PGCM S1 02

MANAGERIAL ECONOMICS

SEMESTER - 1

MASTER OF COMMERCE

BLOCK - 2



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MASTER OF COMMERCE
MANAGERIAL ECONOMICS

Block 2

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BLOCK INTRODUCTION

This is the second block of the course Managerial Economics.

Block 2 concentrates on objectives of the firm, revenue analysis, market structure under perfect competition and imperfect competition, macro economic and selected macro economic aggregates, consumption function and investment function, business cycle and inflation, deflation and stagflation.

This block consists of the following eight units :

Unit 8 : Objectives of a Firm

Unit 9 : Revenue Analysis

Unit 10 : Market Structure: Perfect Competition

Unit 11 : Market Structure: Imperfect Competition

Unit 12 : Macro Economics and Selected Macro Aggregates

Unit 13 : Consumption Function and Investment Function

Unit 14 : Business Cycle

Unit 15 : Inflation, Deflation and Stagflation

UNIT 8: OBJECTIVES OF FIRM

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8.1 LEARNING OBJECTIVES

After going through this unit, we will be able to :

- know Profit Maximizing Model
- explain Cyert and March's Behaviour Theory
- know Marris' Growth Maximation Model
- explain Baumol's Sales Maximisation Model
- explain Williamson's Managerial Discretionary Model

8.2 INTRODUCTION

This unit is concerned with familiarizing the students with the concepts such as theory of the firm, Cyret and March's Behaviour Theory, Marris's Growth maximisation model, Baumol's sales maximisation model and Williamson's managerial discretionary model.

In general parlance, the theories of the firms are basically concerned about earning of profit. Profit is the difference between revenue earned and expenditure incurred. Earning of the profit is the major objectives of the firm. Profit-making is considered to be driving-force behind all business activities of firms. In the market, success or failure of a firm is basically measured by profit earned by that particular firm. In all the theories of the firm, profit is considered to be an important variable.

Cyert and March was considered as one of the pioneer of systematic behavioural theory of the firm. In a modern large multiproduct firm, ownership and management are considered to be two separate entities. In this model, the firm is not considered as a single entity with a single goal of profit maximisation by a single decision-maker, called the entrepreneur. Instead, Cyert and March regard the modem business firm as a group of individuals who are engaged in the decision-making process relating to its internal structure having multiple goals.

Robin Marris in his book The Economic Theory of 'Managerial' Capitalism which was published in the year 1964 has developed a dynamic balanced growth maximising model of the firm. The author concentrates on the proposition that modem big firms are managed by managers and the shareholders are the owners who decide about the management of the firms.

Baumol in his model emphasises on sales maximisation as a goal of the firm. According to Baumol, the separation of ownership from management gives discretion to the managers to pursue goals which maximise their own utility and deviate from profit maximisation, which is the desirable goal of owners.

Williamson has developed managerial utility maximisation objective as against profit maximisation. In large modern firms, shareholders and

managers are two separate groups. The former wants maximum return in their investment and hence their maximisation of profits. The managers on the other hand have consideration other than profit maximisation in their utility functions.

8.3 PROFIT MAXIMIZATION MODEL

As discussed in the introductory section, earning of profit is the sole objective of the firm. The theory of the firm is the microeconomic concept founded in neoclassical economics that states that firms (including businesses and corporations) exist and make decisions to maximize profits.The capacity of a firm to earn profit implies the performance and status of a firm in the market. It is considered to be a test of economic ability and performance of an individual firm. The firm has to earn a reasonable amount of profit in business to survive in the competitive world. Earning of profit is a widely accepted goal and there is nothing bad or immoral about it. Earlier profit maximization was the sole objective of a firm. This assumption has a long history in economic literature and the conventional price theory was based on this very assumption about profit making. In spite of several changes and development of several alternative objectives, profit maximization has remained as one of the single most important objectives of the firm even today. Both small and large firms consistently make an attempt to maximize their profit by adopting different techniques in business. Specific efforts have been made by small and big firms to maximize output and minimize production and other operating costs. Costs reduction, cost cutting and cost minimization has become strategies of a modern firm.

An important aspect of profit maximization model is that it helps to predict the price-output behavior of a firm both in short and long term. It is often argued that no other alternative model can explain and predict the behavior of business firms better than profit-maximization model**.** Profit-maximization implies earning highest possible amount of profits during a given period of time.A firm has to generate largest amount of profits by building optimum productive capacity both in the short run and long run

depending upon various internal and external factors and forces. There should be proper balance between short run and long run objectives. In the short run, a firm is able to make only slight or minor adjustments in the production process as well as in business conditions. The plant capacity in the short run is fixed and as such, it can increase its production and sales by intensive utilization of existing plants and machineries, having over time work for the existing staff etc. Thus, in the short run, a firm has its own technical and managerial constraints. But in the long run, as there is plenty of time at the disposal of a firm, it can expand and add to the existing capacities to build up new plants; employ additional workers etc to meet the rising demand in the market. Thus, in the long run, a firm will have adequate time and ample opportunity to make all kinds of adjustments and readjustments in production process and in its marketing strategies.

8.4 CYERT AND MARCH'S BEHAVIOR THEORY

In this section of the chapter, an analysis is made regarding Cyert and March's behaviour theory. Most of the behavioural theories of the firm have developed in the early fifties of the previous century. Some of the sagnificant works on behavioural theories may be traced in Simon's article 'A Behavioural Model of Rational Choice', published in the Quarterly Journal of Economics in 1955.The theory has sub-sequently been elaborated by Cyert and March.

According to Cyert and March, in a modern large multiproduct firm, ownership is separated from management. In their model, the firm is not considered as a single entity with a single goal of profit maximisation by a single decision-maker, called the entrepreneur. They regard the modern business firm as a group of individuals who are engaged in the decision-making process relating to its internal structure having multiple goals.They deal not only with the internal organisation of the firm but also with the problem of uncertainty. They reject the assumption of certainty in the neo-classical theory of the firm. They emphasise that the modern busi-ness firm is so complex that individuals within it have limited information and imperfect foresight with respect to both internal and external developments.

Cyert and March regard the modem business firm as a complex organisation in which the deci-sion-making process should be analysed in variables that affect organisational goals, expectations, and choices. They look at the firm as an organisational coalition of managers, workers, shareholders, suppliers, customers, and so on.

According to Cyert and March, a modern firm is supposed to have five different goals:

1. **Production Goal of a firm :**

   The production goal represents in large part the demand of those coalition members who are connected with production such as managers, workers and shareholders etc. It reflects pressures towards such things as stable employment, ease of scheduling, development of acceptable cost performance and growth. This goal is directly related to output decisions.

2. **Inventory Goal of a firm:**

   The inventory goal of a modern firm represents the demands of coalition members who are connected with inventory. This goal is related to decisions in output and sales areas. The inventory goal of the firm is mainly influenced by pressures on the inventory from salesmen and customers.

3. **Sales Goal of firm:**

   The sales goal aims at meeting the demand of coalition members connected with sales. The fulfillment of sales goals necessary for the stability of the organisation.

4. **Market-Share Goal:**

   An alternative to the sales goal is the market-share goal. It is related to the demands of sales management of the coalition who are primarily interested in the comparative success of the organisation and its growth. Like the sales goal, the market-share goal is related to sales decisions.

5. **Earning of Profit:**

   The profit goal of a firm is in terms of an aspiration level with respect to the money amount of profit. It may also be in the form of profit share or return on investment. Thus the profit goal is related to pricing of products

and allocation of resources.Cyert and March limit the number of goals to five because, according to them, to expand the list rapidly meets the point of diminishing returns. According to them, all goals must be satisfied because they are relevant to price, output and sales strategy decisions of the organisation. But there should be order of priority of goals of the firms. If one of the goals is not met and the individual responsible for that is not satisfied, a search will be made for a means to meet that goal. The search will be quite narrow and the organisation will use some rules-of-thumb to set the problem right. The rule of thumb of the firms are based on the past experience of the firm and the people within it.The aspiration levels of the individuals within the firm which determine these goals change over time as a result of organisational learning. Thus these goals are regarded as the product of a bargaining- learning process in the organisational coalition. But it is not essential that the different goals may be resolved amicably. Very often it happens that there may be conflicts among these goals. The organisational coalition is thus a coalition of conflicting interests.The conflicting interests can be reconciled by the distribution of payments to members of the coalition. These payments may be in cash or kind, the later being mostly in the form of 'policy side payments' i.e., the right to take part in the policy decisions of the organisation.

An important aspect of Cyert and March's behaviour theory is the satisficing behaviour of the coalition members.The conflicting goals of the organisation can be solved by subjecting them to a constant review. It is generally happen that aspiration levels of coalition members change with experience. In fact, the aspiration level of the coalition members changes with the process of sacrificing. Each person in the organisation has a satisficing level for each of his goals.If these levels are reached, they will not seek for more. But if they are not achieved, the aspiration levels are revised downwards. If they are exceeded, the aspiration levels are raised upwards. In both situations, the satisfactory levels of performance are changed accordingly.

8.4.1 Organisational Slack in Cyert and March's Behaviour Theory

An important aspect of Cyert and March's behaviour theory is organisation slack. It is necessary to define organisation slack before discussing importance of the variable on this model. A coalition is sound and workable if payments made to various members of the coalition are adequate. For this, enough resources are needed to meet demands of all coalition members. This is ordinarily not possible because disparity arises between the total resources available to the organisation and the total payments required to maintain the coalition.This difference between total available resources and total necessary payments is called organisational slack, by Cyert and March. Slack consists in payments to members of the coalition in excess of what is required to maintain the organisation.Many forms of slack exist when the organisation operates under market imperfections. The share-holders may be paid dividends in excess of what is required to keep them within the organisation. The customers may be charged lower prices so that they may stick to the products of the firm.The workers may be paid wages in excess of what is needed to keep them in the firm. The executives may be provided with services and personal luxuries more than what is required to keep them. All such excess payments are slack expenditures for the firm which every member of the coalition obtains from time to time.Thus "slack is typically not zero", is according to Cyert and March. Rather, it is positive. Some members of the coalition ordinarily obtain a greater share of the slack than do others. In general, those members of the coalition who are full-time tend to get slacker than the other members.Organisational slack plays a constructive role. It keeps the coalition in existence. It enables the firm in maintaining itself under 'crisis' type situation and to adjust itself to changes in external environ-ment. The organisational slack serves as a cushion to absorb

the shocks. Slack payments are increased during periods of flourishing business and decreased during periods of bad business. Thus organisa-tional slack plays both a stabilising and an adaptive role.

8.4.2 Decision Making Process in Cyert and March's Behaviour Theory

In the above sub-section of the chapter, we have discussed about organisational slack. In this sub-section of the chapter, an attempt has been made to discuss the decision making process in Cyert and March' behaviour theory. Cyert and March are of the view that the decision-making process rests with the top management to the lower levels of administration. Based on their share of the total budget of the firm, the organisational goals are set by the top management given resources to the various departments. The share of the budget depends on the bargaining power and the skill of each manager. The bargaining power is determined by the past performance of each department. In this process of allocation, the top manage-ment retains some funds to be allocated at its discretion at any time to any department.The decision process at the lower level provides various degrees of freedom of action to the administration. Once the budget share is allocated to each department, each manager has considerable discretion in spending the funds at his disposal. Decisions taken by managers are implemented by the lower level staff based on their experiences and the "blue print" rules lay down earlier.The decision-making process also depends upon information and expectations formed within the organisation. Information is required to facilitate the decision-maker. Information is not a costless activity. Search activity starts whenever a problem arises because search helps to locate and collect information.Information determines the aspirations (i.e., demands) of each department which, in turn, helps the top management in setting goals. Organisational expectations are related to the hopes and wishes of the decision-maker.Given the

information and expectations, the top management examines and decides upon the projects presented by the managers. It evaluates the projects on the basis of two criteria. The first is the budgetary constraint which is the availability of funds for the project. The second is an improvement criterion: Is the project better than the existing one? In making decisions, the top management follows the rule that leads to a better state in the future than it was in the past. The Cyert-March model of behaviourism is thus an adaptive rational system.

8.4.3 Implications of the Cyert-March Model for Price Behaviour

We have already analysed the Cyert-March model. It is necessary to study the implication of the Cyert-March model for price behaviour. They have developed a simplified model to illustrate the key processes at work in an oligopolistic firm when it makes its decisions on price, output, costs, profits, etc. In this model, each firm is assumed to have three sets of goals: for profits, production and sales, and three basic decisions to make on price, output and sales effort in each time period.It takes into consideration the firm's environment at the beginning of each period which reflects its past experience. Its aspiration levels are modified in the light of this experience, and organisational slack is permitted. Each firm was assumed to estimate its demand and production costs and choose its output level.If this output level does not yield the aspired level of profits, it searches for ways to reduce costs, re-estimate demand and, if required, to lower its profit goal. If the firm is prepared to lower its profit goal, it will readily reduce its price. Thus price was found to be sensitive to factors affecting costs due to the close relationship between prices, costs and profits.

8.4.4 Criticisms of Cyert and March Model

Several managerial economists have criticised the Cyert and March model on the following grounds:

1. The economists are of the view that Cyert and March theory deals with particular cases, whereas a theory is expected to be a general approximation of the behaviour of firms. Its empirical base is too limited to provide the details of theorising. Hence it fails as a theory of the firm.
2. Hawkins in his observation points out that "criticism of the behavioural approach is along the lines that it uses a sledgehammer to crack a walnut. Hawkin questioned whatever we really need to construct mirror images of companies, virtually assembling the decision-making process brick by brick, in order to predict their behaviour? He was in favour of simple models to suffice for the limited purpose.
3. The behavioural theory relates to a duopoly firm and fails as the theory of market structures. It does not explain the interdependence and interaction of firms, nor the way in which the interrelationship of firms leads to equilibrium of output and price at the industry level. Thus the conditions for the attainment of a stable equilibrium in the industry are not determined.
4. Another criticism of the theory is that the theory does not consider either the conditions of entry or the effects on the behaviour of existing firms of a threat of potential entry by firms.
5. The behavioural theory explains the short-run behaviour of firms and ignores their long-run behaviour. Thus "it cannot explain the dynamic aspects of inventions and innovations which are related to the long-run."
6. According to Koutsoyiannis, "No exact predictions can be derived from the postulates of the behavioural theory. The acceptance of satisficing behaviour renders practically the theory into a tauto-logical structure: Whatever the firms are observed to do can be rationalised on the lines of satisficing".
8. The behavioural theory is based on the simulation approach which is a predictive technique. It simply predicts the behaviour of the firm but does not explain it.

Despite these criticisms, the behavioural theory of Cyert and March is an important contribution to the theory of the firm which brings into focus 'multiple, changing and acceptable goals' in managerial decision-making.In this regard, Hawkins opines, "Few would doubt that behavioural theories are among the most dramatic of the new approaches to the theory of the firm. What is dramatic is that they dispense with the assumption that firms aim to maximise anything, even utility."



ACTIVITY 1

What are the criticisms of Cyert and March theory of the firm? Give reasons.

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CHECK YOUR PROGRESS

Q.1 : a) Cyert and March regard the modem business firm as a group of individuals who are engaged in the decision-making process relating to its internal structure having multiple goals (True/False)

b) Organisational slack is the difference between total available resources and total necessary payments. (True/False)

c) The rule of thumb of the firms is based on the past experience of the firm and the people within it. (Yes/No)

8.5 MARRIS GROWTH MAXIMISATION MODEL

As discussed in the introductory section of the chapter, Robin Marris in his book The Economic Theory of 'Managerial' Capitalism (1964) has

developed a dynamic balanced growth maximising model of the firm. He concentrates on the proposition that modem big firms are managed by managers and the shareholders are the owners who decide about the management of the firms.

The Growth Maximisation model as developed by Marris is based on certain assumptions:

1. Marris assumed that a given price structure prevailes in the market.
2. Production costs are given.
3. There is no oligopolistic interdependence.
4. Factor prices are constant.
5. Firms are assumed to grow through diversification.
6. All major variables such as profits, sales and costs are assumed to increase at the same rate.

Given these assumptions, Robin Marris is of the view that the objective of the firm is to maximise its balanced growth rate(G). The Growth of the firm itself depends on two factors: First, the rate of growth of demand for the firm's product and second, the rate of growth of capital supply.

Despite the fact that in modern big firms' ownership of the firm is separated from management, owners and managers have a common goal of balanced growth of the firm. According to Marris, there are two different utility functions for the manager and the owner of the firm. The utility function of the manager consists of his emoluments, status, power, job security, etc. On the other hand, the utility function of the owner includes profits, capital, output, market share, etc.Thus the manager of a firm aims at maximising his utility, and his utility depends upon the rate of growth of the firm. Though promoting the growth of the firm is the main aim of the manager, yet he is also motivated by his job security. The manager's job security depends upon the satisfaction of share-holders who are concerned to keep the firm's share prices and dividends as high as possible.Thus the manager aims at maximising the rate of growth of the firm and the shareholders (owners) aim at maximising their profits in the form of dividends and share prices. Marris analyses the means by which the firm tries to achieve its growth-maximisation goal.The firm may grow in size through the creation

of new products which create new demands. Marris calls it differentiated diversification. The introduction of new products depends upon the rate of diversification, advertising expenses, Rearch and Development expendi-tures, etc.Marris establishes the relationship between growth and profits on the demand side through diver-sification into new products. The links between growth and profits are different at different levels of growth. In this growth-profits relationship, growth determines profits. When the rate of growth of the firm is low, the relationship is a positive one.As new products are introduced, the firm expands (grows) and profits increase. With the further increase in the growth rate due to greater diversification into new products, the growth-profit relationship becomes negative. This is because there is the managerial constraint which sets a limit on the rate of managerial growth that restricts the growth of the firm.The firms' managerial ability to cope with a great number of changes at once is limited. It is not possible to develop a larger management team for the development and marketing of new products. The higher rate of diversification requires higher expenditures on advertising and research anddevelopment. As a result, beyond a certain growth rate, the higher growth rate leads to a lower rate of profit.

The other aspect of the growth-profits relation-ship is the rate of growth of capital supply. The aim of the shareholders is to maximise the growth rate of capital stock. The main source of finance for its growth is profits. Thus profits determine growth on the sup-ply side.A higher level of profits provides more funds directly for reinvestment. It also allows more funds to be raised on the capital markets. It, therefore, allows a higher rate of growth to be funded. This gives a direct and positive relationship between profits and growth.

For the equilibrium of the firm, the growth-de-mand and growth-supply relationship must be satis-fied. This is achieved when the demand for the firm's product and the rate of growth of capital supply intersect at a point where the growth-profits combination gives the optimum solution. This point does not provide an optimum solution because the managers desire more growth than is consistent with long-run profit maximisation. The extent to which they can increase the growth rate depends upon their desire for

job security. Their job security is threatened if the shareholders feel that the share prices and dividends are falling and there is the threat of take-over by other firms. This will affect the growth rate of capital supply (GS). Thus it is the financial constraint which sets a limit to the growth of the firm on the supply side. According to Marris, it is the retention ratio which determines the growth rate of capital supply. The retention ratio is the ratio of retained profits to total profits. If the retention ratio is very low, it means that almost all profits have been distributed to the shareholders. As a result, there are limited funds available with the managers for the growth of the firm and the growth rate will be very low.

Althrough Marris Growth Maximisation model is considered to be important contributions towards explaining the relationship between growth and profit, it has been criticised by economist on several grounds:

1. Marris assumes a given price structure for the firms. He, therefore, does not explain how prices of products are determined in the market. This is a serious weakness of his model.
2. Another defect of this model is that it ignores the problem of oligopolistic interdependence of firms in non-collusive market.
3. This model also does not analyse interdependence created by non-price competition.
4. The model assumes that firms can grow continuously by creating new products. This is unre-alistic because no firm can sell anything to the consumers. After all, consumers have their preferences for certain brands which also change when new products enter the market.
5. According to Koutsoyiannis, “Marris’s model is applicable basically to those firms which pro-duce consumers’ goods. The model is not appropriate for analysing the behaviour of manufacturing businesses or traders.”
6. Marris lumps together advertising and Research and Development expenses in his model. This is a serious shortcom-ing of the model because the effectiveness of these two variables is not the same in any given period.

8. Marris assumes that firms have their own research and development department on which they spend much for creating new products. But, in reality, most firms do not have such departments. For product diversifi-cation, they imitate the inventions of other firms and in case of patented inventions they pay royalties for using them.
8. The thoery is highly unrealistic as it assumes that all major variables such as profits, sales and costs increase at the same rate.
9. It is also doubtful that a firm would continue to grow at a constant rate, as assumed by Marris. The firm might grow faster now and slowly later on.
10. It is difficult to arrive at the growth rate which maximises the market value of the firm's shares and the rate at which the take-over is likely to take place.

Despite these criticisms, Marris's theory is an important contribution to the theory of the firm in explaining how a firm maximises its growth rate.

8.6 BAUMOL'S SALES MAXIMISATION MODEL

In this section of the chaper, Prof Baumol's sales maximisation model has been discussed. Professor Baumol emphasises that the main objectives of a firm is to maximise sales rather than profit maximisation. The separation of ownership from management gives power to the managers to pursue goals which maximise their own utility and deviate from profit maximisation, which is the desirable goal of owners. Given the discretion of the manager, Baumol argues that sales maximisation seems the most plausible goal of managers. From his experience as a consultant to large firms,Baumol found that managers are preoccupied with maximisation of the sales rather than profits. Baumol has provided various reasons that explain this attitude of the top management.

Firstly, there is evidence that salaries and other earnings of top managers are correlated more closely with sales than with profits.

Secondly, the banks and other financial institutions keep a close eye on the sales of firms and are more willing to finance firms with large and growing sales.

Thirdly, personnel problems are handled more satisfactorily when sales are growing. The employees at all levels can be given higher earnings and better terms of work in general. Declining sales, on the other hand, will make necessary the reduction of salaries and other payments and perhaps the lay-off of some employees. Such measures create dissatisfaction and uncertainty among personnel at all levels.

Fourthly, large sales, growing over time, give prestige to the managers, while large profits go into the pockets of shareholders.

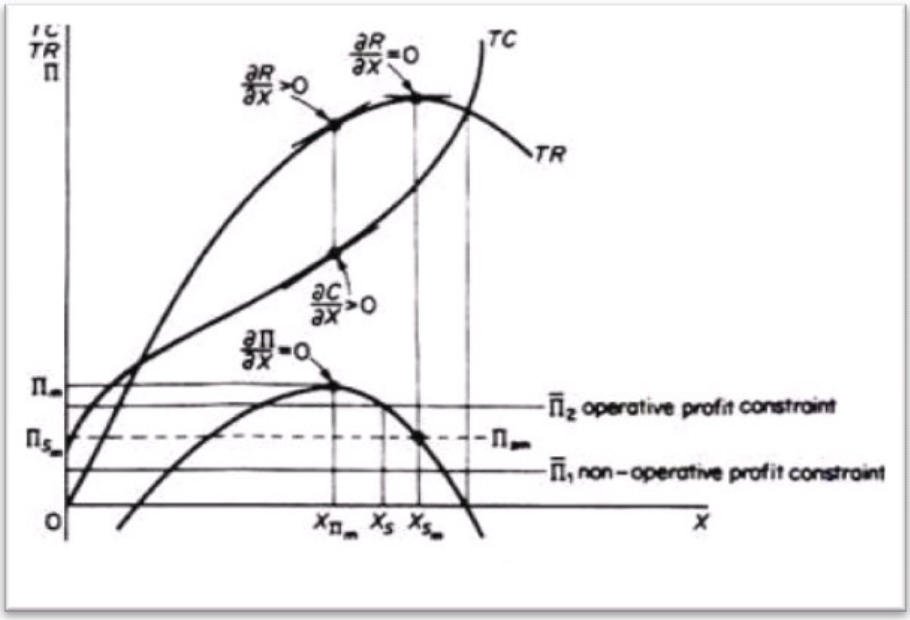
Fifthly, managers prefer a steady performance with 'satisfactory' profits to spectacular profit maximisation projects. If they realize maximum high profits in one period, they might find themselves in trouble in other periods when profits are less than maximum.

Baumol has developed two models of sales maximisation, one with advertisement expenditure and another without advertisment expenditure. Both these models have special sagnificance in expalining the attitude of the manager in modern business enterprises.

8.6.1 Baumol Model without Advertising Expenditure

Professor Baumol's has explained that maximisation of the sales is the sole objective of the manager. But in doing so, the manager has to ensure that while maximisating sales recvenue, a minimum amount of profit must be attianed by the firm. In this model, the firm is assumed to be able to pursue an independent price policy to set its price so as to achieve its goal of sales maximisation (given the profit constraint) without being con-cerned about the reactions of competitors.This can be explained in figure 1 where X axis represent sales revenue and Y axis represent profit of the firm.

Figure 8.1: Baumol Model without advertisement expenditure



Source: Accessed from internet (http://www. yourarticle library.com)

As shown in figure 1, the TR is the total revenue curve and TC is the total cost curve. As shown in the diagram, the level of the minimum acceptabl profit act as a constraint of the firm while going for maximising sales revenue. If the firm wants to maximise profit, it will produce the level of output X_{nm}. Although, in Baumol's model, the firm is a sales maximiser, it must earn a minimum level of profit acceptable to shareholders.If the minimum acceptable level of profit is $Ð_1$, the firm will produce the level of output X_{Sm} which maximises its sales revenue. With this level of output (X_{Sm}) the firm earns profits $Ð_{Sm}$, which are greater than the minimum required to keep the stockholders (and other interested parties) satisfied. Under these circumstances we say that the minimum profit constraint is not operative.If the minimum acceptable profit is $Ð_2$, the firm will not be able to attain the maximum sales revenue because the profit constraint is operative, and the firm will produce $X_s$units of output, which are less than at the level X_{Sm}.To Summarize, two types of equilibrium appear to be possible one in which the profit constraint

provides no effective barrier to sales maximisation (X_{Sm}) units of out-put with a minimum acceptable profit of $Đ_1$, and one in which it does (X_S) units of output with a minimum acceptable profit of $Đ_2$).

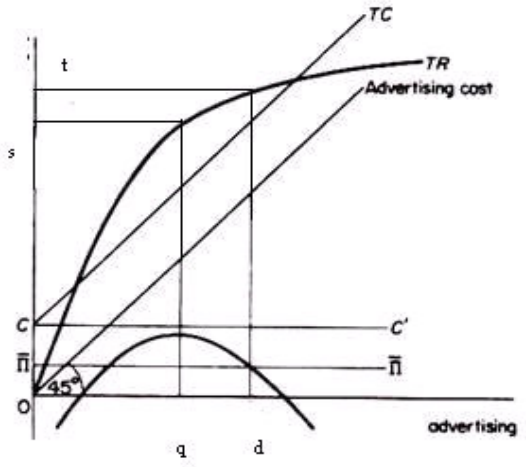
8.6.2 Baumol Model with Advertising Expenditure

The managerial economist Baumol offers another sales maximisation model with advertising expenditure. In this model, the goal of the firm is sales revenue maximisation subject to a minimum profit constraint which is exogenously determined. The new variable in this model is the introduction of advertising as a major policy variable of the firm. In this model, Baumol argues that in the real world non-price competition is the typical form of competition in oligopolistic markets. It is assumed in the model that sales revenue increases with advertising expenditure. This signifies that expenditure on advertisement will always shift the demand curve of the firm to the right and the firm will sell a larger quantity and earn larger revenue. The price is assumed to remain constant. This, however, is a simplifying assumption which may be relaxed in a more general analysis.

Another simplifying assumption of Baumol's model is that production costs are independent of advertising. Baumol recognizes that this is an unrealistic assumption, since with advertising, the physical volume of output increases and the firm might move to a cost structure where production cost is different (increasing or decreasing). But he claims that this assumption is simplifying and can be relaxed without substantially altering the analysis. A firm in an oligopolistic market will prefer to increase its sales by advertising rather than by a cut in price. While an increase in physical volume induced by a price cut may or may not increase the sales revenue, depending on whether demand is elastic or inelastic, an increase in volume brought about by an increase in advertising will always increase sales revenue, since by assumption the marginal revenue of advertising is positive. With advertising introduced into the model,

it is no longer possible to have equi-librium where the profit constraint is not operative. While with price competition alone, it is possible to reach equilibrium where profit is not operative; with non-price competition such an unconstrained equilibrium is impossible. Unlike a price reduction, increased advertising always increases sales revenue.Consequently it will always pay the sales maximiser to increase his advertising expenditure until he is stopped by the profit constraint. Consequently the minimum profit constraint is always operative when advertising (or any other form of non-price competition) is introduced in the model.The sales maximiser will normally have higher advertising expenditures than a profit maximiser. In any case advertising cannot be less in a sales-maximising model. Baumol's single-product model with advertising is shown in figure 8.2.

Figure 8.2: Baumol Model with advertising expenditure



Source: Accessed from internet (http://www.yourarticlelibrary.com)

In figure 8.2, outlay on advertisng is measured on the horizontal axis and the advertising function is a 45 line. Costs, total revenue and profits are measured on the vertical axis. Production costs are shown as being independent of the level of advertising (curve CC/). If these costs are added to the advertising cost line, the total-cost curve (TC) is obtained as a function of advertising outlay. Subtracting the total cost from the total revenue at each level

of output we obtain the total-profit curve Ð. The firm who wants to maximise profit will spend oq on advertising and earns a revenue amouning to os as shown in figure 8.2. However, the sales-maximising firm will spend more on advertising than the profit maximising firm. He will spend od and earns a higher revenue ot.

Baumol Model of Sales reveuemaximistaion has been cricised on the following grounds:

1. The managerial economist criticised Baumal on the ground that Baumol ignores the action-reaction pattern resulting from the advertising. Baumol also does not take interdependence among the firms into consideration.
2. Baumol always assumed that advertising increase sales revenue. But, he does not establish the implied positive relationship between the total revenue and advertising.
3. Baumol assumed that production cost remained unchanged as advertising increases. It means that total quantity produced remains constant. Thus, sales revenue can be increase only if the price of the commodity increases. This is inconsistent with the statement of Baumol that rise in advertisement expenditure will not change the price of the commodity.
4. With the increase in advertisement expenditure, total revenue curve shifts outward and in the new equilibrium revenue will be higher. However, in new equilibrium output may be lower and prices higher depending upon the shift of total revenue curve and elasticity of the demand curve. Baumol does not take these price changes into consideration

8.7 WILLIAMSON'S MANAGERIAL DISCRETIONARY THEORY

In this section of the chapter, a discussion has been made regarding the Williamson's Managerial Discretionary Theory. Williamson theory is considered to be a deviation from the earliar theories as discussed above. He has developed managerial utility maximisation objective as against profit

maximisation. In large modern firms, shareholders and managers are two separate groups. The former wants maximum return in their investment and hence their maximisation of profits. The managers, on the other hand, have consideration other than profit maximisation in their utility functions. Thus the managers are interested not only in their own emoluments but also in the size of their staff and expenditure on them. Thus Williamson's theory is related to the maximisation of the manager's utility which is a function of the expenditure on staff and emoluments and discretionary funds. The manager in a firm has the discretion to pursue goals other than profits to the extent that pressure from the capital market and competition in the product market is imperfect. Williamson's theory, like other managerial theories of the firm, assumes that utility maximisation is the manager's sole objective in a firm. However it is only in a corporate form of business organisation that a self-interest seeking manager can maximise his or her own utility, since there exists a separation of ownership and control. In those circumstances, the managers can use their 'discretion' to frame and execute policies which would maximise their own utilities rather than maximising the shareholders' utilities. This tendency of the manager is popularly known as principal–agent problem. However, this kind of practices could threaten their job security, if a minimum level of profit is not attained by the firm to distribute among the shareholders.

The discretionary theory as developed by Williamson's is based on certain basic assumptions:

1. Williamson assumes that imperfect competition exist in the markets.
2. Williamson also further assumes that there is a separation of ownership and management.
3. A minimum profit constraint exists for the firms to be able to pay dividends to their share holders.

Considering the above mentioned assumptions, to pursue the goal of utility maximisation, the manager directs the firm's resources in three ways:

1. According to Williamson, the manager desires to expand his staff and to increase their salaries. More staff (S) is valued by the

manager because they lead to the manager getting more salary, more prestige and more security.

2. To maximise his own utility, the manager indulges in "featherbedding" such as pretty secretaries, company cars, too many company phones, 'perks' for employees, etc. Such expenditures are charac-terised as 'management slack'(S).
3. The manager also likes to set up "discretionary funds (D)" for making investments to advance or pro-mote company projects that are close to his heart. Discretionary profits or investments are what remain with the manager after paying taxes and dividends to shareholders in order to retain an effective control of the firm.

Thus, considering the above aspect, the manager's utility function can be expressed as,

U = f (S, M, D)

Where, U is the utility function, S is the staff expenditure, M is the management slack and D the discre-tionary investments. These decision variables (S, M, D) yield positive utility and the firm will always choose their values subject to the constraint, S e"0e"M0, De"0. Williamson assumes that the law of diminishing marginal utility applies so that when additions are made to each of S, M and D, they yield smaller increments of utility to the manager.Further in his managerial theory, Williamson regards price (P) as a function of output (X), expenditure on staff (S), and the state of environment which he calls 'a demand shift parameter (E), so that

P = f (X, S, E)

Howevre, the above relationship is subject to the some constraints:

(a) The demand function is assumed to be negatively sloping

$$\frac{\delta P}{\delta X} < 0$$

The above partial derivative implies that price and output are negatively relate

(b) Staff expenditures help increase the demand for the firms product:

$$\frac{\delta P}{\delta S} > 0$$

The result of the partial derivative clearly indicates that staff expenditure has a positive impact on price.

(c) Increases in the demand shift param-eter E, tend to raise demand. In other words,

$$\frac{\delta P}{\delta E} > 0$$

These relationships reveal that the demand for X is negatively related to P, but is positively related to S and E. When the demand increases, the output and expenditure on staff will also increase which will push the costs of the firm, and consequently the price will rise, and vice versa. To formalise his model, Williamson introduces four different types of profits: actual, reported, minimum required and discretionary profits.

Denoting

R = revenue

C = total production costs

T = taxes,

π

then actual profits π_A =R-C-T

If the amounts of managerial slack or emoluments (M) are deducted from the actual profits, we get reported profits ($ð_R$).

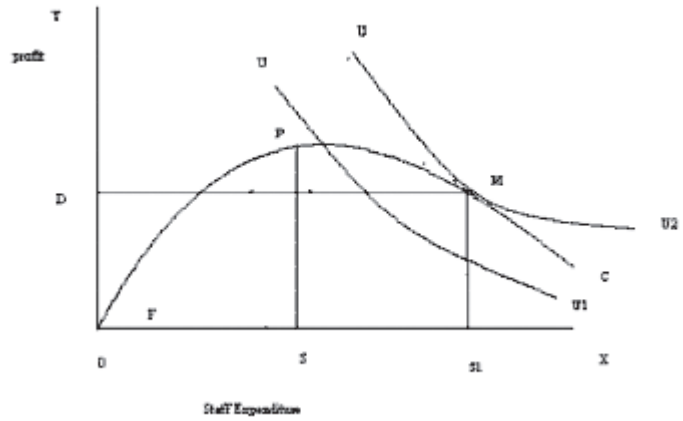
$_R$= $_A$ – M = R –C –T –M

The minimum required profit ($_0$) is the lowest level of profits after paying taxes which the shareholders must receive in order to hold shares of the firm.

Since discretionary profits (D) are what remains with the manager after paying taxes and divi-dends to shareholders, therefore,

D = $_R$ – $_0$ – T

To explain Williamson's utility maximisation model diagrammatically, it is assumed for the sake of simplicity that U=f (S, D) so that discretionary profits (D) are measured along the vertical axis and staff expenditures (S) on the hori-zontal axis as shown in figure 3 produced below.



FC is the feasibility curve show-ing the combinations of discretionary profit and staff expenditure available to the man-ager. It is also popularly known as the profit-staff curve. UU_1 and UU_2 are the indifference curves of the manager which show the combination of D and S. To begin, as we move along the profit-staff curve from point F upwards, both profits and staff expenditures increase till point P is reached. P is the profit maximisation point for the firm where SP is the maximum levels of profit when OS staff expenditures are incurred by the manager.But the equilibrium of the firm takes place when the manager chooses the tangency point M where his highest possible utility function $UU_2$and the feasibility curve FC touch each other. Here the manager's utility is maximised. The discretionary profits OD (=S_1M) are less than the profit maximisation profits SP.But the staff emoluments OS are maximised. However, Williamson points out that factors like taxes, changes in business conditions, etc. by affecting the feasibility curve can shift the optimum tangency point, like M in the Figure. Similarly, factors like changes in staff, emoluments, profits of stockholders, etc. by changing the shape of the utility function will shift the optimum position.

