of all the explicit and implicit expenditures incurred for producing a given level of output. It represents the money value of the total resources required for production of goods and services. For example, a shoe-maker’s total cost will include the amount she/he spends on leather, thread, rent for his/her workshop, interest on borrowed capital, wages and salaries of employees, etc., and the amount she/he charges for his/her services and funds invested in the business.

Average cost (AC) is the cost per unit of output. That is, average cost equals the total cost divided by the number of units produced (N). If TC = Rs. 500 and N = 50 then AC = Rs. 10. Marginal cost (MC) is the extra cost of producing one additional unit. At a given level of output, one examines the additional costs being incurred in producing one extra unit and this yields the marginal cost. For example, if TC of producing 100 units is Rs. 10,000 and the TC of producing 101 units is Rs. 10,050, then MC at N = 101 equals Rs.50.
Marginal cost refers to the change in total cost associated with a one-unit change in output. This cost concept is significant to short-term decisions about profit maximizing rates of output. For example, in an automobile manufacturing plant, the marginal cost of making one additional car per production period would be the labour, material, and energy costs directly associated with that extra car. Marginal cost is that sub-category of incremental cost in the sense that incremental cost may include both fixed costs and marginal costs.

However, when production is not conceived in small units, management will be interested in incremental cost instead of marginal cost. For example, if a firm produces 5000 units of TV sets, it may not be possible to determine the change in cost involved in producing 5001 units of TV sets. This difficulty can be resolved by taking units to significant size. For example, if the TV sets produced is measured to hundreds of units and total cost (TC) of producing the current level of three hundred TV sets is Rs. 15,00,000 and the firm decides to increase the production to four hundred TV sets and estimates the TC as Rs. 18,00,000, then the incremental cost of producing one hundred TV sets (above the present production level of three hundred units) is Rs. 3,00,000.

The total cost concept is useful in break-even analysis and finding out whether a firm is making profit or not. The average cost concept is significant for calculating the per unit profit. The marginal and incremental cost concepts are needed in deciding whether a firm needs to expand its production or not. In fact, the relevant costs to be considered will depend upon the situation or production problem faced by the manager.

### 8.7 FIXED AND VARIABLE COSTS

**Fixed costs** are that part of the total cost of the firm which does not change with output. Expenditures on depreciation, rent of land and buildings, property taxes, and interest payment on bonds are examples of fixed costs. Given a capacity, fixed costs remain the same irrespective of actual output. **Variable costs,** on the other hand, change with changes in output. Examples of variable costs are wages and expenses on raw material.

However, it is not very easy to classify all costs into fixed and variable. There are some costs, which fall between these extremes. They are called **semi-variable costs.** They are neither perfectly variable nor absolutely fixed in relation to changes in output. For example, part of the depreciation charges is fixed, and part variable. However, it is very difficult to determine how much of depreciation cost is due to the technical obsolescence of assets and hence fixed cost, and how much is due to the use of equipments and hence variable cost. Nevertheless, it does not mean that it is not useful to classify costs into fixed and variable. This distinction is of great value in break-even analysis and pricing decisions. For decision-making purposes, in general, it is the variable cost, which is relevant and not the fixed cost.

To an economist the fixed costs are overhead costs and to an accountant these are indirect costs. When the output goes up, the fixed cost per unit of output comes down, as the total fixed cost is divided between larger units of output.

### 8.8 SHORT-RUN AND LONG-RUN COSTS

The **short run** is defined as a period in which the supply of at least one element of the inputs cannot be changed. To illustrate, certain inputs like machinery, buildings, etc., cannot be changed by the firm whenever it so
desires. It takes time to replace, add or dismantle them. **Long run,** on the other hand, is defined as a period in which all inputs are changed with changes in output. In other words, it is that time-span in which all adjustments and changes are possible to realise. Thus, in the short run, some inputs are fixed (like installed capacity) while others are variable (like the level of capacity utilisation); but in the long run all inputs, including the size of the plant, are variable.

