



KLE LAW ACADEMY BELAGAVI

(Constituent Colleges: KLE Society's Law College, Bengaluru, Gurusiddappa Kotambri Law College, Hubballi, S.A. Manvi Law College, Gadag, KLE Society's B.V. Bellad Law College, Belagavi, KLE Law College, Chikodi, and KLE College of Law, Kalamboli, Navi Mumbai)

STUDY MATERIAL

for

MANAGERIAL ECONOMICS

Prepared as per the syllabus prescribed by Karnataka State Law University (KSLU), Hubballi

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This study material is intended to be used as supplementary material to the online classes and recorded video lectures. It is prepared for the sole purpose of guiding the students in preparation for their examinations. Utmost care has been taken to ensure the accuracy of the content. However, it is stressed that this material is not meant to be used as a replacement for textbooks or commentaries on the subject. This is a compilation and the authors take no credit for the originality of the content. Acknowledgement, wherever due, has been provided.

To understand the fundamental concepts of Managerial economics such as, cost principle, equi-marginal principles etc, are introduced with mathematical illustrations for the better appreciation of the subject. The concept of demand with its various hues would be taught using statistical methods. The inevitable aspect of business i.e., 'Competition' is explained with the principles of cost analysis.

Unit – I

Introduction to managerial economics: definition, scope, fundamental concepts. Cost Analysis: incremental cost and revenue principle, time perspective, equi-marginal principles, discounting principle, opportunity cost principle (with mathematical illustrations and problems for opportunity, cost and incremental principle).

Unit – II

Demand analysis and demand forecasting: concept of demand, factors determining demand, laws of demand, and exceptions to the law of demand. Demand forecasting: survey and statistical methods, semi average, moving average and least square methods.

Unit – III

Production and cost analysis: concept of production function, laws of returns to scale, economics of scale. Cost concepts: fixed and variable, total, marginal and average costs, explicit and implicit costs.

Unit – IV

Market analysis: price, demand and supply factors, price determination under different market conditions under: perfect competition, monopoly, oligopoly and monopolistic competition. Introduction to game theory: analysis and equilibrium, pricing policies and practices: meaning and methods, cost plus or make-up pricing, marginal costing (with problems), multiple product pricing, transfer pricing, skimming and penetration price.

Unit – V

Capital budgeting: meaning and significance, technologies, Payback period method and net present value method (theory only).

Reference Books:

1. Managerial Economics– Craig H Peterson and W. Cris Lewis and Sudhir K. Jain
2. Business and Managerial Economics – P. L. Mehta

3. Foundation of Business and Managerial Economics – Prabhakar Shishila
4. Managerial Economics – R. Cauvery & U. K. Sudhanayak
5. Managerial Economics – Varshney R L & Maheshwari K L

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UNIT 1

INTRODUCTION TO MANAGERIAL ECONOMICS

Introduction

Managerial economics as a subject gained popularity in USA after the publication of the book “*Managerial Economics*” by Joel Dean in 1951.

Managerial economics should be thought of as applied microeconomics. It is an application of the part of microeconomics that focuses on the topics that are of greatest interest and importance to manager. These topics include demand, production, cost, pricing, market structure, and government regulation.

Managerial economics and business economics are the two terms, which at the maximum times have been used interchangeably. However, the term managerial economics has become more popular and has overcome the term business economics.

Managerial Economics serves as a connecting link between traditional economics and the decision making sciences' for decision making in business.

The best way to get familiar with managerial economics and decision making is to come face to face with actual problems which requires decision making.

Managerial economics may be defined as the study of economic theories, logic and methodology which are generally used to provide the solution to the problems faced by the managers in the due course of business.

Managerial Economics is (thus) regarded as that part of economic knowledge or economic theories which is used as a means to analyze various business problems for sound business decisions.

Definition

“Business Economics (managerial economics) is the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management.”

-Spencer and Seegelman.

“Managerial economics is a departure from the main stream of economic writings on the theory of the firm.”

-Joel Dean

“Managerial economics is the application of economic theory and methodology to business administration practice.”

-E T Brigham and J L Pappas

“Managerial economics concerned with business efficiency.”

-Christopher I. Savage and John R. Small

Managerial economics is the study of how to direct scarce resources in the way that most efficiently achieves a managerial goal.

Scope of Managerial Economics

There is no general uniform pattern regarding the scope of managerial economics. However, the following areas encompass scope of managerial economics:

i. *Demand analysis and forecasting*

The very reason for the operation of any business firm is the demand for its product in the market. All significant decisions of the firm depends upon the correct estimation in demand analysis managers seeks to collect information about *various factors* which are going to affect demand for a firm's product, *various substitutes* available in the market and *trends* prevailing in the market. All these factors have important bearing on the production schedules.

ii. *Cost analysis*

Whenever managers plan for production, the foremost factors that comes to their mind is the cost of production. Cost analysis facilitates management decisions.

The factor that leads to variations in costs is beyond the control of managers and therefore must be recognized. In the absence of cost estimates one may not be able to properly plan its profits and also not able to determine its pricing policies.

iii. *Production analysis*

Managers while planning for production pays attention to the relation between cost and output, what are the various factors of production which are required to carry on manufacturing, what is the behavior of various costs in relation to the factors, how far we are able to achieve economies of scale.

iv. *Pricing policies*

Pricing is a very important area of managerial economics.

Managers have to spend a lot of time on forecasting and determining the price of products in the various market structures as price acts as a major source of revenue.

There are various methods to determine the prices but the choice of right method is the greatest challenge. Wrong pricing decision will turn the firm out of the market. An accurate pricing decision contributes a lot to the success of a business firm.

v. *Profit management*

The ultimate objective of any economic organization is to earn handsome profits and is considered as the barometer of success. But the future is always uncertain there is uncertainty on account of various factors such as social, political, economic factors which acts as a obstacle in achieving the objective. Thus profit planning and management is regarded as the important area of managerial economics.

vi. *Capital management*

Capital is regarded as the most important resource and also requires greater attention of the managers. Capital expenditure not only has the binding on the present but also on the future profits and once such decisions are taken these are irreversible.

vii. *Advertising*

Since decision making and forward planning is the important areas of managerial economics, therefore the managers have to plan many things about the product they are going to launch in the market. The various activities in this regard are its *design, shape, quantity, deciding about the marketing of good* etc. In this context advertising is important area of managerial economics.

viii. *Environmental issues*

There are many areas of macroeconomics which also becomes part of managerial economics, since the business organization can't work in isolation. These areas are related to general business, social, political and demographic environment in which a business enterprise works. All these issues have great bearing on business activities.

ix. *Business cycles*

Business cycles also seem to affect business decisions.

Business cycles are regular fluctuations in economic activities in the country.

The various phases that constitute business cycle are *depression*, *recovery*, *boom* and *recession*. Therefore managers have to modify their plans according to the phase through which the business is passing out.

Fundamental concepts

i. *Principle of incremental cost and revenue*

Introduction

Incremental costs are the added costs of a change in the level or nature of activity. Incremental costs refer to any kind of change: adding a new product, changing distribution channels, adding new machinery. Incremental cost can be defined as the change in total cost consequent upon a decision.

Incremental costs are not the same as marginal costs. It simply measures the difference between the old and new total costs. Marginal cost has a little meaning. It refers to the cost of an added unit of output. It is per unit cost of the added units. Incremental costs are more flexible than the marginal costs because incremental costs refer to any kind of change, while marginal costs are calculated for unit changes in output.

Incremental costs appear to be more relevant in decision-making at the firm level. Incremental costs may be computed by employing the formula:

$$C=C_2-C_1=IC$$

Where: IC = incremental costs

C_2 = new total costs

Similarly, marginal costs may be computed by using the following formula:

$$MC = \frac{C_2 - C_1}{Q_2 - Q_1}$$

$$= \frac{\Delta C}{\Delta Q}$$

$$= \frac{dC}{dQ}$$

Where: MC = marginal cost
 C_2 = new total cost
 C_1 = old total costs
 Q_2 = new total output
 Q_1 = old total output

Incremental revenue can be defined as the change in total revenue resulting from a (cost) decision. The formula for incremental revenue is

$$IR = R_2 - R_1 = \Delta R$$

Where: IR = incremental revenue
 R_2 = new total revenue
 R_1 = old total revenue
 Δ = 'change in'

Incremental revenue concept is akin to the marginal revenue concept of economic theory. But there exists some difference between the two. Marginal revenue means the addition made to the total revenue by selling an additional or extra unit of output. It shows the change in total revenue when one more or one less unit is sold. In other words, marginal revenue is the addition to the total revenue per unit of output change.

It is derived by employing the following formula.

$$MR = \frac{R_2 - R_1}{Q_2 - Q_1} = \frac{\Delta R}{\Delta Q} = \frac{dR}{dQ}$$

Where:

MR = marginal revenue

R₂ = new total revenue

R₁ = old total revenue

Q₂ = new quantity of output sold

Q₁ = old quantity of output sold

‘d’ or ‘Δ’ indicate ‘change in’

R - Revenue, Q – Output

Example

The difference between the incremental revenue and the marginal revenue will be clear from the following example.

Suppose the price of a commodity falls from Rs. 10 per unit to Rs. 8 per unit. As a result, sales increase from 1,000 units to 1,500 units. In this case, incremental and marginal revenues can be calculated as follows:

$$IR = R_2 - R_1$$

$$= (\text{Rs. } 8 \times 1,500 \text{ units}) - (\text{Rs. } 10 \times 1,000 \text{ units})$$

$$= \text{Rs. } 12,000 - \text{Rs. } 10,000$$

$$IR = \text{Rs. } 2,000$$

$$MR = \frac{R_2 - R_1}{Q_2 - Q_1}$$

$$= \frac{\text{Rs. } 12,000 - \text{Rs. } 10,000}{(1,500 - 1,000) \text{ Units}}$$

$$= \frac{2,000}{500} = Rs. 4$$

$MR = Rs. 4$

Though incremental reasoning of managerial economics is closely related to the managerial reasoning of economic theory, yet there are differences between these two, both of which demand attention.

- i. Marginal cost and revenues are always defined in terms of unit changes in output whereas incremental costs and revenues are not necessarily restricted to unit changes.

The marginal analysis enables one to have a microscopic examination of such unit-by-unit changes. But the decision-maker may not be interested in such a microscopic analysis of the situation.

- ii. Incremental concepts are more flexible than marginal concepts. Marginal costs and marginal revenues are restricted to the effects of unit changes in output. But decision-making may not be concerned with changes in output at all.

Example of incremental cost vs. incremental revenue

Suppose that you have a business that manufactures smart phones and expect to sell 20,000 units. It costs you Rs. 100 to manufacture each Smartphone, and your selling price per Smartphone is Rs. 300.

Incremental cost:

You calculate your incremental cost by multiplying the number of Smartphone units with the manufacturing cost per Smartphone unit.

So, in this case, you will have:

$$20,000 \times 100 = 2,000,000$$

So, incremental cost is Rs. 2,000,000.

Incremental revenue:

You calculate your incremental revenue by multiplying the number of Smartphone units with the selling price per Smartphone unit.

So, you will have:

$$20,000 \times 300 = 6,000,000 \square$$

So, incremental revenue is Rs. 6,000,000.

When you compare the two, it is clear that the incremental revenue is higher than the incremental cost. By subtracting the incremental cost from the incremental revenue, you arrive at a profit of Rs. 4,000,000.

ii. Principle of time perspective

Managerial economists are also concerned with the *short run* and the *long run* effects of decisions on revenues as well as costs. The very important problem in decision making is to maintain the right balance between the long run and short run considerations. The concept of time element was introduced by *Alfred Marshall* in his the theory of value.

Factors of production

Land: All the gifts of nature: soil, air, sun, water, forests, mountains, mines, seas, etc.

Labour: Essentials of labour: human work, physical or mental work, work done for income or reward.

Capital: All man-made means of production, like machines, tools, buildings, etc.

Entrepreneur: Functions: risk bearer, organizer of other factors (land, labour and capital) of production, controller of business, pays factor rewards.

Distinction

Basis	Short run	Long run
Meaning	It is a time period which is less than the minimum required to bring about changes in fixed factors	It refers to time period in which all factors of production can be changed
Output	Output can only be increased by changing the quantity of variable factors.	Output can be increased by making changes in the quantity of both fixed as well as variable factor inputs.
Classification	Factors of production here can be grouped into two categories: i) fixed factors, ii) variable factors.	In the long period, the distinction between the fixed and the variable factors disappears.
Effects on price	Demand plays a dominant role in the determination of price of a commodity.	Supply can be adjusted according to any change in demand. So demand and supply play equal role in price determination.

Short-run costs

A fixed cost (F) is a cost that does not vary with the level of output. Fixed costs, which include expenditures on land, office space, production facilities, and other overhead expenses, cannot be avoided by reducing output and must be incurred as long as the firm stays in business.

A variable cost (VC) is a cost that changes as the quantity of output changes. Variable costs are the costs of variable inputs, which are inputs that the firm can adjust to alter its output level, such as labor and materials.

Illustration 1

Output, q	Fixed Cost, F	Variable Cost, VC	Total Cost, C
0	48	0	48
1	48	25	73
2	48	46	94
3	48	66	114
4	48	82	130
5	48	100	148
6	48	120	168
7	48	141	189
8	48	168	216
9	48	198	246
10	48	230	278

Fixed cost: cost on land, office space, production facilities, and other overhead expenses.

Variable cost: cost on labor and materials.

Long-run costs

In the long run, the firm adjusts all its inputs so that its cost of production is as low as possible.

The firm can change its plant size, design and build new machines, and otherwise adjust inputs that were fixed in the short run.

Although firms may incur fixed costs in the long run, these fixed costs are avoidable (rather than sunk, as they are in the short run).

Illustration 2

Output, q	Labour (Units)	Capital (Units)	Total cost
100	10	7	120
200	12	8	140
300	20	10	200
400	30	15	300
500	40	22	420
600	52	30	560
700	60	42	720

Fixed factor: capital

Variable factor: labour

An example:

Suppose there is a firm with a temporary idle capacity. An order for 5000 units comes to management's attention. The customer is willing to pay Rs 4/- unit or Rs. 20000/- for the whole lot but not more. The short run incremental cost (ignoring the fixed cost) is only Rs. 3/-. Therefore the contribution to overhead and profit is Rs.1/- per unit (Rs. 5000/- for the lot).

An analysis:

The following are the long run repercussions if the order is to be taken into account:

- i. If the management commits itself with too much of business at lower price or with a small contribution it will not have sufficient capacity to take up business with higher contribution.

- ii. If the other customers come to know about this low price, they may demand a similar low price. Such customers may complain of being treated unfairly and feel discriminated against.

Conclusion

In the above example it is therefore important to give due consideration to the time perspectives. “a decision should take into account both the short run and long run effects on revenues and costs and maintain the right balance between long run and short run perspective”.

iii. Principle of equi-marginal satisfaction and productivity

Another important principle of economics is Equi-Marginal principle. It is also called principle of equi-marginal satisfaction and productivity. Originally the concept is used in relation to consumption. The Equi marginal principle states that a consumer will be in equilibrium when the marginal utilities of various commodities consumed by him are equal. This principle is also known as principle of maximum satisfaction. The law of equi-marginal principle has been applied to the allocation of scarce resources among their alternative uses with a view to maximizing profit in case a firm carries out more than one business activity. According to this principle, an input should be allocated in such a manner that the value added by the last unit of the input is the same in all uses. Hence, this principle provides a basis for maximum exploitation of all the productive resources of a firm so that the profitability of the firm may be maximized.

The Equi-marginal principle can be applied only where

- 1) Firms have limited funds available for investment
- 2) Resources have alternative uses
- 3) The investment in various alternative uses is subject to diminishing marginal productivity or returns.

Let us consider a case in which the firm is involved in four activities i.e. activity W, activity X, activity Y, activity Z. All these activities require the services of labour. The firm can increase any one of the activities by employing more labour, but only at the cost of other activities. In this case, the firm

allocates labour for each of the activity in such a manner that the value of the marginal product is equal in all activities.

$$VMP_w = VMP_x = VMP_y = VMP_z$$

Where 'L' indicates labour and W,X,Y,Z represent the activities, that is, the value of the marginal product of labour employed in a is equal to the value of the marginal product of the labour employed in X, and so on. If the firm finds that the value of the marginal product is greater in one activity than another, the firm must realize the fact that an optimum has not been achieved.

The equi-marginal principle can be applied in different areas of management:

- 1) It is used in budgeting. The objective is to allocate resources where they are most productive. It can be used for eliminating waste in useless activities. The management can accept investments with high rates of return so as to ensure optimum allocation of capital resources.
- 2) The equi-marginal principle can also be applied in multiple product pricing. A multi product firm will reach equilibrium when the marginal revenue obtained from a product is equal to that of another product or products.
- 3) The Equi-marginal principle may also be applied in allocating research expenditures.

iv. Principle of discounting

It is a fundamental principle of economics that the worth of a rupee receivable tomorrow is lesser than that of a rupee available today. As it is mentioned in the time perspective principles, if the decision affect the cost and revenue in the long run, therefore all costs and revenue must be discounted to the present values before valid comparison of alternatives is possible because people generally consider a rupee tomorrow to be worth less than a rupee today. This is also implied by the common saying that a bird in hand is worth than two in the bush. Anybody will prefer Rs. 1000 today to Rs. 1000 next year. There are two main reasons for this:

- 1) The future is uncertain
- 2) There is risk factor involved in the future.

Discounting can be defined as a process used to transform future rupees into an equivalent number of present rupees. This is so because a rupee tomorrow to be worth less than a rupee today. Money actually

has time value. For example, Rs. 5000 invested at 10% will be equivalent to Rs.5500 next year. Hence, the timing of receipt of an amount should be duly taken into consideration in the solution of a particular problem relating to investment.

v. *Principle of opportunity cost*

While taking decision in relation to any business activity we have to take into consideration various alternatives. In Managerial economics, the opportunity cost is useful in decision involving a choice between different alternative courses of action. The opportunity cost of any decision is the sacrifice of the next best alternative course of action available to any firm. If we don't have to make any sacrifice then the opportunity cost is zero. Opportunity cost, therefore represent the benefits or revenue foregone by pursuing one course of action rather than another.

The concept of opportunity cost implies following things:

- 1) The calculation of opportunity cost involves the measurement of sacrifices made termed as the cost of sacrificed alternatives.
- 2) Sacrifices may be monetary or real.
- 3) The opportunity cost may also be interpreted as the cost of alternative which we have to forego.

Further W.W.Haynes has clarified the meaning of the concept of opportunity cost with the help of following examples:

- The opportunity cost of the funds tied up in one's own business is the interest (or profits corrected for differences in risk) that could be earned on those funds in other ventures.
- The opportunity cost of the effort one puts into his own business is the salary he could earn in other occupations (with a correction for the relative 'psychic income' in the two occupations).
- The opportunity cost of using a machine that is useless for any other purpose is nil. Since its use requires no sacrifice of other opportunities.

From the above examples it is clear that opportunity cost requires the measurement of sacrifice. If there is no sacrifice involved by a decision, there will be no opportunity cost. Though the opportunity cost is not recorded in the books of accounts. It is an important consideration in business decisions.

The importance of opportunity cost is as follows:

- a) It helps in determining the relative prices of goods.
- b) It helps in determining normal remuneration to factors of production.
- c) It helps in proper allocation of resources.

Thus we can say opportunity cost is the cost of next best alternative use. Following are the various examples that illustrate the concept of Opportunity cost:

- The opportunity cost of the capital employed in the business is the interest that could be earned on that capital which may be deposited in the bank.
- The opportunity cost of the time any person devotes to his own business is the salary he could earn by being employed elsewhere.
- The opportunity cost of using a machinery to produce any product is the earnings foregone which may be possible from the production of other products.
- An Ice cream making firm producing vanilla flavour ice cream can also make pineapple flavour Ice Cream; in this case the opportunity cost of making vanilla is the amount of the pineapple ice cream given up.
- The opportunity cost of holding Rs.10000/- as cash in hand for one year is the 8% rate of interest, which would have been earned had the money been kept as fixed deposit in a bank.

Therefore, we can say that opportunity cost of anything is the next best alternative that could be manufactured by the same factors and by the same amount of expenditure. Thus opportunity costs must be considered by the managers before taking any decision for business.

Nature of Managerial Economics:

There are certain chief characteristics of managerial economics, which can help to understand the nature of the subject matter and help in a clear understanding of the following terms:

1) Managerial economics- Positive or Normative:

Positive economics is descriptive in nature. It uses to describe economic activities as they are.

Prof. Lionel Robbins says that economics is a positive science. While normative economics ensures judgments of value. Managerial economics draws from descriptive economics and tries to pass judgments of value in the context of the firm. Managerial economics is mainly normative in nature.

This nature of Managerial Economics can be illustrated with the help of one example. When the patient goes to the doctor, he used to describe the problem he is suffering from. After listening to the problem of patient and using his knowledge doctor suggest or prescribe him the medicine to cure his disease. Same is the case with Managerial economics it is descriptive as well as prescriptive.

2) *Pragmatic and Realistic:*

Managerial economics is pragmatic and realistic in nature. The principles of managerial economics are made use of to find the optimal solution to the problems faced by the manager in due course of business which may be related to the choice and allocation of resources. It attempts to ignore the complexities of the traditional economics. But ensures the consideration of the facts that are important for decision making but ignored by traditional economics. Thus Managerial economics helps to improve the functioning of the organization.

3) *Goal Oriented:*

Managerial economics is goal oriented; It aims to achieve the objectives to the best possible extent. Right from the very first activity undertaken by the organization it focus on the ultimate goal of the organization, be it the profit maximization, wealth maximization or the sales maximization.

4) *Applied science:*

Managerial economics attempts to solve the business problem by identifying the cause and effect relationship between the variables. Managerial economics also analyses the effect of change in one variable on the other.

5) *Related to other Disciplines:*

It makes use of the services of many other related sciences like mathematics, statistics, engineering, accounting, operation research and psychology etc. to find solutions to business and management problems. Managerial economics is also found to be in close relation with statistics. In business Managers have to go with the estimates of demand, market trends, and probabilities regarding supply. Statistics as an important tool helps to study the various functional relationships and also facilitate forecasting. Operations Research is now largely used in planning and controlling business activities. The

various concepts of mathematics that are used by a managerial economist are logarithms and exponential, geometry, algebra and calculus, vectors and determinants, input-output tables.

6) *Applied Economic Theory:*

Managerial economics is economics which is applied in decision-making process. Managerial economics attempts to link abstract theory with managerial practice. Economics is also concerned with the problem of allocating limited resources among unlimited wants. It involves the practical application of economic theory and methodology to decision-making problems faced by the various private, public and non-profit making organizations. It helps in optimal decision making.

7) *Economics is an art:*

Economics when observed as an art, it is practical. The various branches of economics such as public finance, consumption, production, etc. provide practical and optimal solutions to various economic problems. It helps managers in solving various economic problems which they face in their day-to-day business affairs.

Relation of Managerial Economics to Other Subjects/Disciplines:

Managerial economics has been found to have a great and deep relation with various other subjects. Managerial economics has become rich by the interaction with economics, mathematics, statistics, Psychology. The managerial economics integrates concepts and methods from this discipline to provide the solution to the problems encountered by the Managers.

1) *Managerial Economics and Economics:*

Managerial Economics is the economics applied to decision making to arrive at best solution. It may be studied as a special branch of economics, overcomes the gap between pure economic theory and managerial practice. There are two main branches of economics i.e. —micro-economics and macro-economics. Micro Economics is the study of individual units & also involves the study of decisions made in regard to the allocation of scarce resources and prices of various goods and services. The birth of managerial economics emerges from microeconomic theory. Whereas macro economics is the field that studies the behavior of economy as a whole. Thus macro-economics is aggregative economics. In

this way Macro-economics is also related to managerial economics. In the formulation of policies, the understanding of the overall operation of the economic system is very useful to the managerial economist.

2) *Economics and Theory of Decision Making:*

Managerial economics uses both Economic Theory as well as Econometrics for rational decision making. In the course of business manager has to take various decisions such as related to production, labour, source of raw material, sources of capital, distribution channel, logistics etc. the decision making process entails the evaluation of various possible alternatives & then selecting the best case of action. The theory of decision making is in fact a new subject that has great significance for managerial economics. Managerial economics understand and aims to analyze the problems of business decision making.

3) *Managerial Economics and Operations Research:*

Operations research involves the application of mathematical techniques in solving business problems. Operations Research enables construction of theoretical-models that facilitate the decision-making process. Although the roots of operations research lie in studies of military, it is now mostly used in planning and controlling various business activities. Various techniques of operations research which are found to be useful are linear programming, game theory, dynamic programming, input-output analysis, simulation techniques. Linear programming is found to be of great use in decision-making for business such as machine scheduling, distribution of commodities and determining optimum product mix. Queuing theory is employed to find the solution to the problems as how to meet a given demand at the minimum cost or how to minimize the idle time. Various types of Sequential decision problems can be solved with the help of technique of Dynamic programming.

4) *Managerial Economics and Statistics:*

Managerial economics is closely related with statistics. In business Managers have to go with the estimates of demand, market trends, and probabilities regarding supply. Statistics as an important tool helps to study the various functional relationships and also facilitate forecasting. In this regard Managerial Economics make use of various statistics tools like Trend projection, correlation, multiple

regression, measures of central tendency like the mean, median, mode, measures of dispersion to arrive at the best solution to the business problems.

5) *Managerial Economics and Accounting:*

Managerial economics and accounting goes hand in hand. While continuing with the business a manager has to undergo various transactions of financial nature. The recording of these transactions is facilitated by the subject i.e. accounting. Accounting records all transactions of financial nature on routine basis to provide the realistic view of the business financial position and thus enables decision making through the use of accounting data. The accounting techniques are very essential for the success of the firm because profit maximization is the major objective of the firm.

6) *Managerial Economics and Mathematics:*

Mathematics is yet another important subject closely related to managerial economics. The important concepts of mathematics used by a managerial economist are geometry, algebra and calculus, logarithms and exponential, vectors and determinants, input-output tables. Managerial economics make use of various techniques of mathematics for the derivation and exposition of economic analysis, estimation and prediction of economic factors .all the techniques of mathematics provides the logical and reliable results.

7) *Managerial Economics and Psychology:*

There is found to be close relationship between Managerial Economics and Psychology. Managerial economist while planning for production has to study the psychology of the consumer like what products consumer need, at what price, what are the various factors that are going to influence their demand. Psychology as a subject helps to understand the behavioral aspect, attitude and motivations of the various micro economics variables such as managers, consumer, supplier, investor worker or an employee. At the same time he needs to study the psychology of the various competitors existing in the market.

Role and Responsibility of a Managerial Economist:

A managerial economist realistic attitude can lead the firm to the path of success. He uses his analytical skills in solving complex aspects of successful decision-making and future planning. Since the ultimate goal of any economic organization is to make profits, therefore managerial economist also works and serves the firm by working for the same. In advanced countries, big firms employ managerial economists to assist the management. The various roles played by him are highlighted as follows:

1. *Acquiring knowledge about Environment*

A firm cannot work in isolation. The internal & external environment surrounds the firm. It is a matter of importance that internal environment is controllable but external environment is beyond the control & has important bearing on business. Right information about the environment helps manage a lot to wisely define the extent and trend of their own business plans. The managerial economist has to study the economic trends and use the same information for the best functioning of his firm.