8.7.1 The Major Limitation of the Moddel

The Williamson model has been criticised by managerial economist on several grounds. Here, an attempt has been made to discuss conceptual weaknesses of this model:

1. The major criticism of the model is that the model does not clarify the basis of the derivation of his feasibility curve. In

particular, the author fails to indicate the constraint in the profit-staff relation, as shown by the shape of the feasibility curve.

2. Another criticsim of the model is that it lumps together staff and manager's emoluments in the utility curve. This mixing up of non- pecuniary and pecuniary benefits of the manager makes the utility function ambiguous. But these diffi-culties can be overcome by introducing a three-dimensional diagram. But it will make the analysis more complex.
3. Another limitation of the model is that the theory does not deal with oligopolistic interdependence and of oligopolistic rivalry.
4. Hawkins has criticised the theory on the ground that most economists are reluctant to pursue Williamson's utility-maximisation theory "due to the knowledge that so many factors (e.g., profit, sales, output, growth, number of staff and expenditure on plush offices and cars) are likely to give utility to people in industry that they shall end up with a model incapable of yielding any definite results."

But in spite of all the criticism, Williamson has supported his model by giving a number of empirical examples which are consistent with his model. Thus his theory is considered to be empirically sound as compared with other managerial theories. Williamson model is also considered to be superior to Baumol's sales maximisation model as it does not treat sales maximisation as a single criterion. But it considers sales maximisation as a means of the manager for increasing his staff and emoluments.



ACTIVITY 2

Explain the relationship between growth and profit with the help of Marris Growth Maximisation Model.

_____

_____



CHECK YOUR PROGRESS

Q.2: a) The book "The Economic Theory of Managerial' Capitalism" was written by Robin Marris (True/False)

b) The retention ratio is the ratio of retained profits to total profits. (Yes/No)



8.8 LET US SUM UP

- The success or failure of a firm is basically measured by profit earned by that particular firm. Earning of Profit is considered to be driving-force behind all business activities of firms.
- Cyert and March was considered as one of the pioneer of systematic behavioural theory of the firm. In a modern large multiproduct firm, ownership and management are considered to be two separate entities. They regard modern business firm as a group of individuals who are engaged in the decision-making process relating to its internal structure having multiple goals. Cyert and March consider firm as an organisational coalition of managers, workers, shareholders, suppliers and customers.
- According to Cyert and March, the organisa-tional slack plays both a stabilising and an adaptive role in a firm. The organisational slack serves as a cushion to absorb the shocks. Slack payments are increased during periods of flourishing business and decreased during periods of bad business.
- The dynamic balanced growth maximising model of the firm is provided by Robin Marris in his book The Economic Theory of 'Managerial' Capitalism. His theory is based on the proposition that modem big firms are managed by managers and the shareholders are the owners who decide about the management of the firms.
- Marris Growth Maximisation model is considered to be important contributions towards explaining the relationship between growth

and profit. Marris in his theory introduced a new concept which is known as differentiated diversification. Differentiated diversification means grow in size of the firm through the creation of new products.

- Marris establishes the relationship between growth and profits on the demand side through diver-sification into new products. The links between growth and profits are different at different levels of growth. In this growth-profits relationship, growth determines profits.
- Professor Baumol in his theory emphasises that the main objectives of a firm is to maximise sales rather than profit maximisation. But in doing so, the manager has to ensure that while maximisating sales recvenue, a minimum amount of profit must be attained by the firm
- According to Baumol, the separation of ownership from management gives discretion to the managers to pursue goals which maximise their own utility, which is the desirable goal of owners. Professor Baumol has developed two model of sales maximisation, one with advertisement expenditure and another without advertisement expenditure.
- Williamson's theory, like other managerial theories of the firm, assumes that utility maximisation is the manager's sole objective in a firm. Williamson in his theory assumed that shareholders and managers are two separate groups. The former wants maximum return in their investment and hence their maximisation of profits. The managers on the other hand have consideration other than profit maximisation in their utility functions.
- Williamson model is considered to be superior to Baumol's sales maximisation model as it does not treat sales maximisation as the single criterion.



8.9 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q.No.1 :

a) True

b) True

c) Yes

Ans to Q.No.2 :

a) True

b) Yes



8.10 FURTHER READING

1. H.L.Ahuja (2010), "*Business Economics* ",S. Chand & Company Ltd., India.
2. D. D. Chaturvedi, S. L. Gupta (2012), "*Business Economics*", International Book House, India.



8.11 MODEL QUESTIONS

Q1. Explain in brief the Marris model of maximisation of Growth. Mention the main criticism of the model

Q2. Explain the factors a managers has to take into consideration for formulating its growth strategies.

Q3. Make a critical analysis of the Williamson's Managerial Discretionary Theory.

Q4. Provide an explanation of the Baumol's Managerial Theory of Sales Revenue Maximization.

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UNIT 9 : REVENUE ANALYSIS

UNIT STRUCTURE

9.1 Learning Objectives

9.2 Introduction

9.3 Concepts of Total Revenue, Average Revenue and Marginal Revenue

9.4 Relationship between Total Revenue, Average Revenue and Marginal Revene Curves

9.5 Relationship between Total Revenue, Average Revenue, Marginal Revenue and Price Elasticity of Demand

9.6 Pricing Policies and its objectives

9.7 Pricing Methods

9.8 Let Us Sum Up

9.9 Further Readings

9.10 Answers to Check Your Progress

9.11 Model Questions

9.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- discuss the concepts of total revenue, average revenue and marginal revenue
- derive the relationships between average revenue and marginal revenue curves
- explain the relationship between total revenue, average revenue, marginal revenue and price elasticity of demand.
- discuss Pricing Policies and its objectives and pricing methods

9.2 INTRODUCTION

In the previous course we have already discussed the nature of demand from the viewpoint of an individual consumer. In that context, we discussed that consumers demand goods and services as they provide

certain utility to the consumer. This means that a products available in the market for sale bought by a consumer has a demand. Let us now consider the matter from the viewpoint of a seller. A seller will be very much concerned with the nature of demand for his product. This is because the monetary value of demand of a consumer for the product constitutes his revenue. Thus, the more the demand, the greater will be the volume of revenue earned by the seller. The concept of revenue when viewed from the viewpoint of a seller is classified into three types: average revenue, marginal revenue and total revenue. In this unit, we shall discuss these three concepts and their inter-relationships. Apart from this, we shall also relate these concepts with the concept of price elasticity we have already discussed.

9.3 CONCEPTS OF TOTAL REVENUE, AVERAGE REVENUE AND MARGINAL REVENUE

We have already mentioned, the price paid by a consumer for a product constitutes revenue for the seller. It is, therefore, quite obvious that the more the seller sells, the greater will be the volume of his revenue. As such, the *total revenue* of a seller depends on two basic things; first, the price of a unit of the product, and the sales volume. The price per unit earned gives us *average revenue*. And the revenue earned by selling an additional unit is called the *marginal revenue*. Let us discuss these concepts in detail.

Total Revenue: The whole amount of money received by a seller from selling a given amount of the product is called total revenue. Let us suppose, if a seller sells 150 units of pens and each unit of pen is sold at a market prices at Rs. 12/-. The total revenue earned by the seller is Rs.1800/- (Rs.12 X 150 units). Thus, by definition,

Total Revenue = Market price X total quantity sold.

Symbolically, TR = P X Q.

where, TR stands for total revenue, P stands for market price and Q stands for total quantity sold.

Average Revenue: Average revenue is defined as the average value of total revenue with respect ot the number of units sold. Average revenue can be obtained by dividing total revenue by the number of units sold. Thus,

$$\text{Average Revenue} = \frac{\text{Total revenue}}{\text{Total quantity sold}}$$

$$\text{Symbolically, AR} = \frac{TR}{Q}$$

where, AR stands for average revenue, TR stands for total revenue and Q stands for quantity.

With reference to the previous example, the average revenue of Rs. 12/- is obtained by dividing total revenue (Rs.1800/-) by total quantity sold (150 units).

From the above discussion, it seems that average revenue and price are the same concepts. It may be, or it may not be. If the seller sales each unit of the product at the same price, average revenue and price will be the same. If on the other hand, the seller sales the different units of the product at different prices, average revenue will not be equal to price. Let us consider an example. Suppose our hypothetical seller sales two units of the product to two different consumers, viz., consumer A and consumer B. Let us further suppose that the seller sells one unit of the product to consumer A at Rs.12 while he sells the other unit of product to consumer B at Rs.10. Thus, the average revenue earned by the seller comes out to be Rs.(12+10)/ 2 = Rs.11/- while prices of the two units of the product were Rs.12/- and Rs.10/- respectively.

In practice, we find that the seller sells the individual unit of the product at the same price at a particular point of time. This is because, if an individual seller tends to charge higher prices for the product, consumers will move away from him and will purchase the product from other seller who sells at a lower price. As against this, he cannot lower the price of the product at his will. This is because, if the seller tries to sell the product at a lower price, the other sellers will follow him and he will face competition in the market. Ultimately, a single price will prevail in the market. As such, in

economics average revenue is taken as equivalent to the price of the product except when we discuss the case of price discrimination.

Another important point to be noted here is that as we have already mentioned, the money value of demand of the consumer constitutes revenue for the seller. As such, the demand curve of the consumer is same as the total revenue curve of the seller.

Marginal Revenue: Marginal revenue is the net revenue earned by selling an additional unit of the product. Thus, marginal revenue is obtained when we calculate the changes in total revenue caused by the sale of an additional unit of the product.

Thus, marginal revenue is represented as:

$$\text{Marginal Revenue} = \frac{\text{Change in total revenue}}{\text{Change in total units sold.}}$$

Symbolically, it is represented as:

$$MR = \frac{\triangle TR}{\triangle Q}$$

where, MR stands for marginal revenue, TR stands for total revenue, Q stands for total units sold, and $\triangle$ stands for change in.

Let us consider the case of marginal revenue in the context of our hypothetical seller who sells all units of pens at Rs.12/-. Suppose the seller increase his sales from 150 units to 151 units. In this case, the total revenue earning of the sellers will be Rs.1812/-. Thus, marginal revenue will be (Rs.1812-1800)= Rs.12/-; this is same as average revenue.

However, if price charged in the extra unit of the product is different from the price charged in the earlier units, marginal revenue will be different from average revenue. For example, let us suppose that our hypothetical seller sales the 151st unit at Rs.11.50/- while he sold all the previous units at Rs.12/-. Thus, the total revenue earned by the seller is Rs.1811.50/- and marginal revenue is (Rs.1811.50-1800) = Rs.11.50/-.

9.4 RELATIONSHIP BETWEEN TOTAL REVENUE, AVERAGE REVENUE AND MARGINAL REVNUE CURVES

From the above discussion, we are already familiar with the concepts of average revenue, marginal revenue and total revenue. In this section, we shall discuss the inter-relationships between these revenue concepts in more detail. In doing this, we shall first have to deduce the graphical shapes of the average revenue, marginal revenue and total revenue curves.

Before going to discuss the relationship between these revenue concepts, let us make a point clear here. These revenue concepts have a direct relation with the market structure under which the firm is operating in. Thus, the structure of the market affects the shapes of the revenue curves. We shall discuss the different forms of market structures in the next course in your third semester. For the time being, let us consider that there are two broad classifications of markets, viz., *perfect competition* and *imperfect competition*. Perfect competition is described as the market where there are large number of buyers and sellers and no individual participant is large enough to have the market power to set the price of a homogeneous product. As such, the seller can supply any amount of the product at the existing market price and the buyer also can buy any amount of the product. However, no seller/buyer can individually influence the market price. Again, the products of the different sellers are homogeneous; no differences among the products exist. The absence of perfect competition implies that the market is imperfect. In an imperfectly competitive market, the seller may have control over the market price. Thus, a seller under imperfect competition may have absolute control over the market price or a limited control over it only. However, there exists many forms of imperfect competition, and the degree of control of the seller over the market price depends on the form of the market the seller operates in.

Let us now analyse the shapes of the Total Revenue, Average Revenue and the Marginal Revenue Curves under the two broad market forms of perfect competition and imperfect competition.

Total Revenue, Average Revenue and Marginal Revenue Curves of a Firm under Perfect Competition: As we have already mentioned, a firm under perfect competition has to accept the prevailing market price and can sell any amount of output in the market at that price . Thus, a firm under perfect competition will earn AR, TR and MR similar to the following table 9.1.

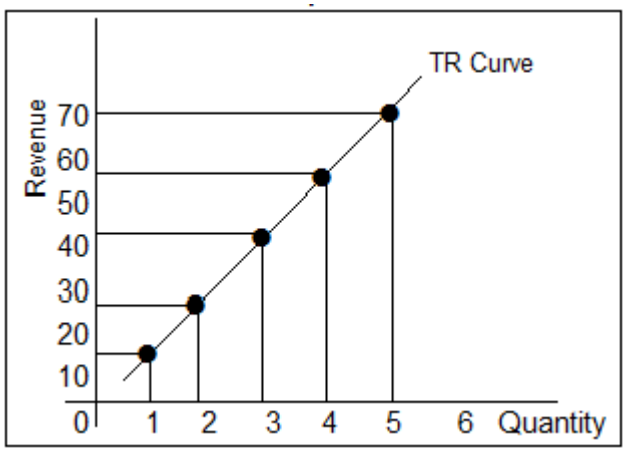
Table 9.1 : Total, Average and Marginal Revenue Schedules under perfect competition *(Revenue figures in* Rs.)

No. of units sold (Q)	Price (AR)	TR(AR X Q)	MR
1	14	14	14
2	14	28	14
3	14	42	14
4	14	56	14
5	14	70	14

Based on the above schedule 9.1, the shapes of TR, AR and MR curves of a perfect competitive firm have been shown in the following.

Total Revenue Curve: The following figure 9.1 portrays the shape of the Total Revenue Curve of a firm under perfect competition.

Figure 9.1: Total Revenue Curve of a Firm under Perfect Competition



From the figure it is obvious that the total revenue curve of the firm is an upward rising straight line. This curve, in fact represents the supply curve of a firm.

Average Revenue and Marginal Revenue Curves: We have already mentioned that under perfect competition, the market price for the product is fixed and the seller has no influence to alter the same. Again, the

seller can supply any amount of the commodity at the prevailing market price. Thus, the prevalent market price also becomes the average revenue and marginal revenue of the firm. This is clear from the above table 9.1. From the table it is clear that the prevalent market price, i.e., Rs.14 is also the average revenue and marginal revenue of the firm. Thus, the shape of average revenue curve and the marginal revenue curve will be the same. This has been shown with the help of the following figure 9.2.

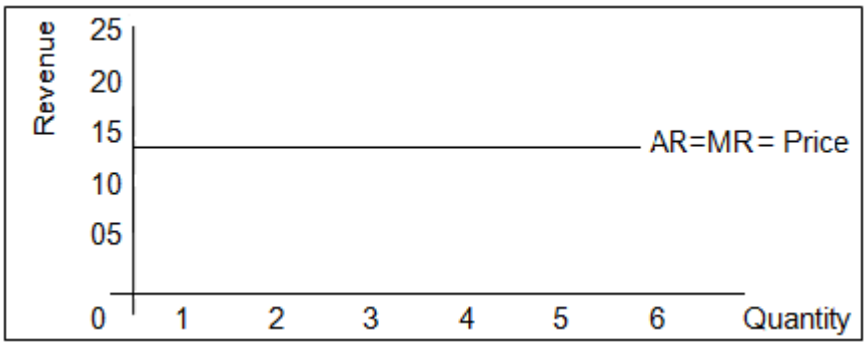


Figure 9.2: Average Revenue and Marginal Revenue Curve under Perfect Competetion

It can be seen from figure 9.2 that the firm's AR and MR curves are the same. The slope of the curve is horizontal.

AR and MR and TR Curves of a Firm under Imperfect Competition: Unlike perfect competition, a firm under imperfect competition does not have to sell its entire amount of the product at a fixed market price. This means that the firm can sell more units of the product as its price falls. We have shown a hypothetical schedule of AR, TR and MR in table 9.2.

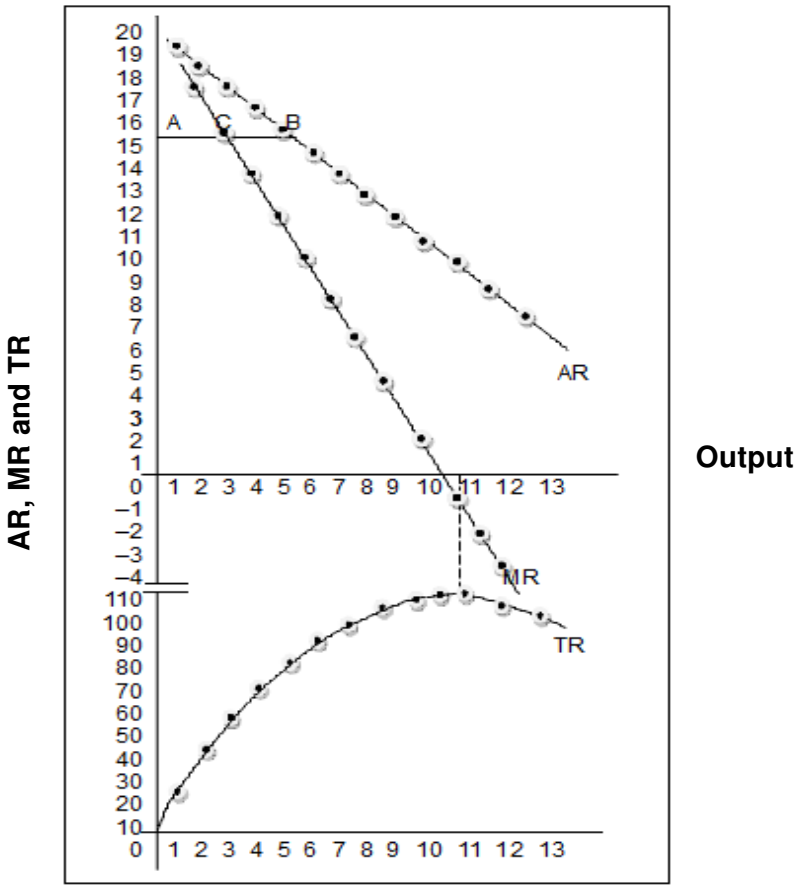
Table 9.2 : Total, Average and Marginal Revenue Schedules of a Firm under Imperfect Competition *(Revenue figures in* Rs.*)*

Number of units sold (Q)	Price or Average Revenue (AR)	Total Revenue (AR x Q)	Marginal Revenue
(1)	(2)	(3)	(4)
1	20	20	20
2	19	38	18
3	18	54	16
4	17	68	14
5	16	80	12

6	15	90	10
7	14	98	8
8	13	104	6
9	12	108	4
10	11	110	2
11	10	110	0
12	9	108	– 2
13	8	104	– 4

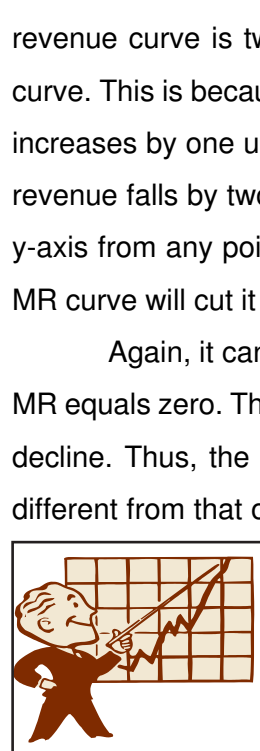
From the above table it can be seen that as AR declines by one rupee with the number of units sold being raised by one unit, MR declines by Rs. 2. Again, TR is the maximum when MR equals 0. After that MR becomes negative, and TR tends to decline. This has been shown in figure 9.3.

Figure 9.3 : AR, MR and TR curves of a Firm under imperfect competition



From figure 9.3 it can be seen that unlike perfect competition, firm's AR and MR curves under imperfect competition are not the same. However, both the curves are downward sloping. Again, the slope of the marginal revenue curve is twice as much steeper as that of the average revenue curve. This is because it can be seen from the above table 9.2 that as sale increases by one unit, average revenue falls by one rupee while marginal revenue falls by two rupees. Thus if we draw a ***perpendicular*** line on the y-axis from any point of the AR curve, say AB as shown in the figure, the MR curve will cut it in the middle. Thus, AC = half of AB.

Again, it can be seen that total revenue (TR) continues to rise until MR equals zero. Thereafter, as MR tends to become negative, TR tends to decline. Thus, the shape of the TR curve under imperfect completion is different from that of perfect competition.



A line is said to be ***perpendicular*** to another line if the two lines intersect at a right angle, i.e., if the two lines create a 90^0 angle.

CHECK YOUR PROGRESS

Q.1. Why are the AR and MR curves same under perfect competition? (Answer in about 40 words)

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Q.2. Is the shape of the total revenue curve same in case of both perfect competition and imperfect competition? (Justify your view in about 40 words)

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Q.3. How will you derive average revenue from total revenue?

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9.5 RELATIONSHIP BETWEEN TR, AR, MR AND PRICE ELASTICITY OF DEMAND

We had already discussed that price elasticity of demand in a horizontal demand curve (which is found in case of perfect competition) is infinite. Again, we also discussed that the price elasticity of demand varies at different point in a linear demand curve. The linear demand curve (which is found in case of imperfect competition) can be utilized in deriving a relationship between the shapes of the AR,MR and TR curves and price elasticity of demand.

The relationship between price elasticity of demand and the revenue concepts, viz., AR, MR is expressed as:

$$MR = AR \frac{e - 1}{e}$$

where, MR = marginal revenue, AR = average revenue and e = price elasticity of demand.

Thus, from this formula we can know what would be the marginal revenue if elasticity and AR are given to us.

Let us take the case when price elasticity of demand is 1.

Thus,

$$MR = AR \frac{1 - 1}{1}$$

Thus, MR = AR X 0 = 0.

Again, from this formula we can find:

If e > 1, MR is positive, and MR<AR

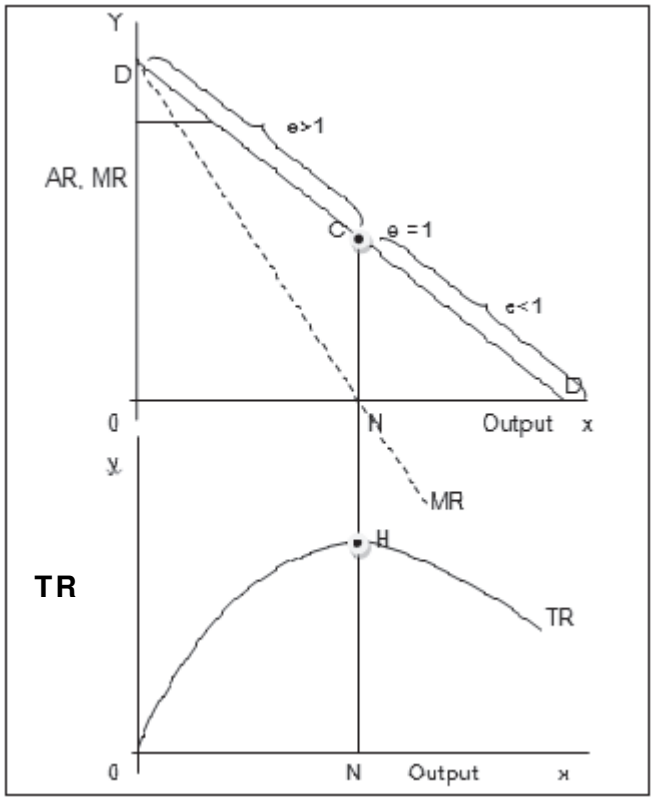
If e < 1, MR is negative, and MR>AR.

This relationship among AR, MR, TR and price elasticity of demand can also be shown graphically in figure 9.4.

From figure 9.4 it can be seen that C is the middle point of the average revenue curve DD. At this point C price elasticity of demand is equal to one . Corresponding to this point C of the DD curve, we can find that MR is equal to zero (this is because, corresponding to C of the DD curve, the MR curve cuts the x-axis at point N). Thus, at quantity 0N, price

elasticity of demand is 1, while MR is zero. At a quantity less than 0N, price elasticity of demand is greater than 1 (or positive) and at a quantity less than 0N, price elasticity of demand is less than 1 (or negative). It has also be seen that when the marginal revenue is positive, price elasticity of demand is also positive and when marginal revenue is negative, price elasticity of demand also becomes negative.

Figure 9.4 : Relationship between AR,MR, TR and price elasticity of Demand



Again, from the bottom panel of the figure it can be seen that total revenue is maximum when price elasticity of demand equals one. It can be further noticed that when the price elasticity of demand is greater than one (or positive), TR tends to increase and when the price elasticity of demand is more than one (or negative), TR tends to diminish.



CHECK YOUR PROGRESS

Q.4. What is the price elasticity of demand in case of a horizontal demand curve?

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Q.5. What happens to marginal revenue when price elasticity of demand equals one?

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Q.6. What happens to total revenue when price elasticity of demand is less than one?

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9.6 PRICING POLICIES AND ITS OBJECTIVES

Pricing is the process of determining what a company will receive in exchange for its product or service. A business can use a variety of pricing strategies when selling a product or service. The price can be set to maximize profitability for each unit sold or from the market overall. It can be used to defend an existing market from new entrants, to increase market share within a market or to enter a new market.Pricing policy refers to the way a company sets the prices of its services and products based on their value, demand, cost of production and the market competition. Pricing policy is essential for all companies as it provides a guideline for creating profits and identifying areas that bring in losses. Pricing policy goes hand in hand with pricing strategy

Objectives of Pricing Policies:

Let us discuss some objectives of pricing policies:

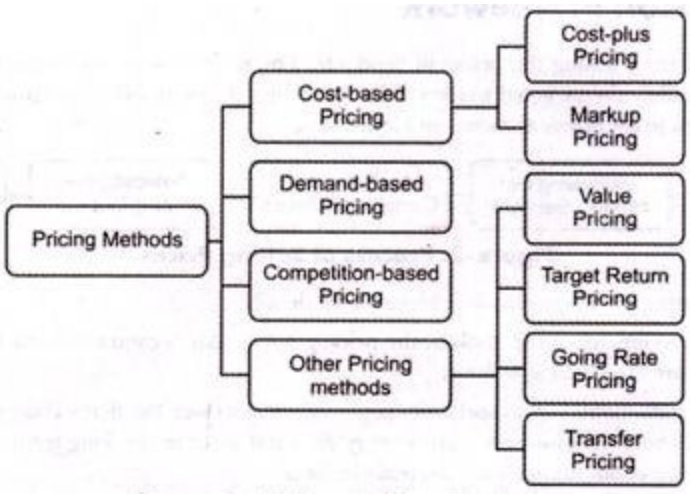
- **To Maximize Profits:** Every firm tries to maximize their profits. So they should have a price policy, which fetches them maximum revenue. Every firm should have a price policy keeping the long run prospects in mind.

- **Price Stability:** Always fluctuating price is not good for the company. A stable price always wins the confidence of customers.
- **Capture the Market:** Producer's aim is to capture the market and to do so, he fixes comparatively lower price for his product, while introducing a product to capture the major share of market. But once they gain stability and consistency they can change their price policy.
- **Facing Competitive Situation:**Every producer should fix the price, keeping the price of the competitor in mind; in some types of market structure; prices are fixed in such a way so as to restrict the entry of rival firms in the industry.
- **Ability to Pay:**The price should be fixed according to the ability of consumer to pay; high price for rich customers and low for poor customers. This can be applied in case of services given by doctors, lawyers etc.

9.7 PRICING METHODS

An organization has various options for selecting a pricing method. Prices are based on three dimensions that are cost, demand, and competition. The organization can use any of the dimensions or combination of dimensions to set the price of a product.

Figure 9.5: Pricing Methods



The different pricing methods as shown in the above figure are discussed below;

A. Cost-based Pricing: Cost-based pricing refers to a pricing method in which some percentage of desired profit margins is added to the cost of the product to obtain the final price. In other words, cost-based pricing can be defined as a pricing method in which a certain percentage of the total cost of production is added to the cost of the product to determine its selling price. Cost-based pricing can be of two types, namely, cost-plus pricing and markup pricing.

These two types of cost-based pricing are as follows:

i. *Cost-plus Pricing:* It refers to the simplest method of determining the price of a product. In cost-plus pricing method, a fixed percentage, also called mark-up percentage, of the total cost (as a profit) is added to the total cost to set the price. For example, XYZ organization bears the total cost of Rs. 100 per unit for producing a product. It adds Rs. 50 per unit to the price of product as profit. In such a case, the final price of a product of the organization would be Rs. 150. Cost-plus pricing is also known as average cost pricing. This is the most commonly used method in manufacturing organizations.

ii. *Markup Pricing:* It refers to a pricing method in which the fixed amount or the percentage of cost of the product is added to product's price to get the selling price of the product. Markup pricing is more common in retailing in which a retailer sells the product to earn profit. For example, if a retailer has taken a product from the wholesaler for Rs. 100, then he/she might add up a markup of Rs. 20 to gain profit.

B. Demand-based Pricing: Demand-based pricing refers to a pricing method in which the price of a product is finalized according to its demand. If the demand of a product is more, an organization prefers to set high prices for products to gain profit; whereas, if the demand of a product is less, low prices are charged to attract the customers.

The success of demand-based pricing depends on the ability of marketers to analyze the demand. This type of pricing can be seen in the hospitality and travel industries. For instance, airlines during the period of low demand,

charge less rates as compared to the period of high demand. Demand-based pricing helps the organization to earn more profit if the customers accept the product at a price more than its cost.

C. Competition-based Pricing: Competition-based pricing refers to a method in which an organization considers the prices of competitors' products to set the prices of its own products. The organization may charge higher, lower, or equal prices as compared to the prices of its competitors. The aviation industry is the best example of competition-based pricing where airlines charge the same or fewer prices for same routes as charged by their competitors. In addition, the introductory prices charged by publishing organizations for textbooks are determined according to the competitors' prices.

D. Other Pricing Methods: In addition to the pricing methods, there are other methods that are discussed as follows:

i. Value Pricing: Implies a method in which an organization tries to win loyal customers by charging low prices for their high- quality products. The organization aims to become a low cost producer without sacrificing the quality. It can deliver high- quality products at low prices by improving its research and development process. Value pricing is also called value-optimized pricing.

ii. Target Return Pricing: Helps in achieving the required rate of return on investment done for a product. In other words, the price of a product is fixed on the basis of expected profit.

iii. Going Rate Pricing: Implies a method in which an organization sets the price of a product according to the prevailing price trends in the market. Thus, the pricing strategy adopted by the organization can be same or similar to other organizations. However, in this type of pricing, the prices set by the market leaders are followed by all the organizations in the industry.

iv. Transfer Pricing: Involves selling of goods and services within the departments of the organization. It is done to manage the profit and loss ratios of different departments within the organization. One department of an organization can sell its products to other departments at low prices. Sometimes, transfer pricing is used to show higher profits in the organization by showing fake sales of products within departments.



9.8 LET US SUM UP

- The whole income received by a seller from selling a given amount of the product is called total revenue.
- Average revenue can be obtained by dividing total revenue by the number of units sold.
- Marginal revenue is the net revenue earned by selling an additional unit of the product.
- In case of perfect competition, the shape of average revenue curve and the marginal revenue curve are the same.
- Unlike perfect competition, firm's AR and MR curves under imperfect competition are not the same.
- Under imperfect competition, the slope of the marginal revenue curve is twice as much steeper as that of the average revenue curve.
- Price elasticity of demand in terms of the revenue concepts, viz., AR, MR is given as:

  $$MR = AR \frac{e - 1}{e}$$

  where, MR= marginal revenue, AR = average revenue and e= price elasticity of demand.
- If e = 1, MR is zero.
  If e > 1, MR is positive, and
  If e < 1, MR is negative.
- Total revenue is maximum when price elasticity of demand equals one.
- When the price elasticity of demand is greater than one (or positive), TR tends to increase and when the price elasticity of demand is less than one (or negative), TR tends to diminish.
- Pricing is the process of determining what a company will receive in exchange for its product or service.
- The different pricing methods are: Cost based pricing, Demand based pricing and Competetion based pricing method.



9.9 FURTHER READINGS

1) Ahuja, H. L. (2006). *Modern Economics.* New Delhi: S. Chand & Co. Ltd.
2) Dewett, K. K. (2005). *Modern Economic Theory.* New Delhi: S. Chand & Co. Ltd.
3) Koutsoyiannis, A (1979). *Modern Microeconomics.* New Delhi: Macmillan
4) Sundharam, K. P. M & Vaish, M. C. (1997). *Microeconomic Theory.* New Delhi: S. Chand & Co. Ltd.



9.10 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q.No. 1 : Under perfect competition, the market price for the product is fixed and the seller has no influence to alter the same. However, the seller can supply any amount of the commodity at the prevailing market price. As a result, the prevalent market price also represents the average revenue curve and marginal revenue of the firm. Hence, both the curves are same.

Ans. to Q.No. 2 : The shape of the total revenue curve is not same in perfect competition and imperfect competition. This is because price of a product remains fixed under perfect competition, while under imperfect competition, price of a product may change.

Ans. to Q.No. 3 : Average revenue can be derived from total revenue by dividing it by the number of units sold. Thus, average revenue = total revenue / no. of units sold.

Ans. to Q.No. 4 : Price elasticity of demand in case of a horizontal demand curve is infinite.

Ans. to Q.No. 5 : Marginal revenue becomes zero when price elasticity demand equals one.

Ans. to Q.No. 6 : When price elasticity is less than one, total revenue tends to diminish from its maximum point.



6.9 MODEL QUESTIONS

Q.1. Define the following terms:
a) Marginal Revenue b) Average revenue c) Total revenue

Q.2. How would you derive marginal revenue from total revenue?

Q.3. Why under imperfect competition, the MR curve is twice as much steeper than the AR curve?

Q.4. Derive the total revenue curve of a firm in a perfectly competitive market.

Q.5. Show the relationship between average revenue and marginal revenue under imperfect competition.

Q.6. Show the relationship between average revenue, marginal revenue and total revenue in a perfectly competitive market. Based on the relationship, derive the AR, MR and TR curves.

Q.7. Derive the relationship between AR,MR, TR and the price elasticity of demand under imperfect competition.

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UNIT 10 : MARKET STRUCTURE: PERFECT COMPETITION

UNIT STRUCTURE

10.1 Learning Objectives

10.2 Introduction

10.3 Concept of Market and Revenue Curves

10.3.1 Classification of Market Structure

10.3.2 Concepts of Total Revenue, Average Revenue and Marginal Revenue

10.4 Perfect Competition

10.4.1 Equilibrium of Firm in the Short-run

10.4.2 Equilibrium of the Industry in the Short-run

10.5 Perfect Competition: Long-run Analysis

10.5.1 Equilibrium of Firm in the Long-run

10.5.2 Equilibrium of the Industry in the Long-run

10.6 Let Us Sum Up

10.7 Further Reading

10.8 Answers to Check Your Progress

10.9 Model Questions

10.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- define market
- classify market into different forms
- discuss perfect competition and equilibrium of a firm and industry both in the short-run and in the long-run.

10.2 INTRODUCTION

We all buy and sell various kinds of ***products*** in a market. In general, whenever we talk of a market, we have a place in mind, where buyers interact with sellers and buy goods and services in exchange of money. In this unit, we shall try to get a deeper insight into this concept 'market'. We



Goods: Those, which are tangible; like – books, foods, torch light, batteries etc.
Services: Those, which are intangible; like- the services of a barber, cobbler, lawyer, nurse etc.

shall try to define the term market in business and economics sense, and shall discuss the evolution of this concept. We shall also try to explain the classification of markets on the basis of different parameters.Again, we shall make an attempt to explain the equilibrium of a firm / industry under one of the major market structures: viz, perfect competition. This unit will be helpful for us in relating the theoretical principles of market with the day-to-day maket envirionment.

10.3 CONCEPT OF MARKET AND REVENUE CURVES

As we have said, by the term market, we in general understand a particular place or locality where goods are sold and purchased. However, in economics, the term 'market' does not mean a particular geographical place or locality. Thus, to define market in economics, the concept of a particular place or locality is not much important. What is important is the contact between the buyers and the sellers so that transaction (i.e., sale and purchase of commodities) can take place at an agreed price.

Thus, the essentials of a market are: a) commodity which is to be 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) a communication between buyers and sellers, which ensures only one price for a commodity at a time.



Barter System: The system where good s and services were exchanged directly without using a separate unit of account or medium of exchange
Plastic money or electronic money: Credits cards, Debit cards, etc. which facilitate cashless transaction.