**Short-run costs** are the costs that can vary with the degree of utilisation of plant and other fixed factors. In other words, these costs relate to the variation in output, given plant capacity. Short-run costs are, therefore, of two types: fixed costs and variable costs. In the short-run, fixed costs remain unchanged while variable costs fluctuate with output. **Long-run costs,** in contrast, are costs that can vary with the size of plant and with other facilities normally regarded as fixed in the short-run. In fact, in the long-run there are no fixed inputs and therefore no fixed costs, i.e. all costs are variable.

Both short-run and long-run costs are useful in decision-making. Short-run cost is relevant when a firm has to decide whether or not to produce and if a decision is taken to produce then how much more or less to produce with a given plant size. If the firm is considering an increase in plant size, it must examine the long-run cost of expansion. Long-run cost analysis is useful in investment decisions.

**Activity 2**

1. Classify different cost concepts into:
   a. useful for decision making
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   b. not useful for decision making
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2. Give specific examples of:
   a. Direct costs: ..............................................................
   b. Indirect costs: ............................................................
   c. Sunk costs: ..............................................................
   d. Traceable costs: ......................................................
   e. Common costs: ....................................................... 
   f. Implicit costs: ........................................................
   g. Social costs: ...........................................................
   h. Non-controllable costs: ..............................................
3. Give examples to distinguish between ‘fixed overheads’ and ‘variable overheads’.

4. Can all ‘direct costs’ be treated as ‘variable costs’? Explain.

8.9 SUMMARY

Cost concepts are important for decision-making but neither the accounting approach nor the economic approach is completely acceptable when decision-making is involved. Costs must be considered in various ways, depending on the decision at hand. Both traditional economists and traditional accountants have tended to be fairly dogmatic in their definitions of costs. On the other hand, managerial economists want a flexible approach. All the cost concepts need to be considered in such a way so as to help make sound decisions. The decision maker should try to discover the “relevant” costs by asking what costs are relevant to a particular decision at hand, and the decision maker is not necessarily bound by traditional concepts constructed for other purposes.

In this unit the basic cost concepts have been covered to give a fair view about the understanding of costs.

8.10 SELF-ASSESSMENT QUESTIONS

1. Differentiate between accounting costs and economic costs?
2. Take a firm you are working with or know its nature. Make a list of relevant cost concepts from the standpoint of an (a) accountant and (b) economist.
3. What is the significance of opportunity cost in managerial decision-making?
4. What is short run cost analysis? For what type of decisions is it useful?
5. What is long run cost analysis? For what type of decisions is it useful?
6. What are marginal costs and incremental costs? What is the difference between these two cost concepts?
7. A pharmaceutical company has spent Rs. 5 crores on developing and testing a new antibiotic drug. The head of the marketing department now estimates that it will cost Rs. 3 crores in advertising to launch this new product. Total revenue from all future sales is estimated at Rs. 6 crores, and therefore, total costs will exceed revenue by Rs. 2 crores. He recommends that this product be dropped from the firm’s product offerings. What is your reaction?
to this recommendation? The head of the accounting department now indicates that Rs. 3.5 crores of corporate overhead expenses also will be assigned to this product if it is marketed. Does this new information affect your decision? Explain.

8. When Mr. Kapoor’s father gave him a new Truck costing Rs. 30 lakhs. Recently Mr. Kapoor was boasting to some of his friends that his revenues were typically Rs. 1,50,000 per month, while his operating costs (fuel, maintenance, and depreciation) amounted to only Rs. 1,20,000 per month. A truck identical to Mr. Kapoor’s Truck is available on a monthly rent of Rs. 35000. If Mr. Kapoor was driving trucks for someone else, he would earn Rs. 5000 per month.

a. How much are Mr. Kapoor’s explicit costs per month? How much are his implicit costs per month?

b. What is the amount of the opportunity cost of the resources used by Mr. Kapoor each month?

c. Mr. Kapoor is proud of the fact that he is generating a net cash flow of Rs. 30000 (=Rs.1,50,000 – Rs. 1,20,000) per month, since he would only be earning Rs. 5000 per month if he were working for some else. What advise would you give Mr. Kapoor?

8.11 FURTHER READINGS

Adhikary, M (1987), Managerial Economics (Chapter V), Khosla Publishing House, Delhi.


Mehta, P.L. (1997), Managerial Economics: Analysis, Problems and Cases (Chapter 10), Sultan Chand & Sons, New Delhi.