2. *Participating in Public Debates*

The role of managerial economists is not confined to the four walls of their business firm rather they actively participate in public debates. They are regularly being the source of advice and views are being sought by the government in the formulation of the various national policies as having their hands on experience of the firm and industry.

3. *Efficient Functioning of the Organization*

A managerial economist is the one who keeps constant eye on the various factors and operations going in the organization. He ensures the efficient functioning of the organization

by helping in formulation of decisions relating to the various areas like price, rate of operations, investment, expansion or contraction, cash availability, wage and price policies, purchase of raw material and production schedules.

4. *Varied Functions*

In the due course of business managerial economists have to perform the various functions such as planning about finance, production, purchase, marketing, sales, making various kinds of forecast, market analysis, determining pricing policies and Practices, acting as an analyst, acting as an adviser and also projecting various technological changes in the market.

5. *Economic Intellect*

Managerial economist use to provide general intelligence service by providing relevant information in regard to prices fixed by competitors, products offered by them, tax and, tariff rates, trends prevailing in the market ,competitive moves, things going on in the international market ,new developments taking place in the market, political issues having effect on the business practices.etc.

6. *Cost Benefit Analysis*

Managerial Economist is constantly involved in the process of cost benefit analysis. While taking the various decisions manager gives due consideration to the cost involved in the particular venture and the benefit expected from the same.

7. *Assists in Decision-making*

He helps the decision maker in formulating the decisions relating to internal functioning of a firm like changes in price, plans of investment, type of goods and services to be manufactured, factor inputs to be employed, production techniques to be used, expansion or contraction plans of firm, allocation of funds, location of various plants, quantity of output to be manufactured, replacement of plant equipment, sales forecasting, inventory forecasting, etc.

8. *Maintaining Relationships*

The managerial economists have to undertake forecasting and also have to analyze various situations. For the same he must establish contacts with the sources of data. He maintains contacts with experts in the different fields and must also join trade and professional associations, subscribe to the journals providing him the updates of the market.

Importance of Managerial Economics:

Managerial Economics has become a highly useful and practical discipline now days as it helps to analyze and offers best s solutions to various kinds of problems faced in routine affairs of the organization in a systematic and realistic manner. The following points highlights significance of the managerial economics:

1. *Better allocation of resources:*

Managerial economics not only offers the better allocation of scarce resources among competing ends but also ensure the proper utilization of resources.

2. *Right decision at the right time:*

It helps the executives working in the firm to understand the various details of business and problems encountered and to take right decision at the right time by the identification of key variables in decision-making process. Thus managerial economics attempt to avoid the complexities of wrong decisions. Every manager has to take various relevant decisions about the utilization of limited resources like land, capital, labour, funds etc. to get the maximum returns, therefore, managerial economics, concentrates on practical aspects which facilitate decision-making.

3. *Identification of Problems:*

In today's scenario economy is becoming highly competitive and dynamic; it helps in identifying various business and managerial problems, their causes and consequence, and suggests various policies and programs to overcome them.

4. *Offers tools and techniques:*

Managerial economics ensures availability of the various conceptual and technical skills, tools of analysis and techniques of judgment and other modern tools and instruments like elasticity of demand and supply, cost and revenue, income and expenditure, profit and volume of production etc to solve various dynamic problems of business.

5. *Attainment of business objectives:*

Managerial economics helps the business executives to become more responsive, realistic and competent to overcome upcoming challenges in the dynamic business scenario. This in turn facilitates achievement of various objectives like profit and wealth maximization, society welfare, Customer satisfaction, attaining industry leadership, market share expansion and social responsibilities etc.

6. *Facilitates decision making and forward planning:*

Managerial Economics enables decision making and forward planning by the evaluation of alternatives available to the managers.

7. Understanding the various external factors:

It also helps in understanding and analyzing the various external factors which affect the decision-making of an organization and ultimately affecting the functioning and the success of the firm.

Limitations of Managerial Economics

Every coin has two sides, positive and negative. No doubt managerial economics provides sophisticated tools of analysis and facilitates the decision making initiated by the managers but on the other side it suffers from certain limitations. The various limitations are as follows:

- 1) Managerial economics has led to the emergence of monopolies for the production of some important product and services. For example: electricity companies, Railways, Telephone companies. These companies exploit the consumers by charging high prices just to earn handsome profits.
- 2) Small scale companies have to face high degree of competition due to the emergence of Multinational companies in or country, posing threat to the existence of the small firms. Small firms find it difficult to survive in the market.
- 3) There seems to be great exploitation of worker, due to weak bargaining power of the workers. It is felt that women and child labour are offered very low wages for the work being taken from them.
- 4) Another limitation of Managerial Economics seems from the emergence of Oligopoly in the market, where firms and producers formally collude with each other or enters into cartel agreement and charge higher price and restricts output.

Summary

Managerial Economics has helped a lot to the business community to arrive at the best decision in regard to the various functional areas like demand forecasting ,production scheduling, resource

mobilization, planning different activities, control of costs, minimization of uncertainties, maximization of profits and wealth etc. leading to the success of the firm and simultaneously achieving the goal of social Responsibility.

UNIT: 2

DEMAND ANALYSIS AND DEMAND FORECASTING

i. Concept of demand:

Conceptually, demand can be defined as the *desire to buy* a good for which the demander has *ability* and *willingness to pay*. In simple words, *demand is a desire for a good, backed by ability and willingness to pay*. A desire without ability to pay is merely a wish. A desire with ability to pay but without willingness to pay is only a *potential demand*. A desire accompanied by ability and willingness to pay makes a *real* or *effective demand*.

Individual and market demand.

For the purpose of demand analysis, a distinction is often made between the individual demand and the market demand—individual demand for analyzing consumer behaviour and market demand for analyzing market behaviour.

Individual demand

Individual demand can be defined as the quantity of a commodity that a person is willing to buy at a given price over a specified period of time, say per day, per week, per month, etc.

Market demand

Refers to the total quantity that all the users of a commodity are willing to buy at a given price over a specific period of time. In fact, market demand is the sum of individual demands for a product.

ii. Factors determining demand

The purpose of the theory of demand is to determine the various factors that affect demand.

Demand is a multivariate relationship, that is, it is determined by many factors simultaneously

Some of the most important determinants of market demand (Sum of total consumers demand) for a particular product are:

1) *Price of the given commodity:*

It is the most important factor affecting demand for the given commodity. Generally, there exists an inverse relationship between price and quantity demanded. It means, as price increases, quantity demanded falls due to decrease in the satisfaction level of consumers. For example, If price of given commodity (say, tea) increases, its quantity demanded will fall as satisfaction derived from tea will fall due to rise in its price. Demand (D) is a function of price (P) and can be expressed as: $D = f(P)$. The inverse relationship between price and demand, known as law of demand.

2) *Tastes and preferences of the consumers:*

An important factor which determines the demand for a good is the tastes and preferences of the consumers for it. A good for which consumers' tastes and preferences are greater, its demand would be large and its demand curve will therefore lie at a higher level. People's tastes and preferences for various goods often change and as a result there is change in demand for them. The changes in demand for various goods occur due to the changes in fashion and also due to the pressure of advertisements by the manufacturers and sellers of different products. On the contrary, when certain goods go out of fashion or people's tastes and preferences no longer remain favorable to them, the demand for them decreases.

3) *Income of the People:*

The demand for goods also depends upon the incomes of the people. The greater the incomes of the people, the greater will be their demand for goods. In drawing the demand schedule or the demand curve for a good we take income of the people as given and constant. When as a result of the rise in the income of the people, the demand increases, the whole of the demand curve shifts upward and vice versa. The greater income means the greater purchasing power. Therefore, when incomes of the people increase, they can afford to buy more. It is because of this reason that increase in income has a positive effect on the demand for a good. When the incomes of the people fall, they would demand less of a good

and as a result the demand curve will shift downward. For instance, as a result of economic growth in India the incomes of the people have greatly increased owing to the large investment expenditure on the development schemes by the Government and the private sector. As a result of this increase in incomes, the demand for goodgrains and other consumer goods has greatly increased. Likewise, when because of drought in a year the agriculture production greatly falls, the incomes of the farmers decline. As a result of the decline in incomes of the farmers, they will demand less of the cotton cloth and other manufactured products.

4) *Changes in prices of the related goods.*

The demand for a good is also affected by the prices of other goods, especially those which are related to it as substitutes or complements. When we draw the demand schedule or the demand curve for a good we take the prices of the related goods as remaining constant. Therefore, when the prices of the related goods, substitutes or complements, change, the whole demand curve would change its position; it will shift upward or downward as the case may be. When the price of a substitute for a good falls, the demand for that good will decline and when the price of the substitute rises, the demand for that good will increase. For example, when price of tea and incomes of the people remain the same but the price of coffee falls, the consumers would demand less of tea than before. Tea and coffee are very close substitutes. Therefore, when coffee becomes cheaper, the consumers substitute coffee for tea and as a result the demand for tea declines. The goods which are complementary with each other, the fall in the price of any of them would favourably affect the demand for the other. For instance, if price of milk falls, the demand for sugar would also be favourably affected. When people would take more milk, the demand for sugar will also increase. Likewise, when the price of cars falls, the quantity demanded of them would increase which in turn will increase the demand for petrol.

5) *Advertisement expenditure.*

Advertisement expenditure made by a firm to promote the sales of its product is an important factor determining demand for a product, especially of the product of the firm which gives advertisements. The purpose of advertisement is to influence the consumers in favour of a product. Advertisements are given in various media such as newspapers, radio, television. Advertisements for goods are repeated several times so that consumers are convinced about their superior quality. When advertisements prove successful they cause an increase in the demand for the product.

6) *The number of consumers in the market:*

The greater the number of consumers of a good, the greater the market demand for it. Now, the question arises on what factors the number of consumers for a good depends. If the consumers substitute one good for another, then the number of consumers for the good which has been substituted by the other will decline and for the good which has been used in place of the others, the number of consumers will increase. Besides, when the seller of a good succeeds in finding out new markets for his good and as a result the market for his good expands, the number of consumers for that good will increase. Another important cause for the increase in the number of consumers is the growth in population. For instance, in India the demand for many essential goods, especially foodgrains, has increased because of the increase in the population of the country and the resultant increase in the number of consumers for them.

7) *Consumers' expectations with regard to future prices:*

Another factor which influences the demand for goods is consumers' expectations with regard to future prices of the goods. If due to some reason, consumers expect that in the near future prices of the goods would rise, then in the present they would demand greater quantities of the goods so that in the future they should not have to pay higher prices. Similarly, when the consumers expect that in the future the prices of goods will fall, then in the present they will postpone a part of the consumption of goods with the result that their present demand for goods will decrease.

iii. Laws of demand

Important information about demand is described by the law of demand. This law of demand expresses the functional relationship between price and quantity demanded. The law of demand or functional relationship between price and quantity demanded of a commodity is one of the best known and most important laws of economic theory. According to the law of demand, other things being equal, if the price of a commodity falls, the quantity demanded of it will rise, and if the price of the commodity rises, its quantity demanded will decline. Thus, according to the law of demand, there is inverse relationship between price and quantity demanded, other things remaining the same. These other things which are assumed to be constant are the tastes and preferences of the consumer, the income of the consumer, and the prices of related goods. If these other factors which determine demand also undergo a change at the same time, then the inverse price-demand relationship may not hold good. Thus, the constancy of these

other things which is generally stated as *ceteris paribus* is an important qualification of the law of demand.

Demand curve and the law of demand.

The law of demand can be illustrated through a demand schedule and a demand curve. A demand schedule of an individual consumer is presented in Table 6.1. It will be seen from this demand schedule that when the price of a commodity is Rs. 12 per unit, the consumer purchases 10 units of the commodity. When the price of the commodity falls to Rs. 10, he purchases 20 units of the commodity. Similarly, when the price further falls, quantity demanded by him goes on rising until at price Rs. 2, the quantity demanded by him rises to 60 units. We can convert this demand schedule into a demand curve by graphically plotting the various price-quantity combinations, and this has been done in Fig. 6.1 where along the X-axis, quantity demanded is measured and along the Y-axis price of the commodity is measured.

Table 6.1. Demand Schedule of an Individual Consumer

<i>Price (Rs.)</i>	<i>Quantity Demanded</i>
12	10
10	20
8	30
6	40
4	50
2	60

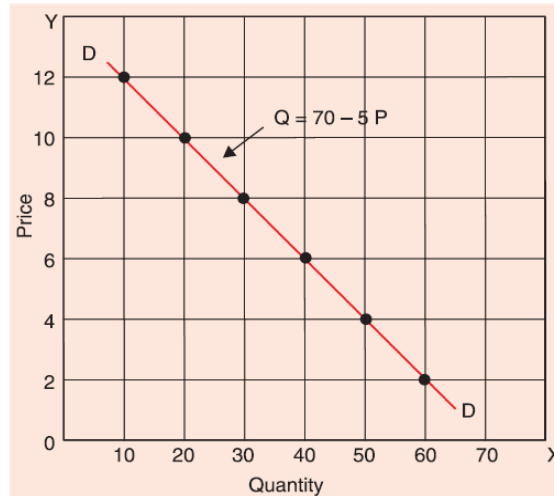


Fig. 6.1. The Demand Curve of an Individual
 $(Q^d = 70 - 5P)$

By plotting 10 units of the commodity against price 12, we get a point in Fig.6.1. Likewise, by plotting 20 units of the commodity demanded against price 10, we get another point in Fig. 6.1. Similarly, other points are plotted representing other combinations of price and quantity demanded of the commodity and are shown in Fig. 6.1. By joining these various points, we get a curve DD, which is known as the demand curve. Thus, this demand curve is a graphic representation of quantities of a good which are demanded by the consumer at various possible prices in a given period of time.

It should be noted that a demand schedule or a demand curve does not tell us what the price is; it only tells us how much quantity of the good would be purchased by the consumer at a various possible prices. Further, it will be seen from both the demand schedule and the demand curve that as the price of a commodity falls, more quantity of it is purchased or demanded. Since more is demanded at a lower price and less is demanded at a higher price, the demand curve slopes downward to the right. Thus, the downward-sloping demand curve is in accordance with the law of demand which, as stated above, describes inverse price-demand relationship. It is important to note here that behind this demand curve or price-demand relationship always lie the tastes and preferences of the consumer, his income, the prices of substitutes and complementary goods, all of which are assumed to be constant in drawing a demand curve. If any change occurs in any of these other factors, the whole demand schedule or demand curve will change and new demand schedule or a demand curve will have to be drawn. Further, in drawing a demand curve, we assume that the buyer or consumer does not exercise any influence over the price of a commodity, that is, he takes the price of the commodity as given and constant for him.

iv. **Exceptions to the law of demand**

The law of demand is one of the fundamental laws of economics. The law of demand, however, does not apply to the following cases.

1) *Expectations regarding future prices.*

When consumers expect a continuous increase in the price of a durable commodity, they buy more of it, despite the increase in its price, to avoid the pinch of still higher price in future. Similarly, when consumers anticipate a considerable decrease in the price in future, they postpone their purchases and wait for the price to fall further, rather than buy the commodity when its price initially falls. Such decisions of the consumers are contrary to the law of demand.

2) *Prestigious Goods.*

The law does not apply to the commodities which are used as a 'status symbol', which enhance social prestige or display wealth and richness, e.g., gold, precious stones, rare paintings and antiques. Rich people buy such goods mainly because their prices are high.

3) *Giffen Goods.*

A classic exception to the law of demand is the case of Giffen goods named after a British economist, Sir Robert Giffen (1837–1910). A Giffen good does not mean any specific commodity. It may be any inferior but essential commodity much cheaper than its substitutes, consumed mostly by the poor households and claiming a large part of their income. If the price of such goods increases (price of its substitute remaining constant), its demand increases instead of decreasing. For instance, let us suppose that the monthly minimum consumption of food grains by a poor household is 30 kg including 20 kg of bajra (an inferior good) and 10 kg of wheat (a superior good). Suppose also that bajra sells at Rs 5/kg and wheat at Rs 10/kg. At these prices, the household spends Rs 200 per month on food grains. That is the maximum it can afford. Now, if price of bajra increases to Rs 6 per kg, the household will be forced to reduce its consumption of wheat by 5 kg³ and increase that of bajra by the same quantity in order to meet its minimum monthly consumption requirement within Rs. 200 per month. Obviously, household's

demand for bajra increases from 20 to 25 kg per month despite increase in its price and that of wheat falls to 5 kg.

DEMAND FORECASTING

Introduction

Estimating the future demand for products, either existing or new is a significant aspect of demand analysis. A manager needs to have information about likely future demand of its product to enable the firm to produce the required quantities of a product at the right time and arrange well in advance for the various inputs (like labor, raw material, machines etc.) as well as to pursue optimal pricing strategies. Demand estimation and forecasting means predicting future demand for the product under given conditions and helped the manager in making decisions with regard to production, sales, investment, expansion, employment of manpower etc., both in the short run as well as in the long run. In this unit attempt has been made to discuss the concept of demand.

Demand estimation and demand forecasting

In Demand estimating manager attempts to quantify the links or relationship between the level of demand and the variables which are determinants to it and is generally used in designing pricing strategy of the firm. In demand estimation manager analyze the impact of future change in price on the quantity demanded. Firm can charge a price that the market will ready to wear to sell its product. Over estimation of demand may lead to an excessive price and lost sales whereas under estimates may lead to setting of low price resulting in reduced profits. In demand estimation data is collected for short period usually a year or less and analyzed in relation to various variables to know the impact of each variable mainly the price on the demand behaviour of the customers. It is for a short period.

In demand forecasting managers forecast the most likely future demand of a product so that he can make necessary arrangement for the various factor of production *i.e* labor, raw material, machines, money etc. Demand forecasting tells the expected level of demand at some future date on the basis of past and present information. It helped in production planning, new product development, capacity enhancement or new schemes etc. Demand forecasting is generally used for short term estimation as well as long term forecasting. Thus, demand estimation and forecasting means when, how, where, by whom and how much will be the demand for a product or service in near future. The process of demand

estimation/forecasting can be broken into two parts *i.e.* analysis of the past conditions and analysis of current conditions with reference to a probable future trend. It helps in estimating the most likely demand of a good or service under given business conditions.

Features of demand forecasting

The main features of the demand forecasting are;

- 1) Demand Forecasting is a process to investigate and measure the forces that determine sales for existing and new products.
- 2) It is an estimation of most likely future demand for a product under given business conditions.
- 3) It is basically an educated and well thought out guesswork in terms of specific quantities
- 4) Demand Forecasting is done in an uncertain business environment.
- 5) Demand Forecasting is done for a specific period of time (i.e. the sufficient time required to take a decision and put it into action).
- 6) It is based on historical and present information and data.
- 7) It tells us only the approximate expected future demand for a product based on certain assumptions and cannot be 100% precise.

Why demand forecasting

As business is done in an uncertain and risky business environment and managers have to take decisions under uncertain and risky conditions. Demand forecasting help the managers in forecasting the most likely future sale of their products, accordingly manager plan their production, arrange various inputs like labour, material, capital and techniques etc. prepare future budgets and formulate various marketing and supply chain strategies or policies to achieve the budgeted targets. This will help up to certain extent in managing the future risks caused due to varied business conditions as well as in optimum utilization of available business resources.

In short run demand forecasting helps in determining the optimum level of output at various periods to avoid under or over production. It helps in better inventory management, of buying inputs and control its inventory level which cuts down overall cost of production. A balanced pricing policy can be formulated to suit short run and seasonal variations in demand. It helps the company to set realistic sales targets for each individual salesman and for the firm as a whole. It helps in advance financial planning required for

achieving the budgeted production and sales and to raise the required funds well in advance at reasonable cost. It also helps the firm in evolving a suitable labour policy and to determine the exact number of workers to be employed in the short run.

In long run, the demand for a product of a firm is forecasted generally for a period of 4 to 6 or 10 years and it helped in taking capital expenditure decisions relating business expansion, capacity enhancement or setting up a new production unit, modification and up gradation of technology as it involves large scale production as well as long gestation period. Accordingly firms can plan long run financial requirements, capital structure and investment programs by floating shares, bond and debentures in the open domestic as well as foreign capital markets at reasonable costs.

Trained and skilled labour and business managers may be needed in long run thus demand forecasting also helps in preparing long term man power planning for imparting training to the existing staff and recruit skilled and efficient labour force and executives for its long run growth.

Demand forecasting can play a significant role in controlling over total costs and revenues of a company and determining the value and volume of business, estimating future profits of the firm and regulating business effectively to meet the challenges of the market. The speed at which the company can grow, stability in firm's performance and interdependence of different industries can be adjudged with the help of demand forecasting.

Demand forecasting process

To have efficient, accurate and reliable demand forecasting a manager must take the following steps:

1) Specifying the objective of Demand Forecasting

While forecasting demand one may have different objectives like quantity and composition of demand, price to be quoted, production planning, inventory planning or capital budgeting, short or long term demand, firm's market share etc. Thus, the objective for which demand is to be estimated must be clearly defined at first stage.

2) Determining the nature of goods

The next step in demand forecasting is identification of type of goods as different type of goods such as consumer goods, capital goods, industrial goods, durable and nondurable goods; perishable or seasonal

goods have different type of demand pattern. This will help in applying write approach to demand estimation process.

3) *Determining the time perspective*

Depending upon the nature of goods and firm's objective, the demand can be forecasted for short term as well as for long term. In short term many of the determinants of demand may remain constant or not to be change significantly but in long run these determinants may change significantly. Thus, while forecasting demand one has to define the time span for the forecast. The time period is normally divided into short run up to 3 to 6 months, medium term up to 2 or 3 years and long term beyond 3 or 5 years.

4) *Determining the level of forecasting;*

Demand forecasting may be undertaken at micro or firm level, industry level, macro level or international level. It may be done for product line forecasting, general or specific purpose or for established or new products. There are different factors that influence the demand at different level of forecasting. Thus one must specify the level of forecasting beforehand.

5) *Selection of proper method or technique of forecasting*

Economists have developed different methods or techniques for forecasting. However, these methods are not suitable for all type of demand forecasting due to the type or objectives of forecasting, data requirement, availability of data and time frame. One has to select an appropriate method for demand forecasting to achieve stated objectives. It also depends upon the purpose, knowledge and experience of the forecaster.

6) *Data Collection and modification*

Depending upon the objective and method of forecasting next step in demand forecasting is to collect the required data. There are different method of collection of primary data like observation, interview, survey or questionnaire, focus group discussion methods etc. Data can also be collected from various secondary sources but, this data required modification as it may not be available in the required mode.

7) *Data analysis and estimations*

Once the data has been collected and method of data analysis has been finalized the next step in demand forecasting is analysis of data and interpretations of results. The Efficiency of estimation depends upon the efficiency with which it has been analyzed and interpretive. Sometimes, estimation required support from background factors which has not been used in estimation process. One must frequently revised the estimates depending upon the changed business conditions.

Determinants of demand forecasting

Different type of goods has different determinants. Broadly goods can classified as Capital goods, Durable and Non durable consumer goods and factors determines the demand of these goods are discussed below;

Capital Goods *i.e* factory building, machinery, equipment, tools etc., have derived demand as demand of these goods depend upon demand of consumer goods industry growth rate, level of capacity utilization, wage rate and size of the market. The demand for these goods comprises of replacement demand and new demand and one should consider Growth potential of the Industry, per unit consumption norms and velocity of their use in estimating the demand of capital goods.

Demand for Consumer Durable goods *i.e.* residential building, car, refrigerators, furniture, readymade garments, TV, Computer etc. depend upon social status, prestige, level of money income, obsolescence rate, maintenance costs, availability of road, petrol, supply of electricity, family size, age-sex distribution and credit facilities. One should consider the trends of these factors while estimating the demand of consumer durables.

Non durable consumer goods are consumed once only *i. e.* milk, food, vegetables, fruits, medicines etc. and their demand is effected by disposable income or purchasing power of the household, price elasticity (own price or price of substitute and complimentary goods) and demographic variables.

Methods of demand forecasting

Demand forecasting methods can be broadly classified into two categories *i.e.* 1.Survey methods and 2. Statistical methods. Different methods of demand estimation have been presented below;

1. Survey Methods

Survey methods are generally used in short run and estimating the demand for new products. In survey methods information about the future purchase plans of potential buyers are collected through direct interview of potential consumers or experts opinions. The different approaches under survey methods are

A. Consumers' Survey method

Under this method, efforts are made to collect the relevant information directly from the consumers with regard to their future purchase plans. It is one of the oldest methods of demand forecasting. It is also called as "Opinion surveys". Under this method, the intentions of the consumer are recorded by trained, reliable and experienced investigators, through personal interviews, e-mail or post surveys and telephonic interviews. A well structure questionnaire is designed with regards to preferences and willingness about particular products, reaction to price change or a change in other variables such as quality, sales promotion, advertisement, channel of distributions, packing, color etc. and consumers are asked to reveal their 'future purchase plans with respect to specific items. There are two type of consumer survey, namely:

(1) Complete enumeration survey and (2) Sample survey.

(1) Under Complete Enumeration Method all potential customers are contacted in the market are surveyed. Since all potential consumers are interviewed in this method, there is a greater degree of accuracy, is more useful in introducing new products, for bulky or costly products or products having few consumers. This method is expensive, time consuming and is not suitable in case of large scattered consumers.

(2) In Sample survey method different cross sections of customers that make up the bulk of the market are carefully chosen. Only such selected consumers from the relevant market through some sampling method are interviewed or surveyed and average demand is calculated on the basis of the consumers interviewed. This average demand is multiplied by the total number of consumers to find the aggregate demand of the product. As compared to Complete Enumeration this method is less costly and time consuming and more information can be collected to make forecasting more reliable.

B. Collective Opinion Method (Sale Force Opinion or Reaction Survey Method)

Another variant of the survey method is Collective Opinion Method also known as “Sales – force polling” or “Opinion poll method” or “Reaction Survey Method”. In this method, instead of customers, salesmen, marketing manager, production manager, professional experts and the market consultants and others are asked to express their considered opinions about the volume of sales expected in the future. It is very simple method and does not involve the use of any statistical techniques and take advantage of collective wisdom of salesmen and managers.

C. Experts Opinion Method or Delphi Method

It is a variant of opinion poll and survey method of demand forecasting. Under this method, outside experts are appointed. They are supplied with all kinds of information, statistical data and posed questions relating to an underlying forecasting problem. The management requests the experts to express their considered opinions and views about the expected future sales of the company. Then, an independent party seeks to form a consensus forecast by providing feedback to the various experts in a manner that prevents identification of individual positions. The process goes on until some sort of unanimity is arrived at among all the experts. This method was originally developed at Rand Corporation in the late 1940's by Olaf Helmer, Dalkey and Gordon and was used to predict future technological changes and has been proved more useful and popular in forecasting non– economic rather than economical variables. This method is best suited in case where intractable changes are occurring. The method is also less time consuming and cheap but the effectiveness of this method is sensitive to the expertise of the independent party chosen.

D. Market Studies and Experiments

Another way of collecting present and future market information of a product is to conduct market and experimental study to investigate consumer behaviour under given environment. Under this method, companies first select some markets or cities having similar features *i.e* population, income culture, social or religious factors etc., then carry out the market experiments by changing prices, quality, packing, advertisement expenditure or other controllable demand determinants under the assumption that other things remain constant.