EVOLUTION OF MARKET: When goods were exchanged for goods in the ***barter system***, markets were very simple. But with the evolution of time, increasing needs and with improvement in science and technology, markets have become complex. Medium of Exchange has evolved from goods to money (metallic and paper); and from money it is now taking the shape of '***plastic money***' or '***electronic money***'. Similarly the geographic coverage of a market has also widened from the local market to the global market. Today, advancement in telecommunication has brought the concept of electronic commerce, which facilitates business on a global scale.

10.3.1 Classification of Market Structure

Market structure refers to the type of market in which firms operate. Market structure may be classified:

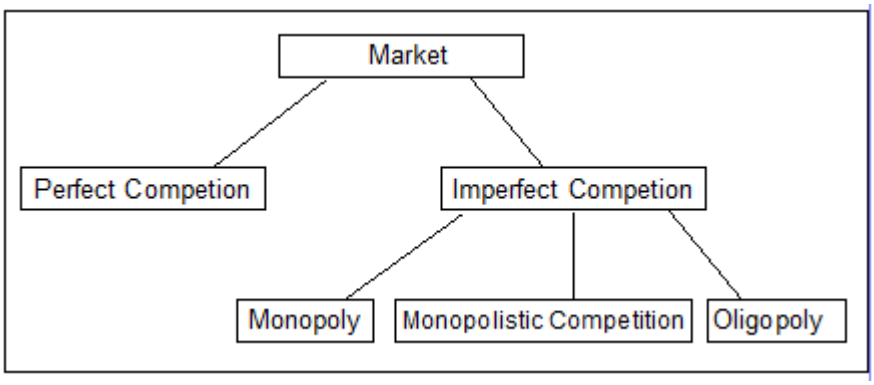
- On the basis of area as local, national and world markets;
- On the basis of time, as market price on any particular day or moment; short-period price, long-period price, or ***secular*** maket price covering a generation; and
- On the basis of nature of competition – perfect competition and imperfect competition.

Here, we shall basically discuss market structure on the basis of nature of competition. Nature of competition can be distinguished based on the following three criteria:

a) Number of Sellers in the industry,
b) Entry barriers into the industry, and
c) Nature of the product.

Thus, based on these above criteria, classification of market structure has been shown in the following tree diagram 10.1:

Figure 10.1: Classification of Market Structure



Thus, we have discussed that the market structure can broadly be classified into two major categories – perfect competition, imperfect competition. Market structure under imperfect competition can be further classified as monopoly, monopolistic competition and

oligopoly. In the following table 10.1, we shall try to look at the individual characteristics of these market structure with regard to the above three criteria.

Table 10.1: Individual Characteristcs of Different Types of Market

Market Type	*Number of Sellers*	*Entry Barrier*	*Nature of Product*
Perfect Competiton	Many, small, Independent	None	Homogenous
Monopoly	One	Very high	Homogenous
Monopolistic Competition	Many, small, virtually independent	None	Differentiated
Oligopoly	Few, interdependent	Substantial	Homogenous or Differentiated

10.3.2 Concepts of Average Revenue,Total Revenue and Marginal Revenue

Before discussing in detail about the different market structures, we shall try to look at the relationship among different concepts of average revenue (AR), marginal revenue (MR) and total revenue (TR). We shall also look at shapes of AR and MR under these major market structures: viz, perfect competition and imperfect competition in general.

Average Revenue: Consumers pay for the goods and services they buy. These constitute the earning of revenue/income of the sellers. Thus, the whole income received by a seller from the sales of a given amount of the product is called his total revenue. If we divide total revenue by the number of units sold, we can attain the average revenue. Converesely, by multiplying average revenue with the number of units sold, we can attain the total revenue. Thus:

$$\text{Average Revenue} = \frac{\text{Total Revenue}}{\text{Total units sold}}$$

$$\text{Symbolically, } AR = \frac{TR}{Q} \quad \text{or, } TR = AR \times Q$$

where, AR = Average revenue, TR = Total Revenue, Q= Total units sold.

Marginal Revenue: Marginal revenue on the other hand is the net revenue earned by selling an additional unit of the product.

Thus:

$$\text{Marginal Revenue} = \frac{\text{Change in Total Revenue}}{\text{Change in Total units sold}}$$

$$\text{Symbolically, } MR = \frac{\Delta TR}{\Delta Q}$$

where, MR = Marginal revenue, TR = Total Revenue, Q= Total units sold, Ä means change in.

Now we will discuss the shapes of the average and marginal revenue curves under perfect and imperfect competition.

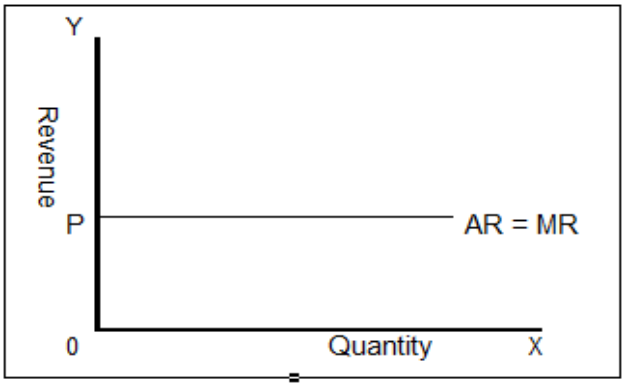
AR and MR Curves of a Firm under Perfect Competition: A firm under perfect competition has to accept the prevailing market price and can sell any amount of output in the market at that price. Thus, a firm under perfect competition will earn AR, TR and MR similar to the following table 10.2

Table 10.2: Total, Average and Marginal Revenue Schedules

Number of units sold (Q)	*Price or Average Revenue*	*Total Revenue (AR x Q)*	*Marginal Revenue*
(1)	(2)	(3)	(4)
1	14	14	14
2	14	28	14
3	14	42	14
4	14	56	14
5	14	70	14

Based on the above schedule, the shapes of AR and MR curves of a perfect competitive firm has been shown in the following figure 10.2:

Figure 10.2: AR and MR Curves of a Firm under Perfect Competition



It can be seen from figure 10.2 that the firm's AR and MR curves are the same. The slope of the curves is horizontal.

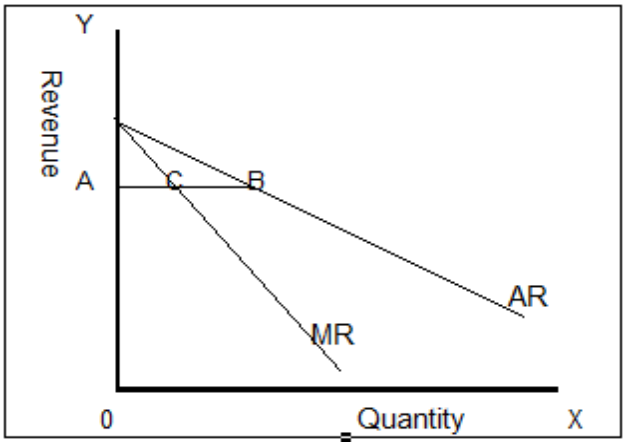
AR and MR Curves of a Firm under Imperfect Competition: Unlike perfect competition, a firm under imperfect competition does not have to sell all its amount at a fixed market price. This means that the firm can sell more units of the product as its price falls. We have shown a hypothetical schedule of AR, TR and MR in table 10.3 in the next page.

Table 10.3: Total, Average and Marginal Revenue Schedules

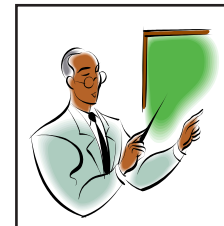
Number of units sold (Q)	*Price or Average Revenue*	*Total Revenue (AR x Q)*	*Marginal Revenue*
(1)	*(2)*	*(3)*	*(4)*
1	20	20	20
2	19	38	18
3	18	54	16
4	17	68	14
5	16	80	12

Based on the above schedule, the shapes of AR and MR curves of a firm under imperfect competition has been shown in the following figure:

Figure 10.3: AR and MR Curves of a Firm under Imperfect Competition



It can be seen from figure 10.3 that unlike perfect competition, the firm's AR and MR curves under imperfect competition are not the same. It is to be noted that both the curves are downward sloping. Again, the slope of the marginal revenue curve is twice as much steeper as that of the average revenue curve. This is because it can be seen from the above table 10.3 that as sale increases by one unit, average revenue falls by one unit of price (as its number of units sold increases by one unit), marginal revenue falls by two units of price. Thus if we draw a ***perpendicular*** line on the y-axis from any point of the AR curve, say AB as in figure 10.3, the MR curve will cut it in the middle. Thus, AC = half of AB.



Perpendicular: A straight line which make 90^0 angle on the axis on which it is drawn. Such a line will also be parallel to the other axis. Thus, a perpendicular line drawn on y-axis will be a parallel line to the x-axis.

LET US KNOW

In real market situation, perfect competition rarely exists. Many economists, therefore, question the usefulness of studying perfect competition. Though unreal, the study of perfect competition helps us to understand as to what may happen, if such a situation actually arises. And secondly, it also helps us to understand the real imperfect market structure – how much they deviate from perfect competition. In many advanced countries the markets of home and car insurance, internet service providers are highly competitive, though not perfectly competitive. Again, the

market of products like detergents, toothpastes etc. constitute the examples of monopolistic competition. In Indian context, the Indian Railways constitutes the example of monopoly in case of passenger carriage through railways. On the other hand, the market of passenger cars can be said to be good example of oligopoly.



ACTIVITY 10.1

Try to give some examples of the market structures like: Monopoly, monopolistic competition and oligopoly. Justify your choice of examples based on the criteria mentioned in table 10.1.

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CHECK YOUR PROGRESS

Q1: Define market. (Answer within 50 words)

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Q2: What are the different categories of a product? Give examples of each of the categories. (Answer within 50 words)

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10.4 PERFECT COMPETITION

Perfect competition is described as the market structure having no rivalry among the individual firms. Thus, the concept of perfect competition

is totally opposite to our general idea, where we mean by competition 'rivalry' among the individual firms. In the subsequent sections, we shall discuss equilibrium of firm and industry both in the short run and in the long run under this market structure.

Again, under perfect competition firms face two cost conditions: ***identical cost conditions*** and ***differential cost conditions***. We shall be confining our discussion only to identical cost conditions. Identical cost conditions will help us generalize our discussion from an individual firm to all other firms and thereby to industry as a whole. We shall now look at the assumptions on which this market structure rests.



Identical Cost Condition assumes that the firms in the industry face similar cost conditions. Thus, it becomes possible to generalise from a firm's analysis to the analysis of the whole industry.

The reverse is the case with ***differential cost condition***.

Assumptions of Perfect Competition: The assumptions of perfect competition are as follows:

- **Large number of sellers and buyers:** Presence of large number of buyers and sellers implies that it is not possible either for the individual firms or the individual buyers to affect the price or output in the market. That means, in perfect competition, individual firms have zero market power. Thus, an individual firm under perfect competition is a price taker.
- **Product homogeneity:** This assumption of perfect competition ensures that neither the buyers nor the sellers have any ground to differentiate among the products and, hence, ask for a different price. *(For the concept of product homogeneity, please refer to 'Let us know' in the next page).*
- **Free entry and exit of firms:** This assumption is supplementary to the assumption of large number of sellers in the industry.
- **Profit maximisation:** The only goal of a firm in perfect competition is profit maximization.
- **No government intervention:** There is no government intervention in the market in any form like: tariffs, subsidies, rationing of production or demand, etc.

The fulfilment of these above five conditions forms a market structure known as '**pure competition**'. This market form is different from perfect competition, which requires the fulfilment of the following additional assumptions:

- **Perfect mobility of factors of production:** The factors of production including labour are fully mobile. Thus, labourers are fully mobile between different jobs and there is no labour union.
- **Perfect knowledge:** All sellers and buyers possess complete knowledge of the conditions of the market. Information is free and costless.

LET US KNOW



Product Homogenity: It is the quality of goods, services or factors which ensures that they cannot be differentiated in the minds of suppliers and consumers. A range of commodities is said to be homogeneous if all of them in that range are perfect substitutes for each other. The commodities may be physically distinct but economically homogeneous. The more the degree of homogeneity of products, the more will be the substitutability among them.

Short-run: It is that period of time which is too short for all economic agents (firm, industry or a buyer) to fully respond to a change. In our present analysis of market, short-run is the period in which a) no firm can enter into or exit from the industry, and b) the individual firms cannot make any adjustments to its *fixed factor of production*.

Long-run: It is that period of time which is sufficient for all economic agents to fully adjust to a change. The firms and industry can change both the variable and the fixed factors of production during this period.



CHECK YOUR PROGRESS

Q 3: State whether the following statements are True or False.(T/F)

(a) Absence of government intervention under perfect competition implies that fiscal instruments like subsidies, tax etc are not utilised by government to regulate the market.(T/F)

(b) Perfect mobility of factors of production is a feature of pure competition. (T/F)

Q 4: What is the basic difference between short-run and long-run in terms of the change in factory of production?

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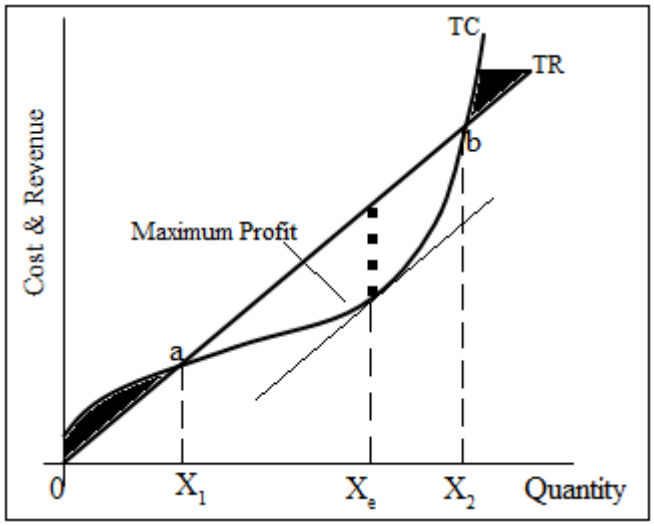
10.4.1 Equilibrium of a Firm in the Short-run

We shall now discuss the equilibrium of an individual firm and the industry both in the short run and in the long run. Here we shall utilize different cost concepts .

While discussing the assumptions of perfect competition, we have seen that the only goal of the firm is profit maximisation. Profit is calculated by: $TR - TC$ (*TR* = Total Revenue and *TC* = Total Cost). Thus, the firm will produce that output which yields the maximum profit. Now, as the price is constant, hence marginal revenue and average revenue are constant and equal to price. The equilibrium of a firm may be shown graphically in two ways: either by using *TR* and *TC* curves, or by using *MR* and *MC* (MR = Marginal revenue and MC = Marginal Cost) curves.

Using TR and TC Curves: The following figure 10.4 describes the equilibrium of a firm using TR and TC curves. The *TR* curve is a straight line through origin O, which means that price is constant at any level of output and *TR* (*TR* = Price x Quantity) increases proportionate to sales. This means that as sales increase, total revenue will also increase by the same proportion.

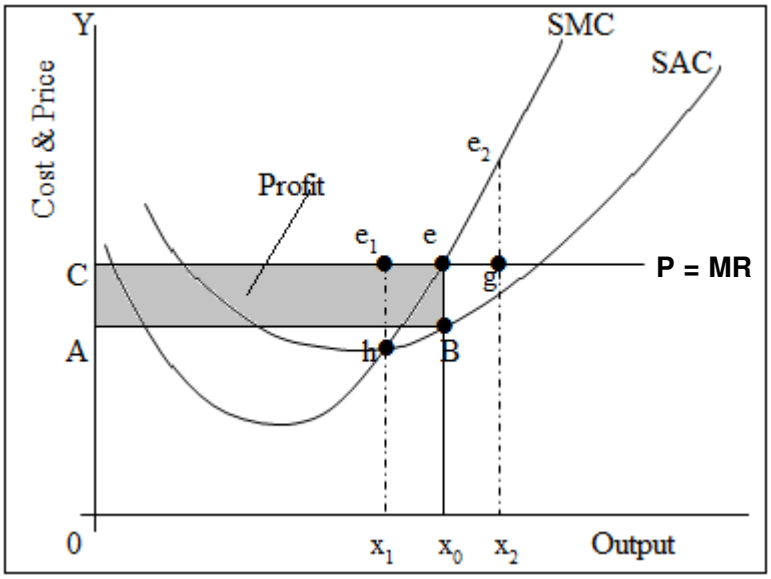
Figure 10.4: Firm's Equilibrium in the Short-run: TR & TC Approach



In the above figure, the shape of the *TC* curve reflects the U shape of *AC* (Average Cost) curve (we have already discussed the shapes of the different cost curves in the previous chapter). We also know that the prime motto of a business firm is to earn maximum profits. The profit maximising firm will attain equilibrium at the output level, where profit (gap between *TR* and *TC*) is maximum, i.e., at the level of output where tangents drawn to the TC and TR curves are parallel. In figure 10.4, X_e is that point and thus is the equilibrium point. At output levels smaller than X_1 and larger than X_2, the firm will incur losses. Because, in both the cases, total cost of the firm will be more than total revenue the firm earns. To the left of *a,* (the point where quantity is X_1), it can be seen that that the Total Cost (TC) curve lies above the Total Revenue (TR) curve, and hence the firm will suffer losses. Similarly, towards the right of *b*, the same thing is observed.

Using MR and MC Curves: This approach of explaining equilibrium of firm is more beneficial as it uses price as an explicit variable; and also helps in explaining the behavioural rule that leads to profit maximisation. Following figure 10.5 explains equilibrium of firm using this approach:

Figure 10.5: Firm's Equilibrium in the Short-run : MR & MC Approach

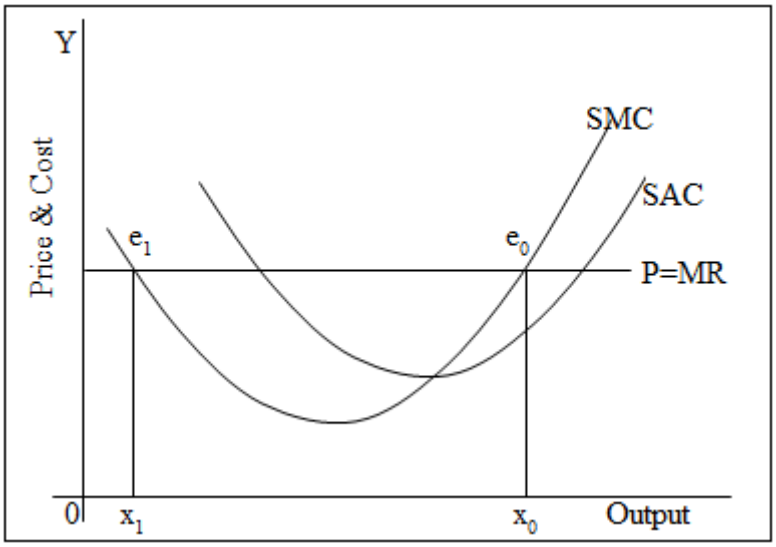


The firm attains equilibrium at that output level, where price=MC above the level of SAC (SAC means short-run average cost). In figure 10.5, *e* is that point and hence is the equilibrium point and x_0 is the equilibrium output. At any point left to x_0 output level, say at x_1, revenue is greater than marginal cost ($x_1e_1 > x_1h$), and this induces the firm to increase the output level to x_0. Similarly, any point right to x_0 output level, say x_2, the marginal cost of the firm is above revenue ($x_2e_2 > x_2g$), and this induces the firm to reduce output to the level x_0.

In figure 10.5, at point e, MR=MC, which means that the short run profit is maximised at the equilibrium output level, x_0. In fact, this is the first condition that must be fulfilled for firm's equilibrium. However, fulfilment of this condition does not always mean that the firm will necessarily be in equilibrium. It is possible, that in certain situations, MR=MC, but the firm is not in equilibrium. The next figure 10.6 explains this point. It is clear from the above figure 10.6 that the first condition of firm's equilibrium, i.e. MR=MC is fulfilled at two points: e_1 and e_0. The firm however, will not attain equilibrium at e_1,

since profit is not maximised. The firm attains equilibrium at e_0, since profit is maximized $x_0 > x_1$.

Figure 9.6:MR=MC Is Not the Sufficient Condition of Firm's Equilibrium



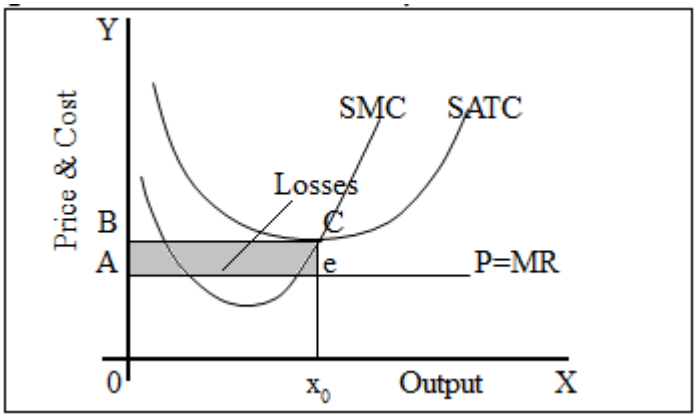
Thus, from the above figure it is clear that a second condition is required for firm's equilibrium. This condition can be stated as: MC cuts MR from below. Thus, we derive two conditions of firm's equilibrium:

a) MC = MR; and

b) MC cuts MR from below.

In case of figure 9.5, the firm earns excess profits of an amount of eB (price x_0e – SAC x_0B) per unit of output. And as the total output sold is $0x_0$ or AB, the excess profit earned by the firm amounts to the shaded area CABe. It is to be kept in mind that the firm, however, does not always earns excess profits while in short run equilibrium. To the contrary, the firm may have to suffer losses in the short-run while in equilibrium. This point has been explained with the help of the next figure 9.7.

Figure 10.7: Firm's Short-run Equilibrium with Losses



It can be seen in figure 10.7 that the firm suffers losses. This is because, at equilibrium point e (MR = MC; and MC cuts MR from below), cost per unit X_0C > revenue X_0e. This means that the firm suffers total losses eC per unit of output. Thus, the firm suffers a total loss of AeCB.



CHECK YOUR PROGRESS

Q 5: MR = MC. Is this condition alone sufficient for a firm's equilibrium? Explain in about 50 words.

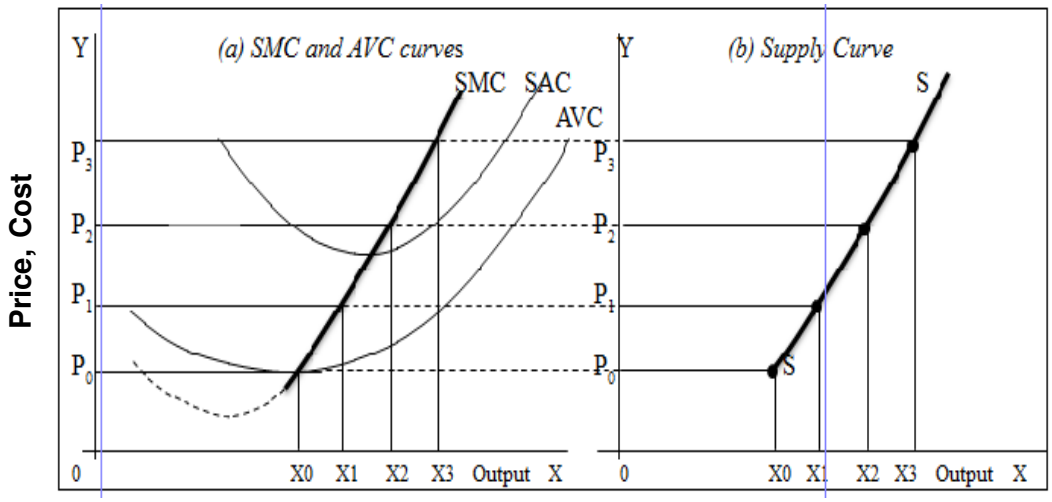
Q 6: When does a firm under perfect competition earn excess proifts? Can the firm earn such excess profits in the long-run as well? (Answer in about 40 words)

In the subsequent sections, we shall discuss industry equilibrium. It is to be noted here that all along we have utilized SMC curves for discussing firm's equilibrium. We have not derived firm's supply curve. This is because we have assumed that the price is given and there are large numbers of firms; hence, it is unlikely that an individual firm will influence either industry supply or demand. But in case of the industry as a whole, the industry can influence the market demand or supply by changing the price. Hence, to discuss industry's equilibrium, it becomes imperative to deduce the industry supply curve.

As we have discussed firm's equilibrium under identical cost conditions in the above, hence derivation of a firm's supply curve will help us derive the industry's supply curve as well.

Derivation of the Firm's Supply Curve: Figure 10.8 depicted in the following shows how much a firm produces under perfect competition at a given price. By varying the price, we get different levels of output, and this gives firm's short run supply curve as has been shown by panel (b) in figure 10.8.

Figure 10.8: Derivation of Short-run Supply Curve of a Firm

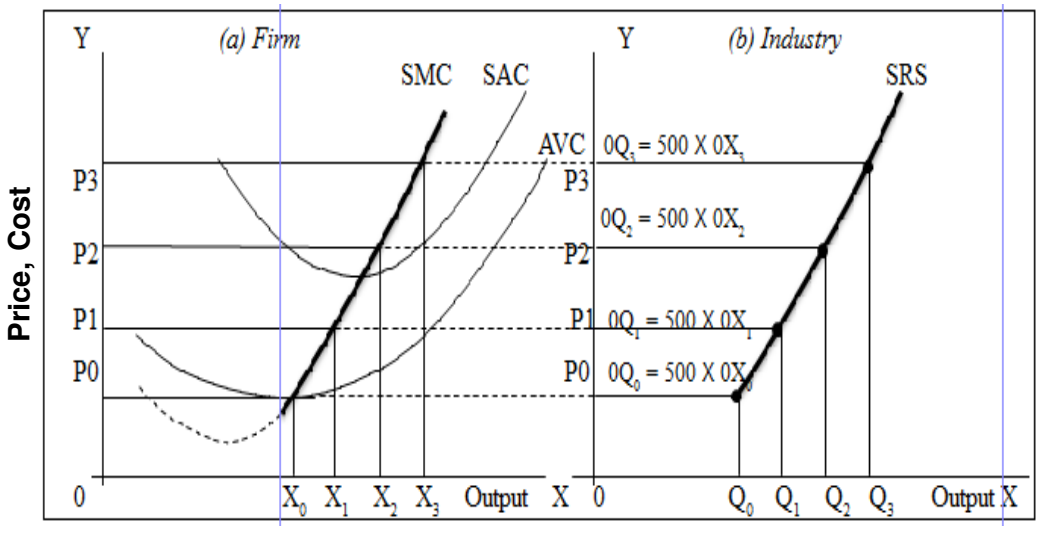


In the above figure, the minimum output the firm produces is $0X_0$, where price P_0 is equal to the minimum point on the *AVC* curve. For any price below P_0, the firm's revenue does not even cover the variable cost, and it does not pay the firm to produce any output. From panel (a), for different levels of the price, we get different quantities supplied by equating price to MC. In figure 10.8 (b) we plot these prices and quantities to get the supply curve.

In the above, while deriving the short run supply curve of the firm we have assumed that the minimum price P_0 is equal to the minimum AVC. That is, we have assumed that the revenues of the firm must cover variable costs. In the long run, unless the revenues of the firm cover the fixed costs as well, the firm cannot stay in production.

Derivation of the Industry Supply Curve: As we have assumed identical cost conditions, hence the market supply curve can be obtained by lateral summation (horizontal addition) of short run supply curves (i.e., short run marginal cost curves) of all individual firms in the industry. This has been explained with the help of figure 10.9 as has been shown in the next page.

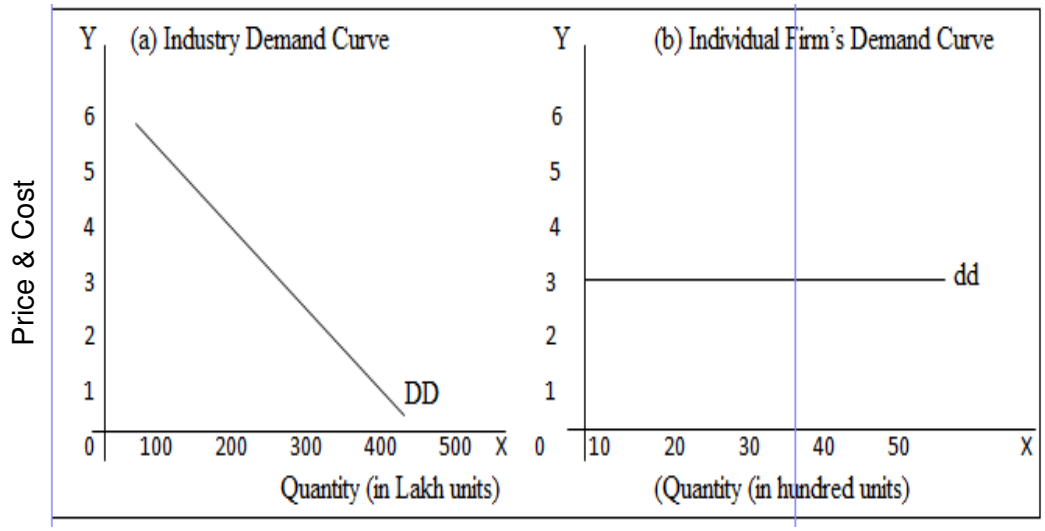
Figure 10.9: Derivation of Short-run Industry Supply Curve



In figure 10.9, we reproduce the panel (a) of figure 9.8, which describes the supply curve (MC curve) of a single firm. Now if we suppose that there are 500 such firms in the industry, the multiplication of each output level of the individual firms will give us the short-run industry supply curve. Thus, $OQ_3 = 500 \times OX_3$; OQ2 = 500 x OX_2 and so on. While putting these different quantities OQ_3, OQ_2, OQ_1 and OQ_0 against the respective prices P_3, P_2, P_1 and P_0, we get the industry supply curve SRS as has been shown in panel (b) of the figure 10.9.

Derivation of the Industry Demand Curve: We know that to explain equilibrium, we need to consider both the demand and the supply curve. We have derived the short-run industry supply curve. Now, let us see how is the shape of the industry supply curve? We have already seen that the demand curve of a competitive firm is horizontal straight line. But the shape of the industry's demand curve is negatively sloped. This has been shown in the following figure 10.10.

Figure 10.10: Short-run Demand curve under Perfect Competition



In panel (a) of the figure the industry demand curve has been depicted, and in panel (b), the firm's demand curve has been shown.

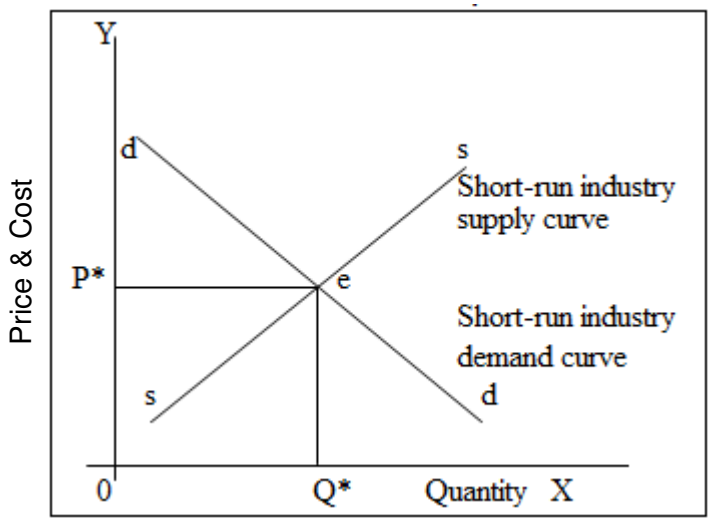
The demand curve for the industry as a whole is downward sloping, because the industry can, as a whole, change the market price, thus affecting consumers' demand. Therefore, the demand curve of industry (DD) represents the general law of demand.

10.4.2 Industry Equilibrium in the Short-run

The industry equilibrium in the short run is attained at the point where the short-run demand curve intersects with the short-run supply curve. This has been shown in Figure 10.11. In figure 10.11, e is the point where demand curve dd intersects the supply curve ss. Hence, *e* is the equilibrium point. Q* is the equilibrium quantity and P* is the equilibrium price.

It is to be noted here that though no individual firm can exert any influence on price, the collective action of suppliers and demanders determines the price.

Figure 10.11: Determination of Equilibrium Price under Perfect Competition





CHECK YOUR PROGRESS

Q 7: State whether the following statements true or false. (T/F)

(a) Under identical cost condition, it is possible to derive the industry supply curve through lateral summation of the individual firms' supply curves. (T/F)

(b) In the long-run, a firm willl continue its production even when its revenue does not cover fixed costs, but the variable costs are covered. (T/F)

Q 8: Unlike firm's horizontal demand curve, the industry's demand curve is negatively sloped. Why? (Answer in about 50 words)

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10.5 PERFECT COMPETITION: LONG-RUN ANALYSIS

So far we have discussed the short-run equilibrium analysis of a firm and industry under perfect competition. In the subsequent sections, we shall discuss the long-run equilibrium analysis of a firm and industry under this market structure.

10.5.1 Equilibrium of a Firm in the Long-run

In the long-run, entry and exit of firms may take place. Again, in the long-run, existing firms can adjust the quantities of their fixed inputs as well. Thus, in the long-run we expect two things: (1) existing firms will make adjustments in their output and costs. (2) if after these adjustments, a firm is still unable to cover its total costs, it will exit the industry. And if existing firms are earning super normal profits, then new firms will be lured into the industry.

Thus, for a competitive firm to be in equilibrium in the long-run, the following three conditions must be fulfilled:

- Price = Marginal Cost
- Price = Average Cost
- LMC curve cuts LAC curve from below.

Again, as both the marginal cost and the average cost is equal to price, hence both these conditions can be combined as:

Price = Marginal Cost = Average Cost.

In the earlier course, you have already known the shapes and concepts of different cost curves. Thus, conceptually we have learnt that the marginal cost can be equal to average cost only at the point where the average cost is neither falling nor rising, i.e., at the minimum point of the average cost curve.

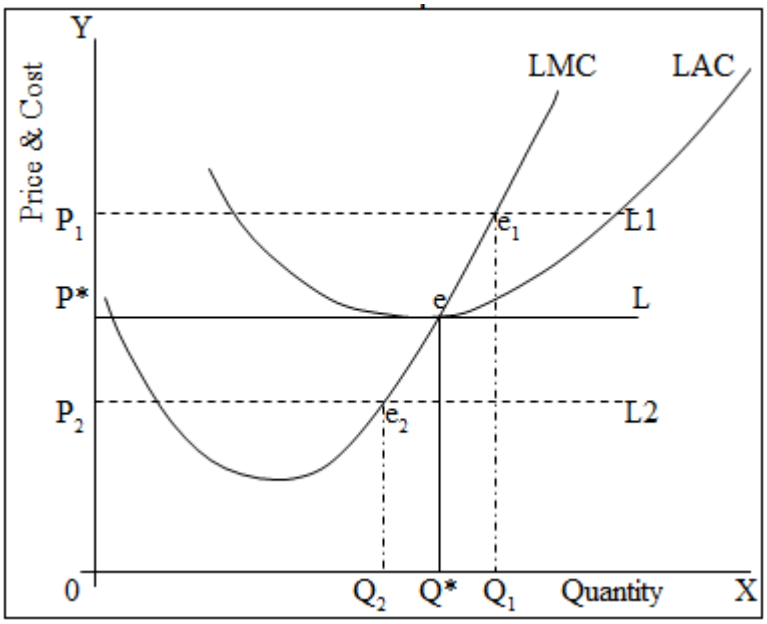
This gives us the condition of long-run equilibrium for a firm as:

Price = Marginal Cost = Minimum Average Cost.

LMC curve cuts LAC curve from below.

This has been explained in the following figure 9.12.

Figure 10.12: Long-run Equilibrium of a Firm under Perfect Competition



In the above figure 9.12, LAC is the long-run average cost curve and the LMC is the long-run marginal cost curve. The firm is in equilibrium at point e, where LMC curve cuts the LAC curve at its minimum. Corresponding to this equilibrium level, the equilibrium price is 0P*, and the equilibrium quantity is 0Q*. At this equilibrium level, the firm earns only normal profit.