2. Statistical Methods

In statistical methods historical or cross sectional data are used to forecast the future probable demand of a particular product by applying statistical models and mathematical, equations. These methods are considered to be superior techniques of demand estimation. The important statistical methods used in demand estimation are;

A. Trend projection method

In trend analysis past data about the dependent and independent variables is used to project the sales in the coming years assuming that factors responsible for the past trends will continue to behave in similar manner in future also as they did in the past in determining the magnitude and trend of sales of a product. In this method a data set of past sales are taken at specified time, generally at equal intervals to depict the historical pattern under normal conditions. On the basis of derived historical pattern, the future sales of a company are project. The main aspect of this method lies in the use of time series and changes in time series occur due to following reasons:-

i. Secular Trend:

Secular Trend also known as long term trend indicate the general tendency and direction in which graph of a time series move in relatively over a long period of time. This can be upward or downward trend, depending upon the behaviour.

ii. Seasonal Trends:

This trend reflects the changes in sales a company due to change in various seasons or climates or due to festival season or sales clearance season etc. These changes are repetitive in nature and related to twelve months period.

iii. Cyclical Trends:

These trends reflect the change in the demand for a product during diverse phases of a business cycle i.e growth, boom, maturity, depression, revival, etc.

iv. Random or irregular trends:

These changes arise randomly or irregularly due to unforeseen events such as famines, earth quakes, floods, natural calamities, strikes, elections and crises. These changes take place only in the short run and have their own impact on the sales of a firm. These trends cannot be predicted.

In trend projection method real problem is to separate and measure each of these trends separately. In order to estimate the future demand of the product the impact of seasonal, cyclical and irregular trends are eliminated from the data and only secular trend is used. The trend in the time series can be eliminated by using any of the following method;

- I. Graphical Method,
- II. The method of semi average,
- III. Moving average method and
- IV. The least square method

I. Graphical Method

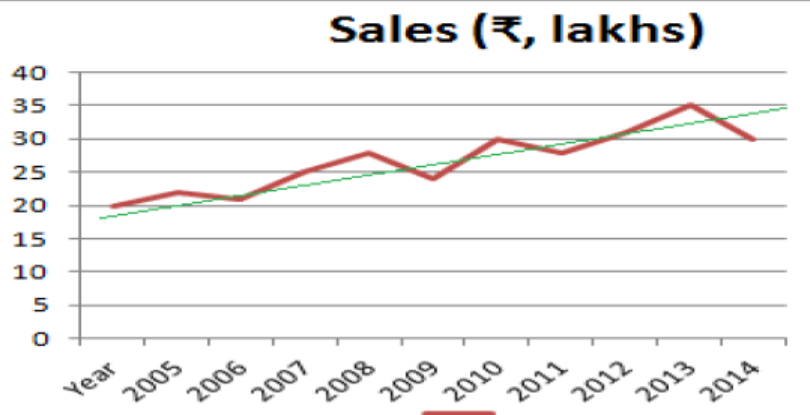
It is simplest method of trend projection. In this method periodical sales data is plotted on a graph paper and a line is drawn through the plotted points. Then a free hand line is drawn passing through as many points as possible. The direction of this free hand line or curve will reflect the general trends whereas the actual trend line will show the seasonal, cyclical and irregular trend. This has been illustrated with the help of table-1 and figure-1.

Table-1
Sales data of XYZ Company

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sales (₹, lakhs)	20	22	21	25	28	24	30	28	31	35	30

Figure-1

Trend Projection Sales of XYZ Company



II. The Semi average method

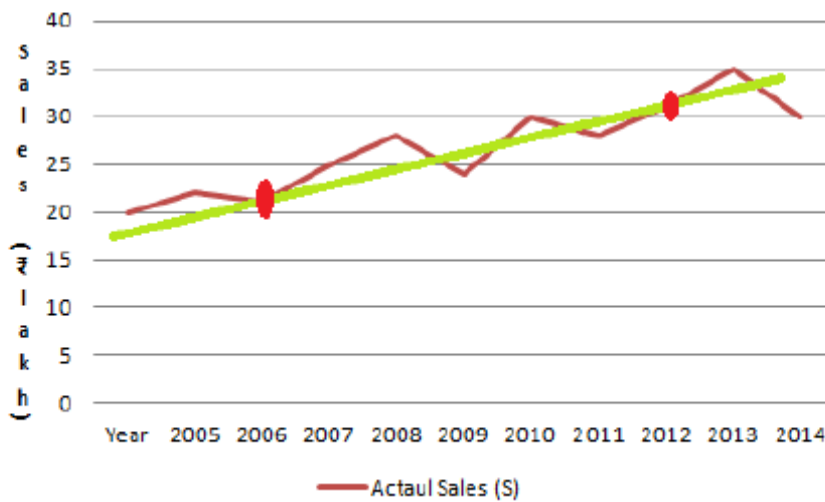
In this method, first of all time series data of sale is divided into two equal parts and thereafter, separate average sale is calculated for each half. The two values of averages are plotted on graph corresponding to the time period. A straight line is then drawn by joining these two points. This line become the trend line and is used to forecast future sale. It has been explained with following example;

In the table -3, we have given time series sales data for 11 years (odd years) so in order to divide the series into two equal parts the sale of the middle year (i.e 2010) has been eliminated for fitting the trend. The average sale of first half i.e. 2005 to 2009 is ₹23.2 lakhs for the next half it is ₹30.8 lakhs. These two points have been plotted and joined with straight line to find the trend of the sale.

Table-2
Sales data of XYZ Company (₹, lakhs)

Year	Sales (S)	Average sale
2005	20	First half $(20+22+21+25+28)/5$ $=23.2$
2006	22	
2007	21	
2008	25	
2009	28	
2010	24	---
2011	30	$(30+28+31+35+30)/5$ $=30.8$
2012	28	
2013	31	
2014	35	
2015	30	

Figure-2
Trend Projection Sales of XYZ Company



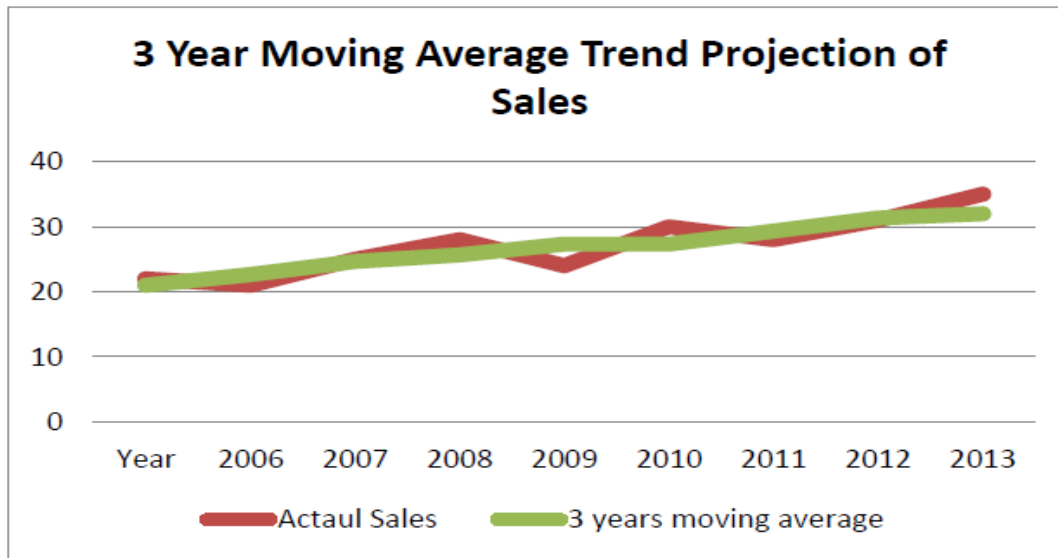
III. Moving average Method

Moving average method is very widely used in practice. Under this method, moving average is calculated. One has to decide what moving year average – 3year or 5year or 7year should be taken up and it depends upon the periodicity of the data. It is determined by plotting the data on the graph paper and noticing the average time interval of successive peaks or trough. After deciding the moving year average, moving average of the given sales data is calculated and these averages are plotted on the graph paper to fit the trend. It has been explained with help of following example;

Table-3
Sales data of XYZ Company (₹, lakhs)

Year	Sales (S)	3 years moving average
2005	20	-
2006	22	$(20+22+21)/3 = 21.00$
2007	21	$(22+21+25)/3 = 22.67$
2008	25	$(21+25+28)/3 = 24.67$
2009	28	$(25+28+24)/3 = 25.67$
2010	24	$(28+24+30)/3 = 27.33$
2011	30	$(24+30+28)/3 = 27.33$
2012	28	$(30+28+31)/3 = 29.33$
2013	31	$(28+31+35)/3 = 31.33$
2014	35	$(31+35+30)/3 = 32.00$
2015	30	-

Figure-3



IV. The least square method

Fitting trend equation or popularly known as least square method is a scientific, formal and popular method of projecting the trend line. In this method a trend line is fitted with the help of straight line

Regression equation *i.e*

$$S = a + bT$$

Where S = annual sales, T = Time, a and b are constants. The coefficients a and b are calculated by solving following two equations;

$$i) \Sigma S = Na + \Sigma T$$

$$ii) \Sigma ST = a \Sigma T + b \Sigma T^2$$

Where,

ΣS = Sum of the original sales of N years (S)

N = Number of years

ΣT = Sum of deviations of the years taken from a central period

ΣT^2 = Sum of the squared deviations of T values

ΣST = Sum of the product of the deviation and corresponding sale

Taking the data given in table-4 given below, the regression equation i) and ii) are given below;

$$i) 294 = 11a + 0$$

ii) $148 = a \cdot 0 + 110b$ by solving these two equation we get;

$$S = 28.73 + 1.345T$$

With the help of this equation, it is quite easy to forecast the sale for any future year *i.e* for the years 2018, 2020 or 2022 by taking T as the deviation from the base year (2010) and t in this case will be 8th, 10th, and 12th year. It can be calculates as follow;

$$2018 \ S_{2018} = 28.73 + 1.345(8) = ₹39.50 \text{ lakhs}$$

$$2020 \ S_{2020} = 28.73 + 1.345(10) = ₹42.18 \text{ lakhs}$$

$$2022 \ S_{2022} = 28.73 + 1.345(12) = ₹44.87 \text{ lakhs}$$

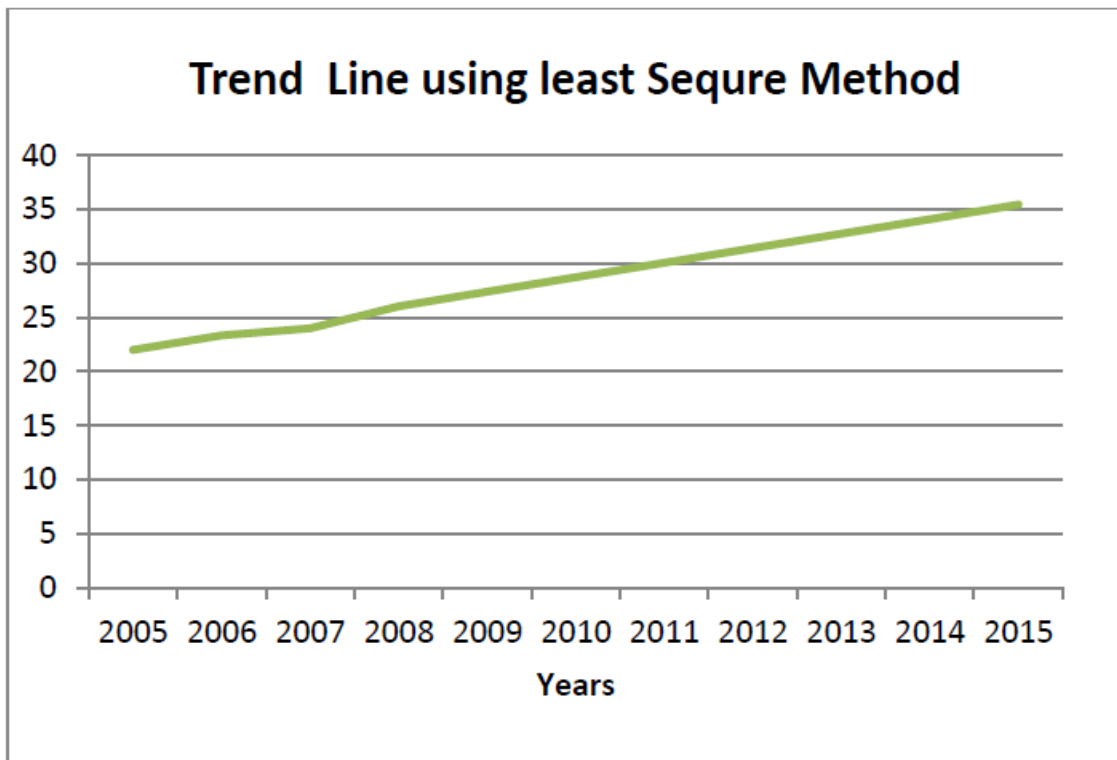
In order to fit the trend line the computed sales value (S_c) are to be plotted on the graph paper as given in the figure-4

Table-4
Sales data of XYZ Company (₹, lakhs)

Year	Sales (S)	T	T ²	ST	S _c (Computed Sales value)
2005	20	-5	25	-100	$28.73 + 1.345(-5) = 22.01$
2006	22	-4	16	-88	$28.73 + 1.345(-4) = 23.35$
2007	21	-3	09	-63	$28.73 + 1.345(-3) = 24.70$
2008	25	-2	04	-50	$28.73 + 1.345(-2) = 26.04$
2009	28	-1	01	-28	$28.73 + 1.345(-1) = 27.39$
2010	24	0	00	0	$28.73 + 1.345(0) = 28.73$
2011	30	1	01	30	$28.73 + 1.345(1) = 30.08$
2012	28	2	04	56	$28.73 + 1.345(2) = 31.42$
2013	31	3	09	93	$28.73 + 1.345(3) = 32.77$
2014	35	4	16	140	$28.73 + 1.345(4) = 34.11$
2015	30	5	25	150	$28.73 + 1.345(5) = 35.46$
	ΣS= 294	ΣT=0	ΣT²=110	ΣST=148	

The least square method is very popular method used in demand forecasting because it is very easy and less expensive method.

Figure-4
Trend Projection Sales of XYZ Company



Thus, Trend projection method requires simple working knowledge of statistics, quite inexpensive and yields fairly reliable estimates of future course of demand.

UNIT 3

PRODUCTION AND COST ANALYSIS

Introduction

The act of production involves the transformation of inputs into outputs. *The word production in economics is not merely confined to effecting physical transformation in the matter, it is creation or addition of value.* Therefore, production in economics also covers the rendering of services such as transporting, financing, and marketing. Laws of production, or in other words, the generalizations regarding relations between inputs and outputs developed in this chapter will apply to all these types of production. *The theory of production provides a formal framework to help the managers of firms in deciding how to combine various factors or inputs most efficiently to produce the desired output of a product or service.*

The relation between inputs and output of a firm has been called the 'Production Function'. Thus, the theory of production is the study of production functions. The production function of a firm can be studied by holding the quantities of some factors fixed, while varying the amount of other factors. This is called short-run production function. The time period in which at least one factor or input is fixed and production is increased by varying other factors is called the short run. The study of short-run production function when at least one factor is kept fixed forms the subject of law of diminishing returns which is also known as law of Variable Proportions. On the other hand, the time period when all factors are variable is called the long run. The length of the long run, that is, the time period required for changes in all inputs depends on the industry. For some industries such as making of wooden chairs or tables the long run may be few weeks or months but for production of steel, it may be many years as it takes several years to expand the capacity of steel production. The behaviour of production when all factors are varied proportionately is the subject-matter of returns to scale. Thus, in the theory of production, the study of (a) the returns to a variable factor and (b) the returns to scale is included. Besides this, the theory of production is also concerned with explaining which combination of inputs (or factors of production) a firm will choose so as to minimize its costs of production for producing a given level of output or to maximize output for a given level of cost.

Concept of production function

Production, as said above, is transformation of physical inputs into physical outputs. The output is thus a function of inputs. The functional relationship between physical inputs and physical output of a firm is known as production function. Algebraically, production function can be written as:

$$q = f(a, b, c, d, \dots)$$

Where q stands for the quantity of output, a, b, c, d etc., stand for the quantities of factors A, B, C, D respectively. This function shows that the quantity (q) of output produced depends upon the quantities, a, b, c, d of the factors A, B, C and D respectively. The above function shows that there exists some relationship between output q and the quantities of inputs a, b, c, d etc., but it does not tell us the specific form of this relationship. This unspecified relationships denoted here by the letter f . If the form of the function f is given, that is, if right-hand side of the equation (i) is given in a specific mathematical form, we can then fully find out precisely the quantity of output that the firm would produce with each set of inputs such as labour and capital.

“The production function is the name given to the relationship between the rates of input of productive services and the rate of output of product. It is the economist’s summary of technological knowledge.”³ Thus, the production function expresses the relationship between the quantity of output and the quantity of various inputs used for the production. More precisely, the production function states the maximum quantity of output that can be produced from any given quantities of various inputs per period of time or, in other words, it states the minimum quantities of various inputs that are required to yield a given quantity of output per period of time, the technology being assumed to remain constant. It is important to note that when a change in technology occurs such as introduction of a new automated machine or the substitution of skilled labour for unskilled labour we will get a new production function. If a small firm produces wooden tables in a day, its production function will consist of the maximum number of tables that can be produced from given quantities of various inputs such as wood, varnish, labour time, machine time, floor space. Or, the production function of that firm may also be defined as the minimum quantities of wood, varnish, labour time, machine time, floor space, etc., that are required to produce a given number of tables per day.

Knowledge of the production function is a technological or engineering knowledge and is provided to the firm by its engineers or production managers. Two things must be noted in respect of production function. First, production function, like the demand function, must be considered with reference to particular period of time, Production function expresses a flow of inputs resulting in a flow of output in a specific period of time. Secondly, production function of a firm is determined by the state of technology. When there is advancement in technology, the production function changes with the result that the new production can yield greater flow of output from the given inputs, or smaller quantities of inputs can be used for producing a given quantity of output.

In economic theory we, are interested in two types of input-output relations or production functions. First, we study the production function when the quantities of some inputs are kept constant and the quantity of one input (or quantities of few inputs) is varied. This kind of input-output relation forms the subject-matter of the law of variable proportion. Since only in the short run, some factors are required to be held constant, the law of variable proportions relates to the short-run production function. Secondly, we study the input-output relation by varying all inputs proportionally. This forms the subject-matter of returns to scale. Since in the long run all factors can be varied, the question of returns to scale relates to long-run production function.

Production function can be represented in various forms; it can be represented by tables, graphs, mathematical equations, showing the maximum quantity of output that a firm can produce per period of time with various combinations of factors (i.e., inputs). When two factors have to be explicitly shown, production function can be represented by iso-quants (i.e., equal product curves). Production function can also be represented by input-output tables. However, it is worth mentioning that although production function provides quite useful information about the production possibilities open to a firm, it does not give all the information required for efficient combination of inputs to produce a given level of output or to determine the profit-maximizing rate of output. As mentioned above, production function describes a physical relationship which must be combined with prices of inputs to determine the efficient resource combination of producing a specific level of output.

Laws of returns to scale

When both the inputs (labour and capital) are changed proportionately, the scale of production, i.e., the size of the firm, changes. The laws of production, i.e. the input–output relationships under the condition of changing scale of production, are called the laws of returns to scale. As mentioned earlier, the laws of returns to scale are a long-term phenomenon. In the long run, supply of both labour and capital is supposed to be elastic. The firms can therefore employ more of both labour and capital to increase their production. The question that we will answer here is: how does total output change when both the inputs are increased proportionately and simultaneously? The answer to this question lies in what law of returns to scale.

Three Laws of Return to Scale

When both labour and capital are increased proportionately and simultaneously, there are technically three possible ways in which total output may increase:

- 1) Output may increase more than proportionately to increase in input,
- 2) Output may increase proportionately to increase in input and
- 3) Output may increase less than proportionately to increase in input.

For example, if both the inputs (labour and capital) are doubled, the resulting output may be more than double, equal to double or less than double. This kind of input–output relationship gives three kinds of laws of returns to scale:

- i. the law of increasing returns to scale,
- ii. the law of constant returns to scale, and
- iii. the law of decreasing returns to scale.

These three law of returns to scale are explained below first graphically with the help of iso-quants and then through the production function.

The Law of Increasing Returns to Scale

When both the inputs—labour and capital—are increased proportionately and simultaneously and output increases more than proportionately, it gives the law of increasing returns to scale. The law of increasing returns to scale implies that output increases more than proportionately to the increase in inputs and the rate of increase in output goes on increasing with each subsequent increase in inputs. For example, suppose inputs are increased by 50 per cent and output increases by more than 50 per cent, say by 75 per cent, and when inputs are again increased again by 50 per cent and output increases by 100 per cent and so on. This kind of input–output relationship shows that the law of increasing returns to scale is in operation. This kind of returns to change in scale is illustrated in Figure 12.9. The three isoquants— Q_1 , Q_2 and Q_3 —represent three different levels of production—10, 25 and 50 units, respectively.

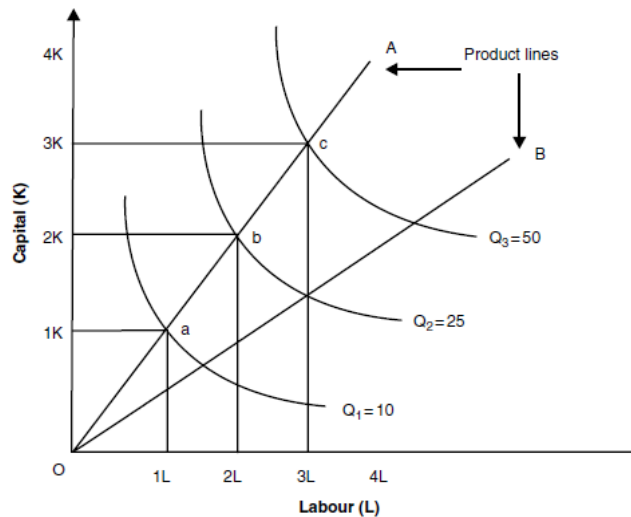


Figure 12.9 Increasing Returns to Scale

Product lines OA and OB show the relationship between input and output. For instance, movement from point a to b denotes doubling the inputs, labour and capital. As Figure 12.9 shows, input combination increases from $1K+1L$ to $2K+2L$. The movement from a to b also indicates increase in output from 10 to 25 units. This means that when inputs are doubled, output is more than doubled. Similarly, movement from point b to c shows increase in inputs from $2K+2L$ to $3K+3L$, *i.e.*, a 50 per cent increase in inputs, and a rise in output from 25 to 50 units, *i.e.* a 100 per cent rise in output. This also gives a more than proportionate increase in the output in response to rise in inputs. This reveals the law of increasing returns to scale.

Factors Causing Increasing Returns to Scale: The Economies of Scale

The law of increasing returns to scale comes into operation because of economies of scale. There are at least three kinds of economies of scale that make plausible reasons for increasing returns to scale.

1) *Technical and Managerial Indivisibilities.*

Certain inputs, particularly machinery and managerial skills, used in the process of production are available in a given size. Such inputs are indivisible. That is, capital and managers cannot be divided into parts to suit the small scale of production. For example, half a turbine cannot be used; a part of a locomotive engine cannot be used; one third or a part of a composite harvester or earthmover cannot be used. Similarly, half of a manager cannot be employed, if part-time employment is not acceptable to him, and so on. Because of their indivisibility, such factors have to be employed in a minimum quantity even if scale of production is much less than their production capacity. Therefore, when scale of production is increased by increasing all inputs, the productivity of indivisible factors increases exponentially. This results in increasing returns to scale.

2) *Higher Degree of Specialization.*

Another factor causing increasing returns to scale is higher degree of specialization of both labour and managerial manpower, which becomes possible with increase in the scale of production. The use of specialized labour and management increases productivity per unit of inputs. Their cumulative effects contribute to the increasing returns to scale. Managerial specialization contributes a great deal to increasing production.

3) *Dimensional Relations.*

Increasing returns to scale is also a matter of dimensional relations. For example, when the size of a room ($15' \times 10' = 150 \text{sq.ft.}$) is doubled to $30' \times 20'$, the area of the room is more than doubled, *i.e.*, $30' \times 20' = 600 \text{sq.ft.}$ When diameter of a pipe is doubled, the flow of water is more than doubled. Following this dimensional relationship, when the labour and capital are doubled, the output is more than doubled over some level of output.

The Law of Constant Returns to Scale

When change in output is proportional to the change in inputs, it shows constant returns to scale. In other words, if quantities of both the inputs, K and L, are doubled and output is also doubled, then the returns to scale are constant. The constant returns to scale are illustrated in *Figure 12.10*. The lines OA and OB are product lines indicating two hypothetical techniques of production. The iso-quants, $Q_1=10$, $Q_2=20$ and $Q_3=30$ indicate three different levels of output. In the figure, the movement from point *a* to *b* indicates doubling both the inputs—capital increases from $1K$ to $2K$ and labour increases from $1L$ to $2L$. When inputs are doubled, output is also doubled, i.e., output increases from 10 to 20. The movement from point *b* to *c* indicates 50 per cent increase in the inputs, as K increases from $2K$ to $3K$ and L from $2L$ to $3L$.

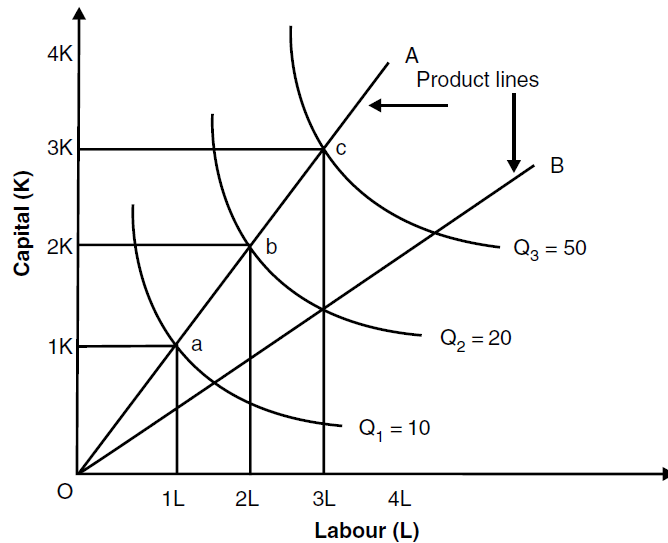


Figure 12.10 *Constant Returns to Scale*

As a result, output increases from 20 to 30, i.e., by 50 per cent. This relationship between the changes in inputs and the proportionate change in output may be summed up of as follows.

$$1K + 1L = Q = 10$$

$$2K + 2L = 2Q = 20$$

$$3K + 3L = 3Q = 30$$

This kind of input–output relationship exhibits the constant returns to scale.

Reason for Constant Returns to Scale:

The constant returns to scale are attributed to the limits of the economies of scale. With the expansion in the scale of production, economies arise from such factors as indivisibility of certain inputs, greater possibility of specialization of capital and labour, use of labour-saving techniques of production and so on. But, there is a limit to the economies of scale. When economies of scale disappear and diseconomies are yet to begin, the returns to scale become constant. The diseconomies arise mainly because of decreasing efficiency of management and scarcity of certain inputs.

The constant returns to scale are said to occur also in productive activities in which factors of production are perfectly divisible. When the factors of production are perfectly divisible, the production function is homogenous of degree 1 like Cobb–Douglas production function.

The Law of Decreasing Returns to Scale

When output increases less than proportionately to increase in inputs, K and L , and the rate of rise in output goes on decreasing it is called decreasing returns to scale. Decreasing returns to scale are illustrated in *Figure 12.11*. As the figure shows, when inputs, K and L , are doubled, *i.e.*, inputs are increased from $1K+1L$ to $2K+2L$, the output increases from 10 to 18 units, *i.e.*, 80 per cent increase, which is less than the proportionate increase in inputs. The movement from point b to c indicates a 50 per cent increase in the inputs. But, the output increases only by 33.3 per cent. This shows decreasing returns to scale.

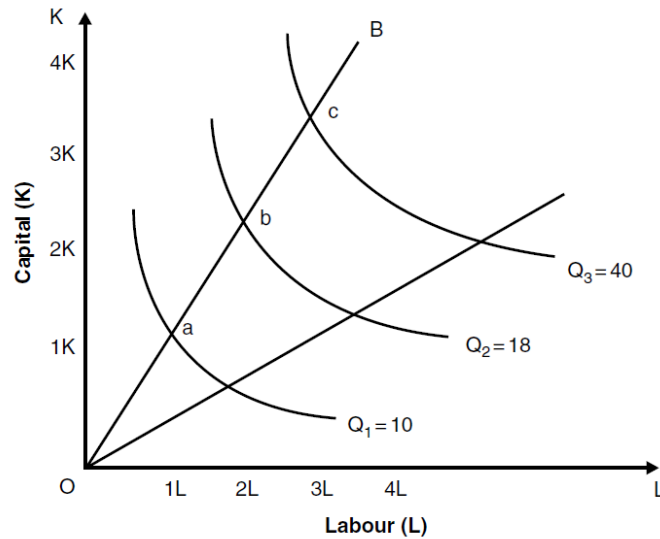


Figure 12.11 *Decreasing Returns to Scale*

Causes of Diminishing Returns to Scale

Decreasing returns to scale are caused by the diseconomies of scale. The most important factor causing diminishing returns to scale is ‘the diminishing return to management’, *i.e.*, due to managerial diseconomies. As the size of the firm expands, managerial efficiency decreases causing decrease in the rate of increase in output.

Another factor responsible for diminishing returns to scale is the limitedness or exhaustibility of the natural resources. For example, doubling the size of coal-mining plant may not double the coal output because of limitedness of coal deposits or difficult accessibility to coal deposits. Similarly, doubling the fishing fleet may not double the fish output because the availability of fish may decrease when fishing is carried out on an increasing scale.

Economies of scale

Increasing returns to scale, sometimes described as economies of scale since average costs decline as the scale of the firm is increased. Prof. Stigler defines economies of scale as synonyms with returns to scale. As the scale of production is increased, up to a certain point, one gets economies of scale. Beyond that, there are its diseconomies to scale Marshall have classified economies to scale into two parts such as internal and external economies.

I. Internal Economies:

As a firm increases its scale of production, the firm enjoys several economies named as internal economies. Basically, internal economies are those which are special to each firm. For example, one firm will enjoy the advantage of good management; the other may have the advantage of specialization in the techniques of production and so on.

“Internal economies are those which are open to a single factory, or a single firm independently of the action of other firms. These result from an increase in the scale of output of a firm and cannot be achieved unless output increases.” Cairncross

Prof. Koutsoyannis has divided the internal economies into two parts:

A. Real Economies

B. Pecuniary Economies

A. Real Economies

Real economies are those which are associated with the reduction of physical quantity of inputs, raw materials, various types of labour and capital etc.

These economies are of the following types:

Technical Economies:

Technical economies have their influence on the size of the firm. Generally, these economies accrue to large firms which enjoy higher efficiency from capital goods or machinery. Bigger firms having more resources at their disposal are able to install the most suitable machinery. Therefore, a firm producing on large scale can enjoy economies by the use of superior techniques.

Technical economies are of three kinds:

i. Economies of Dimension:

A firm by increasing the scale of production can enjoy the technical economies. When a firm increases its scale of production, average cost of production falls but its average return will be more.

ii. Economies of Linked Process:

A big firm can also enjoy the economies of linked process. A big firm carries all productive activities. These activities get economies. These linked activities save time and transport costs to the firm.

iii. Economies of the Use of By-Products:

All the large sized firms are in a position to use its by-products and waste-material to produce another material and thus, supplement to their income. For instance, sugar industries make power, alcohol out of the molasses.

Marketing Economies:

When the scale of production of a firm is increased, it enjoys numerous selling or marketing economies. In the marketing economies, we include advertisement economies, opening up of show rooms, appointment of sole distributors etc. Moreover, a large firm can conduct its own research to effect improvement in the quality of the product and to reduce the cost of production. The other economies of scale are advertising economies, economies from special arrangements with exclusive dealers. In this way, all these acts lead to economies of large scale production.

Labour Economies:

As the scale of production is expanded their accrue many labour economies, like new inventions, specialization, time saving production etc. A large firm employs large number of workers. Each worker is given the kind of job he is fit for. The personnel officer evaluates the working efficiency of the labour if possible. Workers are skilled in their operations which save production, time and simultaneously encourage new ideas.

Managerial Economies:

Managerial economies refer to production in managerial costs and proper management of large scale firm. Under this, work is divided and subdivided into different departments. Each department is headed by an expert who keeps a vigil on the minute details of his department. A small firm cannot afford this specialization. Experts are able to reduce the costs of production under their supervision. These also arise due to specialization of management and mechanization of managerial functions.

Economies of Transport and Storage:

A firm producing on large scale enjoys the economies of transport and storage. A big firm can have its own means of transportation to carry finished as well as raw material from one place to another. Moreover, big firms also enjoy the economies of storage facilities. The big firm also has its own storage and goes down facilities. Therefore, these firms can store their products when prices are unfavorable in the market.

B. Pecuniary Economies:

Pecuniary economies are those which can be had after paying less prices for the factors used in the process of production and distribution. Big firms can get raw material at the low price because they buy the same in the large bulk. In the same way, they enjoy a lot of concessions in bank borrowing and advertisements.

These economies occur to a large firm in the following:

- i. The firms producing output on a large scale purchase raw material in bulk quantity. As a result of this, the firms get a special discount from suppliers. This is a monetary gain to the firms.
- ii. The large-scale firms are offered loans by the banks at a low interest rate and other favorable terms.
- iii. The large-scale firms are offered concessional transportation facilities by the transport companies because of the large-scale transportation handling.
- iv. The large-scale firms advertise their products on large scales and they are offered advertising facilities at lower prices by advertising firms and newspapers.

II. External Economies:

External economies refer to all those benefits which accrue to all the firms operating in a given industry. Generally, these economies accrue due to the expansion of industry and other facilities expanded by the Government. According to Cairncross, “External economies are those benefits which are shared in by a number of firms or industries when the scale of production in any industry increases.” Moreover, the simplest case of an external economy arises when the scale of production function of a firm contains as

an implicit variable the output of the industry. A good example is that of coal mines in a locality. Prof. Cairncross has divided the external economies into the following parts as:

i. Economies of Concentration:

As the number of firms in an area increases each firm enjoys some benefits like, transport and communication, availability of raw materials, research and invention etc. Further, financial assistance from banks and non-bank institutions easily accrue to firm. We can, therefore, conclude that concentration of industries lead to economies of concentration.

ii. Economies of Information:

When the number of firms in an industry expands they become mutually dependent on each other. In other words, they do not feel the need of independent research on individual basis. Many scientific and trade journals are published. These journals provide information to all the firms which relates to new markets, sources of raw materials, latest techniques of production etc.

iii. Economies of Disintegration:

As an industry develops, all the firms engaged in it decide to divide and sub-divide the process of production among them. Each firm specializes in its own process. For instance, in case of moped industry, some firms specialize in rims, hubs and still others in chains, pedals, tires etc. It is of two types-horizontal disintegration and vertical disintegration. In case of horizontal disintegration each firm in the industry tries to specialize in one particular item whereas, under vertical disintegration every firm endeavors to specialize in different types of items. Material of one firm may be available and useable as raw materials in the other firms. Thus, wastes are converted into by-products. The selling firms reduce their costs of production by realizing something for their wastes. The buying firms gain by getting other firms' wastes as raw materials at cheaper rates. As a result of this, the average cost of production declines.

Significance of Economies of Scale:

a) Nature of the Industry:

The foremost significance of economies of scale is that it plays an important role in determining the nature of the industry i.e. increasing cost industry, constant cost industry or decreasing cost industry.

b) Analysis of Cost of Production:

When an industry expands in response to an increase in demand for its products, it experiences some external economies as well as some external diseconomies. The external economies tend to reduce the costs of production and thereby causing an upward shift in the long period average cost curve, whereas the external diseconomies tend to raise the costs and thereby causing an upward shift in the long period average cost curve. If external diseconomies outweigh the external economies, that is, when there are net external diseconomies, the industry would be an Increasing cost industry.

COST CONCEPTS

Introduction

The term 'cost' has different meaning. Accountants view of cost is different from that of economists. The accountants tend to focus on the explicit and historical costs. On the other hand, economists emphasize that for efficient decision making by the firm it is the *opportunity cost* rather than explicit and historical cost that must be considered. And, as will be explained below, the opportunity cost concept includes both the explicit and implicit costs. It is therefore necessary that we should explain the meaning of cost as used by economists and which is relevant for decision-making by a producer.

Fixed and Variable Costs

Fixed costs

Fixed costs are the costs which are fixed in amount for a certain level of output. Fixed costs do not vary with the variation in the output between zero and a certain level or output. The costs that do not vary over a certain level of output are known as fixed cost. Fixed cost includes cost of (i) managerial and administrative staff; (ii) depreciation of machinery, building and other fixed assets and (iii) maintenance of land. The concept of fixed cost is associated with short run.

Variable Cost

Variable costs are those which vary with the variation in the total output. Variable costs are functions of the output. Variable costs include direct labour cost, cost of raw materials, and running cost of fixed capital, such as fuel, ordinary repairs, routine maintenance expenditure and the costs of all other inputs that vary with output.

Total, Average, and Marginal Costs

Total cost (TC) represents the cost of the total resources used in the production of goods and services. It refers to the total outlays of money expenditure, both explicit and implicit, on the resources used to produce a given output. The total cost for a given output is obtained from the cost function.

Average cost (*AC*) is of statistical nature, rather than being an actual cost. It is obtained simply by dividing the total cost (*TC*) by the total output (*Q*), i.e., $TC/Q = \text{average cost}$.

Marginal cost (*MC*) is the addition to the total cost on account of producing one additional unit of product. Or, marginal cost is the cost of marginal unit produced.

Total, average and marginal cost concepts, used in the economic analysis of the firm's productive activities.

Explicit and Implicit Costs

Explicit costs are those which are actually incurred by the business firms and are entered in the books of accounts. The payments on account of wages, salaries, utility expenses, interest, rent, purchase of materials, licence fee, insurance premium and depreciation charges are the examples of explicit costs. These costs involve cash payments and are clearly reflected by the usual accounting practices. In contrast to these costs, there are certain other costs which do not take the form of cash outlays, nor do they appear in the accounting system. Such costs are known as implicit or imputed costs. Implicit costs are similar to opportunity cost. For example, suppose an entrepreneur does not utilize his services in his own business and works as a manager in some other firm on a salary basis. If he starts his own business, he foregoes his salary as manager. The loss of salary is an implicit cost of his own business. It is implicit because the income foregone by the entrepreneur is not charged as the explicit cost of his own business. The implicit cost includes implicit wages, implicit rent, implicit interest and so on. Although implicit

costs are not taken into account while calculating the loss or gain of the business, these costs do figure in business decisions.

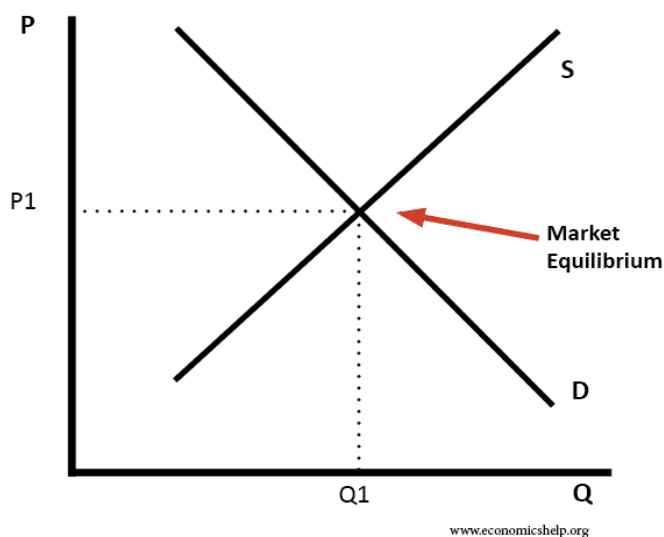
UNIT- IV

MARKET ANALYSIS: PRICE, DEMAND AND SUPPLY FACTORS

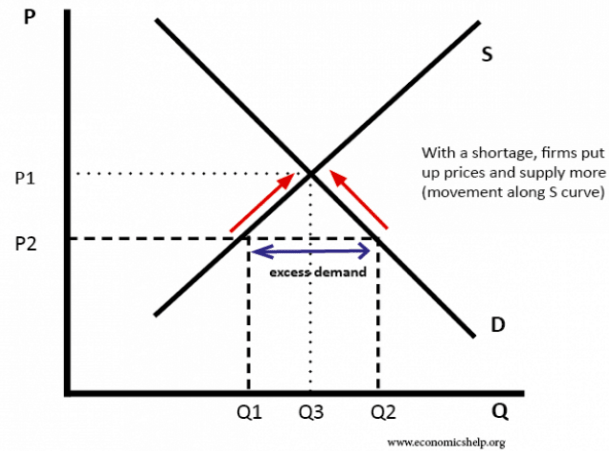
Market equilibrium

A situation where for a particular good supply = demand. When the market is in equilibrium, there is no tendency for prices to change. We say the market-clearing price has been achieved. A market occurs where buyers and sellers meet to exchange money for goods. The price mechanism refers to how supply and demand interact to set the market price and amount of goods sold. At most prices, planned demand does not equal planned supply. This is a state of disequilibrium because there is either a shortage or surplus and firms have an incentive to change the price.

Market equilibrium can be shown using supply and demand diagrams. In the diagram below, the equilibrium price is P_1 . The equilibrium quantity is Q_1 .

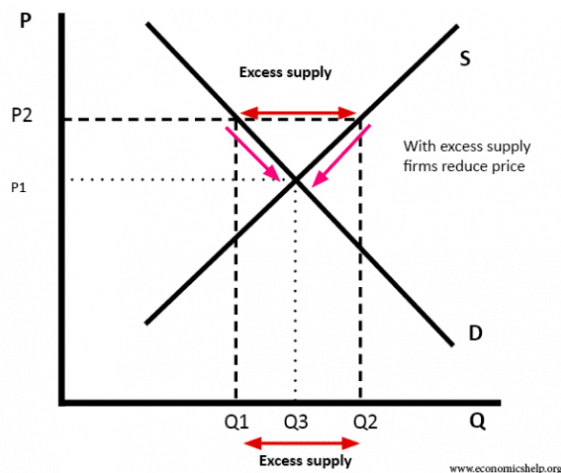


If price is below the equilibrium



In the above diagram, price (P2) is below the equilibrium. At this price, demand would be greater than the supply. Therefore there is a shortage of (Q2 – Q1). If there is a shortage, firms will put up prices and supply more. As price rises, there will be a movement along the demand curve and less will be demanded. Therefore the price will rise to P1 until there is no shortage and supply = demand.

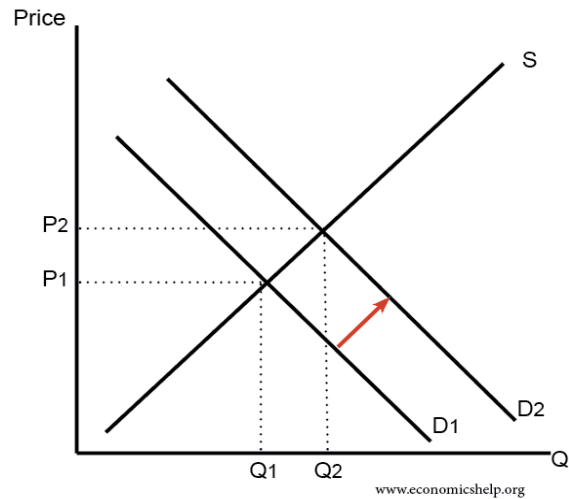
If price is above the equilibrium



If price was at P2, this is above the equilibrium of P1. At the price of P2, then supply (Q2) would be greater than demand (Q1) and therefore there is too much supply. There is a surplus. (Q2-Q1). Therefore firms would reduce price and supply less. This would encourage more demand and therefore the surplus will be eliminated. The new market equilibrium will be at Q3 and P1.

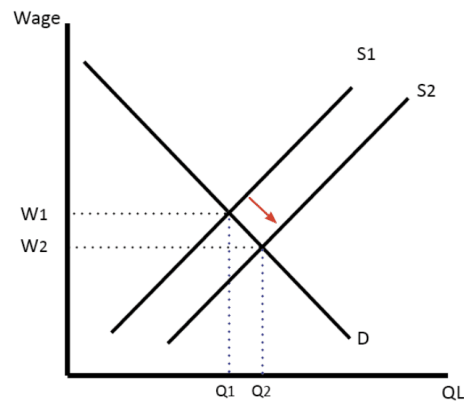
Movements to a new equilibrium

i. Increase in demand



If there was an increase in income the demand curve would shift to the right (D1 to D2). Initially, there would be a shortage of the good. Therefore the price and quantity supplied will increase leading to a new equilibrium at Q2, P2.

ii. Increase in supply



An increase in supply would lead to a lower price and more quantity sold.

Meaning of Market

Market is generally understood to mean a particular place or locality where goods are sold and purchased. However, in economics, by the term ‘market’ we do not mean any particular place or locality in which goods are bought and sold. The idea of a particular locality or geographical place is not necessary to the concept of the market. What is required for the market to exist is the contact between the sellers and buyers so that transaction (*i.e.*, sale and purchase of a commodity) at an agreed price can take place between them. The buyers and sellers may be spread over a whole town, region or a country but if they are in close communication with each other either through personal contact, exchange of letters, telegrams, telephones, etc. so that they can sell and buy a good at an agreed price, the market would be said to exist. Further, it is noteworthy that because in a market, there is close and free communication between various buyers and sellers, price of a homogeneous commodity settled between different sellers and buyers tend to be the same. Thus, in the words of Cournot, a French economist, *“Economists understand by the term market not any particular market place in which things are bought and sold but the whole of any region in which buyers and sellers are in such free intercourse with one another that the price of the same good tends to equality easily and quickly”*.

Thus, the essentials of a market are: (a) commodity which is dealt with, (b) the existence of buyers and sellers, (c) a place, be it a certain region, a country or the entire world, and (d) such communication between buyers and sellers that only one price should prevail for the same commodity at the same time.

The determination of prices and outputs of various products depends upon the type of market structure in which they are produced, sold and purchased. In this connection, economists have classified the various markets prevailing in a capitalist economy into (a) perfect competition or pure competition, (b) monopolistic competition, (c) oligopoly and (d) monopoly. Three market forms, monopolistic competition, oligopoly and monopoly, are generally grouped under the general heading of imperfect competition, since these three forms of market differ with respect to the degree of imperfection in the market. Monopolistic competition is slightly imperfect and monopoly is the most imperfect form of market structure.

PERFECT COMPETITION

Introduction

A perfectly competitive market is one in which there is *large number of buyers and sellers of a homogeneous product* and *neither a seller nor a buyer has any control on the price of the product*.

Perfect competition is perceived by the economists as *a rare phenomenon*. Nevertheless, analysis of price and output determination under perfect competition '*lays the foundation*' of *pricing theory*. This kind of *a notional market* is therefore created by assumption for theoretical purpose.

Characteristics

- 1) Large number of sellers and buyers.
- 2) Homogeneous product.
- 3) Perfect mobility of factors of production.
- 4) Free entry and free exit.
- 5) Perfect knowledge about the market conditions.
- 6) No government interference.
- 7) Absence of collusion and independent decision making by firms.

- 1) *Large number of sellers and buyers.*

Under perfect competition, the number of sellers (the firms) is assumed to be so large that the share of each seller in the total supply of a product is very small. Therefore, no single seller can influence the market price by changing his supply or can charge a higher price. Therefore, firms are price-takers, not *price-makers*.

Similarly, the number of buyers is so large that the share of each buyer in the total demand is very small and that no single buyer or a group of buyers can influence the market price by changing their individual or group demand for a product.

2) *Homogeneous product.*

The commodities supplied by all the firms of an industry are assumed to be homogeneous or almost identical. Homogeneity of the product implies that buyers do not distinguish between products supplied by the various firms of the industry.

Product of each firm is regarded as a perfect substitute for the products of other firms. Therefore, no firm can gain any competitive advantage over the other firms. This assumption eliminates the power of all the firms, the supplier, to charge a price higher than the market price.

3) *Perfect mobility of factors of production*

The factors of production are freely mobile between the firms. Labour can freely move from one firm to another or from one occupation to another. There is no barrier to labour mobility—*legal, linguistic, climate, skill, distance* or otherwise. There is no *trade union*.

Similarly, capital can also move freely from one firm to another. No firm has any kind of monopoly over any industrial input. This assumption implies that factors of production—*land, labour, capital and entrepreneurship*—can enter or exit a firm or the industry at will.

4) *Free entry and free exit.*

In a perfectly competitive market, there is no legal or market barrier on the entry of new firms to the industry. Nor is there any restriction on the exit of the firms from the industry. A firm may enter the industry or exit it at its will.

Therefore, when firms in the industry make supernormal profit for some reason, new firms enters the industry and supernormal profits are eliminated. Similarly, when profits decrease or more profitable opportunities are available elsewhere, firms exit the industry.

5) *Perfect knowledge about the market conditions*

Both buyers and sellers have perfect knowledge about the market conditions. This means that all the buyers and sellers have *full information* regarding the prevailing and future prices and availability of the commodity. Information regarding market conditions is available free of cost. There is no uncertainty in the market.

6) *No government interference.*

Govt. does not interfere in anyway with the functioning of the market. There are no discriminatory taxes or subsidies; no licencing system, no allocation of inputs by the govt. or any other kind of direct or indirect control. That is, the govt. follows the free enterprise policy. Where there is intervention by the government, it is intended to correct the market imperfections if there are any.

7) *Absence of collusion and independent decision making by firms.*

Perfect competition assumes that there is no collusion between the firms, i.e., the firms are not in league with one another in the form of guild or cartel. Nor are the buyers in any kind of collusion between themselves, i.e., there are no consumers' associations. Buyers and sellers take their decisions independently and they act independently.

Perfect versus Pure Competition

The difference between the two kinds of competition is a matter of degree. While '*perfect competition*' has all the features mentioned, under '*pure competition*', there are no perfect mobility of factors and no perfect knowledge about market conditions. 'Pure competition' is 'pure' in the sense that it has absolutely no element of monopoly. The perfect competition, with its all characteristics is considered as a rare phenomenon in the real business world. The actual markets that approximate to the conditions of a perfectly competitive market include markets for stocks and bonds and agricultural market (mandis). Despite its limited scope, perfect competition model has been widely used in economic theories due to its analytical value.

Role of a firm in a perfectly competitive market

In a perfectly competitive market, the role of a firm is limited to producing a commodity or service and selling it at the market determined price.

In fact, an individual firm is one among a very large number of firms producing an almost identical commodity. The share of a firm in the total supply of the commodity is, therefore, very small.

A firm's status in a perfectly competitive market can be described as follows.

a) *A firm has no control over price.*

The market share of an individual firm is so small, rather insignificant, that a firm cannot determine the price of its own product, nor it can influence the prevailing market price by changing its supply. In other words, *an individual firm has no control over the market price.*

b) *A firm is a price-taker.*

Under perfect competition, an individual firm does not determine the price of its own product. Price for its product is determined by the *market demand* and *market supply* for the industry as a whole.

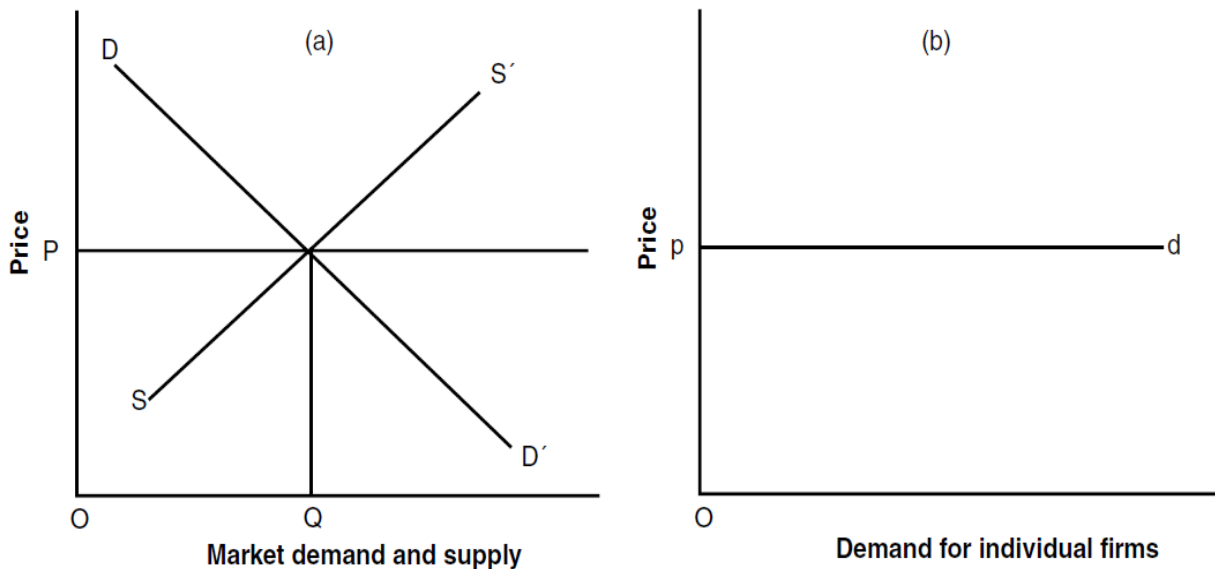


Figure 2.1 *Determination of Market Price and Demand for Individual Firms*

The demand curve, DD' , represents the market demand for the commodity of an industry as a whole. Likewise, the supply curve, SS' , represents the total supply created by all the firms of the industry.

As *Figure 2.1(a)* shows, market price for the industry as a whole is determined at OP and equilibrium output for the industry is determined at output OQ . Equilibrium price OP is given for all the firms of the industry. No firm has power to change this price. At this price, a firm can sell any quantity. It implies that the demand curve for an individual firm is a straight horizontal line, as shown by the line, pd , in *Figure 2.1(b)*, with infinite elasticity.

c) *No control over cost.*

Because of its small purchase of inputs (*labour and capital*), under perfect competition a firm has no control over input prices. Nor can it influence the technology. Therefore, cost function for an individual firm is given. This point is, however, not specific to firms in a perfectly competitive market. This condition applies to all kinds of market except in case of bilateral monopoly.

What are the firm's options?

The firm's option and role in a perfectly competitive market are very limited. The firm has *no option* with respect to *price* and *cost*. It has to accept the *market price* and produce with a given cost function. The only option the firm has is to produce a quantity that maximizes its profits given the price and cost. Under profit-maximizing assumption, a firm has to produce a quantity which maximizes its profit and attains its equilibrium.