The firm will not attain equilibrium at any other price or quantity level. Above the equilibrium price 0P*, let us consider price $0P_1$. At this price level, the firm's marginal cost will be higher than its average cost. Thus, the firm earns super-normal profits. This means that all the firms will earn super-normal profits; and this will attract entry of new firms to the industry. Thus, entry of new firms will ultimately lead the price to be settled at the level 0P*. Similarly, below price level 0P* as well, the firm does not attain equilibrium. Say, at price $0P_2$, the marginal cost of the firm will be below the average cost curve. This means that the firm will incur loss at price level $0P_2$. This means that all the firms will incur losses at this level. This will force some firms to exit from the industry. Thus, exit of firms will ultimately lead to increase in the price level to 0P*.

Thus, we can conclude from the above discussion, that a firm under perfect competition in the long run will be in equilibrium, when:

Price = MC = Minimum AC, and LMC curve cuts LAC curve from below.

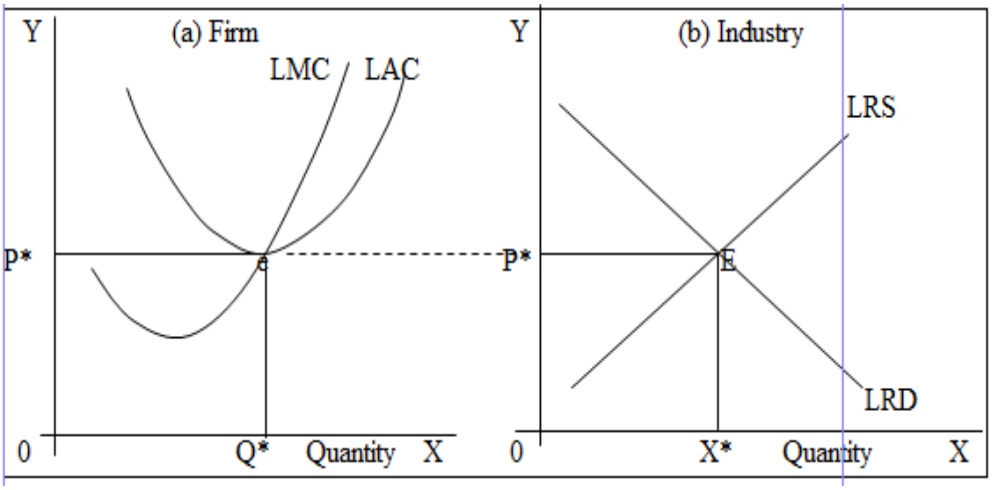
10.5.2 Industry Equilibrium in the Long-run

In the above, we have seen how a firm under perfect competition attains equilibrium in the long-run. An industry in the long-run attains equilibrium when the following three conditions are satisfied:

- the long-run supply and demand for the product of the industry are equal;

- all firms in the industry are in equilibrium; and
- there is neither the tendency for the new firms to enter the industry nor the existing firms to leave it.

Figure10.13: Industry Equilibrium in the Long-run



Panel (b) of the figure 10.13 depicts industry equilibrium in the long run. The long-run supply curve LRS intersects the long-run demand curve LRD at point E and hence long-run equilibrium is established at this point. Therefore, 0X* is the equilibrium quantity of the industry and 0P* is the equilibrium price. Corresponding to this point E, the firm's equilibrium has been shown in panel (a) of the figure. The firm attains equilibrium at point e, where the LAC curve intersects the LMC curve. Corresponding to this equilibrium level, the equilibrium quantity is 0Q*, and the equilibrium price 0P*. As the firm has attained equilibrium at the minimum point of the LAC curve, hence the firm is earning normal profit only. Again, as we have assumed identical cost conditions, hence all the firms will be in equilibrium at this level and will be earning only normal profits. The equilibrium of all firms with normal profit ensures that there is neither the tendency of the existing firms to exit from the industry nor new firms are attracted to enter the industry.

Thus, we have seen that under perfect competition when the industry attains equilibrium in the long-run, all the three conditions are satisfied; i.e.,

- the long-run supply and demand for the product of the industry are equal;
- all firms in the industry are in equilibrium; and
- there is neither the tendency for the new firms to enter the industry nor the existing firms to leave it.



CHECK YOUR PROGRESS

Q 9: State the conditions under which a firm under perfect competition attains equilibrium in the long-run. (Answer in about 30 words)

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10.6 LET US SUM UP

- The essentials of a market are:
  - a commodity which is to be dealt with;
  - the existence of buyers and sellers;
  - a place, be it a certain region, a country or the entire world; and
  - a communication between buyers and sellers, which ensures only one price for a commodity at a time.
- The market structure can broadly be classified into two categories – perfect competition and imperfect competition.
- Market structure under imperfect competition can be further classified into – monopoly, monopolistic competition and oligopoly.
- Market structure can be distinguished based on the three criteria:
  - number of sellers in the industry;

- entry barriers into the industry;
- nature of the product

- Two conditions must be fulfilled for a firm to be in equilibrium. These are:
  - MC = MR; and
  - MC cuts MR from below.
- And under perfect competition, a firm can earn excess profit or incur losses while attaining short-run equilibrium.
- The conditions of long-run equilibrium for a firm are:
  - Price = Marginal Cost = Minimum Average Cost.
  - LMC curve cuts LAC curve from below.
- Under perfect competition when the industry attains equilibrium in the long run, when three conditions are satisfied :
  - the long run supply and demand for the product of the industry are equal;
  - all firms in the industry are in equilibrium; and
  - there is neither the tendency for the new firms to enter the industry nor the existing firms to leave it.



10.7 FURTHER READINGS

1) Ahuja, H. L. (2006). *Modern Economics.* New Delhi: S. Chand & Co.
2) Chopra, P.N. (2008). *Micro Economics*. Ludhiana: Kalyani Publishers.
3) Dewett, K.K. (2005). *Modern Economic Theory*. New Delhi: S.Chand & Co.
4) Koutsoyiannis, A. (1979). *Modern Microeconomics*. New Delhi: Macmillan India.
5) Sundharam, K.P. M. & Vaish, M.C. (1997). *Microeconomic Theory.* New Delhi: S. Chand & Co.

10.8 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: A market can be defined as a place or a common platform, where buyers and sellers interact to exchange goods and services at an agreed price.

Ans to Q No 2: Products include:

Goods : Those, which are tangible; like – books, foods, torch light, batteries etc.

Services : Those, which are intangible; like- the services of a barber, cobbler, lawyer, nurse etc.

Ans to Q No 3: (a) True (b) False

Ans to Q No 4: The basic difference between short-run and long-run is that during short-run an economic agent (a firm or an industry) can change only the variable factor of production. But in the long-run an economic agent can change both the variable and the fixed factors of production.

Ans to Q No 5: No. This is because, it is possible that a firm fulfills the condition of MR=MC, but yet its profit may not be maximised. This may occur when the short-run MC curve cuts the MR curve when it (MC curve) is still falling, and hence minimum cost has not been yet achieved.

Ans to Q No 6: A firm under perfect competition can earn excess profit only in the short-run. The earning of profit by an individual firm will attract new firms into the industry. As a result, in the long-run, a firm will be able to earn normal profit only.

Ans to Q No 7: (a) True (b) False

Ans to Q No 8: Unlike the horizontal demand curve of a pefect competitive firm, the demand curve for the industry as a whole is downward sloping. This is because, the industry can as a whole change the market price; thus affecting consumers' demand. Thus, the demand curve of industry represents the general law of demand.

Ans to Q No 9: A firm under perfect competition attains equilibrium in the long-run when two conditions are fulfilled: first, Price = MC = Minimum AC, and secondly, LMC curve cuts LAC curve from below.



10.9 MODEL QUESTIONS

Q 1: What are the basic the criteria of market classification?

Q 2: What is the difference between pure competition and perfect competition?

Q 3: What is product homegenity?

Q 4: Describe the price and output determination of a firm in the short-run under perfect competition.

Q 5: Discuss the price and output determination of an industry in the short-run under perfect competition.

Q 6: Explain the price and output determination of firm in the long-run under perfect competition.

Q 7: Analyse the price and output determination of an industry in the long-run under perfect competition.

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UNIT 11: MARKET STRUCTURE: IMPERFECT COMPETITION

UNIT STRUCTURE

11.1 Learning Objectives

11.2 Introduction

11.3 Monopoly: Basic Concepts

- 11.3.1 Demand and Marginal Revenue Curves
- 11.3.2 Short-run and equilibrium of the Monopoly Firm
- 11.3.3 Long run Equilibrium of the Monopoly Firm
- 11.3.4 Price Discrimination: Degree and Possibility

11.4 Monopolistic Competition: Definition and Assumptions

- 11.4.1 Equilibrium of a Firm: Short-run
- 11.4.2 Equilibrium of a Firm: Long-run
- 11.4.3 Group Equilibrium
- 11.4.4 Concept of Excess Capacity

11.5 Concepts of Oligopoly and Duopoly

11.6 Let us Sum Up

11.7 Further Readings

11.8 Answers to Check Your Progress

11.9 Model Questions

11.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- define monopoly, and monopolistic competition
- discuss various issues relating to monopoly.
- explain price discrimination and its various degrees, possibility and profitability aspects.
- discuss monopolistic competition and briefly enumerate the meaning and basic features of oligopoly and duopoly.

11.2 INTRODUCTION

In the earlier unit, we have already come across the terms 'market and 'market equilibrium'. We have known that based on certain characteristics, market structures can be broadly classified into two categories: perfect competition and imperfect competition. Again, an imperfectly competitive market structure can be further divided as: monopoly, monopolistic competition and oligopoly. These markets structures can again be segmented into different types. In this unit, we will discuss basically two major imperfect market structures: monopoly and monopolistic competitions. We shall try to define these market structures, discuss relevant issues therein and explain graphically how firms / industry attain equilibrium under these.

11.3 MONOPOLY: BASIC CONCEPTS

In the earlier unit, we had discussed about perfect competition. We have seen that perfect competition is the market structure where there exists a large number of buyers and sellers and in which the influencing power of any seller is nil. The monopoly is just the opposite of perfect competition. The word 'monopoly' has come from the Greek words *monos polein,* which means 'alone to sell'. This single seller is called a *monopolist*. The term is also sometimes used for a single group of sellers that acts as a price setter, although often a group is called *a cartel.* Thus, in simple terms, monopoly can be described as the market structure where there is only one supplier of the product, which has no close substitute in the market.



Cartel: A group of firms acting together to control output and price

As there is only one seller of the product, therefore, the concept of firm and industry is the same in monopoly. In reality, the existence of a monopoly firm is as much rare as perfect competition. However, in some of our remote villages, where there is only one doctor, he may be seen as a monopoly supplier of medical services in the locality.



ACTIVITY 1

Do you notice in your locality that in some of the services/ products, there often only one service provider/supplier? Just think of these services : cooking gas (LPG cylinders), electricity, landline telephone services, fire services, water supply, postal services etc. You may find that until recently, in some of these services there was only one supplier. Some of these still have only one supplier even today. Make a list of such services/products in your locality. These could be interesting examples of monopoly in your area.



Brand name: Its a name or identity of a product that sets it apart from its competitiors.



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There are some reasons behind the emergence of a monopoly.Certain factors may facilitate the monopoly industry by preventing new entrants into the industry. According to Prof. E.A.G. Robinson, there are four such sets of factors: a) legal prohibition (e.g., patents and licensing), b) control of a necessary factor of production, c) advantage of large scale of production and d) existence of goodwill (establishment of brand names in the market).

Patent: A patent is a set of exclusive rights granted by a state to an inventor or his assignee for a fixed period of time in exchange for a disclosure of an invention. The exclusive right granted to a patentee in most countries is the right to prevent or exclude others from making, using, selling, offering to sell or importing the invention.

There exists a category of monopolies known as social monopolies or public utilities. These monopolies are socially favoured to remain as monopolies, as large scale and single-handed operations of such monopolies benefit the socieity. Examples like: defence services (civil and military), public road construction, water supply services are important in this category.

11.3.1 Demand and Marginal Revenue Curves Under Monopoly

The discussion about demand (or, average revenue) and the marginal revenue curves becomes necessary for the equilibrium analysis. Unlike perfect competition, the monopoly firm can control the price or output in the market; it can control either price or output,but not both. The monopolist can sell larger amount of the product in the market by charging a lower price and vice versa. This characteristic of the monopolist ensures a downward sloping demand curve - exhibiting the general law of demand (the law of demand has already been discussed in earlier unit **.** The shape of the demand curve and the marginal revenue curve of the monopolist firm has been shown with the help of the following figure 11.1

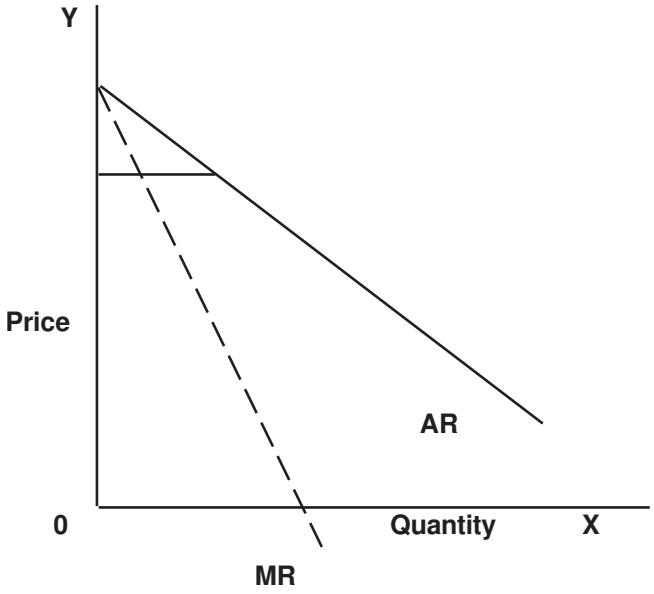


Figure 11.1: AR and MR Curve of a Monopoly Firm

In the above figure 11.1, it can be seen that the monopolist demand curve AR slopes downward. The MR curve also slopes downward and lies below the AR curve. The MR curve slopes at a much steeper rate than the AR curve. We have already discussed in earlier unit that under imperfect competition, the slope of the MR curve is twice as much steeper as the slope of the demand curve.



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Shape of Cost Curves: The shape of cost curvesunder monopoly are not much different from those under perfect competition. The only difference is that a firm under perfect competition can purchase any quantity of factors of production at constant price, but the monopolist may have to pay higher prices for more such factors of production. This induces the MC curve of the monopolist to rise at a higher rate than that of the perfectly competitive firm. The monopolist will not have any fixed cost curve in the long run,like perfectly competititve firm, but will have both the variable cost curves and the fixed cost curves in the short run.

11.3.2 Short Run Equilibrium of the Monopoly Firm

The price-output equilibrium can be easily explained with the help of the following figure 11.2. In figure 11.2 , AR is average revenue or demand curve,

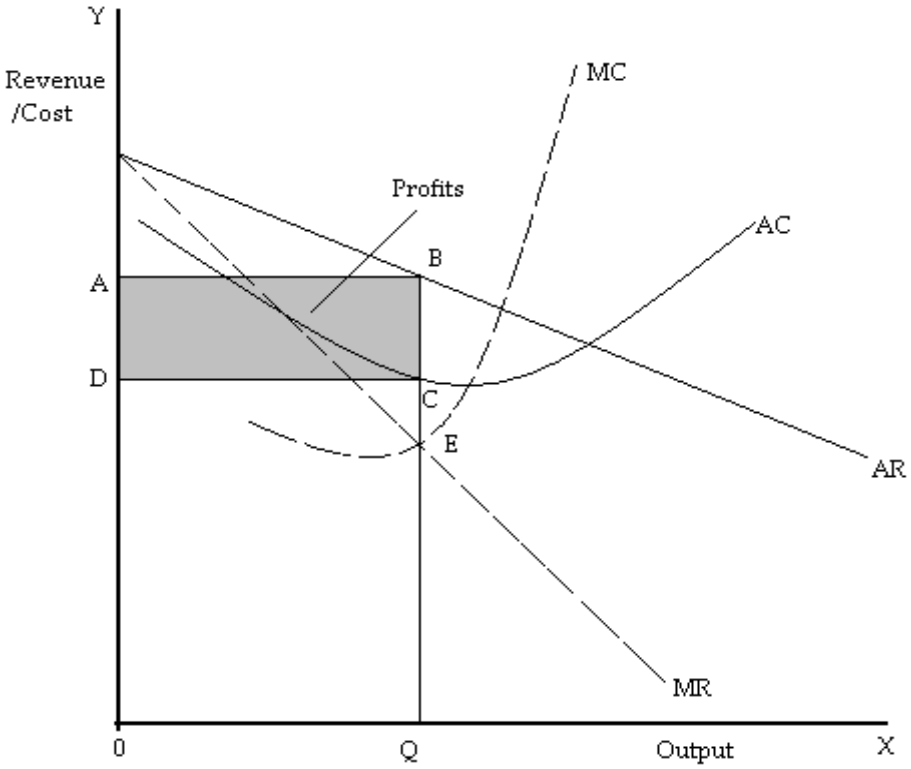


Figure 11.2: Short-run Equilibrium of a Monopoly Firm

MR is the marginal revenue curve, MC is the marginal cost and AC is the average cost curve. In the figure, it has been seen that upto 0Q output, marginal revenue is greater than marginal cost. But beyond 0Q output level, marginal revenue is less than marginal cost, which means losses to the monopoly firm. Therefore, the monopoly will be in equilibrium at 0Q output level, where marginal revenue equals marginal cost.

Therefore, in short-run quilibrium: MR = MC

Again, from the figure it can be seen that corresponding to the equilibrium output 0Q, the equilibrium price is QB (=0A). Now, from this equilibrium price-output levels, we can find out the total amount of profit the monopoly firm earns. In the above figure, we see that the monopoly firm earns QB revenue price (hence average revenue) per unit of output. But QC is the average cost (as point C touches the AC curve; and as cost has been calculated on the vertical axis along with price) per unit of output. Thus the firm earns a profit of BC (QB-QC) per unit of output. Therefore, the total profit of the monopoly firm is:

= BC x 0Q = BC x CD = ABCD

(the shaded rectangle area in the figure).

This is super normal profit as it is over and above normal profit



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Does the monopoly firm earn profit all the time?

In some rare cases, a monopoly firm may also incur losses. This may happen when the product is newly introduced in the market, and hence consumer does not know about it. Thus, in such initial phases, it is possible that the cost of product is more than revenue earned by it (as demand is low in the market).

11.3.3 Long-run Equilibrium of the Monopoly Firm

We have discussed in the earlier unit how a firm under perfect competition attains long-run adjustment through the entry of new firms into or exit of existing firms from the industry. As compared to the market size, if the short-run average cost of the monpoly firm is not optimal, then to increase profit in the long-run it can opt for adjustment in its scale of operation. Thus, the monopoly firm will choose that operation / production size which will be optimum for its market demand level.



LET US KNOW

How does the monopolist make the adjustment in its long run operation scale? A monopoly firm can make this adjustment in three ways; by setting up a) a plant of the less than optimal scale, b) a plant of optimal scale, or c) a plant of greater than optimal scale.

We have seen in the short-run equilibrium analysis that the monopoly firm attains equilibrium at that output level where MR = MC. Similarly, in the long -run after the adjustment in its operation scale, the monopoly firm will attain equilibrium where long-run marginal cost equals the marginal revenue levels, i.e., where long-run MC curve cuts the MR curve (it is to be noted that only the cost condition of the monopoly firm can vary in the long run, while the revenue condition remains the same. Hence, the revenue curves of the monopoly will remian the same even in the long run). This has been shown graphically with the help of the following figure 11.3.

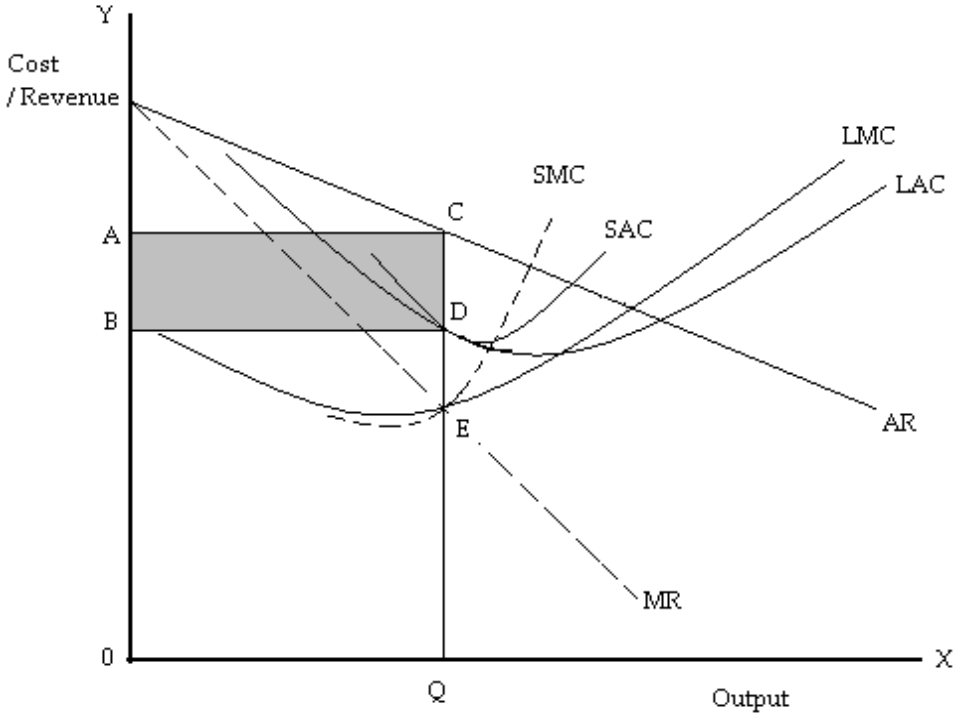


Figure 11.3: Long-run Equilibrium of a Monopoly Firm

From the above figure it can be seen that the long-run marginal cost curve (LMC) and the marginal revenue curve (MR) intersect at point E. So, point E is the long-run equilibrium point. Corresponding to this equilibrium level, equilibrium output is 0Q, and the equilibrium price is 0A.



ACTIVITY 2

What profit does the monpoly firm earn in the long-run? We have already seen in section 6.3.2 the total profit the monopoly firm earns while attaining short-run equilibrium. Now with the help of the above figure 6.3 and the previous discussion about the short-run equilibrium of the monpoly firm, find out the total profit the monopoly firm will earn in the long-run.

11.3.4 Price Discrimination : Degree and Possibility

An important feature of monopoly form of market is that the monopolist can charge different prices for the same good at the same time for reasons not associated with differences with cost. This is known as price discrimination. Let us consider the following example. A tea producer has a manufacturing plant in Dibrugarh. He sells tea at a per unit cost of Rs. 12 in Dibrugarh. He also sells it at the Guwahati market at a per unit price of Rs 15. He charges Rs 3 more in the Guwahati market to cover his transportation cost of Rs 3 per unit of the product. As the difference in the prices between these two markets is equal to the difference in the transport cost, hence we can not call this as price discrimination. But if for example, the producer sells tea at a unit price of more than Rs 15 (say Rs 17) in the Guwahati market then we can say that the producer is practising price discrimination.

■ **Degree of Price Discrimination**

British economist ,A C Pigou in his book *The Economics of Welfare* (1920) has identified three degrees of discriminating power of a monopoly firm leading to three types of price discrimination.

➢ **First degree price discrimination**: First degree price discrimination occurs when the monopoly firm charges a different price for each of the individual unit of the product, even to the same consumer. The maximum price that a consumer is willing to pay for a unit of output is called the *reservation price.* The perfectly discriminating monopolist charges the reservation price for each unit of the output. The first degree discriminition is also called *perfect price discrimination.* This type of price discrimination is very difficult to implement.

➢ **Second degree price discrimination:** This degree of price discrimination occurs when the monopolist is able to charge several different prices for different ranges or groups of output. For example,

we need to pay monthly electricity bills based on different prices charged for different slabs of energy consumption. Say we need to pay Rs. 2 for first 100 units of electricity consumption in a month. Again, a higher price, say, Rs.2.50 can be charged for subsequent units (starting from 101st unit to a certain limit). This type of price discrimination is also seen in case of telephone bills for different units of calls. Magazines also offer different price range for different period of subscription order.

➢ **Third degree price discrimination:** The third degree price discrimination occurs when the monopolist partitions the market into two or more groups of customers and charges different prices to the different groups (the price is uniform for member within a group). For example, an office stationery supplier can charge different prices from different offices.



ACTIVITY 3

You have thus come to know about the concept of price discrimation and its different types. Now, from your own observation, try to give some examples of price discrimination. Also, try to justify as to which type (degree) of price discrimination your examples will fit?

■ **Possibility for Price Discrimination**

Operation of price discrimination requires the fulfillment of the following conditions:

- The seller of the product must have monopoly power.
- The market must be divided into sub-markets with different price elasticities

➢ The buyer of a product can not resell the product to another buyer, or the sub-markets are separate.



CHECK YOUR PROGRESS

Q.1 : Tick whether the following are true (T) or false (F).

(i) Price discrimination is of four degrees. (T / F)

(ii) Differences in prices of a product in two separate markets due to difference in transportation cost is called price discrimination.(T / F)

Q.2 : Fill in the blank:

(i) The word 'monopoly' has come from the Greek words *monos polein,* which means _____.

(ii) *The Economics of Welfare* was written by _____.

(iii) Another name of first degree of price discrimination is _____.

11.4 MONOPOLISTIC COMPETITION : DEFINITION AND ASSUMPTIONS

Monopolistic competition is the mid-way between the two extreme market forms we have already discussed, i.e., perfect competition and monopoly. The term monopolistic competition was first used by E. H. Chamberlin in his book *"TheTheory of Monopolistic Competition".* Monopolistic competition refers to a market structure in which there are many firms selling closely related, similar but not identical products. This market structure is much more realistic than the other two market stuctures we have discussed already. The assumptions of this market form are:

➢ **Large number of sellers and buyers**:This is the first assumption of monopolistic competition. Presence of large number fo firms/sellers implies that each seller can satisfy only a small share of the market demand. And the sellers face stiff competition in the market.

- **Differentiated products that are close substitutes**: The producers under monopolistic competition produce differentiated products. But the products offered by individual producer is a close substitute of another.
- **Free entry and exit from the market**: Free entry and exit from the industry is also another important feature of monopolistic competition. This feature though sounds similar with perfect competition, yet is technically different. Because under perfect competition, a firm entering new into the industry has to produce indentical products already existing in the industry. But in case of monopolistic competition, new firms may introduce new products in the market.Such new products may have some difficulty in competing with the established brands.
- **Selling Cost**: Every firm under monopolistic competition may incur individual selling costs (cost on advertisement, etc) to promote its product.
- **Imperfect knowledge**: Imperfect knowledge on the part of the consumers about the products of different sellers is also an important feature. This is important because even when two products of two different sellers may be identical in terms of quality, but the monopolistic firms try to show variabillity in them to attract the consumers towards the product. This becomes possible when the consumer does not have perfect knowledge about the products of different sellers.

11.4.1 Equilibrium of a Firm: Short Run

As in monopoly, firms under monopolistic competition face a downward sloping demand curve. But this does not mean that monopolistically competitive firms are likely to earn large profits. Monopolistic competition is also similar to perfect competition: as there is free entry, the potential to earn profits will attract new firms with competing brands, driving economic profits down to zero. However the condition of short-run equilibrium of a monopolistic competitive firm is similar to that of a monopoly firm, i.e.

Marginal Revenue = Marginal Cost

This has been explained with the help of the following figure 11.4.

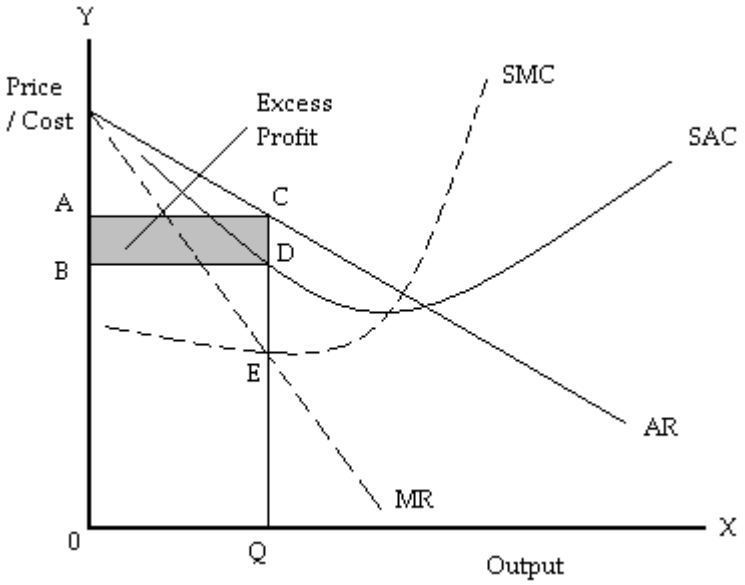


Figure 11.4: Short-run Equilibrium of a Monopolistic Firm

In figure 11.4, AR is the average revenue and MR is the marginal revenue curve. SAC and SMC are short-run average cost and short-run marginal cost curves respectively. The firm attains equilibrium at point E, where SMC curve intersects the MR curve. Corresponding to this equilibrium point E, 0Q is the equilibrium output and QC (or 0A) is the equilibrium price. It can be seen from the figure that the cost per unit of output is QD, while the revenue earned per unit of output is QC. Thus the firm earns CD amount of profit per unit of output. This amounts to a total profit of ABCD (DC X 0Q or BD). Such short-run profit earned by individual firms under monopolistiic firms is termed as excess profits or supernormal profit. However it is also possible that a firm under monopolistic competition can earn either a) normal profit or b) incur losses while attaining short-run equilibrium. These have been shown with the help of figures 11.5 and 11.6.

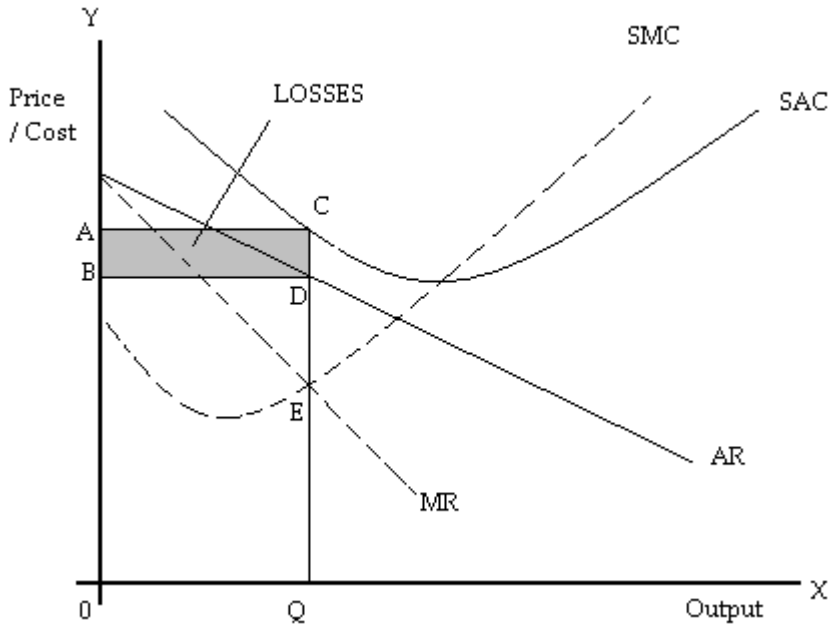


Figure 11.5: Short-run Equilibrium (incurring Losses)

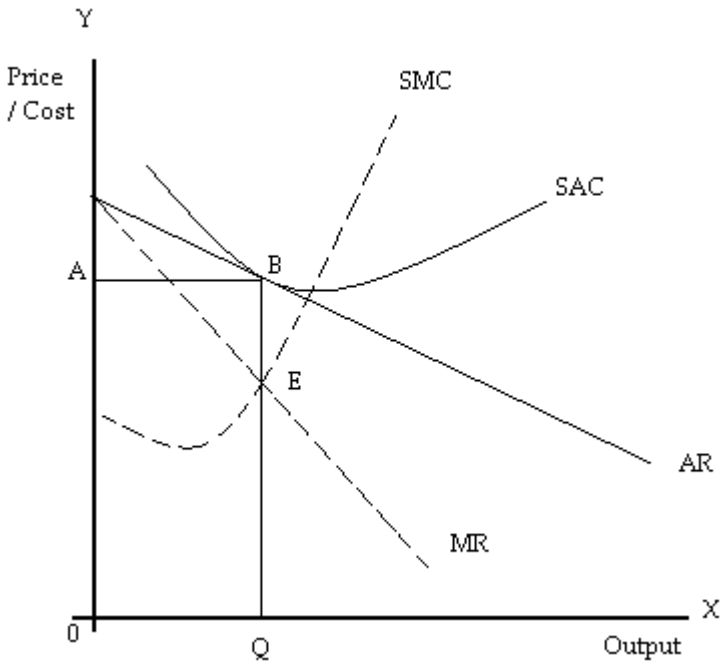


Figure 11.6: Short-run Equilibrium (earning normal profit)



ACTIVITY 4

From figure 10.5 you can see that at the monopolistic firm attains equilibrium at point E. Corresponding to this equilibrium point E, the equilibrium quantity is 0Q while the equilibrium price is 0A. You will also notice that at this equilibrium level, the firm incurs total losses of ABCD as price earned per unit (0B) is less than the cost incurred per unit of production (QC). You are to describe this equilibrim (incurring losses) process of the monopolistic firm. *(You can take help of the discussion of firm's equilibrium with excess profit (explained with the help of figure 11.4)) for the purpose.*



ACTIVITY 5

From figure 11.6 you can see that the monopolistic firm attains equilibrium at point E. Corresponding to this equilibrium point E, the equilibrium quantity is 0Q while the equilibrium price is 0A. You will also notice that at this equilibrium level, the firms earns normal profit as price earned per unit (0A) is equal to cost incurred per unit of production (QB). You are to describe this equilibrium (earning normal profit) process of the monopolistic firm. *(You can take help of the discussion of firm's equilibrium with excess profit (explained with the help of figure 11.4)) for the purpose.*

11.4.2 Equilibrium of a Firm: Long Run

In the above discussion we have seen how an individual firm may earn profit in the short-run. Such earning of profits encrourages other firms to enter into the industry. As new firms enter the industry and as they introduce competing brands, existing firms will lose market share and sales; its demand curve will shift down. Thus, entry of new firms will ultimately lead to disappering of any super-normal profit. Therefore, firms in the long-run will be earning only normal profit. This has been shown graphically with the help of the following figure 11.7.

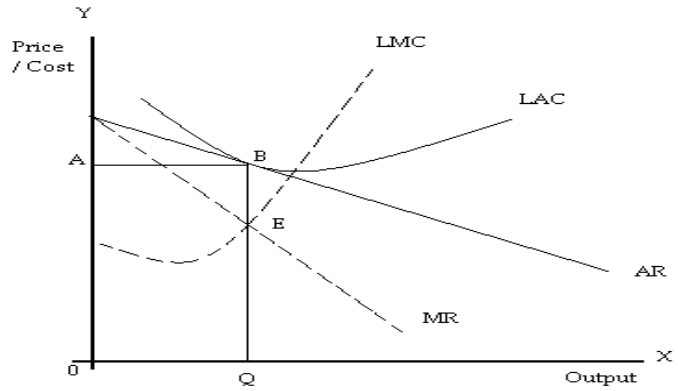


Figure 11.7: Long-run Equilibrium of a Firm

From the above figure it is seen that the firm attains equilibrium at poing E where marginal revenue equals marginal cost. Thus, 0Q is the equilibrium level of output and 0A is the equilibrium level of price. This is, in fact, is also long-run equilibrium because at the equilibrium price (0A), the long-run average cost curve (LAC) is tangent to the the average revenue (AR), which means that the firm earns only normal profit.

Thus, from the above discussion we have seen that a firm under monopolistic market structure will attain equilibrium:

In the short-run when: Marginal Revenue = Marginal cost

In the long-run when : Marginal Revenue = Marginal cost; and

Long-run Average Cost = Average Revenue



CHECK YOUR PROGRESS

Q.3: Tick whether the following are true (T) or false (F).

(i) The firm under monopolistic competition faces a downward sloping demand curve.(T / F)

(ii) A firm under monopolistic competition can earn super normal profits even in the long run.(T / F)

Q.4: Fill in the Blanks:

(i) Monopolistic competition is similar to perfect competition as there are .....and.....

Q.5: Mention the conditions of long-run equilibrium of a monopolistic firm.

11.4.3 Group Equilibrium

So far we have discussed how an indiviudal firm under monopolistic competition attains equilibrium in the short-run as well as in the long-run. Let us now discuss 'group equilibrium'.



LET US KNOW

There is a difference between the concepts 'group' and 'industry'. Group refers to a number of firms producing products which are close substitutes to each other. Industry,on the other hand,refers to the firms which produce identical products. Thus, in the case of perfect competition, we use the term 'industry', while in this unit (in case of monopolistic competition), we have used the term 'group'.