Short-run equilibrium of the firm/price and output determination of the firm

In the traditional theory of firm, the equilibrium of a firm is determined in the following conditions:

- 1) *profit maximization* is assumed to be the basic objective of a business firm and,
- 2) *profit is maximized* at the level of output at which $MR = MC$, under rising MC .

Given these (two) conditions, profit-maximizing firm attains its equilibrium at the level of output at which its $MC = MR$. This condition applies in both short run and long run, even though MR and MC conditions are somewhat different in the long run.

Assumptions

The short-run equilibrium of a firm is analyzed under the following assumptions:

- a) capital cost is fixed but labour cost is variable;
- b) prices of inputs are given;
- c) price of the commodity is fixed; and the firm is faced with short-run U-shaped cost curves.

The determination of market price is shown in panel *Figure 2.2(a)*. As shown in *Figure 2.2(a)*, the market price of a commodity is determined at OP by the market forces—demand and supply—in a perfectly competitive market.

The price OP is fixed for all the firms of the industry. Therefore, a firm faces a straight line or horizontal demand curve, as shown by the line $P = MR$. The straight horizontal demand line implies that price equals marginal revenue, *i.e.*, $AR = MR$. The short-run average and marginal cost curves of the firm are shown by SAC and SMC , respectively.

Firm's short-run equilibrium is illustrated in panel *Figure 2.2(b)*, the SMC curve intersects the $P = MR$ line at point E , from below. At point E , $SMC = MR$. Point E determines, therefore, the point of firm's equilibrium. A perpendicular drawn from point E to the output axis determines the equilibrium output at OQ .

It can be seen in the figure that output OQ meets both *the first* and the *second order conditions* of profit maximization. At output OQ , therefore, profit is maximum. The output OQ is, thus, the equilibrium output. At this output, the firm is in equilibrium and is making maximum profit. Firm's maximum pure profit is shown by the area $PEE'P'$ which equals $PP' \times OQ (=PE)$ where PP' is the per unit super normal profit at output OQ .

Short-run equilibrium of industry/ price and output determination of industry:

An industry is in equilibrium in the short-run when market is cleared at a given price, *i.e.*, when the total supply of the industry equals the total demand for its product. The price at which the market is cleared is the equilibrium price. When an industry reaches its equilibrium, there is no tendency to expand or to contract the output.

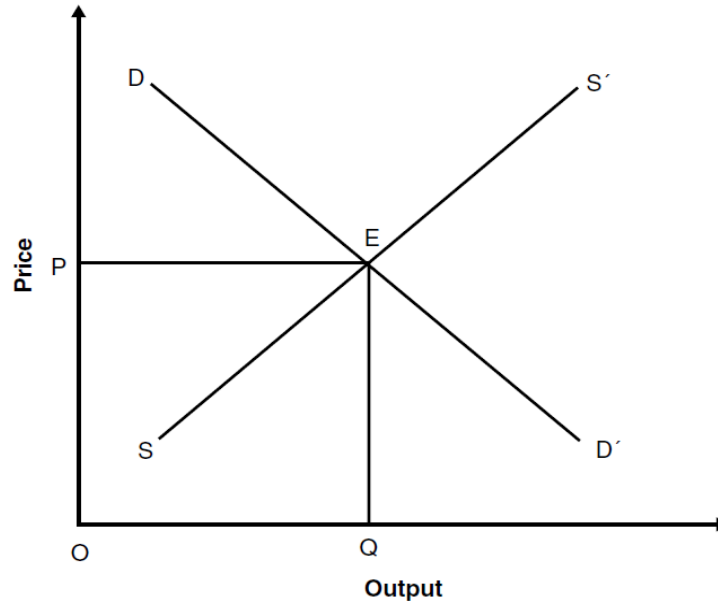


Figure 2.7 *Equilibrium of the Industry*

The industry demand curve DD' and supply curve SS' intersect at point E , determining equilibrium price OP . At price OP , $D=S$. The industry is supplying as much as consumers demand.

In the short-run equilibrium of the industry, some individual firms may make pure profits, some normal profits and some may make even losses, depending on their cost and revenue conditions, this situation will, however, not continue in the long run.

Link between short-run equilibrium of the industry and the firm

The short-run equilibrium of the *firm* and *industry* have been analyzed separately there exists, however, a link between a firm's and industry's equilibrium.

In a perfectly competitive market, change in the *equilibrium* of an individual firm does not affect the *industry's equilibrium*, for the simple reason that the total output of a single firm constitutes a small fraction of the industry's output. But, a change in the industry's equilibrium does alter the equilibrium of an individual firm.

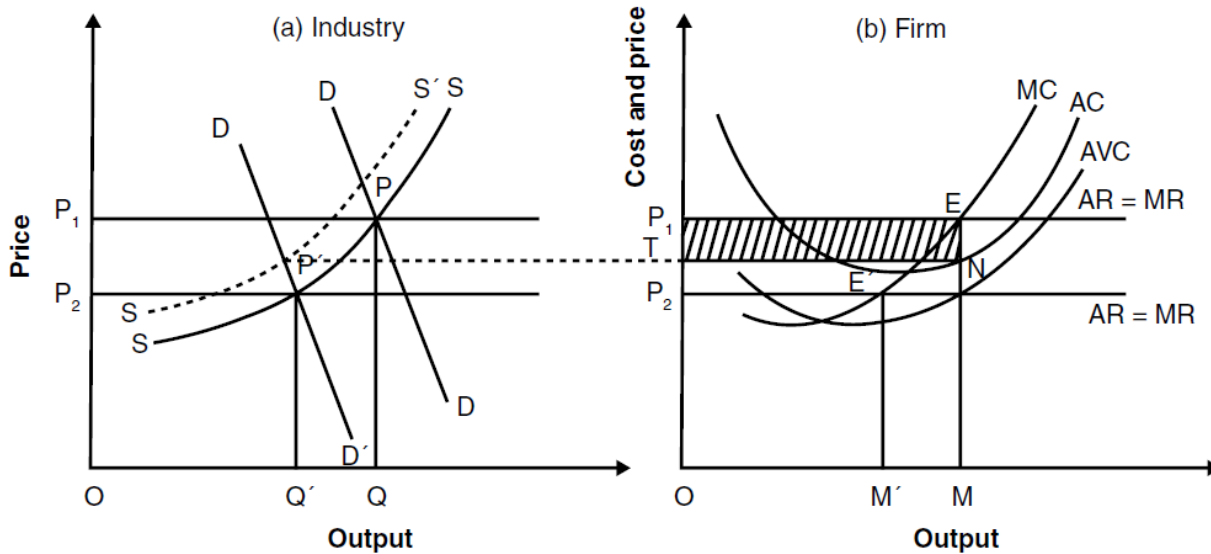


Figure 2.8 Industry's Vs. Firm's Equilibrium in the Short Run

The link between industry's and firm's equilibrium is illustrated in Figure 2.8. Suppose industry's initial demand and supply curves are given as DD and SS respectively (Figure 2.8(a)). As shown in Figure 2.8(a), industry's demand and supply curves intersect each other at point P , determining the market price at $PQ=OP_1$ and industry's equilibrium output is OQ . Thus, the price PQ is given to all the firms of the industry. Given the price PQ and firm's cost curves, an individual firm finds its equilibrium at point E in Figure 2.8(b), where its $MC=MR$.

Firm's equilibrium output is OM in Figure 2.8(b). At price $EM = PQ$, the firm is making an abnormal profit in the short run to the extent of EN per unit of output. The firm's total pure profit is shown by the shaded area, P_1ENT . If industry demand curve DD now shift downward for some reason to DD' , supply curve remaining unchanged. As a result, market price falls to $P'Q'$ and industry's equilibrium output falls to QQ' . With the fall in price, firm's equilibrium shifts from point E to E' where its $MC=MR$. At this point, the firm is making a loss because its AR which equals $E'M'$ is lower than its AC . Thus, change in industry's equilibrium changes firm's equilibrium.

Thus, change in industry's equilibrium changes firm's equilibrium. Firms making loss is, however, a short-run situation. Losses will disappear in the long run through a process of market adjustment. The process of market adjustment begins with loss-making firms exiting the industry. When loss-making

firms quit the industry, supply declined and the supply curve shifts left side as shown by the dotted supply curve SS' . Price goes up and loss disappears and firm reaches another equilibrium point.

Long-run equilibrium of the firm

A comparative look at the short- and long-run market conditions:

The short run is, by definition, a period in which

- i. firm's cost and revenue curves are given,
- ii. firms cannot change their size—their capital is fixed,
- iii. existing firms do not have the opportunity to leave the industry and
- iv. new firms do not have the opportunity to enter the industry.

In contrast, *long run* is a period in which these constraints disappear. Long run permits improvement in production technology and a larger employment of both, labour and capital, *i.e.*, firms can change their size. Some of the existing firms may leave and new firms may enter the industry. In the long run, supply curve not only shifts downward but also becomes more elastic. In this section, we will analyze the equilibrium of the firm and industry in the long run.

Equilibrium of the Firm in the Long-run

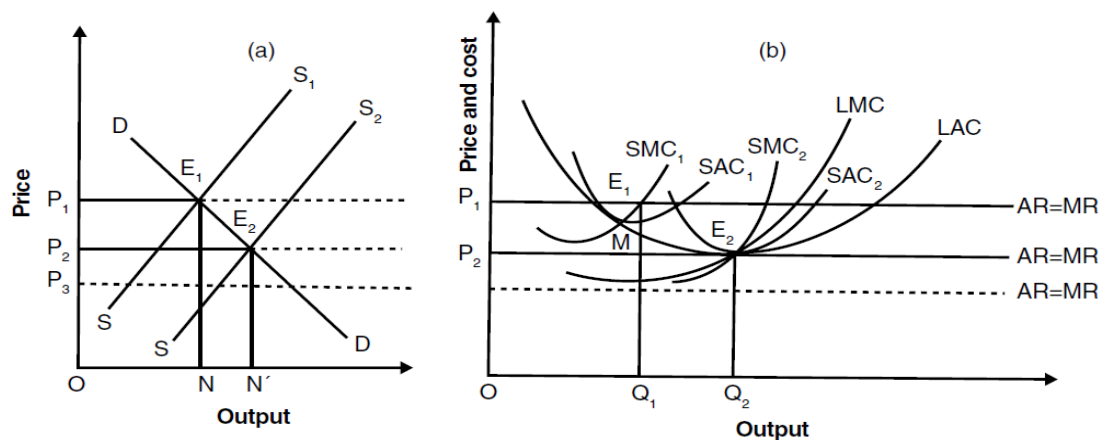


Figure 2.9 Long-run Equilibrium of the Firm and Industry

Suppose (i) short-run price is given at OP_1 (Figure 2.9(a)) and (ii) that firm's short-run cost

curves are given by SAC_1 and SMC_1 , as shown *Figure 2.9(b)*. Given the price OP_1 , firms are in equilibrium at point E_1 . It can be seen in *Figure 2.9(b)* that the firms are making an abnormal profit of $E_1M = E_1Q_1 - MQ_1$ per unit of output.

Abnormal profit brings about two major changes in the industry. *First*, existing firms get incentive to increase the scale of their production. Their average and marginal costs go down caused by the economies of scale. This phenomenon is shown by SAC_2 and SMC_2 . When we draw the LAC and LMC curves, these curves show decreasing costs in the long run. *Secondly*, attracted by the abnormal profit, new firms enter the industry increasing the total supply.

Given the new market price, OP_2 , firms attain their equilibrium in the long run at point E_2 where $AR = MR = LMC = LAC = SMC = SAC$ as shown in *Figure 2.9(b)*. As the figure shows, the firms of industry reach their equilibrium in the long run where both short- and long-run equilibrium conditions are satisfied simultaneously. In a perfectly competitive market, the cost and revenue conditions are given for the firms. Therefore, when price goes down to OP_2 , what firms are required to do is to adjust their output to the given revenue and cost conditions in order to maximize their profit. Through this process of adjustment for output, the firms reach the equilibrium in the long run at point E_2 . Point E_2 is the point of equilibrium for all the firms in the long run.

In case market price falls below OP_2 , say, to OP_3 , all the firms make losses. This brings in a reverse process of adjustment. While some firms quit the industry, some firms cut down the size of the firm. As a result, total supply decreases, demand remaining the same. Consequently, price tends to rise. This process of output adjustment continues until industry reaches back to its equilibrium at point E_2 , where LAC is tangent to $P = AR = MR$ for each firm in the industry. At point E_2 , the point of equilibrium, $P = MR = LMC = LAC = SMC = SAC$. Since $P = LAC$, the firms make only normal profits in the long run. If firms deviate from point E_2 , due to some short-run disturbances, the market forces will restore the equilibrium.

Equilibrium of industry in long-run

An industry is in equilibrium at a price and output at which its market demand equals its market supply. The equilibrium of the industry is illustrated in *Figure 2.9(a)*. When an industry is in equilibrium, all its firms are supposed to be in equilibrium (*as shown in Figure 2.9(b)*) and earn only normal profits. This is so because under the conditions of perfect competition, all the firms are assumed to achieve the same

level of efficiency in the long run. Since industry yields only normal profits, there is no incentive for new firms to enter the industry.

These conditions are fulfilled at price OP_2 in *Figure 2.9(a)* and *(b)*. At price OP_2 , all the firms are in equilibrium, as for each firm, $LMC = LMR = SMC = SAC = P = LAC$.

Since $P = LAC$, all the firms are earning only normal profit. At industry's equilibrium output OM , market demand equals market supply (*Figure 2.9(a)*). At price OP_2 , therefore, market is cleared. The output OM may remain stable in the long run. For, there is no incentive for new firms to enter the industry and no reason for the existing ones to leave the industry. The industry is, therefore, in equilibrium.

MONOPOLY

Meaning and definitions

The word monopoly has been derived from Greek word *monos*, meaning 'alone' and *polein* meaning 'seller'. The term "monopoly" is used to describe the market structure in which there is only one producer of a good or service for which there are no close substitutes and entry into and exit from the industry is impossible. A monopoly firm enjoys an absolute power to produce and sell a commodity.

The single producer may be in the form of *individual owner* or *a single partnership* or *a joint stock company*. In other words, under monopoly there is no difference between firm and industry. Monopolist has full control over the supply of commodity. Having control over the supply of the commodity he possesses the market power to set the price.

"Pure monopoly is represented by a market situation in which there is a single seller of a product for which there are no substitutes; this single seller is unaffected by and does not affect the prices and outputs of other products sold in the economy." *Bilas*

"Monopoly is a market situation in which there is a single seller. There are no close substitutes of the commodity it produces, there are barriers to entry". *Koutsoyiannis*

"Under pure monopoly there is a single seller in the market. The monopolist demand is market demand. The monopolist is a price-maker. Pure monopoly suggests no substitute situation". *A. J. Braff*

“A pure monopoly exists when there is only one producer in the market. There are no direct competitions.” *Ferguson*

“Pure or absolute monopoly exists when a single firm is the sole producer for a product for which there are no close substitutes.” *McConnel*

Characteristics

1) Single Seller of a Product

Under monopoly, there is a single seller selling the product. As a result, the monopoly firm and industry is one and the same thing. Monopolist has full control over the supply and price of the product. However, there are large numbers of buyers of monopoly product and no single buyer can influence the market price.

2) Barriers to Entry and Exit

There exist strong barriers to entry of new firms and exit of existing firms. As a result, a monopoly firm can earn abnormal profits and losses in the long run. These barriers may be due to legal restrictions like licensing or patent rights or due to restrictions created by firms in the form of cartel.

3) No Close Substitutes

The product produced by a monopolist has no close substitutes. So, the monopoly firm has no fear of competition from new or existing products. For example, there is no close substitute of electricity services provided by NDPL. However, the product may have distant substitutes like inverter and generator.

4) Imperfect Knowledge

Imperfect knowledge about the product and market between buyers and seller prevails only in monopoly market it is not possible in other type of markets.

5) Price Discrimination

A monopolist may charge different prices for his product from different sets of consumers at the same time. It is known as ‘price discrimination’.

6) No Supply Curve

Since a monopolized industry is a single firm industry therefore there is no distinction between a firm and an industry in a monopolistic market structure. Hence the demand curve of a monopolistic firm is same as the market demand curve.

7) Price Maker

In case of monopoly, firm and industry is one and the same thing. So, firm has complete control over the industry output. As a result, monopolist is a price-maker and fixes its own price. It can influence the market price by changing the supply of the product.

Sources and kinds of monopolies

The emergence and survival of monopoly are attributed to the factors which prevent the entry of other firms into the industry. The barriers to entry are, therefore, the sources of monopoly power.

The major sources of barriers to entry are

a) *Legal restrictions,*

Some monopolies are created by law in public interest. Such monopolies may be created in both public and private sectors. Most of the state monopolies in the public utility sector, including *postal, telegraph and telephone services, generation and distribution of electricity, railways, airlines and state roadways*, etc., are public monopolies. Such monopolies are created by the government in the public sector.

The government may create monopolies in the private sector also through license or patent. Such monopolies are intended to reduce cost of production by the economies of scale and investment in technical innovations. Such monopolies are also known as *franchise monopolies*.

b) *Sole control over the supply of certain scarce and key raw materials,*

Some firms acquire monopoly power from their legally granted control over certain scarce and key raw materials that are essential for the production of certain other goods, e.g. *bauxite, graphite, diamond*, etc. Such monopolies are often called '*raw material monopolies*'. The monopolies of this kind emerge also because of monopoly over certain specific *technical knowledge* or *techniques of production*.

c) *Efficiency and*

A primary and technical reason for growth of monopolies is the economies of scale. In some industries, long-run minimum cost of production, i.e., the most efficient scale of production coincides almost with the size of the market. In such industries or products, a large size firm finds it profitable, in the long run, to eliminate competition by cutting down its price for a short period.

Once a monopoly is established, it becomes almost impossible for the *new firms* to enter the industry and survive. Monopolies born out of efficiency are known as natural monopolies. A natural monopoly may emerge out of the *technical conditions of efficiency* or may be created by the *law on efficiency grounds* in public interest.

d) *Patent rights*

Another source of monopoly is the patent rights of the firm *for a product* or *for a production process*. Patent rights are granted by the government to a firm to produce a commodity of *specified quality and character* or to use *a specified technique of production*. Patent rights give firm *exclusive rights* to produce the *specified commodity* or to use the *specified technique of production*. Such monopolies are called patent monopolies.

Cost and revenue curves under monopoly

The cost curves—the *AC* and *MC* curves—faced by the monopoly firm are *U-shaped*. The monopoly firms face *U-shaped AC* and *MC* cost curves because the laws of production apply to monopoly firms. The demand of *AR* and *MR* curves that a monopoly firm faces are different from those faced by the firms under perfect competition.

In a perfectly competitive market, there is dichotomy between the firm and the industry. While firms face a horizontal, straight-line demand curve, industry faces a downward sloping demand curve. Under monopoly, however, there is no distinction between the firm and the industry. The monopoly industry is a single-firm industry and industry demand curve has a negative slope. A monopoly firm faces, therefore, a downward sloping demand curve—it may be a linear or a non-linear demand curve. Given the demand curve, a monopoly firm has the option to choose between price to be charged or output to be sold. Once it chooses price, the demand for its output is fixed. Similarly, given its demand curve, if the

firm decides to sell a certain quantity of output, then its price is fixed—it cannot charge any other price inconsistent with the demand curve.

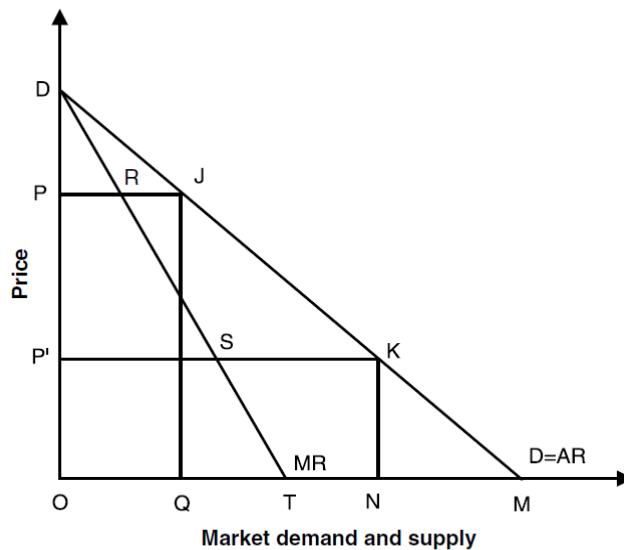


Figure 3.1 AR and MR Curves for Monopoly

The price–quantity constraint is demonstrated in Figure 3.1. Suppose that the demand curve for a monopolized industry is given as DM in Figure 3.1. Demand curve, DM , shows the quantities that can be sold at different prices.

For instance, if monopoly firm chooses price OP , the quantity that it can sell at this price is fixed at OQ —no other quantity can be sold at this price. Similarly, if it decides to sell quantity ON , its price is fixed at OP' —it cannot sell ON output at a higher price. This means that if demand curve is given, the options of monopoly firm become limited—it can choose either price or quantity at a time, not a price and a quantity inconsistent with the demand curve.

AR and MR Curves under Monopoly

The AR curve for a monopoly firm is the same as its demand curve. Since a monopoly firm faces a downward sloping demand curve, its AR also slopes downwards to the right. For example, the demand curve DM in Figure 3.1 is the same as the firm’s AR curve.

What is much more *important* in the analysis of equilibrium of a monopoly firm is the *relationship between the AR and MR curves*. When price is fixed, as in case of perfect competition, firm’s demand curve takes the form of a horizontal line. In that case, $AR = MR$ and MR is a straight line too. But, in

case of a monopoly firm, demand curve has a negative slope. Therefore, its *MR* curve too has a negative slope. There is, however, a *specific relationship* between *AR* and *MR*, i.e., *the slope of MR curve is twice that of that AR curve*. That is, given the linear demand function, marginal revenue curve is twice as steep as the average revenue curve.

Short-run equilibrium of the monopoly: price and output determination

According to the traditional theory of firm, a firm is said to be in equilibrium where it maximizes its profit. As in case of perfect competition, equilibrium of a monopoly is studied under both *short-run* and *long-run* conditions.

The short-run equilibrium of monopoly can be explained by two approaches:

- a) Total revenue–total cost (*TR–TC*) approach and
- b) Marginal revenue–marginal cost (*MR–MC*) approach

a) *Monopoly Equilibrium by Total Revenue–Total Cost Approach*

According to the *total revenue–total cost (TR–TC)* approach, a profit maximizing monopoly firm is in equilibrium at the level of output and price at which its *TR–TC = Total Profit* is maximum.

The equilibrium of monopoly by *TR–TC* approach is illustrated graphically in *Figure 3.2* under the following assumptions:

- i. The monopoly firm faces a *cubic TC function* of the form $TC = F + bQ - cQ^2 + dQ^3$ (where *F* = *fixed cost*) and
- ii. Its demand curve is given by a demand function of the form $Q = a - bP$.

When *TC function* is graphed, it produces a *TC* curve, from the demand function, derived a price function as $P = a/b - Q/b$. Using this price function, derived monopoly's *TR* function as $TR = (aQ - Q^2)/b$.

The *TR function* when graphed produces a *TR* curve as shown in *Figure 3.2*. The *TC* curve shows monopoly's *total cost* at different level of output and *TR* curve shows its total revenue at different level of output and price. As *Figure 3.2* shows, the monopoly firm faces a loss till output *OQ1* and beyond

output OQ_3 That is, monopoly's profitable range of output lies between OQ_1 and OQ_3 because it is only in this range of output that monopoly's $TR > TC$.

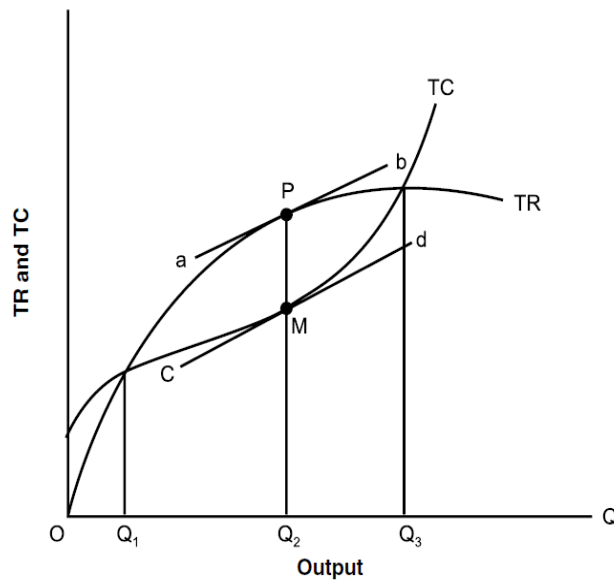


Figure 3.2 Short-run Equilibrium of Monopoly: TR-TC Approach

It is obvious that total profit is maximum where the vertical difference between TR and TC curves is maximum. The maximum difference between the TR and TC curves can be obtained by a simple technique, *i.e.*, by drawing *parallel tangents* to TR and TC curves as shown by the tangent ab and cd . Note that the line ab is tangent to the TR curve at point P and line cd is tangent to the TC curve at point M and line ab and cd are parallel. As a matter of rule, the vertical gap between tangential points P and M is maximum.

That is, given the revenue and cost conditions, the monopoly firm can make a maximum profit of PM . A line drawn from point P , through point M to X -axis determines profit maximizing output at OQ_2 . It means that a profit maximizing monopoly reaches its equilibrium at output OQ_2 . This equilibrium solution satisfies the necessary condition of profit maximization that profit is maximum where $MR = MC$. Recall that the slope of the TR curve gives $\partial TR/\partial Q = MR$ and the slope of the TC curve gives $\partial TR/\partial Q = MC$ at their respective points of tangency. Since tangents ab and cd are parallel, their slopes are equal. It means that at the tangential points, $MR = MC$. This satisfies the necessary condition of profit maximization.

b) *Monopoly Equilibrium by MR–MC Approach*

The short-run revenue curves of the monopoly firm are shown by the *AR* and *MR* curves and its short-run cost curves are given by the *SAC* and *SMC* curves. The *AR* and *MR* curves can be derived from the *TR* function used in *TR–TC* approach. Similarly, *SAC* and *SMC* curves can be derived from the *TC* function.

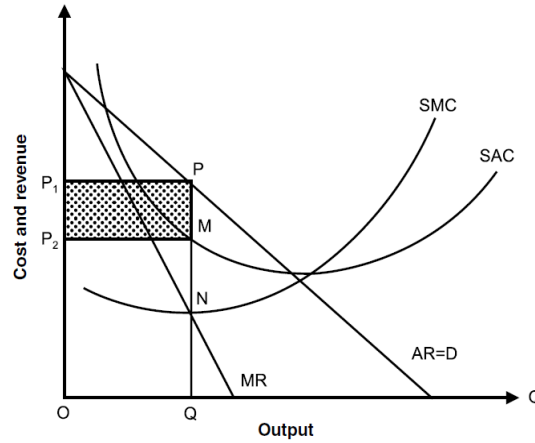


Figure 3.3 *Monopoly Equilibrium: MR–MC Approach*

Given the revenue and cost curves and the profit maximization rule, the equilibrium of the monopoly firm can easily be traced. Recall once again the profit maximization rule, i.e., profit is maximum where $MR = MC$. It can be seen in the figure that *MR* and *MC* curves intersect at point *N*. Note that point *N* satisfies both the conditions of profit maximization: (i) $MR = MC$ and (ii) *MC* curve intersects *MR* curve from below. Point *N*, therefore, determines the equilibrium output and price.

An ordinate drawn from point *N* to *X*-axis determines the profit maximizing output at *OQ*. The ordinate *NQ* extended upwards to the *AR* curve gives the price *PQ* at which output *OQ* can be disposed of, given the demand function. Thus, the *MR–MC* approach to monopoly equilibrium determines both equilibrium output and price simultaneously. No other output and price can increase the monopoly’s profit.

Once equilibrium price and output are determined, given the revenue and cost curve, the maximum monopoly profit can be easily determined as follows. Per unit monopoly profit = $AR - SAC$. In Figure 3.3, $AR = PQ$ and $SAC = MQ$. By substitution, we get per unit monopoly profit = $PQ - MQ = PM$. Given the equilibrium output *OQ*, total monopoly profit = $OQ \cdot PM$

Since $OQ = P_2M$, total monopoly profit at equilibrium can be worked out as $P_2M PM = P_1PMP_2$. The total monopoly profit is shown by the shaded area in the Figure 3.3. Since cost and revenue conditions of the monopoly firm are supposed to be given, the monopoly equilibrium is supposed to be stable.

Monopoly equilibrium in the long-run

The long-run equilibrium conditions of a monopolist are different from those faced by the competitive firms in another important respect. The main differentiating factor is the possibility of the entry of new firms into the industry. While in a competitive market, there is free entry to the industry, a monopoly firm is protected by the *barriers to entry*.

The barriers to entry may be in the form of *patent rights, legal protection, economies of scale and the well established long standing of the monopolist and its powers to eliminate the potential competitors by waging a price war*.

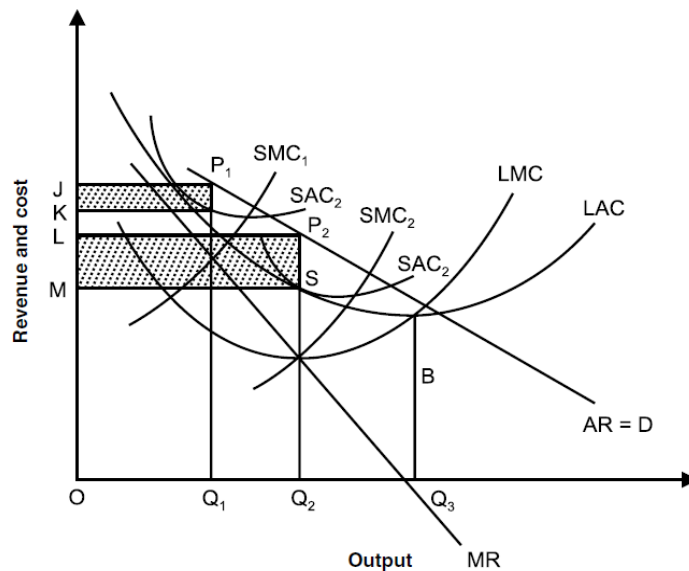


Figure 3.7 Long-Run Equilibrium of the Monopoly Firm

More importantly, a monopoly firm is free to choose between the alternatives available to it in the long run. The alternatives are whether to close down in case of losses or to continue in the business. If $SAC > AR$, the monopolist incurs losses in the short run. If market size is so small that no plant-size can ensure pure profit in the long run (Figure 3.4), the monopolist goes out of business. If its $AR > SMC_1$ it earns a short-run profit as shown at output OQ_1 in Figure 3.3. The firm would, therefore, not only

continue in the business but would also expand its business to the size that yields maximum profit in the long run.

A monopolist gets an opportunity to expand the size of its plant with a view to maximizing its long run profits. The expansion of the plant size may, however, be subject to such conditions as: (a) size of the markets; (b) expected economic profits and (c) risk of inviting legal restrictions.

A general case of monopoly equilibrium in the long run is presented in *Figure 3.7*, assuming none of the above conditions limits the expansion of monopoly firm. The *AR* and *MR* curves show the market demand and marginal revenue conditions faced by the monopoly. The *LAC* and *LMC* curves show the long-term cost conditions. As shown in the figure, the point of intersection between *LMC* and *MR* curves determine the equilibrium output at OQ_2 . Given the *AR* curve, price is determined at P_2Q_2 . Thus the long-run equilibrium output is OQ_2 and equilibrium price is P_2Q_2 . This price–output combination maximizes the monopolist’s long-run profits. The total long-run profit has been shown by the area $LMSP_2$. Here the monopoly firm is in the long-run equilibrium. Price P_1Q_1 and output OQ_1 present the short-run equilibrium. Its total short-run profit is shown by the smaller shaded area.

MONOPOLISTIC COMPETITION

Introduction

Monopolistic competition refers to a market structure in which a large number of sellers sell differentiated products, which are close substitutes for one another. Monopolistic competition combines the basic elements of both perfect competition and monopoly.

The element of monopoly in monopolistic competition arises from the fact that each firm has an absolute right to produce and sell a *branded* or *patented* product. Other firms are prevented by laws from producing and selling a branded product of other firms.

The element of competition comes from the fact that each branded product has several close substitutes and firms selling branded products of the same generic category have to compete for the market share.

One index of the competition between them is the amount that they spend advertising their product. Some of the industries looking monopolistically competitive may be *oligopolistic* in which there are only a few sellers selling differentiated or homogenous products.

Characteristics

Monopolistic competition combines the elements of both *perfect competition* and *monopoly power*, therefore, the main characteristics of monopolistic competition are the blend of perfect competition and monopoly.

The main features of monopolistic competition *vis-à-vis* perfect competition and monopoly are described as:

- i. Product differentiation
- ii. Large number of sellers
- iii. Free entry and free exit
- iv. Selling costs
- v. Downward sloping demand curve.

- i. *Product differentiation*

Product differentiation is the basis of and the main distinctive characteristic of monopolistic competition that distinguishes it from monopoly and perfect competition. Under monopolistic competition, the firms differentiate their products from one another in respect of their *shape, size, colour, design, minor qualitative differences, efficiency in use, some extra facility, packaging, after-sale-service, guarantee and warranty and so on*.

Product differentiation may be real or fanciful and spurious. The basic purpose of product differentiation is to make the consumers believe that a product is different from others and, thereby, to create brand loyalty of the consumers. Product differentiation affects firm's demand curve in a significant way.

ii. *Large number of sellers*

Under monopolistic competition, the number of sellers is *large*. How large? It is difficult to specify number of firms: it may be 10, 20 or more depending on the size of the market. However, the question 'how large' can be answered in conceptual terms with reference to perfect competition. Under perfect competition, the number of sellers is so large that a firm becomes a *price taker*.

In contrast, under monopolistic competition, the number of firms is only so large that a firm retains its power to be a *price maker*. The monopolistically competitive firms have the power to set the price of their product depending on the objective of the firm.

iii. *Free entry and free exit*

As in case of perfect competition, there is no barrier on the entry of new firms and exit of old ones from the industry. New firms are free to enter the monopolistically competitive industry and to quit at will.

Entry of new firms reduces the market share of the existing ones and exit of firms does the opposite. These consequences of free entry and free exit lead to intensive competition among the firms for retaining as well as increasing their market share.

iv. *Selling costs*

Unlike firms under *perfect competition* and *monopolies*, firms under monopolistic competition make heavy expenditure on advertisement and other sales promotion schemes for their product. This is an important feature that distinguishes monopolistic competition from *perfect competition* and *monopoly*. Selling costs include all the expenditure on advertisement, sales promotion schemes and salaries of sales personnel.

v. *Downward sloping demand curve*

As in case of *monopoly*, a *monopolistically* competitive firm faces a downward sloping demand curve. The reason is that a monopolistically competitive firm can, by exercising its monopoly power, increase its price and still retain some buyers with brand loyalty and can increase the demand for its product by decreasing the price because of a relatively higher cross-elasticity of the competitive product.

Basic elements

There are three basic elements of monopolistic competition such as:

- i. *Product differentiation and firm's perceived demand curve;*

Product differentiation is the basis of competition among the monopolistically competitive firms. A general class of product is differentiated if any significant basis exists for distinguishing the goods (or services) of one seller from those of others. Such a basis may be real or fancied, as long as it is of any importance to buyers, and leads to a preference for one variety of product over another.

The basic purpose of product differentiation is to make customers distinguish the product of a firm from those of the others in the industry and to develop a preference or brand loyalty. Once brand loyalty is developed, it alters the course of the demand curve for the product.

Product differentiation aims at changing the slope and position of the demand curve for the product and converting it from a horizontal demand line (as under perfect competition) to a downward sloping demand curve. The downward sloping demand curve gives the firm power to use its discretion in fixing the price of its product.

The preview demand curve

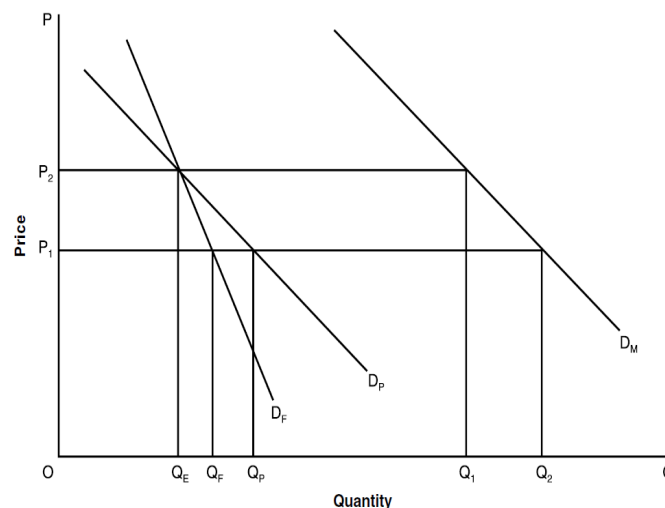


Figure 4.1 Demand Curves for the Industry and the Firms

Under monopolistic competition with product differentiation, each firm perceives that the demand curve for its own product is more elastic than that of the rival firms. This aspect is illustrated in *Figure 4.1*.

Suppose industry's demand curve (*i.e.* market demand curve) is given by the curve D_M . If industry demand is proportionately divided between the firms, each firm is supposed to have a demand curve shown by D_F .

However, firms under monopolistic competition do not take D_F to be the demand curve for their individual product. Each firm perceives that the demand curve for its own product is *more elastic* than that of the other firms. Its *perceived demand curve* is shown by the demand curve D_P . Note that the *perceived demand curve*, D_P , is more elastic than the demand curve D_F . The basis of the perceived demand curve is the firm's belief that if it changes the price of its own product, it will go unnoticed by the other firms and they will not react to change the price of their products. The reason for this assumption is the firm's belief that the number of firms is so large that price changes made by a single firm is very much likely to go unnoticed by the rival firms.

Given the industry demand curve DM in *Figure 4.1*, if price for the industry (the 'product group') is given at OP_2 , the demand for the industry as a whole will be OQ_1 and each firm will be selling an equal quantity, OQ_E . Given this price-quantity combination, an individual firm perceives that if it cuts down the price of its own product to OP_1 , the other firms will not change their price, and then the demand for its product will increase by Q_EQ_P . The additional increase in the demand for its product is the result of cross-elasticity, *i.e.*, when one firm decreases its substitute price and other firms do not, its substitute product becomes relatively cheaper.

Since products of all the firms are close substitutes for one another, some customers will switch over from the constant-price products to the product which has a lower price. Similarly, if only one firm increases its price, it loses its customers to other firms. As a result, demand for its product decreases more than indicated by the demand curve D_F . This holds for all price changes and gives rise to a perceived demand curve D_P . The perceived demand curve plays a significant role in price and output determination in monopolistic competition with price competition.

ii. *Selling costs and firm's cost structure and*

The selling cost incurred by the firms under monopolistic competition and its impact on their cost structure is another important aspect of *Chamberlin's* theory of monopolistic competition. Introduction of selling costs in the theory of price and output determination under monopolistic competition is another innovative contribution made by *Chamberlin*. *Chamberlin* defines *selling costs* as 'costs

incurred in order to alter the position or the slope of the demand curve for a product'. *Chamberlin's* concept of selling costs is not exactly the same as advertisement cost: it is advertisement cost plus. By *Chamberlin's* definition, selling costs include:

- i. Cost of advertisement;
- ii. Expenditure on sales promotion schemes (including gifts and discounts to buyers);
- iii. Salary and commission paid to sales personnel;
- iv. Allowance to retailers for displays and
- v. Cost of after-sale-services.

Also, *Chamberlin* distinguishes *selling costs* and *production cost* on the basis of their basic purpose and functions. According to *Chamberlin*, costs that are incurred to create a product or service of utility and making it available to the consumers are *production costs*. In *Chamberlin's* perception, production cost includes also the cost of transportation. The basic function of the production cost is to create a commodity and to make it available to the consumers. The selling costs, on the other hand, perform the following functions:

- i. Informing potential buyers about the availability of the product;
- ii. Increasing demand for the product by attracting customers of the rival products and
- iii. Making the demand curve shift upward.

What is more important in price and output determination is the effect of selling costs on the total cost that figure in pricing decisions. In his model of monopolistic competition, *Chamberlin* assumes the traditional *U-shaped* cost curves—*AC*, *AVC* and *MC*—and also a *U-shaped average selling cost (ASC)* curve. *ASC* is defined as SC/S (where *SC* = *selling costs* and *S* = *sales*). The *U-shaped ASC* curve is illustrated in *Figure 4.2*.

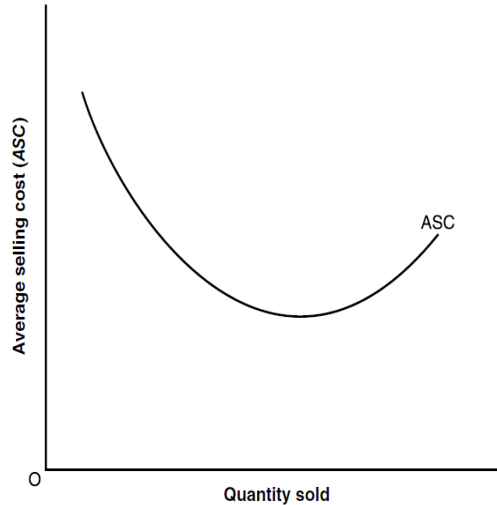


Figure 4.2 The Average Selling Cost Curve

As Figure 4.2 shows, the *ASC* first decreases until it reaches its minimum and then begins to increase. In the beginning, it is very high because a little selling cost (or advertisement cost) is not effective enough to promote sales. With increase in selling costs, however, sales increase at a rate higher than the rate of increase in selling costs. As a result, *ASC* decreases. The decrease in *ASC* is attributed to ‘increasing returns’ to advertising and economies of scale in advertisement cost.

It must, however, be noted that returns to selling cost are determined by the following factors:

Price of the product. A high price makes selling cost less effective;

Price of the substitute. A lower price of the substitutes makes selling cost less productive;

Buyers’ income. Advertising a costly product in low-income society has no pay-off and

Buyers’ loyalty to rival brands. The stronger the loyalty to rival brands, the lower the cross elasticity and the less effective the selling cost.

However, even if all these factors are favorable, a stage is finally reached when returns to selling costs, especially to advertisement cost, tends to become constant. This is the stage of saturation. The stage of saturation may be marked by the size of the market and/or competitive advertisement by the rival firms.

Increasing selling costs or advertisement cost at the stage of saturation tends to become less and less effective in attracting more buyers. Therefore, sales increase at a much lower rate than the increase in the selling costs. Consequently, *ASC* begins to increase and goes on increasing. This is how *ASC* gets its

U-shape, as shown in *Figure 4.2*. The *ASC* curve is added to the *AC* curve in determining the profit maximizing level of output and price.

Optimum level of advertising cost

The optimum level of advertising cost is determined by the objective of the firm—whether it is *profit maximization*, *retaining market share* or *countervailing the advertisement by the rival firms*.

Optimization of advertising expenditure is under the following assumptions.

- a) Objective of the firm is to maximize its profit;
- b) Price of the product is given;
- c) Average production cost (*APC*) and *MPC* curves are given and
- d) Average selling cost (*ASC*) curve is also known

Under these conditions, the optimum level of selling cost is determined where the firm’s overall marginal cost (*MC*) including ‘marginal cost of production’ (*MCP*) and marginal cost of advertising (*MCA*) equals the price. Since price is given by assumptions, $price = AR = MR$. Thus, the condition for the optimum selling cost can be expressed as $MC = MPC + MAC = AR = MR$.

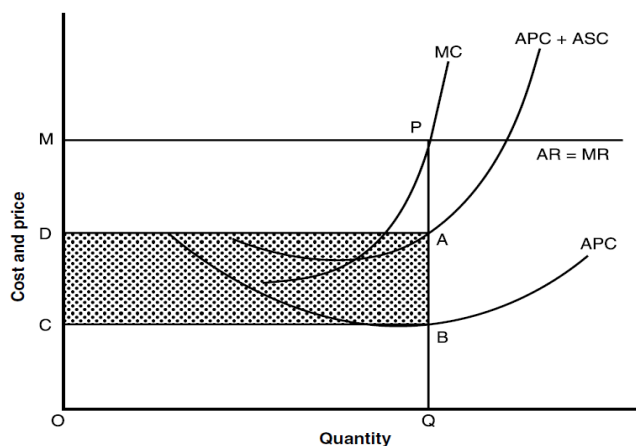


Figure 4.3 Optimization of Selling Cost

The determination of the optimum selling cost is illustrated in *Figure 4.3*. The price of the product is given at OM and firm's APC is shown by the curve APC . The firm's APC curve added vertically with ASC curve (not given in the figure) is shown by the curve labeled $APC + ASC$. The vertical distance between the APC and $APC + ASC$ gives the measure of the *average selling cost (ASC)*. For example, at output OQ , the ASC equals AB . Finally, firm's overall MC (associated with $APC + ASC$) is shown by the MC curve.

As *Figure 4.3* shows, price line, $AR=MR$, and MC curve intersect at point P determining the equilibrium price at OM . An ordinate drawn from point P to the quantity axis determines the profit-maximizing output at OQ . Once profit-maximizing output is determined, the optimum level of all costs (given the cost curves) is automatically determined. It can be seen in *Figure 4.3* that at profit-maximizing output OQ , price equals $OM=PQ=BQ+AB+AP$. Note that at output OQ , average selling cost (ASC) equals AB . That is, at the profit-maximizing level of output, average advertising cost equals AB . Therefore, AB is the *optimum average selling cost (ASC)*. The total optimum selling cost or advertisement expenditure can be obtained by multiplying ASC with output OQ . That is, *total optimum advertisement expenditure* = $OQ \times AB$. Since $OQ = CB$, the total optimum selling cost can be written as $CB \times AB = DABC$, as shown by the shaded area.

iii. Product differentiation and the concept of industry/ Concept of industry and product groups

An industry under perfectly competitive conditions is defined as a group of firms *producing a homogeneous product*. But, this concept of industry cannot be applied to the cases where *products are differentiated*. Where products are differentiated—slightly or substantially—each firm is, in a sense, an industry in itself, exactly as a monopoly firm is an industry in itself.

Since under perfect competition, product is homogeneous, demand curve for an industry can be obtained by adding individual demand curve of individuals firms. But, under monopolistic competition, product is made heterogeneous through product differentiation techniques and in case of heterogeneous products, the demand for individual products cannot be added to obtain market demand and supply curves.

The monopolistically competitive industry defined as a '*group*' of firms producing a '*closely related*' commodity, called *product group*. The products of the '*group*' must be *close, technological and economic substitutes*. The two products are *technological substitutes* for each other if they technically satisfy the same want.

Firm's equilibrium under monopolistic competition

Under monopolistic competition, however, a firm can alter its sales prospects by the following *three methods*:

- i. *By changing the price of its product;*

As regards to changing price, since a firm under monopolistic competition faces a downward sloping demand curve with elasticity less than infinity, it has the option to change the price.

- ii. *By changing 'the nature of the product' and*

In regard to changing the nature of the product, a firm can do it by changing the quality of its product by making technical changes, by introducing a new design, by using superior material, by making a new style of packaging, by establishing a close link with buyers and so on.

- iii. *By incurring the advertisement outlays.*

As regards the methods of sales promotion, a firm can increase its sales by prompt and courteous service, credit facilities and by enhancing expenditure on advertisement.

While making changes in price and output is a short-run phenomenon, changing the quality of the product and attracting larger number of buyers are long-run phenomena. Therefore, Chamberlin's theory (monopolistic competition) of price and output determination is discussed under *short-* and *long-run* conditions.

Assumptions

- i. There are a large number of firms selling slightly differentiated products, which are close substitutes for one another.
- ii. The number of firms in a product group is so large that their activities, especially strategies of price and output, go unnoticed by the rival firms.
- iii. Demand and cost curves for all the products and for all the firms of the group are uniform, *i.e.*, firms face identical demand (including *perceived* one) and cost curves.
- iv. Consumer's preferences are evenly distributed among the different products and product differentiations are not such that they make a difference in cost.

Short-run equilibrium of the firm

The *short-run equilibrium* of the firm under monopolistic competition is illustrated in *Figures 4.4* and *4.5*. *Figure 4.4* illustrates how firms in the state of disequilibrium adjust their price and output to move to the state of equilibrium. *Figure 4.5* presents the final position of the firm's equilibrium and also the determination of equilibrium prices and output.

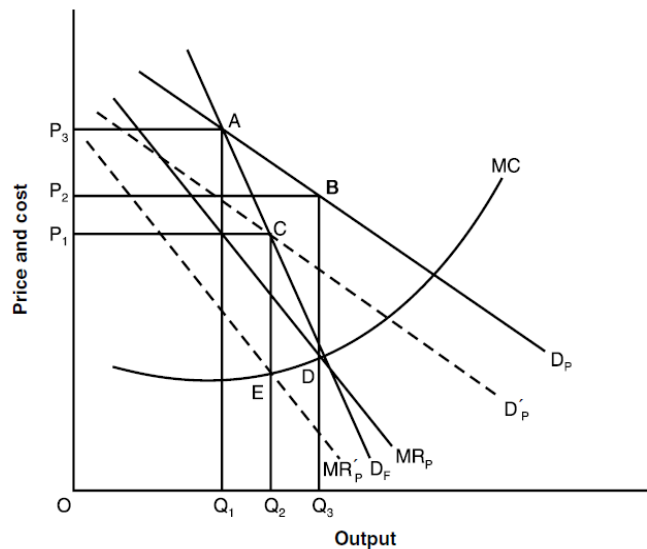


Figure 4.4 Price and Output Adjustments in the Short-run

In *Figure 4.4*, the firm's perceived and proportional market demand curves are given by the curves DP and DH , respectively. The MRP curve shows their *marginal revenue* curve corresponding to their perceived demand curve (DP) and their *marginal cost* curve is shown by the curve MC . Now suppose that in the short-run market price is given at OP_3 determined by the firms themselves or by 'custom', and all the firms are at point A , each one selling output OQ_1 . Incidentally, OQ_1 equals DM/n (where DM is the total market demand for the industry as a whole and n is the number of firms).

Under monopolist competition, however, this position is *not* stable because each firm, given its perceived demand curve (DP), expects to sell more by cutting down the price of its product. Therefore, they cut down their price in anticipation of increase in their sales. They continue to cut down their price until price and output reach the level at which they maximize their profits. The profit-maximizing quantity and price is determined in *Figure 4.4* at point D , the point of intersection between firms' MC

and MR (perceived) curves. Point D determines the profit-maximizing output at OQ_3 and price at OP_2 . That is, each firm produces OQ_3 , and charges price at OP_2 .

It can be seen in *Figure 4.4* that total production based on perceived demand has increased very heavily—by $(Q_1Q_3 \times n)$. The firms find that there is excess production even at a lower price. In order to get rid of their surplus production, the firms begin to cut down their price. As a result, their perceived demand curve (D_p) shifts downward as shown by the dashed perceived demand curve (D'_p). This shift continues until the firms reach the level of final demand curve (D'_f) and they reach their final equilibrium through point E in *Figure 4.4*.

The final short-run equilibrium position of the firm under monopolistic competition is illustrated in *Figure 4.5*. In this figure, the firm's perceived demand curve and the corresponding marginal revenue curve are shown by DP and MR_p curves, respectively, its short-run average and marginal cost curves are shown by the SAC and SMC curves, respectively.

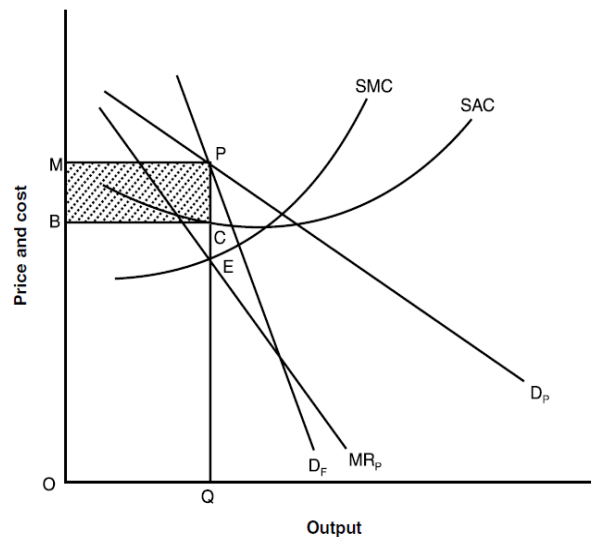


Figure 4.5 Short-run Equilibrium of the Firm Under Monopolistic Competition

As *Figure 4.5* shows, the MR and MC curves intersect at point E determining the profit-maximizing output at OQ and price at M . Each firm produces OQ and sells at price PQ . At this price and output, the firms maximize their short-run profit. The firms are, therefore, in short-run equilibrium at point E . Their maximum pure profit equals $BC \times PC = MPCB$ as shown by the shaded area. Any other price and output will reduce their total profit. Therefore, firms have no incentive to change their price and output. Note that the final price is determined at the point of intersection between D_p and D_f curves. This, however,

should not mean that all the firms in monopolistic competition make pure profits in the short run. Chamberlin does not rule out the possibility of some firms making losses.

Long-run equilibrium of the firm

The long-run conditions differ from the short-run conditions because in the long run:

- i. new firms enter the industry,
- ii. firms indulge in price competition,
- iii. changes (i) and (ii) take place simultaneously and
- iv. firms advertise their product more vigorously.