Product differentiation necessitates a redefinition of industry.This is because heterogeneous products cannot be summed to form

market demand and supply scedules as in case of homogeneous products.In view of this ,E.Chamberlin uses the concept of 'product group' in lien of industry while analysing equilibrium in a monopolistic market.Such 'product group' includes products which are close technological and economic substitutes .But still, product differentiation allows each firm to charge a different price.There can be no unique equilibrium price but a equilibrium cluster of prices which will reflect the preferences of the consumers for the product of the differnt firms in the group.

However, in this analysis of group equilibrium, Chamberlin shows the determination of a unique equilibrium price.This has been made possible by what he called two 'heroic assumptions'.These are:

i) all firms in the group have identical cost conditions giving rise to identical cost curves;
ii) consumers preferences are evenly distributed among product so that all firms have identical demand curves.

These two assumptions also enabled Chamberlin to analyse the equilibrium of the firm and the group in the same diagram.

Chamberlin develops three distinct models of equilibrium.

First Model: In the first model, it is shown that although firms can earn super normal profit in the short run, in the long run the group equilibrium will occur with new firms entering the market whereby all firms will enjoy only normal profits.

Second Model: In the second model , it is shown how in the long run the group will atain equilibrium with price adjustment, instead of new entry. At the equilibrium level of output all the firms will earn just the normal profit. Here, Chamberlin introduces a new demand curve which is called the 'actual sales curve' or 'share of the market' along with the typical downward sloping individual perceived demand curve.The 'actual sales curve' shows the actual sales of the firm at each price after accounting for the adjustment of price of other firms in the group.

Third Model: The third model is a combination of the above two .Here the group attains equilibrium in the long run by both price adjustment and entry and exit of firms. At the equilibrium level of output , as usual, all firms earn just the normal profit.



LET US KNOW

Chamberlin used a different approach to decsribe group equilibrium. For the analysis he adopted two main assumptions:

'Uniformity assumption': He assumes that the demand and cost curves of all the products in the group are uniform. However, this does not mean that the products of the firms will not differentiate.

'Symmetry assumption': This assumption means that the number of firms in the group are so large that the individual decision of a firm regarding price and output is unlikely to have any effect on its rivals. The name 'symmetry' to this assumption was given by Stigler.

11.4.4 Concept of Excess Capacity

From our long-run equilibrium analysis, it is clear that a firm under monopolistic competition attains equilibrium at the point when the two conditions are satisfied, viz.:

Long-run Marginal Revenue = Long-run Marginal cost; and

Long-run Average Cost = Long-run Average Revenue

Now let us reconsider the following figure 11.8 (a) which represents the long-run equilibrim of a firm under monopolistic competition.

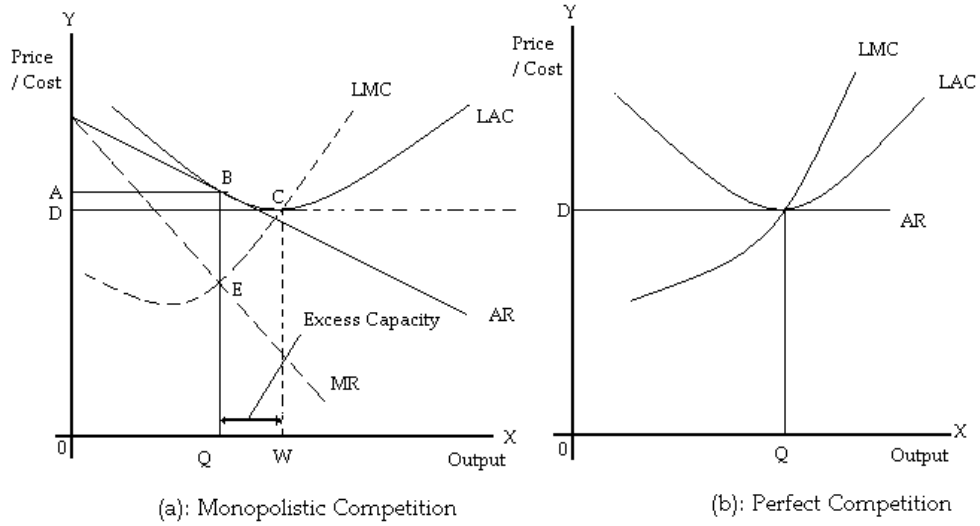


Figure 11.8: Excess Capacity

From the above figure 11.8 (a) we can see that a firm under monopolistic competition attains long-run equilibrium at point E. Again, it can be seen that corresponding to this point, the long-run average cost curve (LAC) is tangent to the average revenue curve (AR) at point B. But at point B, the firm's average cost is not minimum. This means the firm is producing at a point where optimum cost (the lowest possible level of average cost) has not arrived. Hence it can not be said as optimal cost level from society's point of view. Again we can see from the figure that the firm's lowest possible average cost is arrived at point C of the LAC curve. Corresponding to this lowest average cost, the firm's output is 0W. But the firm's equilibrium is 0Q, which is less than the optimal output level by QW. Hence QW represents excess capacity of output which exists under monopolistic competition. Why does it happen? This is because as the demand curve of the firm is downward sloping, it is not possible that the firm's long-run average cost curve be tangent at its optimum point (c) This becomes possible only in case of perfect competition, where the firm faces a horizontal demand curve. This has been shown with the help of panel (b) of the same figure. But as the demand curve of the monopolistic firm becomes flatter in the long-run, the quantum of the excess capacity will get reduced.



CHECK YOUR PROGRESS

Q.6. What is the difference betwee the concepts 'group' and 'industry'?

Q.7 The demand curve of the monopolistic firm does not touch the long-run average cost curve at its lowest point at the point of equiribrium. Why?

11.5 CONCEPTS OF OLIGOPOLY AND DUOPOLY

In the previous units and in the earlier sections of this unit, we have so far discussed the market structures like perfect competition, monopoly and the imperfect competition. Thus, we have come to know that perfect competition is actually an ideal market structure which rarely exists in practice. The opposite of this market structure is the monopoly, where there exists only one seller in the market. While existence of monopoly can also be a reality though rare, monopolistic competition reflects the most practical market situation we find in reality.

The above three are undoubtedly the most prominent market structures dealt with in Economics. However, there still exists a few market structures. Oligopoly and duopoly are among them. Let us first deal with oligopoly. Oligopoly, is a market form where the market or the industry is controlled or dominated by small group of sellers/companies also known as oligopolists. Thus, it is very much clear that in this form of market, there

exists more than one seller but at the same time the number of sellers is not as large as is found in a perfectly competitive market. It is much like monopoly where the small group is made up of major sellers/companies which collectively exert control over the supply of a particular product (good or service) and its price in the market. Since the number of competitors in an oligopoly is few, each of the oligopolist is most likely to be aware of the actions of the others and hence the decision of one company influences and is influenced by the decision of the others. Hence, strategic planning by the oligopolists' needs to consider the responses of other market players as well.

Underlying assumptions: Oligopoly rests on the following assumptions:

- **Existence of a few firms:** There exists a few firms in the market.
- **Control over supply and price:** Each firm produces a large share of the total volume of the product; so it can affect the price by its own action.
- **Entry of New Firms:** No doubt it is very difficult for a new firm to enter into the market but it is not completely blocked. Financially sound firm can only enter into the market.
- **Competition in quality:** The firms compete with each other in the quality of the product also. The firms spend a sufficient amount on the research.
- **Interdependence:** In Oligopoly there is an interdependence on each other. Because the policies of each firm affect the price and output of other firm.
- **Advertising:** A heavy amount is spent on the advertisement by the oligopoly to attract the consumers.



LET US KNOW

A very good example of the oligopoly form of competition is the auto industry. Let us consider the case of small passenger cars. The players in the market in this segment include: Maruti Suzuki, Tata, Hyundai, Honda, Fiat, Hindustan

Motors, Toyota, Chevrolet, Ford, Volkswagen etc. Now, you can easily guess that huge investment worth thousands of crores of rupees is needed to make into this industry. As such, there exist high entry barrier in this form of market. Again, even when the pricing decisions of the products of these companies are taken by the individual industry concerned, yet the influence of other brands of products of other manufacturers of the industry can not be ruled out.

Another example of the oligopoly form of market is the 'cartel'. The cartel is a type of oligopoly in which the participating firms may employ restrictive tactics such as collusion and market sharing to escalate prices and restrict production just as in a monopoly. The OPEC (Organization of the Petroleum Exporting Countries) which has a prominent effect on the international oil prices is an example of cartel.

Collusive Oligopoly: One of the important characteristic of oligopoly is collusion, where rival firms enter into an agreement in mutual interest on various accounts such as price, market share etc. That is in order to avoid uncertainty caused by interdependence and to avoid price wars cut throat competition, firms under oligopoly enter into an agreement for a uniform price output policy to be followed by them. This agreement may be either formal (open) or tacit (secret). When a number of producers (or sellers) enter into a formal agreement, it is called explicit (open) collusion; and when collusion is done secretly, it is known as tacit collusion. When firms enter into such collusive agreemnets formally or secretly, collusive oligopoly is said to prevail.

Collusive oligopoly are of two types:

(a) Cartels and,

(b) Price Leadership

The most commonly found form of explicit collusion is known as cartels. The aim of such collusion is to reduce competition and increase profits of individual firms; i.e. firms jointly fix a price and output policy through agreements. The

aim of such collusion is to reduce competition and increase profits of individual members. However, now a days governments do not encourage cartels because it creates monopoly like situations.

Under price leadership one firm sets the price and others follow it. The one who sets the price is a price leader and the others who follow it are followers. The follower firm adopt the price of the leader; even though at times they need to depart from their profit maximising position.

Duopoly: Duopoly is said to occur when there are only two firms which control the total supply of the market. Each firm produces the large share of the total out put and it can affect the price of the market. If both firm are producing the similar commodity it will be called pure duopoly. On the other hand, if there is some difference in their products then it will be called differential duopoly. Duopoly is also called as the simplest form of oligopoly.



LET US KNOW

The most popular example of duopoly is between Visa and Mastercard who exercise a major control over the electronic payment processing market in the world. If you have a credit/debit card, you must have seen any of the logos as shown alongside.

Pepsi and Coca-cola are the two major shareholders in the soft drinks market. In the market, there are so many brands of soft drinks, e.g., Limca, Mirinda, Sprite, Fanta, Lehar etc. You can find that the brands are either from CocoCola or Pepsi. Of course, there are other brands in the market which are not from these companies, but their market shares in terms of the global soft drink market are not much significant.

Similarly, in the commercial jet aircraft market, Airbus and Boeing are the main leaders. duopolies in the commercial jet aircraft market.

The duopoly market structure may be studied on two basic grounds: a) by ignoring any mutual dependence between the two sellers and b) recognising mutual dependence between the two sellers. The Cournot-Edgeworth solutions explains the duopoly market situations by ignoring mutural dependence between the two sellers. On the other hand, Chamberlin explains the model of the duopoly market when we assume that there is mutual dependence between the two sellers.



CHECK YOUR PROGRESS

Q 8: State whether the following statements are True or False.

(a) Duopoly is a variety of oligopoly where there are more than two firms in the industry. (T/F)

(b) In oligopoly, there exists high degree of entry barriers. (T/F)

(d) 'Product group' is found in oligopoly. (T/F)

Q 9: What type of entry barriers does there exist in the oligopoly market?

Q 10: Define the term oligopoly.



11.6 LET US SUM UP

Thus, in this unit we have discussed -

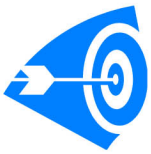
- What a monopoly market structure is. We have discussed that monopoly can be described as the market structure where there is only one supplier of the product, which has no close substitute in the market.

- The equilibriuim of a monopoly both in the short-run and in the long-run.
- The concept of price discrimination and its various types.
- About monopolistic competition.
- The equilibriuim of a monopolistic firm and its group both in the short-run and in the long-run.
- The concept of excess capacity under this market structure.
- Some of the managerial economics pricing techniques: pioneer pricing and cost-plus pricing.
- Oligopoly, is a market form where the market or the industry is controlled or dominated by small group of sellers/companies also known as oligopolists.
- Duopoly is said to occur when there are only two firms which control the total supply of the market.
- If both firm are producing the similar commodity it will be called pure duopoly.



11.7 FURTHER READINGS

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2) Chopra, P.N.: *Micro Economics*, Kalyani Publishers, 2nd Ed, 2008.
3) Ahuja, H L: *Modern Economics,* S. Chand, 12th Ed., 2006.
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5) Mankar, V.G.: Business Economics, MacMillan, 1999.



11.8 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress

Ans to Q No 1: (i) False (ii) False

Ans to Q No 2: (i) Alone to sell (ii) A C Pigou (iii) Perfect price discrimination

Ans to Q No 3: (i) True (ii) False

Ans to Q No 4: Large number of sellers in the industry and no entry/exit barrier.

Ans to Q No 5 : A firm under monopolistic firm attains long-run equilibrium when the following two conditions are fulfilled:

Marginal Revenue = Marginal cost; and

Long-run Average Cost = Average Revenue

Ans to Q No 6: The difference between 'group' and 'industry' is that 'group' refers to a number of firms producing products which are close substitutes to each other. Industry, on the other hand, refers to the firms which produce identical products.

Ans to Q No 7: As the demand curve of the firm is downward sloping and hence under monpolistic competition, it is not possible that the firm's long-run average cost curve be tangent to its average curve. This becomes possible only in case of perfect competition, where the firm faces a horizontal demand curve

Ans to Q No 8: (a) False (b) True (d) False

Ans to Q No 9: Theoretically, entry of new firms in the oligopolistic form of market is not completely blocked. However, entry barrier to the industry is considerably very high, because only financially sound firm can only enter into the market.

Ans to Q No 10: Oligopoly, is a market form where the market or the industry is controlled or dominated by small group of sellers/companies also known as oligopolists.



11.9 MODEL QUESTIONS

1. Discuss the concept of price discrimination.
2. What are the different degrees of price discrimination?
3. What is excess capacity? Why does it arise?
4. Following data are given for a certain product:

Variable cost per unit: Rs. 11; Fixed Cost: Rs. 275,000; Expected sales volume: 1,15,000 units. The manufacturer aims a profit of 12% per unit. Calculate the Mark-up price of the product.

5. Write a short note on oligopoly form of market.
6. Describe how monopoly firm attains equilibrium in the long-run.
7. How does a firm under monopolistic competition attain equilibrium in the short run and in the long run?
8. How does a group under monopolistic competion attain equilibrium in the long run?

*** ***** ***

UNIT 12: MACRO ECONOMICS AND SELECTED MACRO AGGREGATES

UNIT STRUCTURE

12.1 Learning Objectives

12.2 Introduction

12.3 Basic Concepts of National Income

12.4 Gross National Product(GNP), Net National Product(NNP), Per Capita Income(PCI), Disposable Income

12.5 Importance of the study of National Income

12.6 Methods of National Income Measurement

12.7 Difficulties in Measurement of National Income

12.8 Circular flow of National Income

12.9 GDP deflator

12.10 Index Numbers: Concept and uses

12.11 Construction of Simple Index Numbers

12.12 Construction of Weighted Index Numbers

- 12.12.1 Laspeyres' Index Number
- 12.12.2 Paasche's Index Number
- 12.12.3 Fisher's Index Number

12.13 Base Shifting, Splicing and Deflating

12.14 Let Us Sum Up

12.15 Further Readings

12.16 Answers to Check Your Progress

12.17 Model Questions

12.1 LEARNING OBJECTIVES

After going through this unit you will be able to

- describe the basic concepts of national income
- give the concepts of gross national product, net national product, per capita income, disposable income
- explain the importance of national income.

- explain the difficulties in the measurement of National Income
- describe the uses of index numbers

12.2 INTRODUCTION

Macroeconomics is that branch of economics which deals with the performance, structure, behaviour and decision making of an economy as a whole. It studies aggregate indicators such as GDP, unemployment, national income, inflation, savings, inveastment, price indices etc. While macro economics is a broad field of study, we discuss here two aggregates- National income and Index numbers.

In this unit we are going to discuss the basic concepts of national income. Along with the basic concepts we will further discuss the Gross National Product (GNP), Net National Product (NNP), Per Capita Income(PCI), Disposable Income etc. We will also make a discussion about the methods of measurement of natioonal income and the importance of the study of national income.This unit deliberates on index numbers. Index numbers are the indicators of the various trends in an economy. Price index numbers indicate the position of prices whether they are rising or falling and at what rate. Similarly, index numbers regarding agricultural production indicates the trend of change whether it is rising or falling at what rate over a period of time. An index number is an economic data figure reflecting price or quantity compared with a standard or base value. The base usually equals 100 and the index number is usually expressed as 100 times the ratio to the base value.

After going through this unit, you will be able to discuss the different concepts relating to index numbers, construct simple and wighted, discuss the concepts of base shifting, splicing and deflating of index numbers.

12.3 BASIC CONCEPTS OF NATIONAL INCOME

National income can be viewed from different angles and, depending on the purpose of study, various concepts of national income are used that basically proxy the same entity. In addition, there are various aggregates

that are derived from the broad concept of national income. The different aggregates that are used to indicate the economic status of a nation and other related aggregates are explained in this section in a simple manner.

National Income is one of the basic concepts in macroeconomics. National Income means the total income of the nation, The aggregate economic performance of the whole economy is measured by the national income data.

National Income or Gross Domestic Income refers to the money value of all final goods and services produced by the normal residents of a country while working both within or outside the domestic territory of a country in an accounting year. National Income also includes net factor income from abroad.

Symbolically,

$$Y = PG + PS$$

Where, Y = National Income

P = Price

G = Goods

S = Service

Traditional Definitions of National Income :

Marshall

"The labour and capital of a country acting on its natural resources produce annually a certain net aggregate of commodities, material and immaterial including services of all kinds..... This is the true net annual income or revenue of the country or national dividend."

Pigou

"National income is that part of objective income of the community, including of course income derived from abroad, which can be measured in money."

Fisher

"The national dividend or income consists solely of services as received by ultimate consumers, whether from their material or from their human environments. Thus, a piano, or an over coat made for me this year is not

a part of this year's income, but an additions to the capital. Only the services rendered to me during this year by these things are income."

KEYNESIAN APPROACH TO NATIONAL INCOME

Keynes has suggested three approaches to national income :

(1) Income - Expenditure approach : According to this approach, national income is equal to total expenditure on consumption and investment goods.

(2) Factor - Income approach : According to this approach, national income is measured as the aggregate of incomes received by all the factors of production.

(3) Sales proceeds minus cost approach : According to this approach, national income is defined as the aggregate sales proceeds minus cost.

12.4 GROSS NATIONAL PRODUCT(GNP), NET NATIONAL PRODUCT(NNP), PER CAPITA INCOME(PCI), DISPOSABLE INCOME

Gross National Product (GNP) : When we add the net factor income from abroad to the figure of GDP we get the Gross National Product of the country. The net factor income from abroad refers to the surplus of factor income earned from foreign countries by the residents of the country over the factor income earned by the foreigners within the domestic territory of the country. This surplus may be positive or negative.

Thus, we may write :

GNP = GDP + Net Factor Income from Abroad

Net National Product (NNP) : During the process of production a part of the capital assets get used up. This is called wear and tear of capital or consumption of capital or simply the depreciation of capital. In order to find out the net addition made to the national output we must deduct this depreciation from the GNP. Thus, NNP of a country is its GNP less depreciation.

NNP = GNP- Depreciation

The NNP of a country may be viewed in two alternative ways. It may be seen as a sum of payments made to the factors of production engaged in the production of the national output or as the market value of the national output. The former will give us NNP at factor cost and the latter will give us NNP at market price. In a country where Government plays no role in the market, there cannot be any difference between the two. But with government intervention a discrepancy between the two arises . More specifically, in the NNP at market price, indirect tax gets included in the valuation of the product , while subsidies get left out. Therefore, indirect taxes and subsidies account for the differences between the two. We can obtain NNP at factor cost from NNP at market price by deducting indirect taxes but adding subsidies to it.

NNP at factor cost = NNP at market price – Indirect Taxes + Subsidies

We may note here that the NNP at factor cost is popularly known as the National Income of a country.

The relation among the above concepts of national income can be shown with the help of the following figure 14.1

12.5 IMPORTANCE OF THE STUDY OF NATIONAL INCOME

The study of national income statistics is very important. It helps in analysing the actual performance of the economy and in preparing future policies. The increasing importance of the study of the national income is due to the following reasons :

(i) Index of Economic structure : An important index of the economic structure of the economy is national income estimates. National income estimates tell us how incomes are earned and spent in the country. The knowledge about the relative importance of various sectors of the economy and their contribution to national income are also provided by national income estimates.

(ii) Economic Welfare Indicator : National income figures are an indicator of the economic welfare of the people of a country. With the help of

these figures, we can compare the standard of living of the people of various countries. We can also compare the standard of living of the people of the same country at different times.

(iii) Measures Aggregate Yield : National income statistics measure the aggregate yield of the economic policy for development.

(iv) Tools for Economic Planning : National income estimates are the tools for economic planning. Because for framing an economic plan, a prior knowledge of the trends in national income is required.

(v) Provide Information about Inflationary and Deflationary gaps : National income estimates provide information about inflationary and deflationary gaps in the economy. National income estimates also assist in formulating anti-inflationary and anti-deflationary policies.

(vi) Helpful in the Allocation of burden of international payments : National income estimates help in allocating the burden of international payments among different nations.

(vii) Determination of Subscription and Quotas : National income estimates enable us to determine the subscriptions and quotas of different countries to international organisations like IMF, IBRD, etc.

(viii) Help in the Determination of Grants-in-Aid : National income estimates help the federal government to determine the amount of grants-in-aid to be provided to the state governments.

(ix) Basis of Budgetary Policies : On the basis of national income statistics, government prepare their budgets and make necessary changes in the taxation and borrowing policies.

(x) Importance in Defence and Development : National income estimates help in determining the proper allocation of national product between defence and development of the economy.

(xi) Depreciation Provision : National income estimates guide us to make provision for reasonable depreciation to maintain the capital stock of the country.

(xii) Helpful to the government : National income estimates help the government in making future plans for the expansion of public sectors.

(xiii) Important for less developed or developing countries : National income

estimates throw light on the importance and backwardness of various sectors of the less developed or developing economics and help in formulating appropriate economic polices.

(xiv) Help in Economic Analysis : National income estimates help us in analysing the functioning, growth and anatomy of the economy.

(xv) Basis of Social Accounting : The basis of social accounting or national income accounting is the national income figures.



CHECK YOUR PROGRESS

Q 1: Define national income.

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Q 2: State the Keynesian apprach to national income

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.....

12.6 METHODS OF NATIONAL INCOME MEASUREMENT

The income of a country can be viewed from three different angles. It can be viewed from the side of production, distribution or dispension. This necessitates different methods and data for the calculation of national income. The basic idea about these methods are presented in this section.

There are three approaches to the measurement of National Income. These are:

A) Output Approach

B) Income Approach

C) Expenditure Approach

A) Output Approach : In this approach the aggregate value added in the different sectors of the economy is worked out. Here the national income accounting authority calculate the total value of the output produced in the economy during the accounting period by taking into account the values

added at each stage of production in the various sectors of the economy. Such a method is known as the *Value Added Method*. This method involves the following steps:

i) Identification of the producing enterprises and classification of them into various industrial sectors according to their activities;

ii) Estimation of the net value added by each producing enterprise, industrial sector and then adding up of the net values created by all the sectors for the economy as a whole.

The value added method may be illustrated with the help of a simple example. Let us take Bread as the final product and see how values are added at different stages of production until it reaches the hands of the ultimate consumers. This has been shown in the following table 12.1

Table 12.1: Product : Bread(Value in Rs.Crore)

Item	Buyer	Seller	Value	Value Added
Wheat	Flour Mills	Farmers	100	100
Flour	Bakeries	Flour Mills	150	50
Bread	Wholesalers	Bakeries	175	25
Bread	Retailers	Wholesalers	200	25
Bread	Consumers	Retailers	220	20
	Total Value Added			**220**

B) Income Approach : Also known as the Income Method, in this approach the sum of the incomes derived from different economic activities is estimated. Steps involved in this approach are as follows :

i) Identification and classification of the producing enterprises that employ factor inputs (i.e enterprises in the Primary , Secondary and Tertiary Sectors);

ii) Classification of factor payments (i.e wages, interest, profit etc.);

iii) Estimation of factor payments and aggregation of the same for the economy as a whole.

When we add the factor payments in all the industrial sectors we get the domestic factor income. Then by adding the net factor income from abroad to it we get the National Income of the country. Thus,

National Income = Compensation to the employees + Mixed income of the self employed + All kinds of rent including imputed rent + All interest payments + All profits + Net factor income from abroad.

C) Expenditure Approach : The expenditure approach aggregates the consumption and investment expenditures occurring in the country during the accounting period to obtain the domestic expenditure at current price. It takes into account only the final purchases. The final expenditure on GDP consists of private final consumption expenditure, government final expenditure, gross fixed capital formation, change in stocks/inventories (unsold stock of goods consisting of raw materials, semi finished and finished products during the accounting period) and net exports of goods and services. Therefore,

GDP at market price = Private consumption expenditure + Private Investment expenditure + Government expenditure + Exports – Imports

GNP at market price = *GDP at market price +* Net factor income from abroad

National Income = GNP at market price -Depreciation – Indirect Taxes + Subsidies

From the above we can observe that the three approaches look at the three different phases of the circular flow of national income. These phases are- production, distribution and disposition. Although each approach requires different data and methods, they give rise to identical results as they estimate the same entity. The choice of a particular method depends on the nature of the sector and availability of data.

Important Inclusions and Exclusions : In the calculation of national income we need to be careful to include certain incomes/activities and exclude some others. Some of the important inclusions and exclusions are noted below :

Inclusions *:*

i. Value of production for self consumption;

ii. Own account production of fixed assets by government, enterprise and household;

iii. Imputed rent of owner occupied house;

iv. Purchase of new house by consuming households;

v. Work in progress at the site of production;

vi. Capital repairs like major alterations of the old buildings or adding a new room to the existing building;

Exclusions :

i. Transfer payments;

ii. Windfall gains and losses;

iii. Corporate tax and income tax should not be included separately;

iv. Duties and taxes paid from wealth or past savings;

v. All expenditures on the purchase of old shares and bonds from other people or new shares and bonds from producing enterprises; and

vi. All expenditures on intermediate goods and services.



ACTIVITY 15.1

Illustrate the Value Added method of accounting giving your own example.

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12.7 DIFFICULTIES IN MEASUREMENT OF NATIONAL INCOME

There are many difficulties in measuring national income of a country. Some of these difficulties are discussed below:

Non Monetary Transactions

The first problem in National Income accounting relates to the treatment of non-monetary transactions such as the services of housewives to the members of the families. For example, if a man employs a maid

servant for household work, payment to her will appear as a positive item in the national income. But, if the man were to marry the maid servant, she would be performing the same job as before but without any extra payments. In this case, the national income will decrease as her services performed remains the same as before.

Problem of Double Counting

Only final goods and services should be included in the national income accounting. But, it is very difficult to distinguish between final goods and intermediate goods and services. The difference between final goods and services and intermediate goods and services depends on the use of those goods and services. If by mistake one good or service is calculated in the national income estimates at its intermediate stage and it is calculated again at its final stage it is called as double counting. So there are possibilities of double counting in national income estimates.

The Underground Economy

The underground economy consists of illegal and uncleared transactions where the goods and services are themselves illegal such as drugs, gambling, smuggling, and prostitution. Since, these incomes are not included in the national income, the national income seems to be less than the actual amount as they are not included in the accounting.

Petty Production

There are large numbers of petty producers and it is difficult to include their production in national income because they do not maintain any account.

Public Services

Another problem is whether the public services like general administration, police, army services, should be included in national income or not. It is very difficult to evaluate such services.

Transfer Payments

In economics, a transfer payment (or government transfer or simply transfer) is a redistribution of income in the market system. These payments are considered to be non-exhaustive because they do not directly absorb

resources or create output. In other words, the transfer is made without any exchange of goods or services. Individuals get pension, unemployment allowance and interest on public loans etc. are examples of transfer payments. But these payments create difficulty in the measurement of national income as they are not given for any production or service in the present period. These earnings are a part of individual income and they are also a part of government expenditures.

Capital Gains or Loss

When the market prices of capital assets change and the owners make capital gains or loss, such gains or losses are not included in national income.

Price Changes

National income is the money value of goods and services. Money value depends on market price, which often changes. The problem of changing prices is one of the major problems of national income accounting. Due to price rises the value of national income for particular year appears to increase even when the production is decreasing.

Wages and Salaries paid in Kind

Additional payments made in kind may not be included in national income. But, the facilities given in kind are calculated as the supplements of wages and salaries on the income side.

Illiteracy and Ignorance

Due to illiteracy and ignorance of many sections of people; information regarding household and individual income are not available to a large extent. This is specially visible in case of small scale agriculture and other cottage industry or business. As a result, there arises immense difficulties in the measurement of national income.

Apart from these, there are some other aspects or segments where national income accounting face difficulties. These are:

Second hand transactions;

Environment damages;

Calculation of depreciation;

Inadequate and unreliable statistics; etc.

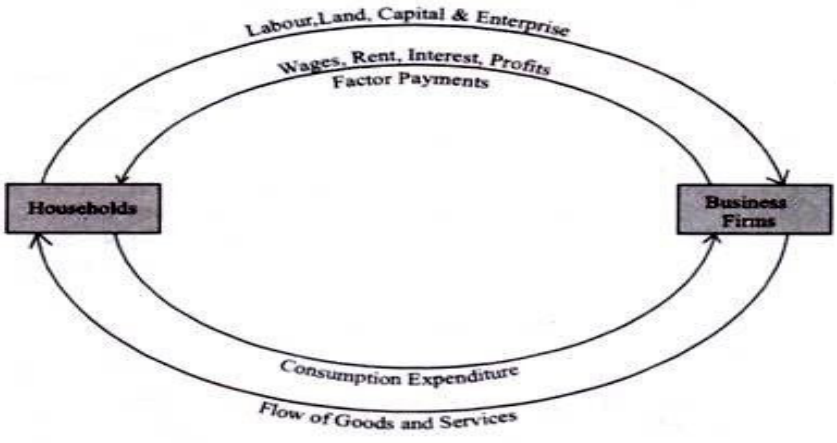
12.8 CIRCULAR FLOW OF NATIONAL INCOME

The circular flow of income or circular flow is a model of the economy in which the major exchanges are represented as flows of money, goods and services, etc. between economic agents. The flows of money and goods exchange in a closed circuit and correspond in value, but run in the opposite direction. The circular flow analysis is the basis of national accounts and hence of macroeconomics.

The modern economy is a monetary economy. In the modern economy, money is used in the process of exchange. Money has facilitated the process of exchange and has removed the difficulties of the barter system. Thus money acts as a medium of exchange. The households supply the economic resources or factors to the productive firms and receive in return the payments in terms of money. It is thus clear that, in the monetary economy, there will be flows of money corresponding to the flows of economic resources and the flows of goods and services. But each money flow is in opposite direction to the real flow.

Circular Income Flow in a Two Sector Economy:

Real flows of resources, goods and services have been shown in Fig. 15.1. In the upper loop of this figure, the resources such as land, capital and entrepreneurial ability flow from households to business firms as indicated by the arrow mark.



In opposite direction to this, money flows from business firms to the households as factor payments such as wages, rent, interest and profits. In the lower part of the figure, money flows from households to firms as consumption expenditure made by the households on the goods and services produced by the firms, while the flow of goods and services is in opposite direction from business firms to households.

Thus we see that money flows from business firms to households as factor payments and then it flows from households to firms. Thus there is, in fact, a circular flow of money or income. This circular flow of money will continue indefinitely week by week and year by year. This is how the economy functions. It may, however, be pointed out that this flow of money income will not always remain the same in volume.

In other words, the flow of money income will not always continue at a constant level. In the year of depression, the circular flow of money income will contract, i.e., will become lesser in volume, and in years of prosperity it will expand, i.e., will become greater in volume.

This is so because the flow of money is a measure of national income and will, therefore, change with changes in the national income. In year of depression, when national income is low, the volume of the flow of money will be small and in years of prosperity when the level of national income is quite high, the flow of money will be large.

In order to make our analysis simple and to explain the central issues involved, we take many assumptions. In the first place, we assume that neither the households save from their incomes, nor the firms save from their profits. We further assume that the government does not play any part in the national economy.

In other words, the government does not receive any money from the people by way of taxes, nor does the government spend any money on the goods and services produced by the firms or on the resources and services supplied by the households. Thirdly, we assume that the economy neither imports goods and services, nor exports anything.

In other words, in our above analysis we have not taken into account the role of foreign trade. In fact we have explained above the flow of money

that occurs in the functioning of a closed economy with no savings and no role of government.

12.9 GDP DEFLATOR

The GDP deflator is a tool used to measure the level of price change over time so that current prices can be accurately compared to historical prices. That is, it eliminates the effect of price change over time.

There are two variables that are needed to calculate the GDP deflator.

Nominal GDP – which is the Gross Domestic Product (GDP) of the current year in current prices

Real GDP –which is the Gross Domestic Product (GDP) after it has been adjusted to reflect the historical changes in prices. The real GDP takes into consideration the inflation and deflation between the present year and the year that is being compared. This means that the effect of price changes are negated so that previous years figures can be compared with current numbers.

$$\text{GDP deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

12.10 INDEX NUMBERS: CONCEPT AND USES

Dear learners, you might have often come across situations like the people making hue and cry over rising prices of goods and commodities. How do we analyse the rising prices in Economics? What tools do we use? To analyse the rising prices, rather change in the price levels, we use the tool 'index numbers' in Economics. Index numbers are one of the most frequently used statistical tools in the field of Economics and other social sciences. Index numbers represents the 'state of happening' in certain variables like the general price level, the wholesale price level, wage rate of labours, retail sales volume, wholesale sales volume, export and imports of a country etc. On such accounts, the index numbers are aptly termed as 'barometers of economic activity'.

We can define an index number as a statistical measure designed to show changes in a variable or a group of related variables with reference to time, geographic location or other entities like income, profession etc. As a statistical measure, an index number is calculated as a ratio of the current value to a base value (also called as reference value) and is expressed in percentage. It should be kept in mind that the index number is more commonly called as an index.

Thus, an index number is a statistical device (measure) with a purpose of showing average changes in one or more related variables (like price or quantity) between two periods of time (say, between 1991 and 1996) or two places like cities (say, Delhi and Mumbai) or countries (say, India and Japan). For example, we may be interested in knowing which city of India out of Delhi, Mumbai, Kolkata and Chennai is the costliest or the cheapest in terms of price level. A tourist may be interested in knowing about the cost of living at different tourist places. Consumer price index number or cost of living index number helps in taking such decisions.

Let us consider the following table showing the changes in the wholesale prices of primary articles, manufactured products and commodities across all categories in India with reference to the price levels of 1981-82. This means, 1981-82 is the base year prices, i.e., (the index of prices of 1981-82=100).

Table 12.1: Index Numbers of Wholesale Prices in India

Base year 1981-82 (=100)

Period	Primary articles	Manufacture products	All commodities
July, 1992	237.6	222.6	226.6
October, 1992	237.1	229.3	232.4
January, 1993	235.0	228.6	231.6
April, 1993	234.2	231.2	234.6
June, 1993	234.9	233.5	237.7

Source: Centre for Monitoring Indian Economy, July, 1993.

From Table 12.1 it can be seen that compared to the 1981-82 price levels, the price level of primary goods (primary goods comprises food items, non-food items and minerals) in January, 1993 has increased by

234.2 percent or 2.342 times of the 1981-82 price levels of the corresponding period (i.e., January, 1982).

Thus, we have seen that index numbers give us a comparative picture over a period of time. This means that index numbers essentially reflects upon the changes in the variable or the group of related variables over a period of time. For example, if the index of industrial production was 215.1 in 1992-93 (base year: 1980-81), it means that the industrial production in that year increased by 2.151 times compared to 1980-81. It should however be noted that this does not mean that compared to 1980-81, all the sectors of the industry witnessed similar trend of progress. The index of 1992-93 reflects an 'average picture' of the industrial sector. It does not necessary imply that all the sectors of the economy witnessed similar progress. This means that a few sectors of the industrial sectors might have performed above the average level, while a few might have performed below that level. According to Croxton and Cowden, "Index numbers are devices which measures the change in the level of a phenomenon with respect to time, geographical location or some other characteristics."

It should be kept in mind that different commodities are measured in different units. For example, rice and wheat are measured in kilograms, cloth in meters and milk in liters etc. Index numbers attempt some averages relating to commodities which are measured in different units. For purpose of comparison, we are interested in knowing relative changes. These relative changes are expressed in percentage terms.