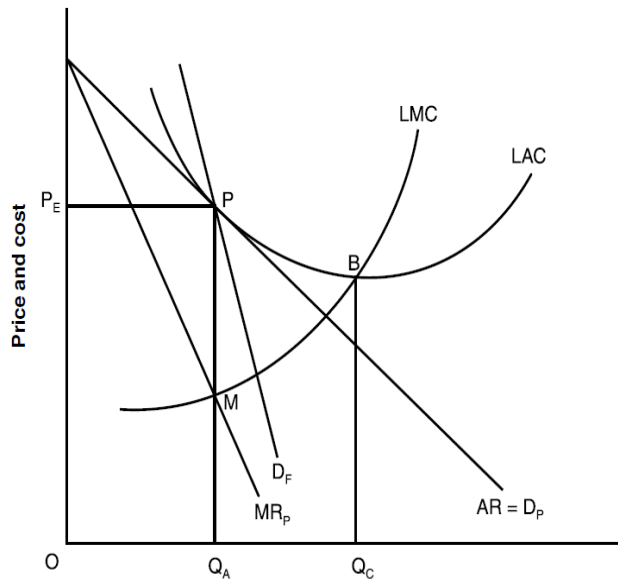


Figure 4.6 Long-run Equilibrium of Firms Under Monopolistic Competition

The long-run equilibrium of the firms under monopolistic competition is illustrated in *Figure 4.6*. The revenue and cost curves in *Figure 4.6* are similar to those given in *Figure 4.5*. As *Figure 4.5* shows, each firm makes a *pure or supernormal profit* of PC per unit of output, *i.e.*, to the extent of the difference between the price and SAC . Supernormal profit attracts new firms to the industry as there is no barrier to entry. With the entry of new firms, the existing firms lose a part of their market share to the new entrants. As a result, the proportional demand curve (DP) of the firms shifts leftward and perceived demand curve (DP) shifts downward. This shift continues until firms reach a new equilibrium point with their perceived $MRP=MC$. This stage is shown by point M when MC intersects with MRP . Point M determines the equilibrium output at OQ_A and price at PQ_A . Note that at point P , demand curve DP is

tangent to *LAC* curve and demand curve *DP* intersects with them. Since price equals *LAC* at point *P*, no firm is making pure profit. There is, therefore, no incentive for new firms to enter the industry nor is there any disincentive for the existing ones to quit the industry. The firms are, therefore, in the state of their long-run equilibrium at point *P*. It is important to note here that point *P* is not imaginary or coincidental. It is determined by the intersection of the *MR* and *MC* curve determining profit-maximizing output at *OQA* and price at *PQA*. At their equilibrium, firms produce and sell quantity *OQA* at price $PQA = OPE$. An important outcome of this analysis is that, in the long run all firms in monopolistic competition make only normal profit.

OLIGOPOLY

Definition

Oligopoly is the market structure in which there are a few sellers selling homogeneous or differentiated products. However, economists do not specify what number of sellers make the market oligopolistic. In fact, it depends on the market size. However, two sellers is the *limiting case* of oligopoly. When there are only two sellers, the market is called *duopoly*.

In any case, if oligopoly firms sell a homogeneous product, it is called *pure* or *homogeneous oligopoly*. For example, industries producing bread, cement, steel, petrol, cooking gas, chemicals, aluminium and sugar are industries characterized by *homogeneous* oligopoly. And, if firms of an oligopoly industry sell *differentiated products*, it is called *differentiated* or *heterogeneous oligopoly*. Automobiles, television sets, soaps and detergents, refrigerators, soft drinks, computers, cigarettes, etc., are some examples of industries characterized by *differentiated* or *heterogeneous oligopoly*.

Factors Causing Oligopoly

The main factors that lead to the growth of oligopoly are described here briefly.

- i. *Huge Capital Investment.*

Some industries are by nature capital intensive, e.g., firms manufacturing automobiles, aircraft, ships, TV sets, refrigerators, steel and aluminium goods, etc., and hence require huge investment. Therefore, only a few firms can enter these kind of industries. In fact, a huge investment requirement works as a natural barrier to entry to the oligopolistic industries.

ii. *Economies of Scale.*

By virtue of huge investment and large scale production, large units enjoy absolute cost advantage due to economies of scale in their purchase of industrial inputs, acquiring external finance, and in sales organization. This gives the existing firms a comparative advantage over new firms, especially in price competition. This works not only as a deterrent for the entry of new firms, but also causes exit of high cost firms.

iii. *Patent Rights.*

In case of differentiated oligopoly, firms get their differentiated product patented which gives them monopoly power, i.e., an exclusive right to produce and market the patented commodity. This prevents other firms from producing the patented commodity. Therefore, unless new firms have something new to offer and can match the existing products in respect of quality and cost, they cannot enter the industry. This keeps the number of firms limited.

iv. *Control over Certain Raw Materials.*

Where a few firms acquire control over almost the entire supply of important inputs required to produce a certain commodity, new firms find it extremely difficult to enter the industry. For example, if a few firms acquire the right from the government to import certain raw materials, they control the entire input supply.

v. *Merger and Acquisition.*

Merger of rival firms or takeover of rival firms by the bigger ones with a view to protecting their joint market share or to put an end to waste of competition is an important factor creating oligopoly. In fact, in modern times, this is the most important factor that gives rise to oligopolies and strengthens the oligopolistic tendency in modern industries.

Features of Oligopoly

i. *Small Number of Sellers.*

As already mentioned, there are a small number of sellers under oligopoly. How small the number of sellers is not given precisely: it depends largely on the size of the market.

Conceptually, however, the number of sellers is so small that the market share of each firm is so large that a single firm can influence the market price and the business strategy of its rival firms. The number may vary from industry to industry.

ii. *Interdependence of Decision Making.*

The most striking feature of an oligopolistic market structure is the interdependence of business decision of oligopoly firms. The characteristic fewness of firms under oligopoly brings the firms in keen competition with each other. The competition between the firms takes the form of action, reaction and counteraction in the absence of collusion between the firms. Since the number of firms in the industry is small, the business decision and strategy of each firm in respect of pricing, advertising, product modification is closely watched by the rival firms and it evokes retaliatory actions. What is equally important in strategic business decisions is that firms initiating a new business strategy anticipate and take into account the counteraction by the rival firms. This is called interdependence of oligopoly firms.

iii. *Barriers to Entry.*

Barriers to entry to an oligopolistic industry arise due to such market conditions as (i) huge investment requirement to match the production capacity of the existing ones, (ii) economies of scale and absolute cost advantage enjoyed by the existing firms, (iii) strong consumer loyalty to the products of the established firms based on their quality and service and (iv) resistance by the established firms by price cutting. However, the new entrants that can cross these barriers can and do enter the industry, though only a few, that too mostly the franchise branches of MNCs.

iv. *Indeterminate Price and Output.*

Another important feature, though controversial, of the oligopolistic market structure is the indeterminateness of price and output. The characteristic fewness and interdependence of oligopoly firms makes derivation of the demand curve a difficult proposition. Therefore, price and output are said to be indeterminate. However, price and output are said to be determinate under collusive oligopoly. But, collusion may last long or it may breakdown. An opposite view is that price under oligopoly is sticky, i.e., if price is once determined, it tends to stabilize.

The Oligopoly Models: An Overview

Under oligopolistic conditions, rival firms adopt an intricate pattern of actions, reactions and counteractions showing a variety of behavioral patterns. The uncertainty arising out of unpredictable behaviour, actions and reactions of oligopoly firms makes systematic analysis of oligopoly an extremely difficult task. Under (these) circumstances, a very wide variety of behaviour pattern becomes possible. Rivals may decide to get together and cooperate in the pursuit of their objectives ... or, at the other extreme, may try to fight each other to death. Even if they enter an agreement, it may last or it may breakdown.

Economists have, therefore, found it extremely difficult to make a systematic analysis of price and output determination under oligopoly. The complexity of the problem, however, could never deter the economists from their efforts to find a reasonable solution to the problem.

In accordance with the wide variety of behaviour patterns, economists have developed a variety of analytical models based on different behavioural assumptions. The widely quoted models of oligopoly include Cournot's duopoly model (1838), Bertrand's duopoly model (1880), Edgeworth's duopoly model (1897), Stackelberg's model (1933), Sweezy's kinked demand curve model (1939), Neumann and Margenstern Game Theory model (1944), and Baumol's sales maximization model (1959). None of these models, however, provides a universally acceptable analysis of oligopoly, though these models do provide an insight into oligopolistic behaviour.

INTRODUCTION TO GAME THEORY

Introduction

The game theory uses a mathematical technique to show how oligopoly firms play their game of business. The first systematic attempt in this field was made by *Von Neumann* and *Margenstern*.

Although their work was followed by many others, *Martin Shubik* is regarded as the ‘most prominent proponent of the game-theory approach’ who ‘seems to believe that the only hope for the development of a general theory of oligopoly is the games theory’.

The Nature of the Problem: Prisoners’ Dilemma

The nature of the problem faced by the oligopoly firm is best explained by the *Prisoners’ Dilemma Game*.

There are two bookies, *Ranga* and *Billa*, who are partners in an illegal activity of match fixing. On a tip-off, the *CBI* arrests *Ranga* and *Billa* on suspicion of their involvement in fixing cricket matches. They are arrested and lodged in separate jails with no possibility of communication between them. They are being interrogated separately by the *CBI* officials with the following conditions disclosed to them in isolation.

- i. If you confess your involvement in match fixing, you will get a five-year imprisonment.
- ii. If you deny your involvement and your partner denies too, you will be set free for lack of evidence.
- iii. If your partner does not confess and you confess and turn approver, then you get two-year imprisonment, and your partner gets 10-year imprisonment.

Given these conditions, each suspect has two options open to him: (i) to confess, and (ii) not to confess. Now, both *Ranga* and *Billa* face a dilemma on how to decide whether or not to confess. While taking a decision, both have a common objective, i.e., to minimize the period of imprisonment. Given this objective, the option is quite simple that both of them deny their involvement in match fixing. But, there is no certainty that if one denies, the other will also deny: the other may confess and turn approver. With this uncertainty, the dilemma in making a choice still remains.

For example, if *Ranga* denies his involvement, and *Billa* confesses (settles for a two-year imprisonment), and turn approver, then *Ranga* gets a 10-year jail term. So is the case with *Billa*. If they both confess, then they get a five-year jail term each. Then what to do? That is the dilemma. The nature of their problem of decision making is illustrated in the following *Table 5.4* in the form of a ‘pay-off

matrix'. The pay-off matrix shows the pay-offs of their different options in terms of the number of years in jail.

Table 5.4 Prisoners' Dilemma: The Pay-off Matrix

Ranga's Options	Billa's Options			
	Confess	Deny	Confess	Deny
Confess	Ranga 5	Billa 5	Ranga 2	Billa 10
Deny	Ranga 10	Billa 2	Ranga 0	Billa 0

Given the conditions, it is quite likely that both the suspects may opt for 'confession', because neither *Ranga* knows what *Billa* will do, nor *Billa* knows what *Ranga* will do. When they both confess, each gets a five-year jail term. This is the second best option. For his decision to confess, *Ranga* might formulate his strategy in the following manner. He reasons out: if I confess (though I am innocent), I will get a maximum of five year's imprisonment. But, if I deny (which I must) and *Billa* confesses and turns approver, I will get 10 year's imprisonment. And, that will be the worst of the worst. It is quite likely that suspect *Billa* also reasons in the same manner, even if he too is innocent. If they both confess, they would avoid 10 year's imprisonment, the maximum possible jail term under the law. This is the best they could achieve under the given conditions.

Relevance of prisoners' dilemma in oligopoly:

The prisoners' dilemma illustrates the nature of problems oligopoly firms are confronted within the formulation of their business strategy with respect to strategic advertising, price cutting and cheating in case of a cartel. Look at the nature of the problems an oligopoly firm is faced with when it plans to increase its advertisement expenditure (ad-expenditure for short). The basic issue is whether or not to increase the ad-expenditure.

If the answer is 'do not increase', then the questions are: Will the rival firms increase ad-expenditure or will they not? And if they do, what will be the consequences for the firm under consideration? And, if the firms answer is 'increase', then the questions that arise are: What will be the reaction of the rival firms? Will they increase or will they not increase their ad-expenditure? What will be the pay-off if they

do not and what if they do? If the rival firms do increase their advertising, what will be the pay-off to the firm? Will the firm be a net gainer or a net loser?

The firm will have to find answer to these questions under the conditions of uncertainty. To find the answer, the firms will have to anticipate actions, reactions and counteraction by the rival firms and chalk out its own strategy. It is in case of such problems that the case of prisoners’ dilemma becomes an illustrative example.

Application of Game Theory to Oligopolistic Strategy

Assuming that there are only two television companies, *Sony* and *Samsung i.e.*, the case of a duopoly. In all the games, the players have to anticipate the move made by the opposite player (s) and formulate their own strategy to counter the different possible moves by the rival. To apply the game theory to the case of ‘whether or not to increase ad-expenditure’ a company needs to know or anticipate:

- i. The counter moves by the rival company in response to increase in ad-expenditure by this company and
- ii. The pay-offs of this strategy when (a) the rival company does not react and (b) the rival company does make a counter move by increasing its ad-expenditure.

Table 5.5 Pay-off Matrix of the Ad-Game (Increase in Sales in Million Rs)

Sony's Strategy	Samsung's Options			
	Increase Ad		Don't Increase	
Increase Ad	A	B	A	B
	20	10	30	0
Don't increase	A	B	A	B
	10	15	15	5

After this data is obtained, the company will have to decide on the best possible strategy for playing the game and achieving its objective of, say, increasing sales and capturing a larger share of the market. The best possible strategy in game theory is called the ‘dominant strategy’. A *dominant strategy is one that*

gives optimum pay-off, no matter what the opponent does. Thus, the basic objective of applying the game theory is to arrive at the dominant strategy.

Suppose that the possible outcomes of the ad-game under the alternative moves are given in the payoff matrix presented in *Table 5.5*. In the figure, A indicates Sony's gain and B indicates Samsung's gain in terms of increase in sales.

As the matrix shows, if Sony decides to increase its ad-expenditure and Samsung counteracts by increasing its own ad-expenditure, Sony's sales go up by *Rs 20* million and that of Samsung by *Rs 10* million. And, if Sony increases its advertisement and Samsung does not, then Sony's sales gain is *Rs 30* million and no gain to Samsung. One can similarly find the pay-offs of the strategy 'Don't increase' in case of both of firms.

Given the pay-off matrix, the question arises as to what strategy should Sony choose to optimize its gain from extra ad-expenditure, irrespective of moves of the rival Samsung. It is clear from the pay-off matrix that Sony will choose the strategy of increasing the ad-expenditure because, no matter what Samsung does, its sales increase by at least *Rs 20* million. This is, therefore, the *dominant strategy* for Sony. A better situation could be that when Sony increases its expenditure on advertisement, Samsung does not. In that case, Sony's sales could increase by *Rs 30* million and sales of Samsung do not increase. But there is a greater possibility that Samsung will go for counter advertising, in anticipation of losing a part of its market to Sony in future. Therefore, a strategy based on the assumption that Samsung will not increase its ad-expenditure involves a great of uncertainty.

Nash Equilibrium

There is a continuous *one-to-one* and *tit-for-tat* kind of warfare. *Actions, reactions* and *counteractions* are regular phenomena. Under these conditions, a *dominant strategy* is often found to be non-existent. To analyze this kind of situation, John Nash, an American mathematician, developed a technique, known as Nash equilibrium.

Nash equilibrium technique seeks to establish that each company does the best it can, given the strategy of its competitors.

By definition, Nash equilibrium implies a situation in which none of the players can improve their pay-off given the strategy of the other players.

In the example Nash equilibrium can be defined as one in which none of the companies can increase its pay-off (sales) given the strategy of the rival company. The Nash equilibrium can be illustrated by making some modifications in the pay-off matrix given in *Table 5.5*. Now assuming that *action* and *counteraction* between *Sony* and *Samsung* is a regular phenomenon and that the pay-off matrix that appears finally is given in *Table 5.6*. The only change in the modified pay-off matrix is that if neither Sony nor Samsung increases its ad-expenditure, then pay-offs change from (15, 5) to (25, 5).

Table 5.6 *Pay-off Matrix of the Ad-Game (Sales Figures in Million Rs)*

A's Strategy	B's Options			
	Increase Ad		Don't Increase	
Increase Ad	Sony	Samsung	Sony	Samsung
	20	10	30	0
Don't increase	Sony	Samsung	Sony	Samsung
	10	15	25	5

It can be seen from the pay-off matrix (*Table 5.6*) that Sony has no more a *dominant strategy*. Its optimum decision depends now on what Samsung does. If Samsung increases its ad-expenditure, Sony has no option but to increase its advertisement expenditure. And, if Sony reinforces its advertisement, Samsung will have to follow the suit. On the other hand, if Samsung does not increase its ad-expenditure, Sony does the best by increasing its ad-expenditure. Under these conditions, the conclusion that both the companies arrive at is to increase ad-expenditure if the other company does so, and 'don't increase', if the competitor 'does not increase'.

In the ultimate analysis, however, both the companies will decide to increase the ad-expenditure. The reason is that if none of the companies increases advertisement, Sony gains more in terms of increase in its sales (Rs 25 million) and the gain of Samsung is much less (Rs 5 million only). And, if Samsung increases advertisement expenditure, its sales increase by Rs 10 million. Therefore, Samsung would do best to increase its ad-expenditure. In that case, Sony will have no option but to increase its ad-expenditure. Thus, the *final conclusion* that emerges is that both the companies will go for advertisement war. In that case, each company finds that it is doing the best, given what the rival company is doing. This is the Nash equilibrium.

PRICING POLICIES AND PRACTICES: MEANING AND METHODS

Meaning of Pricing Policy:

A systematic approach to pricing requires the decision that an individual pricing situation be generalized and codified into policy cover-age of all the principal pricing problems. Policies can and should be tailored to various competitive situations. A policy approach which is becoming normal for sales activities is comparatively rare in pricing.

Most well managed manufacturing enterprises have a clear cut advertising policy, product customer policy and distribution-channel policy. But pricing decision remains a patchwork of ad hoc decisions. In many, otherwise a well managed firm, price policy has been dealt with on a crisis basis. This kind of price management by catastrophe discourages the kind of systematic analysis needed for clear cut pricing policies.

Considerations involved in formulating the pricing policy:

The following considerations involve in formulating the pricing policy:

i. Competitive Situation:

Pricing policy is to be set in the light of competitive situation in the market. We have to know whether the firm is facing perfect competition or imperfect competition. In perfect competition, the producers have no control over the price. Pricing policy has special significance only under imperfect competition.

ii. Goal of Profit and Sales:

The businessmen use the pricing device for the purpose of maximizing profits. They should also stimulate profitable combination sales. In any case, the sales should bring more profit to the firm.

iii. Long Range Welfare of the Firm:

Generally, businessmen are reluctant to charge a high price for the product because this might result in bringing more producers into the industry. In real life, firms want to prevent the entry of rivals. Pricing should take care of the long run welfare of the company.

iv. Flexibility:

Pricing policies should be flexible enough to meet changes in economic conditions of various customer industries. If a firm is selling its product in a highly competitive market, it will have little scope for pricing discretion. Prices should also be flexible to take care of cyclical variations.

v. Government Policy:

The government may prevent the firms in forming combinations to set a high price. Often the government prefers to control the prices of essential commodities with a view to prevent the exploitation of the consumers. The entry of the government into the pricing process tends to inject politics into price fixation.

vi. Overall Goals of Business:

Pricing is not an end in itself but a means to an end. The fundamental guides to pricing, therefore, are the firms overall goals. The broadest of them is survival. On a more specific level, objectives relate to rate of growth, market share, maintenance of control and finally profit. The various objectives may not always be compatible. A pricing policy should never be established without consideration as to its impact on the other policies and practices.

vii. Price Sensitivity:

The various factors which may generate insensitivity to price changes are variability in consumer behaviour, variation in the effectiveness of marketing effort, nature of the product, importance of service after sales, etc. Businessmen often tend to exaggerate the importance of price sensitivity and ignore many identifiable factors which tend to minimize it.

viii. Reutilization of Pricing:

A firm may have to take many pricing decisions. If the data on demand and cost are highly conjectural, the firm has to rely on some mechanical formula. If a firm is selling its product in a highly competitive market, it will have little scope for price discretion. This will have the way for reutilized pricing.

Objectives of Pricing Policy:

The pricing policy of the firm may vary from firm to firm depending on its objective. In practice, we find many prices for a product of a firm such as wholesale price, retail price, published price, quoted price, actual price and so on.

Special discounts, special offers, methods of payment, amounts bought and transportation charges, trade-in values, etc., are some sources of variations in the price of the product. For pricing decision, one has to define the price of the product very carefully.

Pricing decision of a firm in general will have considerable repercussions on its marketing strategies. This implies that when the firm makes a decision about the price, it has to consider its entire marketing efforts. Pricing decisions are usually considered a part of the general strategy for achieving a broadly defined goal.

While setting the price, the firm may aim at the following objectives:

i. Price-Profit Satisfaction:

The firms are interested in keeping their prices stable within certain period of time irrespective of changes in demand and costs, so that they may get the expected profit.

ii. Sales Maximization and Growth:

A firm has to set a price which assures maximum sales of the product. Firms set a price which would enhance the sale of the entire product line. It is only then, it can achieve growth.

iii. Making Money:

Some firms want to use their special position in the industry by selling product at a premium and make quick profit as much as possible.

iv. Preventing Competition:

Unrestricted competition and lack of planning can result in waste-ful duplication of resources. The price system in a competitive economy might not reflect society's real needs. By adopting a suitable price policy the firm can restrict the entry of rivals.

v. Market Share:

The firm wants to secure a large share in the market by following a suitable price policy. It wants to acquire a dominating leadership position in the market. Many managers believe that revenue maximization will lead to long run profit maximization and market share growth.

vi. Survival:

In these days of severe competition and business uncertainties, the firm must set a price which would safeguard the welfare of the firm. A firm is always in its survival stage. For the sake of its continued existence, it must tolerate all kinds of obstacles and challenges from the rivals.

vii. Market Penetration:

Some companies want to maximize unit sales. They believe that a higher sales volume will lead to lower unit costs and higher long run profit. They set the lowest price, assuming the market is price sensitive. This is called market penetration pricing.

viii. Marketing Skimming:

Many companies favour setting high prices to 'skim' the market. Dupont is a prime practitioner of market skimming pricing. With each innovation, it estimates the highest price it can charge given the comparative benefits of its new product versus the available substitutes.

ix. Early Cash Recovery:

Some firms set a price which will create a mad rush for the product and recover cash early. They may also set a low price as a caution against uncertainty of the future.

x. Satisfactory Rate of Return:

Many companies try to set the price that will maximize current profits. To estimate the demand and costs associated with alternative prices, they choose the price that produces maximum current profit, cash flow or rate of return on investment.

Factors Involved in Pricing Policy:

The pricing of the products involves consideration of the following factors:

i. Cost Data in Pricing:

Cost data occupy an important place in the price setting processes. There are different types of costs incurred in the production and marketing of the product. There are production costs, promotional expenses like advertising or personal selling as well as taxation, etc.

They may necessitate an upward fixing of price. For example, the prices of petrol and gas are rising due to rise in the cost of raw materials, such as crude transportation, refining, etc. If costs go up, price rise can be quite justified. However, their relevance to the pricing decision must neither be underestimated nor exaggerated. For setting prices apart from costs, a number of other factors have to be taken into consideration. They are demand and competition.

Costs are of two types:

Fixed costs and variable costs. In the short period, that is, the period in which a firm wants to establish itself, the firm may not cover the fixed costs but it must cover the variable cost. But in the long run, all costs must be covered. If the entire costs are not covered, the producer stops production.

Subsequently, the supply is reduced which, in turn, may lead to higher prices. If costs are not covered, the producer stops production. Subsequently, the supply is reduced which, in turn, may lead to higher prices. If costs were to determine prices why do so many companies report losses?

There are marked differences in costs as between one producer and another. Yet the fact remains that the prices are very close for a somewhat similar product. This is the very best evidence of the fact that costs are not the determining factors in pricing.

In fact, pricing is like a tripod. It has three legs. In addition to costs, there are two other legs of market demand and competition. It is no more possible to say that one or another of these factors determines price than it is to assert that one leg rather than either of the other two supports a tripod.

Price decisions cannot be based merely on cost accounting data which only contribute to history while prices have to work in the future. Again it is very difficult to measure costs accurately. Costs are affected by volume, and volume is affected by price. The management has to assume some desired price-volume relationship for determining costs. That is why, costs play even a less important role in connection with new products than with the older ones. Until the market is decided and some idea is obtained about volume, it is not possible to determine costs.

Regarding the role of costs in pricing, Nickerson observes that the cost may be regarded only as an indicator of demand and price. He further says that the cost at any given time represents a resistance point to the lowering of price. Again, costs determine profit margins at various levels of output. Cost calculation may also help in determining whether the product whose price is determined by its demand, is to be included in the product line or not. What costs determine is not the price, but whether the production can be profitably produced or not is very important.

Relevant Costs:

The question naturally arises: "What then are the relevant costs for pricing decision? Though in the long run, all costs have to be covered, for managerial decisions in the short run, direct costs are relevant. In a single product firm, the management would try to cover all the costs." In a multi-product firm, problems are more complex. For pricing decision, relevant costs are those costs that are directly traceable to an individual product. Ordinarily, the selling price must cover all direct costs that are attributable to a product. In addition, it must contribute to the common cost and to the realization of profit. If the price, in the short run, is lower than the cost, the question arises, whether this price covers the variable cost. If it covers the variable cost, the low price can be accepted.

But in the long run, the firm cannot sell at a price lower than the cost. Product pricing decision should be lower than the cost. Product pricing decision should, therefore, be made with a view to maximize company's profits in the long run.

ii. Demand Factor in Pricing:

In pricing of a product, demand occupies a very important place. In fact, demand is more important for effective sales. The elasticity of demand is to be recognized in determining the price of the product. If the demand for the product is inelastic, the firm can fix a high price. On the other hand, if the demand is elastic, it has to fix a lower price.

In the very short term, the chief influence on price is normally demand. Manufacturers of durable goods always set a high price, even though sales are affected. If the price is too high, it may also affect the demand for the product. They wait for arrival of a rival product with competitive price. Therefore, demand for product is very sensitive to price changes.

iii. Consumer Psychology in Pricing:

Demand for the product depends upon the psychology of the consumers. Sensitivity to price change will vary from consumer to consumer. In a particular situation, the behaviour of one individual may not be the same as that of the other. In fact, the pricing decision ought to rest on a more incisive rationale than simple elasticity. There are consumers who buy a product provided its quality is high. Generally, product quality, product image, customer service and promotion activity influence many consumers more than the price. These factors are qualitative and ambiguous. From the point of view of consumers, prices are quantitative and unambiguous.

Price constitutes a barrier to demand when it is too low, just as much as where it is too high. Above a particular price, the product is regarded as too expensive and below another price, as constituting a risk of not giving adequate value. If the price is too low, consumers will tend to think that a product of inferior quality is being offered.

With an improvement in incomes, the average consumer becomes quality conscious. This may lead to an increase in the demand for durable goods. People of high incomes buy products even though their prices are high. In the affluent societies, price is the indicator of quality.

Advertisement and sales promotion also contribute very much in increasing the demand for advertised products. Because the consumer thinks that the advertised products are of good quality. The income of the consumer, the standard of living and the price factor influence the demand for various products in the society.

iv. Competition Factor in Pricing:

Market situation plays an effective role in pricing. Pricing policy has some managerial discretion where there is a considerable degree of imperfection in competition. In perfect competition, the individual producers have no discretion in pricing. They have to accept the price fixed by demand and supply. In monopoly, the producer fixes a high price for his product. In other market situations like oligopoly and monopolistic competition, the individual producers take the prices of the rival products in determining their price. If the primary determinant of price changes in the competitive condition is the market place, the pricing policy can least be categorised as competition based pricing.

v. Profit Factor in Pricing:

In fixing the price for products, the producers consider mainly the profit aspect. Each producer has his aim of profit maximization. If the objective is profit maximization, the critical rule is to select the price at which $MR = MC$. Generally, the pricing policy is based on the goal of obtaining a reasonable profit. Most of the businessmen want to hold the price at constant level. They do not desire frequent price fluctuation. The profit maximization approach to price setting is logical because it forces decision makers to focus their attention on the changes in production, cost, revenue and profit associated with any contemplated change in price. The price rigidity is the practice of many producers. Rigidity does not mean inflexibility. It means that prices are stable over a given period.

vi. Government Policy in Pricing:

In market economy, the government generally does not interfere in the economic decisions of the economy. It is only in planned economies, the government's interference is very much. According to conventional economic theory, the buyers and sellers only determine the price. In reality, certain other parties are also involved in the pricing process. They are the competition and the government.