Uses of Index Numbers: Index numbers are constructed with various aims and purposes. Index numbers constructed are put into several uses. Some of them are described below:

- The most commonly used types of index numbers are those that relate to changes in level in prices of a commodity or a group of commodities. Such index numbers are price index numbers. Price index numbers are useful in studying price movements with a view to analyzing their causes, as well as to determine their effects on the economy. To determine economic relationships, it is often useful to compare changes in the market price level with changes in other series, such

as gold, bank deposits, bank loans, and the physical volume of production.

- Indices of physical changes over a period of time in production, in marketing, in sales, in imports and exports, and so on have important uses. Such index numbers over a period of time are known as index time series. These index numbers are extremely useful in the study of the movement of the characteristics over time, in the study of seasonal and cyclic behaviour, and in the study of business cycles, etc.
- Index numbers can be used for forecasting future trend in demand of commodities or in volume of production etc. Index numbers of industrial and agricultural production not only reflect the trend but also are useful in forecasting production. Index numbers of unemployment which reflect the trend of unemployment are useful in determining factors leading to unemployment and in forecasting future trends.
- Index numbers which reflect the general price level, and in particular, the consumer price index numbers are useful in determining the quantum of additional wages or dearness allowances to compensate for the changes in the cost of living. The Government of India and most of the State Governments have index linked formulae for grant of dearness allowances to their employees.
- The changes in consumer price index can be used to determine the real income over a period. Suppose that a person's income in 1980 was 150 times than that in 1970, that is, there is an increase of 50% in money income. Suppose that the cost of living index number in 1980 was 175 times than that in 1970, that is, there is an increase of 75%. Then the person's real income in 1980 is $\frac{150}{175} = 85.7\%$ of his income in 1970. Thus index numbers are useful in determining the real income.



CHECK YOUR PROGRESS

Q3: State whether the following statements are True (T) or False (F).

(i) Index numbers are specialized averages to measure relative changes. (T/F)

(ii) Index numbers measure net change in related variables over time. (T/F)

(iii) Simple index numbers require weights in their construction. (T/F)

(iv) Index numbers do not indicate the trend of change in the economy. (T/F)

Q4: Fill in the blanks:

(i) Index number is a statistical device to express ..... change in related variable.

(ii) An index number is a ..... average.

12.11 CONSTRUCTION OF SIMPLE INDEX NUMBERS

In general we are interested in general price level rather than on the price level of any particular item. So we have to consider a number of items at the same time. If each commodity is of different qualities then all such qualities have also to be taken into consideration. We have to consider simultaneously a number of items or commodities together for measuring change in price or production.

The sources of data must be reliable and care should be taken in selecting the sources of data. For example, official publications as well as other reliable unofficial reports from producers and merchants should be considered for computing index for production. If retail food prices are being considered, then prices in stores, not in wholesale markets, are to be taken into consideration.

Now we shall discuss how to construct simple index numbers from a given set of data, like prices of certain commodities, production of certain commodities etc.

There are two methods of constructing simple index numbers. These are:

- Simple aggregate method and
- Method of simple average of relatives.

Remember that all items in a simple index number are assigned equal weights. These are unweighted index numbers.

- **Simple Aggregate Method:** In this case each item is given equal weights. If we give an equal weight to each item it means the same thing, whether each item is given a weight or not. It is the simplest method of constructing index numbers.

  Simple aggregate method to find price index numbers: We use the following three steps to find price index number.

  Step 1: Find the sum of the current year (that is, given period) prices of all the items included in the list. If 1 denote the current year, then find $\sum p_1$.

  Step 2: Find the sum of the base year prices of all the items included in the list. If 0 denote the base year, then find . $\sum p_0$

  Step 3: Use the formula $p_{0/1} = \frac{\sum p_1}{\sum p_0} \times 100.$

Exercise 1: Find the price index number, using simple aggregate method, for the following information.

Prices (in Rupees)

Commodities	Units	2000	2005
Wheat	Quintal	800	1200
Rice	Quintal	1200	1600
Milk	Litres	12	18
Tea	Kilograms	100	120
Clothing	Metres	30	40
Meat	Kilograms	80	120

Solution: Represent prices of 2005 (current year) as p_1 and that of 2000 (base year) as p_0 and reconstruct the table as follows:

Commodities	p_0	p_1
Wheat	800	1200
Rice	1200	1600
Milk	12	18
Tea	100	120
Clothing	30	40
Meat	80	120
	$\sum p_0 = 2222$	$\sum p_1 = 3098$

Therefore, the price index of 2005 with base year 2000 is:

$$p_{0/1} = \frac{3098}{2222} \times 100 = 139.4$$

Thus the increase in prices (or price level) is 139.40 - 100 = 39.4%.

Exercise 2: The prices of three commodities A, B and C increased from Rs.50, Rs.7 and Rs.3 in 2005 to Rs.52, Rs.8 and Rs.5 respectively in 2006. Using the simple aggregate method, find by how much on an average the prices have increased?

Solution: We know construct the following table:

Commodities	Price in 2005 (p_0)	Price in 2006 (p_1)
A	50	52
B	7	8
C	3	5
	$\sum p_0 = 60$	$\sum p_1 = 65$

Therefore, the price index of 2006 with respect to the base period 2005 is:

$$p_{2005/2006} = \frac{\sum p_1}{\sum p_0} \times 100 = \frac{65}{60} \times 100 = 108.33$$

This shows that the price index of current year 2006 with respect to base year 2005 is 108.33%. Hence the price increase in one year is 108.33 - 100 = 8.33%.

Simple aggregate method to find quantity index numbers: We use the following three steps to find quantity index number.

Step 1: Find the sum of the current year (that is, given period) quantity or volume produced, consumed or transacted of all the items included in the list. If 1 denote the current year, then find $\sum q_1$.

Step 2: Find the sum of the base year quantity or volume produced, consumed or transacted of all the items included in the list. If 0 denote the base year, then find $\sum q_0$.

Step 3: Use the formula $q_{0/1} = \frac{\sum q_1}{\sum q_0} \times 100.$

- **Method of Simple Average of Relatives:** In this method, average of the relatives is obtained by using any one of the measures of central tendency. In particular, here we shall use arithmetic mean for averaging the relatives. We shall discuss briefly this method only for price relatives. Similar formulas on quantity index number and value index number can be obtained considering quantity and value relatives instead of price relative. There are few questions to find quantity and value index numbers in the section "Possible Questions". You should work out those problems with the help of the problems on price index numbers which are solved below.

Method of Simple Average of Price Relatives:

We know that a price relative is nothing but the ratio of current year prices to those in the base year. Taking the arithmetic mean of the price relatives, we get the following formula for price index number:

$$p_{0/1} = \frac{\sum\left(\frac{p_1}{p_0} \times 100\right)}{N}$$

where N stands for number of commodities included in the index numbers. Steps to calculate price index numbers by Simple Average of Price Relatives Method:

Step 1: Find percentage price relative for each commodity, that is, $\frac{p_1}{p_0} \times 100$

Step 2: Find the sum of these percentage price relatives, that is, $\sum\left(\frac{p_1}{p_0} \times 100\right)$.

Step 3: Divide $\Sigma\left(\frac{p_1}{p_0}\times 100\right)$ by the total number of commodities included in the list.

Exercise 3: Give the solution of Exercise 1 using the Simple Average of Price Relatives.

Solution: We construct the following table:

Sl No.	Commo-dities	Units	Prices (in Rupees)		Price Relative $\frac{p_1}{p_0}\times 100$
			2000 p_0	2005 p_1	
1	Wheat	Quintal	800	1200	$\frac{1200}{800}\times 100 = 150.00$
2	Rice	Quintal	1200	1600	$\frac{1600}{1200}\times 100 = 133.33$
3	Milk	Litres	12	18	$\frac{18}{12}\times 100 = 150.00$
4	Tea	Kilograms	100	120	$\frac{120}{100}\times 100 = 120.00$
5	Clothing	Metres	30	40	$\frac{40}{30}\times 100 = 133.33$
6	Meat	Kilograms	80	120	$\frac{120}{80}\times 100 = 150.00$

N = 6 $\qquad \Sigma\left(\frac{p_1}{p_0}\times 100\right) = 836.66$

Hence, the price index number of 2005 with respect to base year 2000 is:

$$p_{0/1} = \frac{\Sigma\left(\frac{p_1}{p_0}\times 100\right)}{N} = \frac{836.66}{6} = 139.44.$$

Exercise 4: Give the solution of Exercise 2 using the Simple Average of Price Relatives.

Solution: We first prepare the following table:

Sl No.	Commo-dities	Prices (in Rupees)		Price Relative
		2005 p_0	2006 p_1	$\frac{p_1}{p_0}\times 100$
1	A	50	52	$\frac{52}{50}\times 100 = 104.00$
2	B	7	8	$\frac{8}{7}\times 100 = 114.29$
3	C	3	5	$\frac{5}{3}\times 100 = 166.66$

N=3 $\sum\left(\frac{p_1}{p_0}\times 100\right) = 384.95$

Hence, the price index number of 2006 with respect to base year 2005 is:

$$p_{0/1} = \frac{\sum\left(\frac{p_1}{p_0}\times 100\right)}{N} = \frac{384.95}{3} = 128.32.$$

12.12 CONSTRUCTION OF WEIGHTED INDEX NUMBERS

In weighted index number each item is given weight according to the importance it occupies in the list. There are two groups of methods to calculate index number of this category: (a) Weighted aggregate method and (b) Weighted average of price relative methods. In this unit, we will study three types of weighted aggregate method. These methods are popularly known as (1) Laspeyre's Method, (2) Paasche's Method and (3) Fisher's Method. All the methods are used to calculate weighted index numbers. The main difference between the Laspeyre's Method and Paasche's Method is that Laspeyre's uses base year quantities of commodities as their relative weights, while Paasche's uses current year quantities of commodities as their relative weights for preparing a price index.

12.12.1 Laspeyre's Index Number

Laspeyre's Price Index Number: It uses base year quantities as the weights. Accordingly, the formula is

$$P_L = \frac{\sum p_1 q_0}{\sum p_0 q_0} \times 100$$

Laspeyre's Quantity Index Number: If we multiply the quantities by the base year price, then we get Laspeyre's quantity index number. Accordingly the formula for Laspeyre's quantity index number is:

$$Q_L = \frac{\sum q_1 p_0}{\sum q_0 p_0} \times 100$$

Steps to Calculate Weighted Index Number by Laspeyre's Method:

Step 1: Multiply current year price (p_1) with the base year quantity (q_0) to get $p_1 q_0$ for each item/ commodity.

Step 2: Multiply base year price (p_0) with the base year quantity to get $p_0 q_0$ for each item/ commodity.

Step 3: Add all $p_1 q_0$ and $p_0 q_0$ separately to get $\sum p_1 q_0$ and $\sum p_0 q_0$.

Step 4: Divide $\sum p_1 q_0$ by $\sum p_0 q_0$ and multiply by 100 to obtain Laspeyre's price index number.

Exercise 5: Find Laspeyre's price index number from the following data.

	Price (in Rs)		Quantity bought in units	
Commodity	1995	1996	1995	1996
A	50	52	10	12
B	7	9	3	4
C	3	5	7	6

Solution: Represent prices and quantities in current year by p_1 and q_1 respectively and represent prices and quantities in base year by p_0 and q_0 respectively. Let us construct the following table following the steps 1-3.

Commodities	p_0	q_0	p_1	p_0q_0	p_1q_0
A	50	10	52	500	520
B	7	3	9	21	27
C	3	7	5	21	35

$\sum p_0q_0 = 542$ $\sum p_1q_0 = 582$

Therefore the Laspeyre's price index number is:

$$P_L = \frac{582}{542} \times 100 = 107.38$$

12.12.2 Paasche's Index Number

Paasche's Price Index Number uses current year quantities *(q_1)* as the weights. Accordingly, the formula is

$$P_P = \frac{\sum p_1q_1}{\sum p_0q_1} \times 100$$

Paasche's Quantity Index Number: It uses current year prices *(p_1)* as the weights. Accordingly, the formula is

$$Q_P = \frac{\sum q_1p_1}{\sum q_0p_1} \times 100$$

Exercise 6: Find Paasche's price index number from the data given in Exercise 5.

Solution: Represent prices and quantities in current year by p_1 and q_1 respectively and represent prices and quantities in base year by p_0 and q_0 respectively. Let us construct the following table.

Commodities	p_0	q_1	p_1	p_1q_1	p_1p_1
A	50	10	52	500	520
B	7	3	9	21	27
C	3	7	5	21	35

$\sum p_0q_1 = 646$ $\sum p_1q_1 = 690$

Therefore the Paasche's price index number is:

$$P_P = \frac{690}{646} \times 100 = 106.8$$

Remark: You have noticed that the value of Laspeyre's index number (107.38) and the value of Paasche's index number (106.8) are different for the same data. The difference has arisen because of differences in weights.

12.12.3 Fisher's Index Number

The Fisher's price index number is nothing but the geometric mean of the Laspeyre's and Paasche's price index numbers. Hence the formula for Fisher's price index number is:

$$P_F = \sqrt{P_L \times P_P} = \sqrt{\left(\frac{\sum p_1 q_0}{\sum p_0 q_0} \times 100\right) \times \left(\frac{\sum p_1 q_1}{\sum p_0 q_1} \times 100\right)}$$

$$= \sqrt{\frac{\sum p_1 q_0}{\sum p_0 q_0} \times \frac{\sum p_1 q_1}{\sum p_0 q_1}} \times 100 \qquad \cdots(1)$$

Similarly, the Fisher's quantity index number is given by:

$$Q_F = \sqrt{Q_L \times Q_P} = \sqrt{\left(\frac{\sum q_1 p_0}{\sum q_0 p_0} \times 100\right) \times \left(\frac{\sum q_1 p_1}{\sum q_0 p_1} \times 100\right)}$$

$$= \sqrt{\frac{\sum q_1 p_0}{\sum q_0 p_0} \times \frac{\sum q_1 p_1}{\sum q_0 p_1}} \times 100 \qquad \cdots(2)$$

Exercise 7: Find Fisher's price index number from the data given in Exercise 5.

Solution: We have already found that for the given data,

$P_L = 107.38$ and $P_P = 106.8$.

Hence the Fisher's price index number is:

$$P_F = \sqrt{107.38 \times 106.8} = 107.09$$



CHECK YOUR PROGRESS

Q 5: State whether the following statements are true (T) or False (F).

(i) There are two types of index numbers: simple or unweighted and weighted index numbers.(T / F)

(ii) There are two methods of constructing simple index numbers: simple aggregate method and simple average relatives. (T / F)

(iii) We the same index number whether we use simple aggregate method or simple average of price relatives' method. (T / F)

(iv) Laspeyre's uses current year quantities as weights. (T / F)

(v) Paasche's uses base year quantities as weights. (T / F)

Q 6: Fill up the blanks.

(i) In Laspeyre's method of finding price index number we use ..... quantities as weights.

(ii) In Paasche's method of finding price index number we use ..... quantities as weights.

(iii) $I = \frac{\sum p_1 q_0}{\sum p_0 q_0} \times 100$ is ..... weighted index number.

(iv) $I = \frac{\sum p_1 q_1}{\sum p_0 q_1} \times 100$ is ..... weighted index number

12.13 BASE SHIFTING, SPLICING AND DEFLATING

In this section, we shall briefly discuss the concepts of base shifting, splicing and deflating.

Base Shifting: In Statistics, we often require to change the reference base of an index number series from one time period to another without returning to the original raw data and recomputing the eniture series. The change in reference base period is usually referred to as '*base shifting*'.

ACTIVITY 12.1



The Ministry of Statistics, Government of India has changed the base for the calculation of GDP from time to time. Undertake an exercise on tracking such changes since 1990.

Base shifting is undertaken for two important reasons. a) The previsous base (i.e., the base year currently in practice) has become too old is not much relevant for making comparision in the present times. By shifting the series, the series is presented to be 'current' and more relevant to the present times. b) When different data are presented for comparision pertaining to the different time periods, it becomes necessary to first make them comparable with the 'time' dimension. For example, it would be irrevalent to compare the GDP estimates of a country of 1850, 1920, 1950 and 2010 without any statistical treatment. For making the comparision effective, the data must be first worked out to one base year (say, 2010). This is particularly important when we compare them in one single graph.

Splicing: Splicing means combining two or more series of overlapping index numbers to obtain a single index number on a common base. Sometimes, a series of index numbers is available for a period of time, which has been substantially revised including shifting of the base year. It may also happen that the weights assigned to the series have become out dated. As such, new weights may be assigned and the series is worked out anew. In such cases, two series would result, the old one and the new one. Now, it may become necessary to convert the two series into one continuous series. This is done with the help of splicing.

Splicing can be done only if the index numbers are constructed with

the same items and have an overlapping year. Splicing like base shifting will give accurate result of the index numbers, use simple geometric mean and satisfy the circular test. In splicing of index numbers, we find a common factor by which the spliced index number series is multiplied to get a common base.

Deflating: Deflating means adjusting, correcting or reducing a value which is inflated. Thus, in defilating, we make adjustments for the effect of changing price levels. You know that a rise in price levels essentially reduces the real purchasing power of money. So, to compare the value of money (or its purchasing power), in different time peirods, we need to adjust the rate of inflation during the given peirod. This is done through deflating. Deflating is a technique of converting a series of values calculated at current prices into constant prices of a given year. This is particularly desirable in the case of an economy which has inflationary trends because in such an economy, the increase in the prices of commodities over a period of years means a fall in their real incomes. For example, a rise in money income may not amount to a rise in real income. As such, it becomes necessary to adjust or correct nominal wages in accordance with the rise in the corresponding price index to arrive at the real income. The purchasing power is given by the reciprocal of the index number and consequently the real income is obtained on dividing the money or nominal income by the corresponding appropriate price index and multiplying the result by 100.



12.14 LET US SUM UP

- National Income means the total income of the nation, The aggregate economic performance of the whole economy is measured by the national income data.
- National Income refers to the money value of all final goods and services produced by the normal residents of a country while working both within or outside the domestic territory of a country in an accounting year.

- National Income also includes net factor income from abroad.
- Keynes has suggested three approaches to national income :

(1) Income - expenditure approach : According to this approach, national income is equal to total expenditure on consumption and investment goods.

(2) Factor - income approach : According to this approach, national income is measured as the aggregate of incomes received by all the factors of production.

(3) Sales proceeds minus cost approach : According to this approach, national income is defined as the aggregate sales proceeds minus cost.

- Modern economists consider three aspects of national income and emphasise the fundamental identity between these three aspects. These three aspects are : (a) product aspect (b) income aspect, and (c) expenditure aspect.
- When we add the net factor income from abroad to the figure of GDP we get the Gross National Product of the country.
- NNP of a country is its GNP less depreciation.
- Per Capita Income is a measure of the amount of money that is being earned per person in a certain area.
- Transfer payments are those payments that do not correspond to any productive work.
- Personal Disposable Income is that portion of the personal income of the residents of the country that is at its command or disposal.
- Factor income earned by the private enterprises and workers within the domestic territory and foreign countries and current transfers from government and net transfers from outside the country constitute the Private Income of the residents of a country.
- The study of national income statistics is very important. It helps in analysing the actual performance of the economy and in preparing future policies.
- Index number is a statistical measure or device with a purpose of showing average change in one or more related variables over

time and space.

- Price index numbers are more commonly used. It measures relative changes in prices over a time period.
- We can have either simple or weighted index number. Simple index is also called unweighted index number or index number with equal weights. In this unit, we have discussed about the simple index numbers as well as weighted index number.
- We have learnt about two methods of constructing simple index numbers: Simple aggregate method and Method of simple average of relatives. The formula to find index number using simple aggregate method is given by $p_{0/1} = \frac{\sum p_1}{\sum p_0} \times 100.$

  Again, the formula to find price index number using the method of simple averages of relatives is given by $p_{0/1} = \frac{\sum\left(\frac{p_1}{p_0} \times 100\right)}{N}$.
- We have also leant about weighted index numbers. There are two groups of methods to calculate index number of this category: (a) Weighted aggregate method and (b) Weighted average of price relative methods. We briefly discussed about three types of weighted aggregate method. These methods are popularly known as (1) Laspeyre's Method, (2) Paasche's Method and (3) Fisher's Method.
- We have also learnt about the test of adequacy of index numbers. We mentioned three properties that a good index number should have. Fisher's index number satisfies both the time reversal and factor reversal tests and hence it is known as Fisher's Ideal Index Number.



12.15FURTHER READING

1) NCERT (2007) : *Introductory Macroeconomics* (Textbook in Economics for Class XII), New Delhi.
2) Bakerman, W. (1993) : *An Introduction to National Income Analysis*, 3rd Ed., New Delhi: Universal Book Stall.
3) Rana, K.C. & Verma, K.N. (2009). *Macroeconomic Analysis*, Jalandhar: Vishal Publications.

12.16 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q No. 1: National Income means the total income of the nation, The aggregate economic performance of the whole economy is measured by the national income data.

National Income refers to the money value of all final goods and services produced by the normal residents of a country while working both within or outside the domestic territory of a country in an accounting year. National Income also includes net factor income from abroad.

Ans. to Q No. 2: Keynes has suggested three approaches to national income :

(1) Income - expenditure approach : According to this approach, national income is equal to total expenditure on consumption and investment goods.

(2) Factor - income approach : According to this approach, national income is measured as the aggregate of incomes received by all the factors of production.

(3) Sales proceeds minus cost approach : According to this approach, national income is defined as the aggregate sales proceeds minus cost.

Ans to Q No 3: (i) True (ii) True (iii) False (iv) False

Ans to Q No 4: (i) average (ii) specialized

Ans to Q No 5: (i) True (ii) True (iii) False (iv) False (v) False

Ans to Q No 6: (i) base year (ii) current year (iii) Laspeyre's (iv) Paasche's



12.14 MODEL QUESTIONS

Q1: What is meant by national income? State briefly the Keynesian approach to national income.

Q2: Distinguish between:

(a) Gross National Product and Net National Product

(b) National Income at Market Prices and National Income at Factor Cost.

(c) Personal Income and Personal Disposable Income.

(d) Traditional Approach and Modern Approach of national income

Q3: Explain the following concepts

(a) National Income.

(b) Personal Income.

(c) Disposable Income.

(d) Value Added Method.

Q 4: Discuss the modern approach to national income. Can we say it as an improvement over the traditional approach. Give reasons.

Q 5: Discuss the importance of national income.

Q 6: Explain the meaning of an index number and its main characteristics.

Q 7: "Index numbers are economic barometers". Why are index numbers so called? Explain.

Q 8: Explain the method of construction of unweighted index numbers by Simple Aggregate Method.

Q 9: Explain the method of construction of unweighted index numbers by Simple Aggregate of Price Relative Method.

Q 10: The exchange rate of a US dollar was Rs.44.00 in July 2008 and was Rs.50.00 in February 2009. Find the price relative.

Q 11: The production of rice in Assam in the month of January 2008 was

3608 tonnes and that in February 2009 was 3700 tonnes. Find the quantity relative.

Q 12: The following table shows the prices of the commodities consumed in 1970 and 1978.

		1970	1978
Commodities	Unit	Price (Rs)	Price (Rs)
A	kilogram	4.00	4.60
B	litre	8.00	8.75
C	metre	7.00	8.00
D	kilogram	14.00	16.00
E	litre	3.00	4.00

Find the price index number using:

(a) simple aggregate method

(b) method of simple aggregate of price relatives.

Q 13: The production of rice, milk, cloth, wheat and petrol are given in the following table. Taking 1980 as base year, compute quantity index number using:

(a) simple aggregate method

(b) method of simple aggregate of quantity relatives.

		Quantity produced	
Commodities	Unit	1980	1990
Rice	kilogram	400000	700000
Milk	litre	800000	905000
Cloth	metre	100000	105000
Wheat	kilogram	140000	160000
Petrol	litre	300500	400000

Q 14: What do you mean by tests of index numbers?

Q 15: Explain the important criterion or test that a good index number should satisfy.

Q 16: The prices and quantity of five commodities are given in the following table. Taking 2000 as base year, compute value index number using:

(a) simple aggregate method

(b) method of simple aggregate of value relatives.

Comm-	2000		2002	
odities	Price (Rs)	Quantity (Kg)	Price (Rs)	Quantity (Kg)
A	400	10	700	12
B	800	15	1905	17
C	100	5	125	5
D	140	7	160	7
E	300	6	400	6

Q 17: Find Laspeyre's and Paasche's price and quantity index number from the following data. Also find the Fisher's price and quantity index numbers.

	Base year		Current year	
Commo-	Price (Rs)	Quantity (kg)	Price (Rs)	Quantity (kg)
dities	p_0	q_0	p_1	q_1
A	5	25	6	30
B	10	5	15	4
C	3	40	2	50
D	6	30	8	35

Q 18: The following table shows the price quantity of the commodities consumed in 2000 and 2006.

Commo-	2000		2006	
dities	Price (Rs)	Quantity (kg)	Price (Rs)	Quantity (kg)
I	400	35	460	35
II	800	10	1000	10
III	300	15	50	12
IV	4000	10	5000	8
V	50	20	300	20

Find the following index numbers.

(1) Laspeyre's Price and Quantity index numbers.

(2) Paasche's Price and Quantity index numbers.

(3) Fisher's Price and Quantity index numbers.

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UNIT 13: THE CONSUMPTION FUNCTION AND INVESTMENT FUNCTION

UNIT STRUCTURE

13.1 Learning Objectives

13.2 Introduction

13.3 Consumption Function

13.4 Average Propensity to Consume and Marginal Propensity to Consume

13.5 Factors Affecting Consumption Function

13.6 Investment: Basic Concepts

- 13.6.1 Meaning of Investment
- 13.6.2 Gross Investment vs Net Investment
- 13.6.3 Induced Investment vs Autonomous Investment

13.7 Factors affecting the Investment Function

- 13.7.1 Marginal Efficiency of Capital
- 13.7.2 Rate of Interest
- 13.7.3 Relationship between Rate of Interest and Marginal Efficiency of Capital

13.8 Factors affecting Marginal Efficiency of Capital

13.9 Let Us Sum Up

13.10 Further Readings

13.11 Answers to Check Your Progress

13.12 Model Questions

13.1 LEARNING OBJECTIVES

After going through this unit you will be able to:

- explain the concept of Keynesian Consumption Function, and describe how it is related to income and what is the basis for such relationship
- acquire knowledge about the technical attributes of Consumption Function, viz., the Average Propensity to Consume (APC) and Marginal Propensity to Consume (MPC) , and how they are related to one another

- illustrate how various subjective and objective factors influence the consumption expenditure in an economy .
- state the meaning of autonomous and induced investment
- describe the concept of marginal efficiency of capital.
- explain the relation between marginal efficiency of capital and the rate of interest.
- enumerate the factors that affect the marginal efficiency of capital.

13.2 INTRODUCTION

The classical economists believed in the concept of full employment in a free enterprise capitalist economy brought about by the operation of the Say's Law of Markets in the product market and wage flexibility in the labour market. This theory was severely attacked during the Great Depression of the 1930s by Keynes. Keynes rejected the notion of full employment and said that full employment was a special case; economics (specially underdeveloped economics) usually suffer from unemployment. He explained his theory of employment with the help of the Consumption Function and Investment Functions. And showed how it is the level of investment which ultimately can increase the level of employment and income in the economy. The concept of the multiplier was used by Keynes to show the overall increase in investment and income due to an increase in total income (both direct and indirect). The concept of the accelerator was not taken into account by Keynes. This concept is now used in the study of the theories of trade cycles and economic growth. This principle states that when income or consumption increases, investment increases by a multiple amount.

This unit is concerned with familiarizing you with some basic concepts of investment. Thus, through this unit, you will be able to derive the meaning of investment and distinguish between autonomous and induced investment. Autonomous investment is independent of the change in income. That is why it is known as autonomous investment. Induced investment depends upon change in the level of income. When there is

change in income, there is a change in induced investment. Most of the private investment is of induced type.

Marginal efficiency of capital describes the rate of discount which would make the present value of expected income from fixed capital assets equal to the present supply price of the asset. The relation between marginal efficiency of capital and the rate of interest has been explained in this unit. Apart from this, the factors that affect the marginal efficiency of capital have also been discussed.

13.3 CONSUMPTION FUNCTION

As we have already noted, the pioneering work on consumption function was done by J.M.Keynes. He brought consumption to the forefront of macroeconomic analysis. The Keynesian consumption function is based on the fundamental psychological law of consumption. According to this law, human beings, in general and on an average are disposed to increase consumption when their income increases but not as much as the increase in their income. In other words, the Keynesian consumption function is non-proportional. According to Keynes, consumption relates to current disposable income alone. This consumption function can be expressed as follows:

$C = f(Yd)$

where, C : Consumption expenditure and Yd : Disposable income

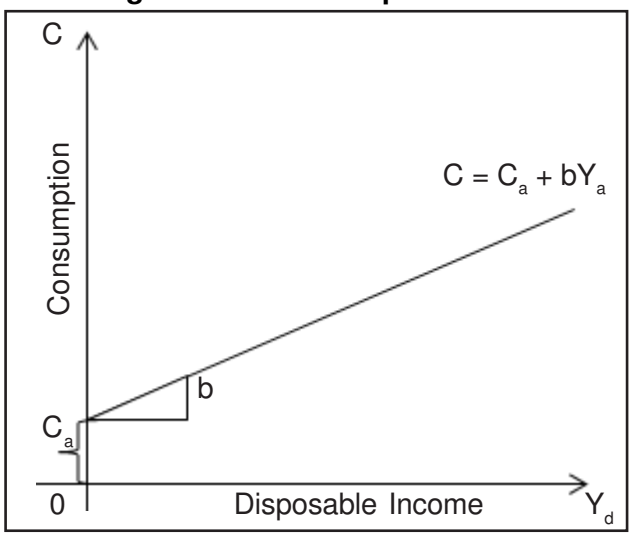
This functional relationship is captured by the equation:

$C = C_a + bY_d, \quad 0<b<1$

where, C_a: autonomous consumption; and b : marginal propensity to consume.

It is obvious from the above equation that the Keynesian consumption function is not only non-proportional but also linear. Linearity implies that when the consumption function is depicted in a two dimensional diagram, with income measured along the X-axis and consumption measured along the Y-axis, it gives rise to a straight line. The intercept of the straight line is given by the autonomous consumption (C_a) and the slope or inclination of the straight line is given by the marginal propensity to consume (b). Such a consumption function has been shown with the help of figure 13.1.

Figure13.1: Consumption Function



Assumptions of Keynesian Consumption Function: While stating the fundamental psychological law of consumption, Keynes made the following assumptions:

- The traditions, customs, and mores that determine the consumption behaviour of a community remain unchanged. Keynes believed that behavioural changes can not occur in the short run.
- It is also assumed that normal circumstances prevail in the economy. Abnormalities like war, famines, hyper inflation etc. are ruled out.
- The economy concerned is a developed free market economy.

Implications/Importance of Keynesian Consumption Function:

The consumption function constitutes an important tool in the Keynesian analysis. The important implications of consumption function are the following:

- **Importance of Investment:** The Keynesian consumption function highlights the importance of investment in an economy. The law refers to the tendency which creates a gap between income and consumption. Since consumption function is stable in the short-run, income, output and employment can not increase unless investment increases to fill the gap between consumption and income.
- **Repudiation of Say's Law:** Say's law becomes invalid because consumption rises less than the output or real income, and the gap

between consumption and income widens. Thus, supply does not automatically create its own demand.

- **Decline in Expected Rate of Profit:** When consumption does not increase to the same level as income, the demand for consumer goods falls. This reduces the profitability of fresh investment. This further indicates the possibility of a less than full employment situation.
- **Secular Stagnation:** The long run tendency of increasing saving and fall in investment leads to secular stagnation in the economy. In a wealthy economy, the saving gap increases and investment opportunities decrease over time. This tendency is known as secular stagnation.
- **Turning points of Trade Cycle:** The marginal propensity to consume being less than one also helps to explain the turning points of the business cycle. Keynes attributes the upper turning point to the fact that consumption expenditure does not increase as fast as income increases. This fact results in over production of consumer goods which has an adverse effect on the profitability of investment. Similarly, the lower turning point is explained by the fact that as income falls consumption also falls, but less than proportionately.
- **State Intervention:** The Keynesian consumption function logically leads to the intervention of the State in the economy. It invalidates the thesis that there is automatic adjustment in the economy under *Laissez Faire.* When consumption lags behind income and causes overproduction and unemployment in the economy, State intervention becomes necessary for encouraging consumption.

On account of the above, Prof. Hansen regards the Keynesian consumption function as “an epoch making contribution to the tool of economic analysis”. He considered it even more important than Marshall’s discovery of demand function. But despite this, we must also note that Keynes has been criticized both on account of his assumptions and empirical evidence. The following are the main points of criticism:

- The customs and traditions that determine the consumption behaviour of a community may change even in the short run. In any dynamic society, change is the norm and behavioural pattern can change very fast.

- By limiting the value of marginal propensity to consume between 0 and 1, Keynes made his analysis unrealistic for the poor developing countries of the world where marginal propensity to consume can not only be 1 but even more than 1. This is because of the very low level of income and very large unfulfilled needs of even basic amenities of life.
- Empirical evidence seems to suggest that while the Keynesian consumption function conforms to the short run and cross sectional data, it does not conform to the long run time series data. In the long run consumption function appears to be proportional.



CHECK YOUR PROGRESS

Q 1: What is the fundamental psychological law of consumption?

.....

.....

.....

Q 2: Keynesian consumption function is ……(Fill in the blank)

Q 3: Express the Keynesian consumption function in equation form.

.....

Q 4: State the basic assumptions of the fundamental psychological law of consumption.

.....

.....

.....

13.4 AVERAGE PROPENSITY TO CONSUME AND MARGINAL PROPENSITY TO CONSUME

The average propensity to consume (APC) and the marginal propensity to consume (MPC) are the two technical attributes of consumption function. The APC is defined as the ratio of consumption

expenditure to income (C/Y_d), while the MPC is defined as the ratio of change in the consumption expenditure to the change in income ("C/ "Y_d). Let us suppose that the income and consumption of a community are Rs.100,000/ and Rs.60,000/ respectively, then the APC = Rs.60,000/ Rs.100,000 = 0.6 (60%). Now if the income increases to Rs.1, 25,000/ and as a result consumption increases to Rs.80, 000/ then MPC = Rs.20,000/Rs.25,000 = 0.8 (80%).

We know that the Keynesian consumption function is linear. The graphical depiction of such a consumption function gives rise to a straight line. The MPC of a straight line consumption function is constant, since "C/ "Y_d , the slope of the line, is constant. However, the average propensity to consume, C/Y_d, decreases as income increases.

The proportionality of consumption function implies that the APC remains constant at all levels of disposable income. Similarly, the non-proportionality of consumption function implies that the APC also changes when income changes. Since APC in the Keynesian consumption function decreases with increases in income, the Keynesian consumption function is said to be non-proportional. Table 13.1 and the figure 13.2 exhibit a typical non-proportional consumption function.



△C = Change in consumtpion to its previsous level. For example, C at stage 2 is (160-100)=60. Similar is the case with Y_d.

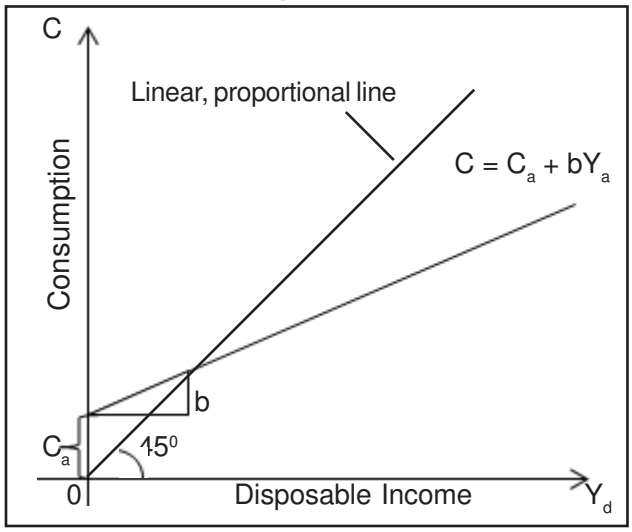
Table 13.1: APC and MPC

Stage	Yd (Rs.)	C(Rs.)	APC	MPC
(1)	(2)	(3)	(4) = (3)/(2)	(5)=△C/△Y_d
1	100	100	1.00	--
2	200	160	0.80	0.6
3	300	220	0.73	0.6
4	400	280	0.70	0.6
5	500	340	0.68	0.6

In the above table we observe that the income has been increasing over time, and in response, consumption is also increasing. But APC has been falling with increases in income and consumption. Therefore, the consumption-disposable income relationship presented in the table is non-proportional. At the same time, the MPC remains constant at 0.6 with every

increase in income and consumption. Thus, this consumption disposable income relationship is also linear. Such a linear non-proportional consumption function is depicted in the following figure 13.2.