The government's practical regulatory price techniques are ceiling on prices, minimum prices and dual pricing. In a mixed economy like India, the government resorts to price control. The business

establishments have to adopt the government's price policies to control relative prices to achieve certain targets, to prevent inflationary price rise and to prevent abnormal increase in prices.

COST PLUS OR MAKE-UP PRICING

Defining and Calculating Cost-Plus Pricing

Cost-plus pricing, also called markup pricing, is the practice by a company of determining the cost of the product to the company and then adding a percentage on top of that price to determine the selling price to the customer.

Cost-plus pricing is a very simple cost-based pricing strategy for setting the prices of goods and services. With cost-plus pricing you first add the direct material cost, the direct labor cost, and overhead to determine what it costs the company to offer the product or service. A markup percentage is added to the total cost to determine the selling price. This markup percentage is profit. Thus, you need to start out with a solid and accurate understanding of all the business' costs and where those costs are coming from.

In certain cases, the markup percentage is agreed upon by both buyer and seller. This percentage can also serve as a bargaining chip during the sale.

3 Steps to Computing Cost-Plus Pricing

There are three steps involved in computing cost-plus pricing for a product:

Step 1: Determine the total cost of the product or service, which is the sum of fixed and variable cost (fixed costs do not vary by the number of units, while variable costs do).

Step 2: Divide the total cost by the number of units to determine the unit cost.

Step 3: Multiply the unit cost by the markup percentage to arrive at the selling cost and the profit margin of the product.

A Cost-Based Pricing Example

Suppose that a company sells a product for \$1, and that \$1 includes all the costs that go into making and marketing the product. The company may then add a percentage on top of that \$1 as the "plus" part of cost-plus pricing. That portion of the price is the company's profit.

Depending on the company, the percentage of markup may also include some factor reflecting the current market or economic conditions. If demand is slow, then the markup percentage may be lower in order to lure in customers. On the other hand, if demand for the product is high and economic conditions are good, the markup percentage may be higher as the company feels it can demand a higher price for its product.

Advantages and Disadvantages

In certain situations, such as a contracted sales agreement, it makes sense to use a cost-plus pricing method, while it could cause big financial problems if used in other pricing scenarios. Following are some of the positives of using this type of pricing method:

Building up the selling price of a product: It's simple using this method, with one caveat. You need to have a consistent method for allocating overhead costs each accounting period going forward to maintain integrity with the cost buildup.

Locking revenues in with a contract: Any supplier would like to have a contract with cost-plus pricing because it essentially guarantees sales with a certain profit percentage and coverage of all production costs with no risk of having a loss.

A way for suppliers to justify and explain a price increase: With cost-plus pricing, price increases are easier to roll out because companies can simply inform clients that the costs to produce the product have risen.

The cost-plus model comes with its share of disadvantages, including the following:

Pricing doesn't consider the competition: The product could be priced too high, which would cost the company in terms of lost sales and market share. The pricing could also be lower than the competition's, causing the company to lose potential profits because of not charging the market rate for its goods.

Suppliers have little incentive to control or reduce costs: When they've entered into a cost-plus pricing arrangement, companies end up producing what they want, regardless of what it costs to produce or how it sells in the market.

Runaway costs from suppliers hired on a cost-plus basis: Suppliers have the incentive to include every possible cost in a cost-plus contract, rather than looking for ways to cut costs and streamline.

Doesn't consider most recent replacement costs. The cost-plus method is based on historical costs and doesn't factor in any recent changes in the amount of costs incurred.

Considerations

A significant issue with cost-plus pricing is that it doesn't consider any measure of demand for the product or service. The formula is unmindful of whether potential customers will actually purchase the product at the indicated price. To compensate, some business owners have tried to apply the principles of price elasticity to cost-plus pricing. Others may simply look at competitive offers, trends, and business acumen to determine what price the market will bear.

An alternative is value-based pricing, which is the process of determining the selling price of a product or service based on the benefits it provides to buyers, not what it costs to produce. If your business offers specialty or unique products with highly valuable features, you may be well positioned to take advantage of value-based pricing, which typically generates a higher profit percentage.

MARGINAL COSTING

Meaning of Marginal Costing:

According to the Institute of Cost and Management Accountants, London, "Marginal Costing is the ascertainment, by differentiating between fixed costs and variable costs, of marginal cost and of the effect of profit of changes in the volume or type of output."

An understanding of the concept of marginal cost requires a thorough understanding of the various classes of costs and their relation with the change in the level of activity. Under marginal costing, costs are mainly classified into fixed costs and variable costs. The essential feature of marginal costing is that the product or marginal costs i.e., those costs that are dependent on the volume of activity are separated from the period or fixed costs i.e., costs that remain unchanged with a change in the volume of activity.

Variability with the volume of output is the main criterion for the classification of costs into product and period categories. Even semi-variable costs have to be bifurcated into their fixed and variable components based on the variability criterion.

Advantages of Marginal Costing:

The important advantages of Marginal Costing are:

- (a) Marginal costing is easy to understand. It can be combined with standard costing and budgetary control and thereby makes the control mechanism more effective.
- (b) Eliminating of fixed overheads from the cost of production prevents the effect of varying charges per unit, and also prevents the carrying forward of a portion of the fixed overheads of the current period to the subsequent period. As such, costs and profits are not vitiated and cost comparisons become more meaningful.
- (c) The problem of over or under absorption of overheads is avoided.
- (d) A clear – cut division of costs into fixed and variable elements makes the flexible budgetary control system easy and effective and thereby facilitates greater practical cost control.
- (e) It helps profit planning through break-even charts and profit graphs. Comparative profitability can easily be assessed and brought to the notice of the management for decision-making.
- (f) (f) It is an effective tool for determining efficient sales or production policies, or for taking pricing and tendering decisions, particularly when the business is at low ebb.

Managerial Uses of Marginal Costing:

The following may be listed as specific managerial uses:

- (a) Cost Ascertainment:

Marginal costing technique facilitates not only the recording of costs but their reporting also. The classification of costs into fixed and variable components makes the job of cost ascertainment easier. The main problem in this regard is only the segregation of the semi-variable cost into fixed and variable elements. However, this may be overcome by adopting any of the methods in this regard.

- (b) Cost Control:

Marginal cost statements can be understood easily by the management than those presented under absorption costing. Bifurcation of costs into fixed and variable enables management to exercise control over production cost and thereby affect efficiency. In fact, while variable costs are controllable at the

lower levels of management, fixed costs can be controlled at the top level. Under this technique, management can study the behaviour of costs at varying conditions of output and sales and thereby exercise better control over costs.

(c) Decision-Making:

Modern management is faced with a number of decision-making problems every day. Profitability is the main criterion for selecting the best course of action. Marginal costing through 'contribution' assists management in solving problems.

Some of the decision-making problems that can be solved by marginal costing are:

- (a) Profit planning
- (b) Pricing of products
- (c) Make or buy decisions
- (d) Product mix etc.

Limitations of Marginal Costing:

Despite its superiority over absorption costing, the marginal costing technique has its own limitations.

- (a) Segregation of all costs into fixed and variable costs is very difficult. In practice, a major technical difficulty arises in drawing a sharp line of demarcation between fixed and variable costs. The distinction between them hold good only in the short run. In the long run, however, all costs are variable.
- (b) In marginal costing, greater importance is attached to the sales function thereby relegating the production function largely to a secondary position. But, the real efficiency of a business is to be assessed only by considering the selling and production functions together.
- (c) The elimination of fixed costs from the valuation of inventories is illogical since costs are also incurred in the manufacture of goods. Further, it results in the understatement of the value of stock, which is neither the cost nor the market price.

- (d) Pricing decision cannot be based on contribution alone. Sometimes, the contribution will be unrealistic when increased production and sales are effected, either through extensive use of existing machinery or by replacing manual labour by machines. Another possibility is that there is danger of too many sales being affected at marginal cost, resulting in denial to the business of inadequate profits.
- (e) Although the problem of over or under absorption of fixed overheads can be overcome to a certain extent, the same problems still persists with regard to variable overheads.
- (f) The application of the technique is limited in the case of industries in which, according to the nature of business, large stocks have to be carried by way of work-in-progress (*e.g.* contracting firms).

MULTIPLE PRODUCT PRICING

Most microeconomic models of price determination are based on the assumption that a firm produces a single, homogeneous product. In actual practice, however, production of a single homogeneous product by a firm is an exception rather than a rule. Almost all firms have more than one product in their line of production. Even the most specialized firms produce a commodity in multiple models, styles and sizes, each so much differentiated from the other that every model or size of the product may be considered a different product.

For example, the various models of refrigerators, TV sets, cell phones, computers and car models etc. produced by the same company may be treated as different products for at least pricing purpose. The various models are so differentiated that consumers view them as different products and, in some cases, as close substitutes for each other. It is for this reason that each model or product has different AR and MR curves and that one product of the firm compete against the other product. The pricing under these conditions is known as multi-product pricing or product-line pricing.

The major problem in pricing multiple products is that each product has a separate demand curve. But, since all the products are produced less than one establishment by interchangeable production facilities,

they have only one joint and one inseparable marginal cost curve (MC). That is, while revenue curves, AR and MR, are separate for each product, cost curves, AC and MC, are inseparable. Therefore, the marginal rule of pricing cannot be applied straightaway to fix the price of each product separately unless products are viewed as differentiated.

TRANSFER PRICING

Most large firms have upstream and downstream managers who must make price and output decisions for their own divisions.

For example, automakers like Toyota have upstream managers who control the production of inputs (like car engines) produced in upstream divisions. These inputs are “transferred” to downstream divisions, where downstream managers operate plants that use the inputs to produce the final output (automobiles).

An important issue in this setting is optimal transfer pricing—the internal price at which an upstream division should sell inputs to the firm’s downstream division to maximize the overall profits of the firm.

Transfer pricing is important because most division managers are provided an incentive to maximize their own division’s profits.

If the owners of a firm do not set optimal transfer prices, but instead let division managers set the prices of internally manufactured inputs so as to maximize their division’s profits, the result might be lower overall profits for the firm.

SKIMMING PRICING

Price skimming is the strategy of charging a relatively high price during the launch of a new, innovative product and then lowering the price over time to access different points on the demand curve.

Customers known as early adopters will pay steeper prices for a cutting edge product if it's marketed as a "must have", whether the price accurately reflects the value or not. Eventually, prices are lowered to follow the product demand curve and attract more price-sensitive customers. Theoretically, as each customer segment is "skimmed" off the top a company can capture some of the consumer surplus by charging the maximum price each segment is willing to pay.

"Theoretically", although price skimming can effectively segment the market, it's almost impossible for the strategy to capture the entire consumer surplus. Price skimming is most effective when the product follows an inelastic demand curve, meaning the quantity demanded doesn't rise or fall drastically in response to a change in prices.

Advantages

- i. Higher return on investment

Charging more during the launch of an innovative product, particularly in high tech-industries, can help the company recover research and development costs as well as promotional expenses.

- ii. It helps create and maintain brand value

Price skimming can also create the perception that a product is a high quality "must have" for those early adopters who can't live without the latest tech products. Higher prices in the beginning of a product's life cycle enable to build a prestigious brand image that actually attracts status conscious consumers.

- iii. It segments the market

Price skimming is an effective way to segment customer base, potentially allowing earning the greatest possible profits from different types of customers as reducing the price. Starting with a higher price won't deter early adopters, and lower the price over time will attract more price sensitive consumers. If alter prices based on the product demand curve and the maximum price the customers are willing to pay, seller can capture some of that consumer surplus and rake in more revenue.

- iv. Early adopters helps in testing new products

One benefit of early adopter customers is they act as testers of new products. Those status conscious consumers that purchase innovative product first can provide valuable feedback and help to work out the kinks before the next update and foreseeable a wider user base.

In addition to being valuable testers, early adopters who love the product can act as brand ambassadors that create a perception of quality via word of mouth. This free promotion will persuade new customers to buy the product when the price drops.

Disadvantages

- i. It only works when demand curve is inelastic

Price skimming might be a viable tactic for Apple, but that's because the quantity demanded doesn't rise and fall dramatically when the prices change. If the demand curve for product is generally elastic, meaning price changes have a greater effect on product demand, then initial high prices could really hurt sales. The goal of any company is to make a product as inelastic as possible, but not everyone is selling tech products or services that are ingenious enough to appear indispensable to consumers.

- ii. It's not a great strategy in a crowded market

In any industry, assessing customer valuations and analyzing the competition prior to setting prices is crucial.

Price skimming is not a viable strategy in an already busy market, so unless the product includes amazing new features no one can match, it might be a good idea to avoid skimming if fierce competition already exists.

- iii. Skimming attracts competitors

The success of high prices in the beginning of a new product's life cycle will intrigue competitors to enter the market, and the inelasticity of a demand curve is almost always reduced over time due to the introduction of viable substitutes.

Price skimming can also slow the rate of adoption by your potential customers, giving the competition more time to imitate and improve upon your product before you've capitalized on the demand for the innovation.

iv. It can infuriate early adopters

If prices drop too much or too soon after the initial product launch, your early adopters will feel like they got the short end of the stick. To ensure the customers at the top of firm demand curve don't feel cheated, it's important to use price skimming in a consistent manner and avoid hurried or blatantly obvious reductions in price. Apple experienced this type of backlash in 2007 when the company reduced the price of the iPhone by \$200 dollars just two months after its introduction. The quick 33% price drop from \$599 to \$399 may have helped increase demand, but some of the phone's early adopters were understandably upset.

PENETRATION PRICE

Penetration pricing is a pricing strategy that is used to quickly gain market share by setting an initially low price to entice customers to purchase. This pricing strategy is generally used by new entrants into a market. An extreme form of penetration pricing is called predatory pricing.

Rationale behind Penetration Pricing

It is common for a new entrant to use a penetration pricing strategy to quickly obtain a substantial amount of market share. Price is one of the easiest ways to differentiate new entrants from existing market players. The overarching goal of this pricing strategy is to:

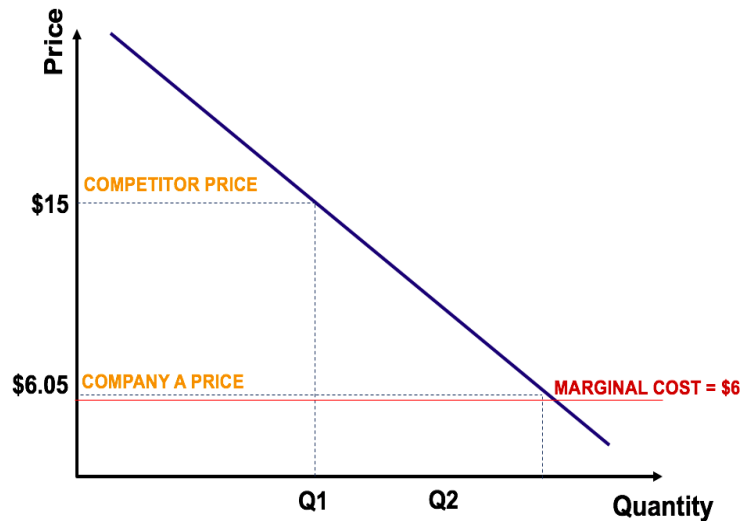
- i. Capture market share
- ii. Create brand loyalty
- iii. Switch customers from competitors
- iv. Generate significant demand, looking to utilize economies of scale
- v. Drive competitors out of the market

Situations where penetration pricing works effectively:

- i. When there is little product differentiation
- ii. Demand is price-elastic
- iii. Where the product is suitable for a mass market (and, therefore, for utilizing economies of scale).

Illustration and Example of Penetration Pricing

A current small-sized player in the marketplace where laundry detergent sells at around \$15. Company A is an international company with a large amount of excess production capacity and is, therefore, able to produce laundry detergents at a significantly lower cost. Company A decides to enter the market, employ a penetration pricing strategy, and sell laundry detergent at a sale price of \$6.05. The company's cost to produce laundry detergent is \$6.



With a marginal cost of \$6 and a sale price of \$6.05, Company A is making nominal profits per sale. However, the company is comfortable with this decision as its overarching goal is to switch customers over, capture as much market share as possible, and utilize economies of scale with their high production capacity.

Company A believes that its competitor will not be able to sustain itself in the long-term and will eventually exit the market. When the competitor exits the marketplace, Company A will become the only seller of laundry detergent and therefore be able to establish a monopoly over the market and raise prices to a level that will provide a high profit margin.

Advantages of Penetration Pricing

High adoption and diffusion: Penetration pricing enables a company to get its product or service quickly accepted and adopted by customers.

Marketplace dominance: Competitors are typically caught off guard by a penetration pricing strategy and are afforded little time to react. The company is able to utilize the opportunity to switch over as many customers as possible.

Economies of scale: The pricing strategy generates a high sales quantity that enables a firm to realize economies of scale and lower its marginal cost.

Increased goodwill: Customers that are able to find a bargain in a product or service are likely to return to the firm in the future. In addition, this increased goodwill creates positive word of mouth.

High inventory turnover: Penetration pricing results in an increased inventory turnover rate, making vertical supply chain partners, such as retailers and distributors, happy.

Disadvantages of Penetration Pricing

Pricing expectation: When a firm uses a penetration pricing strategy, customers often expect permanently low prices. If prices gradually increase, customers may become dissatisfied and may stop purchasing the product or service.

Low customer loyalty: Penetration pricing typically attracts bargain hunters or those with low customer loyalty. Said customers are likely to switch to competitors if they find a better deal. Price cutting, while effective for making some immediate sales, rarely engenders customer loyalty.

Damage brand image: Low prices may affect the brand image, causing customers to perceive the brand as cheap or poor quality.

Price war: A price penetration strategy may trigger a price war. This decreases overall profitability in the market, and the only companies strong enough to survive a protracted price war are usually not the new entrant who triggered the war.

Inefficient long-term strategy: Price penetration is not a viable long-term pricing strategy. It is usually a better idea to approach the marketplace with a pricing strategy that your company can live with, long-

term. While it may then take longer to acquire a sizeable market share, such a patient, long-term strategy is more likely to serve your company better overall, and less likely to expose you to severe financial risks.

UNIT – V

CAPITAL BUDGETING

Introduction

It is important to note that as a factor of production capital has certain features, which make it possible to distinguish it from the other factors. Unlike the other factors, it yields returns over a number of years. These returns have to be discounted to find the present value and then compared with the cost of the capital asset before a final decision is made relating to the investment in the capital asset.

Capital budgeting is the process, which involves the planning of the capital expenditures in the various investment projects. Only those investment projects are included here, which are expected to yield returns beyond one year. It is also called long-term investment analysis as it involves only long-term capital expenditure.

Capital expenditure is expenditure on the projects, which yield a return beyond one year, for example, expenditure on building, machinery and research and development. Short-term capital expenditures, for example, expenditure on inventories, which can be adjusted in the short run are not included. Only capital expenditures, which are at least for a year, are considered under capital budgeting.

Definitions

According to Charles T. Homgreen, “Capital Budgeting is long-term planning for making and financing proposed capital outlays.”

As per Richards and Greenlaw, “The capital budgeting generally refers to acquiring inputs and long-run returns.”

In the words of G. C. Philipattos, “Capital budgeting is concerned with the allocation of the firm’s scarce financial resources among the available market opportunities. The consideration of investment opportunities involves the comparison of the expected future streams of earnings from a project; with the immediate and subsequent stream of expenditures for it.”

According to Joel Dean, “Capital Budgeting is a kind of thinking that is necessary to design and carry through the systematic programme for investing stockholders’ money.”

Significance of Capital Budgeting

Capital budgeting or the planning of long-term expenditures is very crucial for a firm. This is due to many following reasons:

- i. Capital expenditure is very expensive and, in general, irreversible. This is because investments in machinery, capital equipments and others cannot be reverted back as their resale value is very low and involves heavy costs. Hence, a careful planning is essential before long-term capital expenditure is undertaken.
- ii. A firm cannot survive in the long run, unless a well-planned capital expenditure is undertaken. Given the objectives of the firm, the various investment projects must be evaluated and then only the projects which are profitable for the firm must be undertaken. These projects affect the profitability of the firm in the long run and thus increase the firm’s value.

Steps in Capital Budgeting

Capital budgeting can increase the value of a firm. The steps involved in capital budgeting are as follows:

1. Determination of the Cost of the Project:

In capital budgeting, it is most important at the outset to determine the cost of the project under consideration. The cost of the project will include the capital expenditure on the machinery and equipment to be bought, the foreign

exchange required if equipment is to be imported and the necessary expenses involved in the installation of the machinery.

2. Estimation of the Cash Flows from the Project:

The next step involves the estimation of the net cash flows from the project to be undertaken. The cash flows will include cash outflows, which are the incremental costs incurred over the years when the project is operational while cash inflows are the incremental revenues generated over the years when the project is operational. The incremental net cash flows, which a project generates, are determined by taking the difference between the incremental cash inflows and the incremental cash outflows.

3. Measurement of the Risk Involved in the Cash Flows:

As the cash flows from the investments occur in the future, which is uncertain, there is an element of risk attached to the cash flows. This risk factor has to be accounted for in estimating the cash flows and in deciding whether the investment project should be undertaken.

4. Determination of the Appropriate Discount Rate:

The next step is to decide on the rate at which the cash flows should be discounted to arrive at the present value of the cash flows. In general, the opportunity cost of funds, which is the market rate of interest, is used for the purposes of discounting.

5. Obtaining the Present Value of the Future Cash Flows:

Once the decision has been made on the discount rate, the cash inflows and the cash outflows are both discounted to arrive at the net cash flows.

6. Comparing the Present Value of the Future Cash Flow with the Project's Cost:

Once the present value of the future cash flow is arrived at, it is compared with the initial cost of the project, which is to be undertaken. If the present value of the future cash flow from the project is greater than the initial cost of the project, then in that case the firm should undertake the project as it will increase the value of the firm. If the present value of the future cash flow from the project is smaller than the initial cost of the project, then the firm should not undertake the project.

The role of capital budgeting in technology decision-making

As technology continues to transform *professional environments* and *modern workflows*, the need for information technology budgeting grows increasingly important.

Cutting-edge hardware and *software tools* often come with a hefty price tag, and a single hasty decision can cost an organization thousands without adding any value to its daily operations.

Investing in the right technologies at the right time involves a lot of internal planning and strategic analysis. Waiting too long can lead to missed opportunities and detrimental inefficiencies.

The importance of capital budgeting in IT management

Capital budgeting is an essential decision-making process that helps companies evaluate the short- and long-term value of capital-intensive projects, from opening new facilities to replacing outdated computers.

Before an organization invests in new technologies, it must first assess whether the project is likely to be profitable, especially if it involves a lot of upfront expenditures.

For example, upgrading networking equipment can help companies improve their in-office connectivity and the performance of their web-based applications, but it's not always clear how these changes translate to a positive return on investment. Some of the financial benchmarks organizations consider include:

- a) Budgetary constraints
- b) Cash inflows and outflows
- c) Internal rate of return
- d) Net present value
- e) Payback period

Breaking down the information technology budgeting process

Although many organizations view their *IT* budgets as a single pool of available capital, the surest way to supercharge decision-making and maximize return on investment (*ROI*) is to sort relevant expenses into distinct categories. This can help *CIOs* and other *C-suite* executives develop precise operating models that demonstrate how each tech investment will improve their operational and financial outcomes.

To streamline this process, the global research firm Gartner developed the “run-grow-transform (*RGT*) method,” which considers the *upfront costs* of *IT* investments along with the resources needed to effectively implement, manage and supports the proposed improvements.

PAY-BACK PERIOD METHOD

Pay-back method is the easiest method of investment evaluation. It is based on the pay-back period. Pay-back period refers to the number of years necessary to recover the original cash outlay invested in a project. It is a period during which the initial outlay is recovered in the form of cash benefits. It is also called Cash-to-cash concept. The method of calculating the pay-back period is:

Initial investment:

Annual cash flow:

When a project requires a cash outlay of Rs. 70,000 and the annual return expected is Rs. 10,000, then the pay-back period is 7 years. Thus the limit period between investment and recovery by a firm is called pay-back method. The returns here are referred to as cash benefits of revenues in excess of expenditure. In case where annual cash inflows are unequal the pay-back period is calculated by adding cash inflows till the total is equal to initial cash outlay.

But this method has its limitations.

1. It fails to measure the profitability of investment projects and it exaggerates liquidity. Highly profitable projects do not necessary pay off in the initial years though lucrative gains may occur in later years.
2. Again under this method, profits are limited to the pay-back time i.e. the profits that accrue after the pay-back period.
3. This method ignores the value of money. The value of Rs. 10,000 today may become less after 7 year period.

In spite of its limitations the pay-back method is the most widely used method for ranking investment proposals. This is due to the following reasons:

1. This method is extremely simple and easy to understand.

2. This method emphasizes the quick cash return flow. Hence professional managers, particularly younger ones, use relatively short pay-back periods as a means to demonstrate their ability to generate quick profits.
3. It is a useful method in industries subject to rapid technological advances, where the plants become obsolete before the end of its physical life.
4. In tight money periods, the quick pay-back project may be proffered to one which may yield a higher rate of return and yet commit funds for a longer period.

The desire on the part of the manager to buy the right to remake his decision and the more rapid rate of technological advance, explains the continued use of the pay-back approach.

NET-PRESENT VALUE METHOD

Net-present value method attempts to compare the present value of the future benefits with the present value of the investment. This is done by discounting the cash flows by an appropriate rate of interest. When the current value of benefits does not exceed the current value of investment, the proposal for investment should be discarded. The main advantage of this method is that it allows comparison of profits having different service lives. Even if the life span differs, comparison of the projects is possible by just artificially extending the life of those project lives. For instance, if there are two projects with a life of four and six years, the life of the first project may be extended to make a comparison.

To find out the total present-value of all cash inflows generating out of an investment the formula may be stated as follows.

$$\begin{aligned}
 V &= \frac{R_1}{1+i} + \frac{R_2}{(1+i)^2} + \dots + \frac{R_N}{(1+i)^n} + \frac{S}{(1+i)^n} \\
 &= \sum_{t=1}^n \frac{R_t + S}{(1+i)^t}
 \end{aligned}$$

Where

V denotes present value

i represents interest rate/cost of capital

$R_1, R_2 \dots R_N$ indicate cash inflow after taxes in year 1, 2, ... n

n shows the life of asset

S implies salvage value of the asset in years N

Cash flows represent a cash receipt and expenditure over the life of an investment project. Salvage value means scrape or resale value of the assets including goodwill at the end of the project.

The net-present value (V) can be worked out and this should be compared with supply price or cost of the asset (C). If V exceeds C the investment is worth undertaking. When the net present value is positive or equal to zero, the project can be considered. If it is negative the project is to be rejected.

If in case the number of project proposals is more, the present value of all cash flows of the various projects has to be compounded and net present value index has to be constructed for comparison.

$$\text{Net present value index (NPVI)} = \frac{\text{Total present value of all cash flows}}{\text{Initial investment}}$$

If the index is more, projects can be accepted and ranked accordingly.

The main advantage of this method is that it lies in its recognition of time value of money. It considers the cash flows over the entire life of the project.

The disadvantage of this method are, firstly it lacks simplicity. Secondly, it is based on the assumption that the discount rate is known in calculating the net present value. But it is not true. Thirdly, this method may not offer proper help and guidance when projects with different amount of investment are compared, as project with higher NPV may be undesirable if they involve large investment.

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