Figure 13.2: Linear, Non-proportaional Consumption Function



In the above figure 13.2, the line C represents the linear non-proportional consumption function. The intercept (i.e the distance of the starting point of the line from the origin) is given by the autonomous consumption C_a , the slope (i.e the inclination) of the line is given by the MPC which is a constant b. The constancy of MPC makes the line C a straight line. At point P the APC is 1; to the left of P, it is greater than 1; to the right of P it is less than one. This variation in APC makes C non-proportional.



CHECK YOUR PROGRESS

Q 5: What are the two technical concepts of consumption function?

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Q 6: What does the shape of the consumption line represent? (Answer in about 40 words)

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Q 7: How does APC behave in a non-proportional consumption function? (Answer in about 20 words)

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Q 8: Suppose, Yd=Rs.500/-, C=Rs. 400/-, $\triangle Y$ = Rs. 150/-, C = Rs.12/-. Determine APC and MPC

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13.5 FACTORS AFFECTING CONSUMPTION FUNCTION

We know that in the linear consumption function $C = C_a + bY_d$, the constant C_a represents autonomous consumption. It is the consumption at zero disposable income, or the consumption which is independent of the disposable income. Thus, the autonomous consumption also represents the consumption which is influenced by the non-income factors or determinants. Keynesian analysis categorizes the non-income determinants of consumption into two broad groups:

- Subjective Factors
- Objective Factors
- ***Subjective Factors*** reflect psychological preferences. For instance, individuals' desire to have higher social status, to amass fortune, to satisfy miserly instincts etc. can influence the consumption expenditure. Similarly, business corporations' desire to expand, to possess liquidity, to demonstrate successful management etc. influence their consumption decisions. Consumption habits are also influenced by advertising, attractiveness of the product and by expectations about the price level, the future availability of goods or the future level of income.
- ***Objective Factors*** include non-income variables affecting households' ability to consume. The major objective factors that influence consumption function are :
  - *Distribution of Income:* When the distribution of income is such that it is more in favour of the poor, then the consumption expenditure

is likely to increase. This is because the poor people have a higher propensity to consume than the rich. With increased income share going to the poor, they will spend more than what will be cut down by the rich due to decrease in their share of income.

- *General Price Level:* Usually an increase in the general price level is expected to curtail consumption expenditure. Similarly, a fall in the general price level is likely to increase consumption expenditure. But, if people expect the increase in the price level to accelerate, then consumers may perpetually postpone their consumption plan and consumption will decline with the decline in the price level.
- *Rate of Interest:* Rate of interest can influence consumption directly as well as indirectly. As low rate of interest is likely to discourage savings, thereby it will encourage consumption. At the same time, low rates of interest reduce cost of borrowing and thereby encourage durable consumption through hire purchase schemes.
- *Availability of Credit:* The larger is the availability of credit in the economy, the higher is likely to be the consumption, particularly on durable commodities like car, furniture, refrigerator, television sets etc.
- *Holding of Liquid Assets:* Holding of liquid assets such as cash balances, demand deposits, government bonds etc. also influence the consumption function. When people have large amount of liquid asset, they will tend to spend more out of current income and thus their propensity to consume will increase. An increase in the real value of such assets on account of a general fall in the prices also raises consumption.
- *Stock of Assets:* Through the annual saving flows households add to their stock of assets (i.e., their wealth). Greater wealth, in turn, increases their ability to consume. It, therefore, follows that the annual saving flows, *ceteris paribus*, increase the households' stock of assets and shift the aggregate consumption function upward.



CHECK YOUR PROGRESS

Q 9: What does autonomous consumption represent? (Answer in about 30 words)

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Q 10: The non-income determinants of the Keynesian consumption function has been divided into ..... and ..... (Fill in the blank).

Q 11: Suppose, the Finance Minister assures the publilc that the economy is going to recover very soon. What impact will it have on the level of aggregate consumption, and why? (Answer in about 20 words)

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13.6 INVESTMENT: BASIC CONCEPTS

We often hear people making investment in the stock market. Such investments are made in the form of purchasing of shares, stocks, securities etc. However, in Economics paralance this is not considered as investment. This is because, investment in shares, securities etc. are the mere transfer of resources from one hand to another. Hence, such type of financial investment does not affect the aggreagate spending of the economy (one person has purchased shares of a company means that another person has sold that share).

13.6.1 Meaning of Investment

In Economics, investment refers to real investment which adds to the exisiting stock of capital in the economy. Such investment leads to increase in the levels of income and production by increasing the production and purchase of capital goods. Thus, in Economics, investment includes new plant and equipment, construction of public

works like dams, roads, buildings etc., net foreign investment, inventories and stocks and shares of new companies. In the words of Joan Robinson, "By investment is meant an addition to capital, such as occurs when a new house is built or a new factory is built. Investment means making an addition to the stock of goods in existence." The term capital here refers the real assets like factories, plants, equipmnment, and other inventories of finished and semi-finished goods. Capital also means any previously produced input that can be used in the process to produce other goods. The amount of capital available in the economy is nothing bu the aggregate stock of capital in that economy. Thus, capital is a stock concept.

Thus, from the above discussion it follows that investment is the production or acquisition of real capital assets during any period of time. Say, for example, the capital assets of a company as on 31st March, 2011 is Rs.10,000 crores and it invests an amount of Rs.500 crores in the financial year of 2011-12. Thus, at the end of the financial year 2011-12 (i.e., on 31st March, 2012), the aggregate investment of the company will stand at Rs.10,500 crores. Symbilically, let *I* be the investment and *K* be the capital in year *t* (here, *t* is the current year, i.e., 2011-12), then $I_t = K_t - K_{t-1}$. Please note that t-1 denotes the previous year (i.e., 2010-11 ending on March, 31, 2011).

13.6.2 Gross Investment vs Net Investment

The inter-relationship between capital and investment is shown by net investment. In the above example, when we talked about making an investment of Rs.500 crore during the year 2011-12, we talked about gross investment. Thus, gross investment is the total amount of investment made on new capital asset in a particular year. It should be noted that some capital stock wears out every year and is used up as depreciation and obsolescence. To derive the net investment in a particular year, the amount of

expenditure made as depreciation and obsolescence is deducted from the gross investment made in that particular year. When gross investment equals the cost of depreciation and obsolescence, net investment becomes zero, and there is no addition to the existing stock of capital in the economy. When gross investment is less than depreciation and obsolescence, there is disinvestment in the economy and the capital stock dereases. In this sense, for an increase in the real capital stock in the economy, gross investment must exceed the cost of depreciation and obsolescence. This also implies that there is some net investment in the economy.

13.6.3 Induced Investment vs Automonous Investment

Investment may be categorised as induced or autonomous. Autonomous investment is independent of the level of income, output, and profit and sales of a business firm. Prof Alvin Hanson and some other economists are of the opinion that this type of investment is associated generally with the factors like the development of new resources, growth of population and labour force and technological innovations or invention like the introduction of new products into the market.

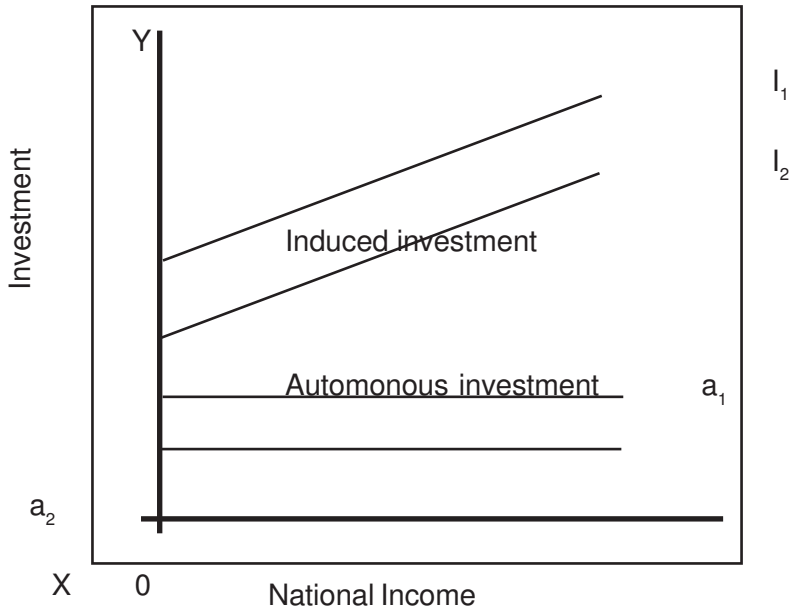
The investment expenditure which is related in some way with the current income, output and sales is termed as *induced investment*. If there is a change in income and output, it will result in change in induced investment. Since the incentive for such an investment is the direct consequence of the change in current income, output or demand.

The autonomous investment is generally undertaken by the public authorities like federal state or local governments. On the other hand, most of the induced investment is undertaken by private authorities. This is because people are driven by profit motive. Autonomous investment is generally is not induced by profit, but induced investment is induced by profit.

From the above discussion, it seems like that there is no relation between induced and autonomous investment. They are totally different concept. But autonomous investment and induced investment are related. It can be explained with the help of an example. Suppose there is increase in autonomous investment of 20 crores undertaken by the government. Assuming the multiplier coefficient is 2, it will automatically lead to an increase in income of 40 crores. This increase in income or output of 40 crores encourages the private investors to undertake induced investment. It implies that autonomous investment has its effect induced investment.

The distinction between autonomous and induced investment has been shown with the help of figure 13.3. In the figure, a_1 and a_2 represent autonomous investment while I_1 and I_2 represent induced investment.

Figure 13.3: Autonomous and Induced Investment





CHECK YOUR PROGRESS

Q12: State whether True or False

i) Induced investment is undertaken by the government authority.

ii) Autonomous investment is motivated by profit motive.

Q13: Differentiate between induced investment and automonous investment.

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Q14: What is meant by induced investment?

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13.7 FACTORS AFFECTING THE INVESTMENT FUNCTION

As we have already mentioned, induced investment (or, private investment) are basiclly driven by the profit motive. As private entrepreuners are basically driven by the profit motive, hence their inducement to invest in capital goods are basically driven by two basic objectives, either to replace the depreciated machineries or to expand the existing plant capacity. Private investment depends upon marginal efficiency of capital and the rate of interest. The marginal efficiency of capital (MEC), in turn, depends upon future expectations which may be very fluctuating. As such, private investment becomes very much undependable and very low.

Thus, marginal efficiency of capital along with the rate of interest determines the amount of new investment. As has been discussed in the earlier units, in the Keynesian equaltion Y = C + I, given the propensity to consume and hence consumption being stable in the short-run, volume of investment determines the volume of empoyment. Investment thus an essential requirement for attaining full employment in a capitalist economy.

In fact, not only net investment, but an increasing rate of net investment is necessary to maintain full employment for a longer period of time.

13.7.1 Marginal Efficiency of Capital

Keynes defined marginal efficiency of capital as the highest rate of return expected from an additional unit of a capital asset over its cost. Thus, marginal efficiency of a particular type of capital asset is the highest rate of return over cost expected from an additional or marginal unit of that type of asset. In general, however it may be regarded as the highest rate of return over cost expected from producing an additional unit of the most profitable of all categories of the capital assets. Thus, the prospective yield (y) is the aggregate net return from an asset during its life-time, while supply price (p) is the cost of producing that asset. We can express MEC mathematically as:

$$i = \frac{y}{p}$$

where i= marginal efficiency of capital, y= perspective yields of a capital asset per unit of time and p = supply price of the asset.

For example, if the annual yield over a series of years is Rs 2000 and the supply price of the capital asset are 20,000, then;

$$i = \frac{y}{p} = \frac{2000}{20000} \times 100 = 10\%$$

An increase in the supply price (p) of the capital assets given the expected annual yield will reduce the marginal efficiency of capital (i). Similarly, a decrease in the supply price of the capital asset given the annual expected yield will raise the marginal efficiency of capital. Thus, i is directly related to the rise in y and inversely to the supply price of the capital assets (p).

In a more generalized sense, Keynes has defined marginal efficiency of capital as *"the rate of discount which would make the present value of the series of annuities given by the returns expected from the capital asset during its life just equal the supply price"*.

Symbolically it can be expressed as:

$$Sp = \frac{R_1}{1+i} + \frac{R_2}{(1+i)^2} + \frac{R_3}{(1+i)^3} + ... + \frac{R_n}{(1+i)^n}$$

where, Sp is the supply price or the cost of the capital asset, R_1, R_2…….and R_n are the prospective yields or the series of annuities given by the returns expected from the capital asset in the years 1,2…..upto n and i is marginal efficiency of capital.

The marginal efficiency of capital of a particular type of capital asset is the highest rate of return over cost expected from an additional, or marginal unit of that type of capital asset.

13.7.2 Rate of Interest

The first element affecting inducement to invest is in fact is the rate of interest. The Keynesian theory dealing with determination of rate of interest is known as the Liquidiy Preference Theory. According to Keynes, demand for money (liquidity preference) arises out of three basic motives, viz., *transaction motive, precautionary motive* and *asset and speculative motive. Transaction motive* relates to the need of the people to hold money for purchasing goods and services to fulfill the daily necessities of life. Apart from fulfilling the transaction purposes, people also have to hold money to take proper precautions against unforeseen future contingencies like sickness, unemployment, accidents, old age etc. Holding of money for such precautions is called the *precautionary motive*. According to Keynes, people also keep cash in hand to take advantage of the rise and fall of prices of bonds and securities. Keynes called this as speculative demand for money. This speculative for money arises, as Keynes argued, on account of the uncertainty regading the future rate rate of interest.

All the three motives of holding money, i.e., transaction motive, precautionary motive and speculative motive when added gives us the total demand for money. The liquidity preference (i.e.,

demand for money) for transaction motive and precautionary motive is more or less stable and is interest-inelastic. They basically depend on the level of income. On the other hand, holding of money under the speculative motive is very much sensitive to the changes in the market rate of interest. If the rate of interest in investment instruments, e.g., bond is higher, say 10%, people would choose to hold less amount of money in hand or more to invest in bond. On the contrary, if the rate of interest on bond is lower, say 2%, people would be reluctant to invest more in bonds; they would choose to hold money in cash.

Let us suppose, we represent the demand for money for transaction and precautionary motives by M_1 and the demand for speculative motive by M_2, then we can write:

$M = M_1 + M_2$,

where M stands for total demand for money.

As we have already stated, the demand for money for transaction and precautionary motives are interest-inelastic and the demand for speculative motive as interest elastic, we can write:

$M = M_1(Y) + M_2(r)$

where $M_1(Y)$ indicates that M_1 is a function of income (Y) and $M_2(r)$ indicates that M_2 is a funciton of the rate of interest (r).

According to Keynes, the equilibrium rate of interest is determined at the point where the demand for money equals the supply of money.

13.7.3 Relationship between Rate of Interest and Marginal Efficiency of Capital

As we have already mentioned, MEC and the rate of interest are the two important factors that affect the volume of investment. We know that the rate of interest is the price paid for loanable funds and is dtermined, like any other price, by the demand for and supply of loanable funds. A potential investor will go on comparing the MEC

on new investment against the rate of interest. As long as MEC is more than the rate of interest, investment will continue to be made, till MEC and the rate of interest are equalled. Once MEC becomes equated to the rate of interest, equilibrium investment in determined.

The relationship of MEC and the rate of interest in the determination of inducement to invest has been shown with the help of Table 13.1

Table 13.2: Relationship of MEC and the Rate of Interest in determination of Investment

Supply price	Annual return	MEC	Rate of interest	Effect on investment
Rs. 25,000/-	Rs. 1,000/-	4%	4%	Neutral
Rs. 20,000/-	Rs. 1,000/-	5%	4%	Favourable
Rs. 25,000/-	Rs. 1,000/-	3%	4%	Adverse

In above table 5.1 it has been assumed that the new capital asset gives a constant return of Rs. 1,000/- annually. Now it can be seen that when the rate of MEC (4%) is eaual to the rate of interest, the effect on investment is neutral. When the rate of interest (5%) is higher than the rate of interest (4%), there is a favourable affect on investment. On the contrary, when the rate of MEC (3%) is less than the rate of interest (4%), the affect on investment is unfavourable.



CHECK YOUR PROGRESS

Q 15: Choose the correct alternative from below:

Marginal Efficiency of capital can be defined as the ratio of:

(a) Supply price of the capital asset and its prospective yield

(b) Prospective yield and the supply price (c) Others

Q 16: Mention the three important criteria a business firm considers in making investment. (Answer in about 40 words).

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13.8 FACTORS AFFECTING MARGINAL EFFICIENCY OF CAPITAL

There are a number of short-run and long-run factors which affect the marginal efficiency of capital. The shor-run factors include :

- **Existing stock of capital:** If the existing stock of capital is large, it would limit the scope for new investment. Similarly, inducement to investment would be low if there exists excess or idle capacity in the existing stock of capital.
- **Change in income:** Sudden changes in income caused by windfal profits or losses, tax concessions or levies also influence the marginal efficiency of capital and hence investment. A rise in income will stimulate the MEC while a fall in it will affect it adversely.
- **Elements of Uncertainty:** According to Keynes, MEC is more volatile than the rate of interest. This is because, prospective yield of capital is dependent upon business expectations. These business expectations are very much sensitive to certain factors like macro economic environment, growth rate of the economy etc. As a result, it is difficult to calculate the expected annual returns on the life of a capital asset. Further, because of uncertainty, investment projects usually have a short pay-off period.
- **Consumer Demand:** Levels of present and future consumer demand also affect the level of investment in the economy. For example, the current demand for consumer durables is increasing more rapidly. This will attract more investment to that sector.

The long-run factors include:

- **Invention and innovations:** In economies where invention and innovations are sound, investment tend to be higher. This is because, invention and innovation help to bring new products to the market, and as such, the earing of profit also remains higher. This in fact is the key factor behind huge investment in advanced economies where we find large number of inventions and also find higher investment of resources in research and development.

- **Population growth rate:** If population growth rate in the economy is higher, it could mean a larger market and hence level of investment is also likely to be higher. On the contrary, a declining populaiton results in a shrinking market for goods, thereby lowers the inducement to invest.
- **Development of new territories:** The growth and development of new territories lead to heavy investment activities of all types. There will be need to provide for additional transport facilities, residential and commercial buildings. The development of new areas and townships in India, for example Noida and Okhla (U.P.) has necessitated huge development expenditure and investment.

Apart from the above short-run and long-run factors, the other general factors that affect MEC are:

- **State policy:** The economic policies adopted by the Government always affects the investment climate in an economy. Government policies like taxation policies, environmental policies etc. have much influence on inducement to invest in the economy. In general, if the government imposes high progressive rate of taxes on corporates, inducement to invest will be low and vice-versa. Investment will be lowered if the government adopts the policy of nationalisation of industries. On the other hand, if the government adopts measures like setting up of infrastructural facilties, e.g., roads and transport, power and other such facilties, inducement to invest will be higher.
- **Political climate:** The existing political climate in the economy also affects the level of investment. Investment will be higher in a stable economy, while inducement to invest will be adversely affected in a hostile political environment. Investment would be low if there exists excess or idle capacity in the existing stock of capital.



CHECK YOUR PROGRESS

Q 17: How does consumer demand affect MEC?

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Q18: How does population growth affect MEC?

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13.9 LET US SUM UP

- The Keynesian consumption function is based on the fundamental psychological law of consumption. According to this law, human beings, in general and on an average are disposed to increase consumption when their income increases but not as much as the increase in their income.
- The above implies that the Keynesian consumption function is non-proportional. According to Keynes, consumption relates to current disposable income alone. This functional relationship can be expressed in the following equation form : $C = C_a + bY_d$, $0<b<1$; where C_a : autonomous consumption, b = Marginal Propensity to Consume and Y_d : Disposable Income
- Keynesian consumption function is not only non-proportional but also linear. Linearity implies that when the consumption function is depicted in a two dimensional diagram, with income measured along the X-axis and consumption measured along the Y-axis, it gives rise to a straight line.
- While developing the consumption function Keynes assumed that consumer behaviour, which is shaped by customs and traditions, do not change in the short run, that normal circumstances prevail in the economy, and that the economy is a developed free market economy.
- The Keynesian consumption function repudiates Say.s Law, highlights

the importance of investment, hints at secular stagnation in a wealthy economy, provides an explanation to the turning points of the business cycle, and finally, justifies the intervention of the State in the affairs of the economy.

- However, Keynes has been criticized on account of his unrealistic assumptions as well as for a lack of statistical justification for the non-proportionality of consumption function.
- The average propensity to consume (APC) and the marginal propensity to consume (MPC) are the two technical attributes of consumption function. The APC is defined as the ratio of consumption expenditure to income (C/Y_d), while the MPC is defined as the ratio of change in the consumption expenditure to the change in income ("C/ "Y_d).
- The non-proportionality of consumption function implies that the APC changes with changes in income and linearity implies that the MPC remains constant.
- The autonomous consumption refers to the consumption at zero disposable income, or the consumption which is independent of the disposable income. Thus the autonomous consumption also represents the consumption which is influenced by the non-income factors or determinants. Keynesian analysis categorizes the non-income determinants of consumption into two broad groups: *subjective and objective.*
- The subjective factors belong to the realm of human psychology. They reflect the psychological preferences of the consumers. The objective factors include non-income variables affecting households' ability to consume. The major objective factors that influence consumption function are : income distribution, general price level, rate of interest, availability of credit, holding of liquid assets, and stock of assets.
- Investment refers to real investment which adds to the existing stock of capital in the economy.
- For an increase in the real capital stock in the economy, gross investment must exceed the cost of depreciation and obsolescence.
- Investment may be autonomous or induced. Autonomous investment

is not induced by profit motive, but induced investment depends on profit.

- MEC is the rate of discount which will make the present value of the capital assets over the years equal to its supply price.
- Rate of interest affect inducement to invest.
- All the three motives of holding money, i.e., transaction motive, precautionary motive and speculative motive when added gives us the total demand for money.
- There are a number of short-run and long-run factors which affect the marginal efficiency of capital.



13.10 FURTHER READINGS

1) Dillard, D. (2005). *The Economics of John Maynard Keynes*: *The Theory of a Monetary Economy,* USA: Kessinger Publishing, LLC.

2) Diulio, E. A.(1983). *Theory and Problems of Macroeconomic Theory*, Singapore: Schaum's Outline Series, McGraw-Hill Book Company.

3) Rana, K.C. & Verma, K.N. (2009). *Macroeconomic Analysis*, Jalandhar: Vishal Publications.



13.11 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: According to the fundamental psychological law of consumption, human beings, in general and on an average are disposed to increase their consumption when their income increases but not as much as the increase in their income.

Ans to Q No 2: Linear and non-proportional.

Ans to Q No 3: $C = C_a + bY_d$

Ans to Q No 4: a) The traditions, customs, and mores that determine the consumption behavior of a community remain unchanged. Keynes believed that behavioural changes can not occur in the short run.

b) It is also assumed that normal circumstances prevail in the economy. Abnormalities like war, famines, hyper inflation etc. are ruled out.

c) The economy concerned is a developed free market economy.

Ans to Q No 5: The two technical concepts of consumption function are Average Propensity to Consume and Marginal Propensity to Consume.

Ans to Q No 6: The slope of the consumption line represents the MPC.

Ans to Q No 7: APC changes with changes in income.

Ans to Q No 8: APC = 0.8, and MPC = 0.8.

Ans to Q No 9: The autonomous consumption represents the consumption which is influenced by the non-income determinants.

Ans to Q No 10: The non-income determinants of the Keynesian function has been divided into subjective and objective factors.

Ans to Q No 11: The aggregate consumption expenditure is likely to go up as income holders will expect a rising income due to growth

Ans to Q No 12: (a) False (b) False

Ans to Q No 13: Autonomous investment is independent of change of income, but induced investment depends on level of income.

Ans to Q No 14: The investment expenditure which is related in some way with the current income, output and sales is termed as *induced investment*. If there is a change in income and output, it will result in change in induced investment. Since the incentive for such an investment is the direct consequences of the change in current income, output or demand.

Ans to Q No 15: (b)

Ans to Q No 16: The three criteria that a business firm takes into consideration in making an investment decision are:

- the cost of the capital asset,
- the expected rate of return from it during the life time, and/or
- the market rate of interest.

Ans to Q No 17: Levels of present and future consumer demand affect the level of investment in the economy. For example, if the current demand for consumer durables is increasing more rapidly, it will attract more

investment to that sector.

Ans to Q No 18: If population growth rate in the economy is higher, it could mean a larger market and hence level of investment is also likely to be higher. On the contrary, a declining populaiton results in a shrinking market for goods, thereby lowers the inducement to invest..



13.12 MODEL QUESTIONS

Q1: Mention any five important implications of the Keynesian Consumption Function.

Q2: What are the major criticisms of the theory of Keynesian Consumption Function?

Q3: Write a short note on marginal efficiency of capital.

Q4: Write a short note on autonomous investment and induced investment. Differentiate between the two.

Q5: What is menat by autonomous investment and induced investment? Differentiate betwee the two.

Q6: What is Keynesian Consumption function? What are the implications of this consumption function?

Q7: Elaborate the concepts of the average propensity to consume and marginal propensity to consume.

Q8: Discuss the non-income determinants of the Keynesian consumption Function.

Q9: What do you mean by marginal efficiency of capital? How does marginal efficiency relate to the rate of interest?

Q10: Discuss the factors affecing the marginal efficiency of capital.

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UNIT 14: BUSINESS CYCLES

UNIT STRUCTURE

14.1 learning Objectives

14.2 Introduction

14.3 Business Cycles

- 14.3.1 Meaning and Definition
- 14.3.2 Features of Business Cycles
- 14.3.3 Different Phases
- 14.3.4 Significance of the Phases

14.4 Causes of Business Cycles

14.5 Theories of Business Cycles

- 14.5.1 Multiplier-Accelerator Interaction: Samuelson's Theory of Business Cycles
- 14.5.2 Hick's Theory of Trade Cycles

14.6 Control of Business Cycles

14.7 Let Us Sum Up

14.8 Further Reading

14.9 Answers to Check Your Progress

14.10 Model Questions

14.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- describe the concept of business cycles and discuss the different phases of business cycles with their significance
- explain different features, causes and effects of business cycles
- discuss the theories of Business Cycle
- put forward anti-cyclical measures.

14.2 INTRODUCTION

Economists have pointed out that a capitalist economy passes through certain phases. This means that even when a capitalist economy

(for example economy of USA or the UK economy) experiences growth (growth in output, income and employment) over a longer period of time, there are some ups and downs in the economic activity of these economies. Interestingly, these ups and downs are recurring in nature; more or less they occur at regular intervals; though the time period of their occurrence is not fixed.

Economists have termed such ups and downs as business cycles. Keynes used the term trade cycles instead of business cycles. The ups and downs have been divided into certain phases. This unit discusses meaning, definition, features and the various phases of this phenomenon. At the end of this unit, you will be able to forward some of the important anti-cyclical measures as well.

14.3 BUSINESS CYCLE

Business cycle is one of the complex phenomena that a capitalist economy faces. Economists have tried to explain this phenomenon from different perspectives. They seem to be divided equally while discussing the basic concepts like causes and phases as well. We shall however try to put forward the most common observations on the topic.

14.3.1 Meaning and Definition

Broadly speaking, business cycles are a kind of fluctuations which occur in business activities in an economy with a certain degree of regularity and which follows the different phases in certain sequence. Different economists have tried to define the term business cycles differently. In the following, we discuss some of the important definitions.

The definition put forward by Wesley C Mitchell and Arthur F Burns is considered to be the most comprehensive. According to them,

[Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work

mainly in business enterprises : a cycle consists of expansions occurring

at about the same time in many economic activities followed by similarly general recessions, contractions and revivals which merge into the expansion phase of the next cycle; this sequence of change is recurrent but not periodic in duration; business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles with amplitudes approximating their own.]

This definition highlights the following points:

- Business cycles emerge in organised capitalist economies.
- Cyclical fluctuations are important features of such economies led by private entrepreneurs.
- Business cycles refer to the fluctuations in aggregate economic activity.
- The phases of expansion, recession, contraction and revival occur and re-occur in a definite sequence.
- The cyclical fluctuations are recurrent but not periodic. This means that they re-occur. But their re-occurrence does not follow a definite time-frame.

Keynes has defined business cycles (he used the term trade cycles) as "*A trade cycle is composed of periods of good trade characterised by rising prices and low unemployment percentages altering with periods of bad trade characterised by falling prices and high unemployment percentage."*

Haberler defines the term in these simple words: *"The business cycle in the general sense may be defined as an alteration of periods of prosperity and depression of good and bad trade."*

14.3.2 Features of Business Cycles

Business cycles are very complex phenomena to explain. However, some of the common features may be explained. Some of the features of business cycles are as follows:

- **Affect the Whole Economy:** Business cycles affect the whole economy. Business cycles often emerge in regular intervals and it affects all the sectors of an economy. Temporary and partial fluctuations are not considered as trade cycles or business cycles.
- **Different sectors are affected with different intensities:** Even when all the sectors of the economy are affected by business cycles, during the phases of depression and prosperity, but all sectors of the economy do not feel the same pressures. For example, capital goods producing industries suffer more**.**
- **Irregular Time Duration:** A business cycle may complete its phases in a period of 5 to 10 years. Sometimes, this period may extend to more than 10 years while it may also last less than 5 years**.**
- **International by Character:** In today's age of Globalisation, countries of the world are closely connected with each other through international trade. As a result, prosperity or depressionary shocks in one part of the world affects all the countries. As a result, if depression emerges in a big economy, its repercussions are felt in many other countries of the world.
- **Recovery is comparatively slower than recession:** The trough of depression phases, (we shall discuss these phases in detail in the next sub-section) contains the vital seeds for recovery while the boom of expansion contains the germs of recession. But international experiences suggest that usually recovery is slower than recession.
- **Complex in Nature:** Business cycles are very complex phenomena to explain. Their emergence are results of myriad factors. This is the reason, why all trade cycles do not have uniform characteristic and causes. Due to this reason it is difficult to make accurate prediction of trade cycles before their occurrence.

- **An Overall Growth Trend across different Business Cycles:** Even when the economy suffers from business cycles from time to time, as the market economy grows over a long period of time, there seems to be overall growth trend. This means that the peak level of every next trade cycle occurs at a higher level of national income than the previous trade cycle**.** We have explained this phenomenon graphically in the next sub-section of this Unit.
- **Business Cycles affect beyond the Economy:** The affects of business cycles are not limited to economic activities only. In fact, they cause serious social consequences as well. It affects behaviour of people, and also results in increase in social crimes etc.

14.3.3 Different Phases

Business cycles consist of four phases viz., expansion (also called boom, upswing or prosperity); peak (also called turning point); contraction (also called downswing, recession or depression) and trough (also called lower turning point). We shall now consider the following figures depicting different phases of business cycles as has been shown in Figure 14.1. Then, we shall briefly discuss the significance of each of the phases.

Figure 14.1: Four Phases of Business Cycles without Growth Trend

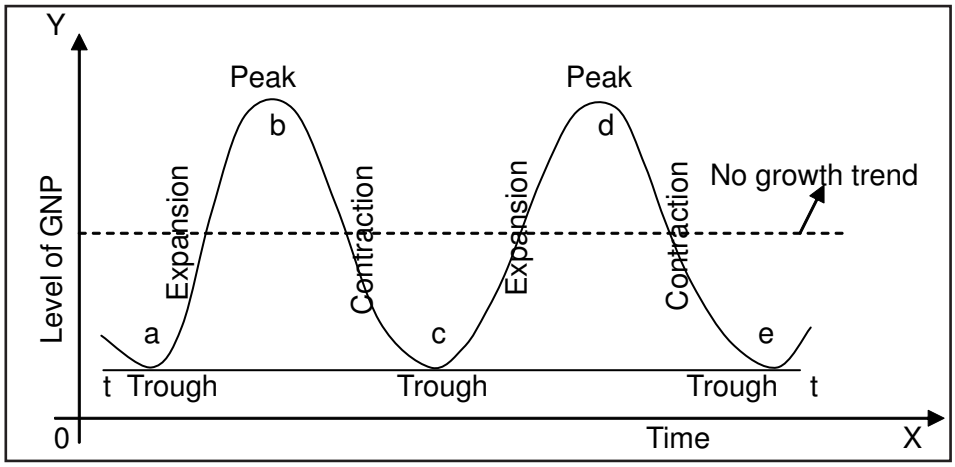


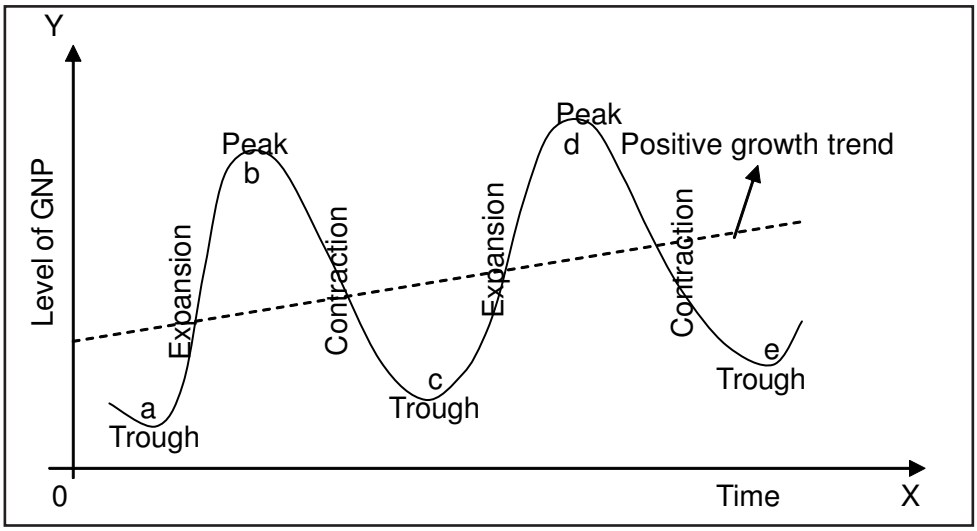
Figure 14.1 depicts the different phases of business cycles. From the figure it can be seen that the initial phase of the economy is at point a. This is termed as trough or depression. The economic activities (output, employment) are lowest at this level. With revival in the economy, the economy moves from a toward b. This is called expansion phase of business cycles. The economic activities prosper most during this phase. It reaches the peak level at point b. Level of output, employment and income all remain high at this stage. But the economic activities do not remain at such peak levels (we shall discuss its causes later while elaborating each of the phases) for all the time. The economy has to come down after some time. Thus, the economy activities gradually slow down and it moves from b to c. This phase (movement from b to c; i.e, until it reaches c) is called contraction. When the economy reaches its lowest level at c, it faces the stage of trough (or, depression) once again. This is just the repeat of the stage a. After the economy reaches the stage of depression, it gradually tends to recover and the business activities start to expand. Thus, the previous movement from a to b is repeated when the economy moves from c toward d. When it reaches the peak of the expansion phase at d, the economy grows to the highest level. After some time, it gradually starts to come down; which is simply the repeat of the previous stage from d to e. As it reaches point e, the depression phase of the economy is repeated once again.

Further, you will notice from the Figure 14.1 that as the economy passes though these phases, the overall economic activities have remained stagnant. This means that the level of output, employment and income has remained the same at each corresponding phases of the cycles. This can be found out from the fact that when the economy passes through the trough (depression) stages at different times viz., a, c and e, the level of economic activities has remained the same. This is obvious

from the fact that all these points are tangent to the line tt parallel to the x-axis. This can be found out by drawing a parallel to the x-axis line through the mid-points of expansion and contraction phases of the business cycles as well. The dotted line in the figure thus, represents a dynamic stability i.e., no growth trend over the years. No growth in output, employment and national income has been thus experienced over the period.

Contrary to this, economists like J R Hicks has pointed out even when the economy passes through these phases repeatedly, but they actually experience cyclical fluctuations rather than dynamic stability. This means, the level of economic activities do not remain the same over the years; thus, overall it grows. In such cases, when we depict a dotted through the mid-points of expansion and contraction phases, it will show positive growth in the economic activities. This has been shown with the help of Figure 14.2.

Figure 14.2: Four Phases of Business Cycles with Growth Trend



From the above figure 14.2 it is obvious that the economy passes through the same phases as it does in case of previous Figure 14.1. The only difference however in this case is that the dotted line drawn through the mid-points of expansion and contraction phases shows a positive growth trend. This means over the years, there is expansion in output, employment and

income even when it passes through the same phases. Such movements of the business cycles thus depict cyclical fluctuations rather than dynamic stability.



LET US KNOW

It is to be noted that an economy may not follow each of the phases of business cycles in proper sequence as suggested by the curve of business cycles. Examples are available which show deviations from theoretical understanding of it. In 1929, the economy of England passed through Great Depression. Prior to the Great Depression, the depression phase of the England economy seemed to have stabled; thus, it should have actually moved towards expansion. But to the contrary, it moved towards the Great Depression. Again, the USA economy in 1937 once again moved towards recession (contraction phase) after it had recovered from the same phase.

Again, the time period of each of the phases is also not fixed. Sometimes, an economy may recover quickly, while at another instance it may require longer time to recover.

14.3.4 Significance of the Phases

Let us now discuss the significance of each of these phases in brief.

Expansion and Peak: During the phase of expansion, the economic activities start to expand. The level of output, income and employment rises. It gains the highest level of prosperity when it reaches the peak point of the business cycles. Economy reaches the highest level of national income. It means that there is no difference between the potential level of national income of the economy and the actual level. The demand for output (goods and services including durable consumer goods) reaches the highest level; it reaches the level of full employment as well.

However, the economy does not sustain at this level for good. It takes the turning point toward decline in economic activities. Economists differ regarding the possible causes for such down turn. Keynes has made falling MEC (decline in expected rate of profit) responsible for this. ***Monetary economists*** point out that contraction in bank credit may be responsible for this.

Contraction: As stated above, the economic activities tend to decline. Thus, the level of employment, output and income declines. There exists large scale ***involuntary unemployment*** in the economy. The rate of interest also falls. As a result, people choose to hold cash in hand rather than keeping deposits in the bank. Industries accumulate a large volume of excess capacities as the level of production declines.

Trough or Depression: As the economy reaches the lowest level of economic activities, the economy reaches the phase of trough. The whole economy tends to break down during this phase. If sustained for a long time, it may lead to depression. The Great Depression of 1929-33 may be cited as an example which causes immense human suffering.

The depression phase of the economy will not however lead to prosperity automatically. If left at its own, the depression phase may sustain for an inordinately long period. The government must come to its rescue; it will have to undertake policies for the revival of the economy like stabilization policy, monetary measures like expansion of credit facility etc. such that the entrepreneurial spirit can be revived and promoted.



CHECK YOUR PROGRESS

Q 1: Match the following sets (A) with (B). Write the correct options in the alongside boxes.

Set (A)	Set (B)
(i) Expansion	(a) Turning point
(ii) Peak	(b) Boom

(iii) Contraction (c) Lower turning point

(iv) Trough (d) Recession

Q 2: Do you agree that the economy will automatically recover from the depression phase of business cycles? Give your arguments.

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14.4 CAUSES OF BUSINESS CYCLES

We have already mentioned that business cycles are complex phenomena. It is very difficult to list out the causes to its emergence. Even then, economists and others operating in the market have tried to list a few causes to its emergence. Some have tried to categorise them as monetary and non-,monetary factors while others have tried to attribute them to psychological factors. Samuelson has pointed out two sets of factors responsible for the emergence of business cycles: external and internal. Let us dicuss these factors in brief.

External factors: External causes of business cycles emerge outside the economy and may range from sunspots, enviornmental disturbances, wars, revolutions, political events, gold discoveries, growth rate of population, migration, industrial discoveries and innovations etc. For example, political instability in a big influential economy may adversely affect the economic environment of that country along with the other economies who are closely linked with that economy in terms of international trade etc. An innovation like the railroads, telecommunication brought unprecendented business opportunites to the economies. Economic activities like investment, consumption saw mainfold increase with such innovations. Similarly, situations like wars, famine, major earthquakes etc. in one part of the world adversely affect the economic activities in the rest of the world often causing chain reactions in the global economy.

Internal factors: The internal causes of business cycles emerge from within the economy. Haberler has broadly classified them as monetary and non-monetary factors. The monetary factors include bank credit, over-saving or under-consumption and over-investment.

Monetary economists like Hawtrey, Friedman and others have pointed out that cyclical fluctuations are caused by expansion and contraction of bank credit. Expansion of bank credit leads to higher demand of goods and services while contraction limits the demand. Thus, they argue that increase in money supply (expansion in bank credit) brings prosperity and a decrease leads to depression.

Economists like Hobson, Foster and Douglas argue that over-saving or under-consumption leads to depressionary phase of an economy. They argue that the rich section of the people do not spend their entire income on consumption. As a result, they tend to save and invest more. This leads to over-production of consumer goods. The poor section of the economy on the other hand, though have higher propensity to consume, lack sufficient income in their hand to purchase the consumer goods. Thus, there is a supply and demand gap in the economy. While supply is more, demand tends to be less. As a result, stocks of consumer goods pile up. This further leads to fall in prices of consumer goods and the income of the producers. The final consequence is that depression sets in the economy.

Economists like Hayek, Cassel and Robertson makes similar arguments. However, they have pointed out that rather than under-consumption, it is over-investment that leads an economy towards depression. According to them, due to availability of bank credits, over-investment is experienced in capital-goods industries compared to the consumer-goods industries. As a result, money supply exceeds the amount of voluntary savings. While increased money supply leads to a boom phase in the economy, due to lack of voluntary savings, banks remain unable to supply sufficient credits for a longer period of time. In this way, over-investment leads to a depression in the economy.

The important non-monetary factors that cause business cycles include: macro economic environment, competition, psychological causes, innovations etc.

When the local and global macro economic environments are stable and pass through a boom phase, there is a general positive sentiment across the world economy. As a result, businesses in most of the countries experience a high demand and go into a high growth cycle. On the contrary, when global economy passes through an economic slowdown with cyclical unemployment, the general business environment also experiences a recessionary phase. This also adversely affects the local economy of the country. On the other hand, if the local economy (particularly, the major economies of the world) experiences serious economic downturns, they are bound to adversely affect the local businesses, even if the rest of the global economy is going through a growth cycle.

Chapman points out that competition may also lead to over-production, which ultimately leads to a depressionary situation. Pigou pointed out that psychological factors like 'over optimism' and 'over pessimism' lead to depression. According to him, over optimism of the business class leads to over-production in the economy, while over-pessimism leads to under-production. Pigou points out that these psychological factors of the business class act like alternating waves, and as a result of these reversals, business cylces occur in an economy.

Schumpeter points out that innovations in an economy are the sources of business fluctuations. He puts it succinctly: 'the cause of depression is prosperity'. He argues that innovations in one field leads to innovations in other fields. Soon, over-production results in the economy which further leads to depression.

14.5 THEORIES OF BUSINESS CYCLES

14.5.1 Multiplier-Accelerator Interaction: Samuelson's Theory of Business Cycles

In the previous unit, we have pointed out a few factors for the emergence of business cycles. J. M. Keynes also made significant

contributions to the understanding of business cycles. He maintained that business cycles are the results of ups and downs in investment demand. In Chapter 22 entitled 'Notes on the Trade Cycles' of his famous book "The General Theory of Employment, Interest and Money", Keynes argued that the problem of business cycle (Keynes used the term Trade cycle) in the economy was caused 'by a cyclical change in the marginal efficiency of capital, though complicated and often aggravated by associated changes in other significant short-period variables of the economic system.' Thus, according to Keynes, the prime factors of cyclical fluctuations in the economy stems from investment changes generated by the cyclical changes in the marginal efficiency of capital.

In his theory of business cycles, Keynes, with the help of the multiplier theory has shown the effect of increase and decrease in investment on output and employment get magnified when multiplier is working during either the upswing or downswing of a business cycle. However, he did not explain the cyclical and cumulative nature of the fluctuations in economic activity. This is because he did not lay any emphasis on utilising the accelerator in the explanation of business cycles.

Later economists tried to utilise both the multiplier and the interaction principles to explain economic phenomena including business cycles. Samuelson was among the pioneers. He showed that the interaction between the multiplier and accelerator caused cyclical fluctuations in economic activities.

The basic tenet of the Samuelson's model is that multiplier alone cannot adequately explain the cyclical and cumulative nature of the economic fluctuations. An autonomous increase in the level of investment raises income by a magnified amount depending upon the value of the multiplier. This increased income further acts as an inducement to increase investment through the acceleration effect. Thus, the increase in income raises aggregate demand for goods and services. To fulfil the increased demand of more goods, the

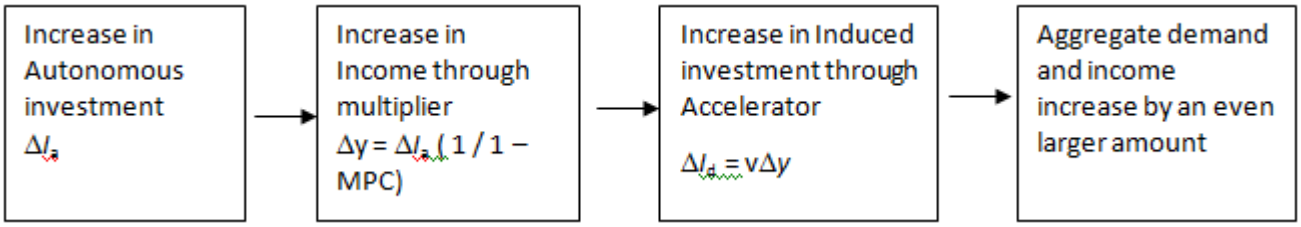
economy would require more capital goods for which extra investment is needed. In this way, the relationship between investment and income is one of mutual interaction; investment affects income which in turn affects investment demand and in this process income and employment fluctuate in a cyclical manner.

Samuelson's model rests on the following assumptions:

- Consumption spending in the current period is related to the change in income in the preceding period.
- Investment in the current period is related to the change in income with a lag of one period.
- There is also an additional factor in the form of exogenous (government) spending, which is constant.
- The model does not consider the determinants of this exogenous spending nor the effects of it's changes on the level of income.

Working of the Model: To explain the working of the Samuelson's model, let us first consider the following Figure 14.1 which explains with how income and output will increase by even larger amount when accelerator is combined with the Keynesian multiplier.

Figure 14.1: Combining Accelerator with Keynesian Multiplier



In Figure 14.1, "I_a = Increase in Autonomous Investment, "Y = Increase in Income, 1/ 1 –MPC = Size of Multiplier where MPC = Marginal Propensity to Consume, "I_d = Increase in Induced Investment, v = Size of accelerator.

The model of interaction between multiplier and accelerator can be mathematically represented as under:

$$Y_t = C_t + I_t \qquad \ldots(i)$$

$$C_t = C_a + c\ (Y_{t-1}) \quad \ldots(ii)$$

$$I_t = I_a + v\ (Y_{t-1} - Y_{t-2}) \quad \ldots.(iii)$$

Here Y_t, C_t and I_t stand for income, consumption and investment respectively for a period t, C_a stands for autonomous consumption, I_a for autonomous investment, c for marginal pro-pensity to consume and v for the capital-output ratio or accelerator.From the above three equations and from the assumptions of the model we have already discussed, it can be seen that consumption in a period t is a function of income of the previous period Y_{t-1}. Similarly, induced investment in period t is a function of the change in income in the previous period. This further implies that there is two periods gap for changes in income to determine induced investment (consider the second assumption of the model).

Now, in the equation (iii) above, induced investment equals $v(Y_{t-1} - Y_{t-2})$ or v ("Y_{t-1}).

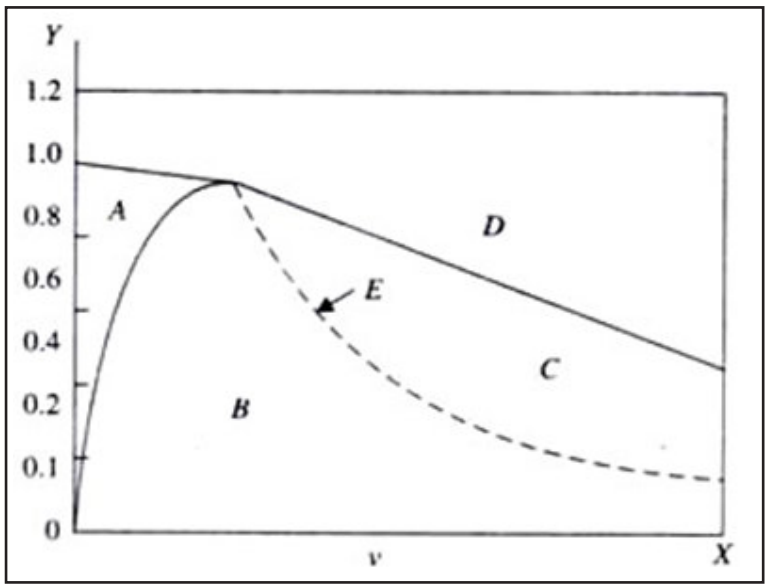
Substituting equations (ii) and (iii) in equation (i) we get the following income equation (iv).

$Y_t = C_a + c\ (Y_t -_1) + I_a + v\ (Y_{t-1} - Y_{t-2})$ …(iv)

Equation (iv) explains how changes in income are dependent on the values of marginal propensity to consume (c) and capital-output ratio v (i.e., accelerator).

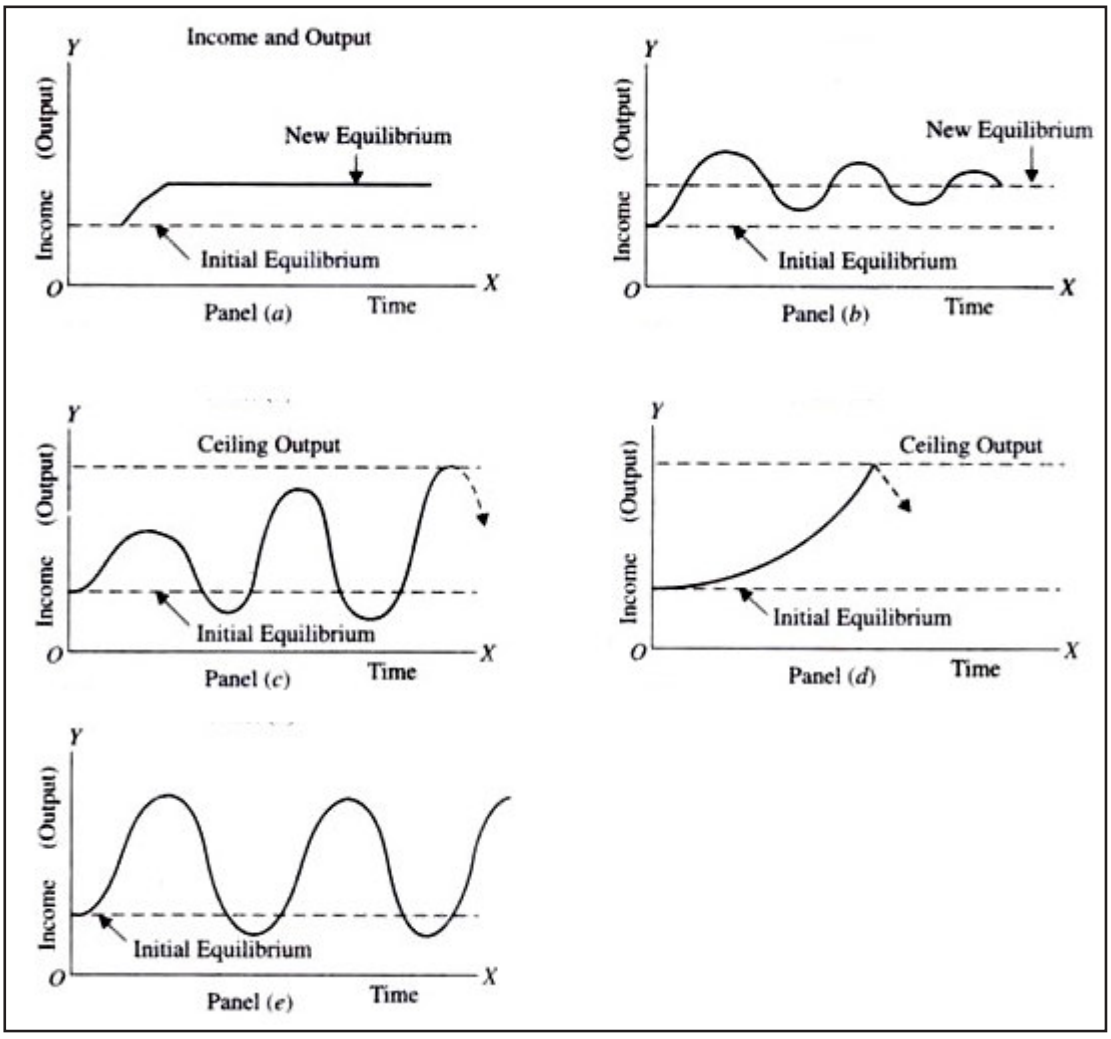
With the help of different combinations of the values of marginal propensity to consume (c) and capital-output ratio (v), Samuelson explained different paths which the economy will follow. The various combinations of the values of marginal propensity to consume and capital-output ratio (which respectively determine the magnitudes of multiplier and accelerator) have been shown with the help of Figure 14.2.

Figure 14.2: Combination of Multiplier and Accelerator



The above figure 14.2 though seem simple, is yet actually a combination of five distinct patters, marked by A to E. These paths or patterns of movements which the economic activity (as measured by gross national product or income) can have depending upon various combinations of the values of marginal propensity to consume (c) and capital-output ratio (v) have been explained with the help of Figure 14.3.

Figure 14.3 (panel a to e): Interaction between multiplier and accelerator (Different patterns of income (output) movements for various values of c and v.



Explanation of different panels of Figures 14.2 and 14.3: When the combinations of the value of marginal propensity to consume (c) and capital-output ratio (v) lie within the region marked A (in Figure 14.2), with a change in autonomous investment, the gross national product or income moves upward or downward at a decreasing rate and finally reaches a new equilibrium as is shown in panel (a) of Figure 14.3.

Now, if the values of c and v are such that they lie in region B (in Figure 14.2), the change in autonomous investment or

autonomous consumption will generate fluctuations in income which follow the pattern of a series of damped cycles whose amplitudes go on declining until the cycles disappear as is shown in panel (b) of Figure 14.3.

Similarly, region C in Figure 14.2 represents the combinations of c and v which are relatively high as compared to the region B and determine such values of multiplier and accelerator that bring about explosive cycles, that is, the fluctuations of income with successively greater explosive growth. This situation has been shown in panel (c) of Figure 14.3. In the figure it has been seen that the system tends to explode and diverges greatly from the equilibrium level.

The region D in Figure 14.2 provides the combinations of c and v which cause income to move upward or downward at an increasing rate which has somehow to be restrained if the cyclical movements are to occur. This has been explained in subsequent panel (d) of Figure 14.3. Like the values of multiplier and accelerator of region C, their values in region D cause the system to explode and diverge from the equilibrium state by an increasing amount.

In a special case when values of c and v (and therefore the magnitudes of multiplier and accelerator) lie in region E in Figure 14.2 , they produce fluctuations in income of constant amplitude as is shown in panel (e) of Figure 14.3.

Thus, we have seen **the interaction of multiplier and accelerator in case of various values of m**arginal propensity to consume (c) and capital-output ratio (v). On the basis of the interaction of the multiplier and accelerator the two categories of business cycle theories have been put forward.

One category of these business cycle theories assumes the values of multiplier and accelerator which generate explosive cycles. For example, Hicks' theory of business cycles falls in this category. On the other hand, Hansen has propounded a business cycle theory based on the interaction of multiplier with a weak

accelerator which produces only damped oscillations. In the next section, we shall discuss Hicks' theory of business cycles.



CHECK YOUR PROGRESS

Q3: State whether the follwing statements are True (T) or False (F).

(a) Keynes utilised the multiplier-accelerator interaction technique to explain trade cycles. (T/F).

(b) Samuelson assumed consumption to be a factor of income of the preceding period (T/F)

Q 4: Mention the assumptions of the Samuelson's theory of business cycles. (Answer in about 50 words).

14.5.2 Hick's Theory of Trade cycles

Hicks presented his theory of trade cycles in his book 'A Contribution to the Theory of Trade Cycle' published in the year 1950. Even after more than 50 years of publication, his theory continues to remain prominent in the discussion of the theory of trade cycles. Hicks' theory of trade cycles is based on three important concepts, viz., J M Keynes' multiplier analysis, J M Clark's acceleration analysis and Harrod's growth analysis.

Assumptions of the Theory: Before discussing Hicks' theory of business cycles in detail, let us consider the assumptions on which the theory rests. These assumptions are:

- Hicks has assumed that the economy is in equilibrium initially.
- The economy is progressive in the sense that autonomous investment increases at a constant rate such that the economy over the period of time does not remain static at one point. This

means the economy faces the situation of dynamic equilibrium (please recall/review the discussion in the previous unit).

- Consumption in the current period is a function of income of the previous period. Symbolically, it can be represented by $C_t = f\ Y_{t-1}$; where C means consumption, Y means income and t represents time. This is different from Keynes analysis where he assumed consumption to be a function of current income.
- Induced investment in the current period is a function of change in output of the previous period. Symbolically, it can be represented by $I_t = f(Y_{t-1} - Y_{t-2})$; where I means investment, Y means income and t represents time.
- Values of multiplier and accelerator remain fixed.
- There exists a limit to upward limit of growth (Hicks used the term 'ceiling') of the economy. It cannot grow beyond the full employment level of output.
- There is no such direct constraint in the downward (i.e., contraction) movement of the economy. However, there exists indirect constraints. This is due to the fact that ***disinvestment*** can not exceed depreciation cost (termed as transformation of the accelerator) acts as the indirect constraint. Again, gross investment can not fall below zero. Thus, it means that just like as the upward limit, there also exists a downward limit (Hicks used the term 'floor') to fluctuations.

Distinctive Features of the Theory: Though Hicks' theory is based on three earlier concepts, his theory possesses certain distinctive features. Before explaining the theory, it will therefore be better to consider these distinctive features in brief.

- **Ceiling and floor limits to growth:** Hicks propagates that there exists a ceiling (i.e. upper limit) to growth. Thus, according to him, interaction between the accelerator and multiplier (termed as 'leverage effects') cause the economy to grow at cumulative rates. Such growth continues till it reaches the level of full employment. In a dynamic economy however, due to rising ceiling, and hence it

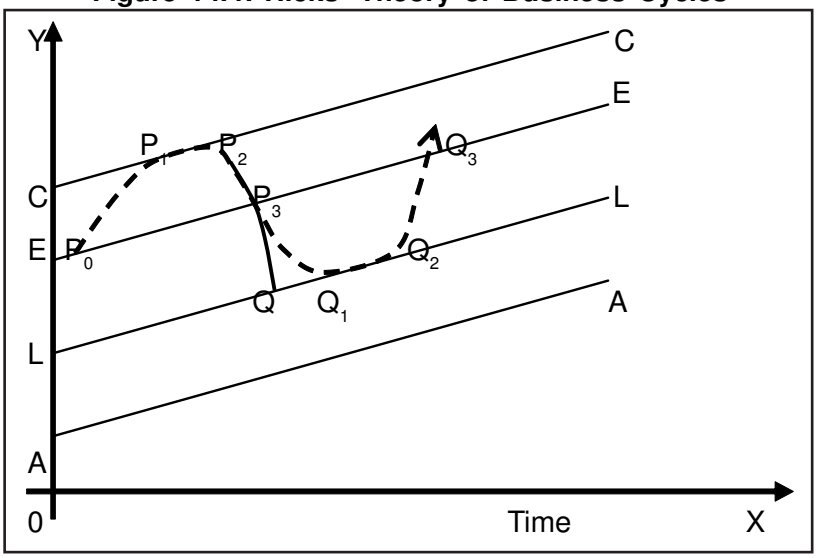
may take longer time (compared to a static economy) to reach the ceiling.

The economy starts to take downward swing after it reaches the ceiling. The downward turn however depends on the availability of resources viz., population, technology, capital stock etc. The economy in fact may not be able to reach the ceiling and take downward turn if the leverage effect (interaction between multiplier and accelerator) is not strong enough. In fact, the economy may sustain at ceiling and creep along this level for sometime (we shall discuss about this while explaining the theory). It is to be remembered that according to Hicks, while both multiplier and accelerator tend to push up the economy toward ceiling, but its downturn depends only on the multiplier (as accelerator remains inoperative most of the times). This in fact, reduces the rate of decline in growth less as it could have been if both the multiplier and accelerator were in action. Again, according to Hicks though there is no direct constraint in the downward movement of the economy, there exists indirect constraints as we stated earlier. These constraints are: *first,* gross investment can not fall below zero. *Secondly,* even at this lower level, some basic investment (or, disinvestment) as takes place for replacing inventories and equipment. Again, autonomous investment starts increasing and is higher than the amount of disinvestment. Thus, increase in net investment causes an upturn of aggregate income and pushes the economy towards expansion phase.

- **Rising trend of cycle:** Another distinctive feature of Hicks theory of business cycles has been the rising trend of the cycles. Hicks has assumed that even the economy move through a growth path even when it faces the different phases of trade cycles (please recall/ review the discussion of the previous unit). This assumption is quite realistic and matches the real working of an economy.

  Explanation of the Theory: We shall explain Hicks theory in terms of the four phases of trade cycles we have discussed already. The theory can be explained with the help of the figure 14.4.

Figure 14.4: Hicks' Theory of Business Cycles



In figure 14.4, the line AA shows autonomous investment, which is assumed to be growing at a constant rate 'g'.

- EE shows the equilibrium path of output which depends upon the level of autonomous investment (AA). This equilibrium path is affected by the interaction of multiplier and accelerator.
- LL represents the lower equilibrium path of output.
- FF represents the highest level of full employment (i.e, the ceiling point). In general, it is above the equilibrium path EE and is assumed to grow at the same rate at which AA is growing.

The four phases of the trade cycle as have been shown with the help of the above figure are as follows.

- **prosperity:** As we have stated earlier, P_0 is the initial equilibrium point. Now, as autonomous investment is increased at the rate 'g' and the interaction of the multiplier and accelerator pushes the economy upward toward the ceiling path CC. CC represents the path of full employment equilibrium. Thus, the economy reaches the point of P_1. Now as we have discussed already, we are concerned with a dynamic economy which exhibits dynamic equilibrium. Hence, endowed with sufficient manpower, technology and other resources and the ***lagged relationship*** of induced investments actually tends to creep the economy to a higher level even after attainment of the

level of full employment ceiling at point P_1. Thus, the economy creeps from point P_1 to P_2. It is important to note that according to Hicks, full employment ceiling is independent of the path of output. Thus, employment does not depend on output; rather it depends upon the factors like population growth, technological factors etc. Again, these factors have been assumed to grow at the same rate of growth of autonomous investment.

- **Downturn:** Now, the economy can not sustain at ceiling for all the time. It has to make a downturn. As we have discussed already, according to Hicks, the downward movement of the economy may start even before reaching the path of full employment equilibrium, i.e., before touching point P_1. It is interesting to note that while the economy is pushed by the combined forces of multiplier and accelerator, in its downturn the accelerator remains inoperative. As a result its rate of fall becomes less as it could have been if both the forces were to operate (in figure the line P_2P_3Q represents this path). However, as the multiplier is alone operative in the downturn of the economy and due to the indirect constraints we have already mentioned, the economy actually moves towards the path $P_2P_3Q_1$ and not along the path P_2P_3Q.
- **Depression:** You will notice from the figure that as the economy make downturn, it passes the initial equilibrium path EE at point P_3. So, will the economy be stable at this level and be in equilibrium again? The answer is negative. The reverse multiplier effects however pull the economy below EE. The lower limit however is determined by the indirect constraints discussed already. In our case, the line LL depicts that floor limit. The economy thus, reaches the floor limit Q_1.
- **Recovery:** After the economy reaches the floor limit at Q_1, it will not immediately move upward; but it creeps along and reaches a slightly higher floor limit at point Q_2. This movement from Q_1 to Q_2 is basically due to the existence of excess capacity in the economy. Such movement from Q_1 to Q_2 generates some growth in national income.

Again, as autonomous investment is continuously being increased at the rate 'g' and the interaction of multiplier and accelerator will once again move the economy upward towards the growth path Q_2Q_3.

Critical Evaluation: Hicksian theory of trade cycles possesses theb following merits.

- Hicks has made distinct departure from earlier theories of trade cycles with the argument that the economy actually declines at a slower rate. His analysis that the accelerator remains inoperative during downturn of the economy is quite significant.
- The creeping movements both in case of ceiling and floor limits are also quite remarkable. Hicks has shown that the creeping effect at the ceiling point is caused by multiplier-accelerator interaction and the lagged response of investment. Again, the creeping effect at the floor point is caused by absorption of excess capacity. Both these are very sound arguments.
- Linking economic growth with trade cycles is another important milestone.

However, in spite of the above merits, Hicks theory has been criticised on the following grounds:

- The theory has been criticised for being too rigid. The acceleration principle has been utilized in too rigid form.
- Hicks has assumed fixed values for the multiplier and the accelerator. This is quite unrealistic.
- Hicks theory though does not neglect the role of autonomous investment in the economy, but it has been attached a passive role. The increase in autonomous at a constant rate has also been criticised.
- Hicks' argument that the full employment is independent of the path of output has also been criticised.

Despite the above criticisms Hicks theory of trade cycles is considered to be a major contribution in the field. Many critics acknowledge its merit. It is also worth mentioning that even after 50

years of its existence, the theory till today is considered as an important theory in the discussion of trade cycles.



CHECK YOUR PROGRESS

Q 5: State whether True (T) or False (F).

a) Hicks has assumed a static economy in his analysis. (T/F)

b) Hicks has assumed that the economy is initially in equilibrium. (T/F)

Q 6: How according to Hicks does the economy recover after it faces the situation of depression? (Answer in about 60 words)

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14.6 CONTROL OF BUSINESS CYCLES

Different economists put forward different versions of remedial measures based on their arguments of trade cycles. Economists however agree that it is not always possible to avoid cyclical fluctuations in the economy fully. So, they argue that two sets of measures should be adopted. Preventive measures may delay the occurrence of such phenomenon while curative measures will help the economy revive from the crisis.

Remedial measures for prevention of economic crisis depend on diagnosis of the crisis. Certain factors like change in climates or monsoon, availability of raw materials are highly unpredictable and can not be controlled. Again, the economic environment in an agrarian economy is bound to be different from an industrial economy. An agrarian economy however can reduce its dependence on climate through

provision of adequate irrigation facilities. However, certain phenomena like drought, earthquake and epidemics can not be predicted with certainty.

The important economic variables like change in demand, export and import, per capita income, cost of living index, movement of prices etc., however, can be predicted much accurately if there exists a sophisticated and up-to-date statistical system. This may help business community to forecast economic variables to a large extent and follow business decisions accordingly.

The corrective measures on the other hand, can be discussed under the following heads:

Monetary Measures: As you have already known, monetary measures relate to the banking and credit policy of a country. Thus, the central bank of a country has very important role to play in setting the right kind of banking and credit environment of the country. The important measures of a central bank have been discussed in detail in unit 2 of the next course. We just simply mention in this unit that bank rate and open market operations are such two instruments. Thus, in boom conditions, the central bank raises the bank rate with a view to contract the credit supply in the economy. Again, during depression, a policy of cheap money may help stimulate business investment and thus recover the economy. Again, the central bank may also adopt sector-specific credit policies to promote certain sectors of the economy.

Economists however differ regarding the effectiveness of monetary policies to tackle cyclical fluctuations in the economy.

Fiscal Measures: We shall discuss in detail the important fiscal measures adopted by the government in the next course. Fiscal policy, in a wider sense, consists of public spending and appropriate taxation. Keynes was prominent to acknowledge the role of government spending during the period of depression. During depression government should spend beyond its capacity of revenue earning. This means that deficit budget is an important tool during depression. Such government investments are expected to raise the level of employment in the

economy. In the long-run, as the economy recovers, the government should undertake budget-balancing measures to offset any adverse effects on the economy. Such measures will help the economy to stabilise in the long-run.

Again, the similar taxation policies are suggested:

- Tax structure and tax rates should be designed such that the business firms are motivated to undertake investment decisions.
- Government should provide employment benefits to the employees. This will help in boosting up the domestic consumption levels.
- Monetary measures should be suggested such that credit availability is enhanced.
- An appropriate international economic policy should be followed so that the domestic export sector is promoted.

International Measures: Business cycle is an international phenomenon and the fluctuations in a country will also affect other countries as well (especially in the present era of globalisation). Three measures are suggested to control depression phase of the business cycles (viz., international production control, international buffer stocks and international investment control). International production control tries to control the prices and production of primary products. Buffer stocks go hand in hand with production and price control. Buffer stocks mean holding stocks of primary commodities as a measure to wipe out price fluctuations. Thus, buying buffer stocks during slump or low-price and releasing the same when prices are high can help the economy ease out. Similarly, international investment controls are adopted to promote economic development of the backward regions of the developed economies. Such efforts have long-run effects on raising the living standard as well as reducing economic inequalities among the under privileged people.



CHECK YOUR PROGRESS

Q 7: State whether the following statements are True (T) or False (F).

(a) Preventive measures help the economy revive from depression. (T/F)

(b) Keynes was critical of government investment during depression. (T/F)

Q 8: Why are the international measures important in controlling depression? What international measures are generally adopted? (Answer in about 50 words)

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14.7 LET US SUM UP

- Business cycle is one of the complex phenomena a capitalist economy faces.
- Business cycles consist of four phases viz., expansion (also called boom, upswing or prosperity); peak (also called turning point); contraction (also called downswing, recession or depression) and trough (also called lower turning point).
- It is to be noted that an economy may not follow each of the phases of business cycles in proper sequence as suggested by the curve of business cycles. Again, the time period of each of the phases is also not fixed. Sometime, an economy may recover quickly, while at another instance it may require longer time to recover.
- Samuelson was among the pioneers to use multiplier-accelarator interaction to explaion the phenomenon of business cycle. He showed

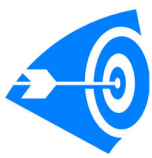
that the interaction between the multiplier and accelerator caused cyclical fluctuations in economic activities.

- The basic tenet of the Samuelson's model is that multiplier alone cannot adequately explain the cyclical and cumulative nature of the economic fluctuations.
- Hicks theory of trade cycles is considered as a significant contribution in the field.
- Various measures are suggested for the prevention of and cure from cyclical fluctuations. Monetary measures like bank rate operations and credit control are important for the control of inflation. However, economists differ regarding the effectiveness of the monetary measures.
- Anti-cyclical fiscal measures consist of public spending and appropriate taxation. .



14.8 FURTHER READING

1) Ajuja, H.L. (2007) : Macroeconomics: Theory and Policy (Twelfth Edition), S.Chand & Co., New Delhi
2) Gupta and Rana (1997) : Keynes Post-Keynesian Economics, Kalyani Publisher, Jalandhar
3) Rana and Verma (1998) : Macroeconomic Analysis, Vishal Publications,Jalandhar
4) Shapiro, Edward (1988) : Macroeconomic Analysis (Fifth Edition), Galgotia Publications pvt.ltd



14.9 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No. 1:

Set (A)	Set (B)
(i) Expansion	(b) Turning point

(ii) Peak (a) Boom

(iii) Contraction (d) Lower turning point

(iv) Trough (c) Recession

Ans to Q No. 2: The depression phase of the economy will not automatically recover. If left at its own, the depression phase may sustain for an inordinately long period and this may ruin the whole economy. The government must come to its rescue, especially for the revival of the economy through adoption of stabilization policy, monetary measures etc.

Ans to Q No 3: (a) False (b) True

Ans to Q No 4: Samuelson's model rests on the following assumptions:

- Consumption spending in the current period is related to the change in income in the preceding period.
- Investment in the current period is related to the change in income with a lag of one period.
- There is also an additional factor in the form of exogenous (government) spending, which is constant.
- The model does not consider the determinants of this exogenous spending nor the effects of its changes on the level of income.

Ans to Q No 5: a) False b) True

Ans to Q No 6: According to Hicks, the economy will not automatically recover from the floor limit of trade cycles. Rather it tends to creep along this floor limit and reaches a slightly higher point than this. This movement is basically due to the existence of excess capacity in the economy and it generates some growth in national income. Again, as autonomous investment is continuously being increased at a constant rate and the interaction of multiplier and accelerator will once again move the economy towards the growth path.

Ans to Q No. 7: a) False b) False

Ans to Q No. 8: Business cycles is an international phenomenon and the fluctuations in a country will also affect other countries as well (especially in the present era of globalisation). This

necessitates adoption of international measures for the control of business cycles.

Three measures are suggested to control depression. They are a)international production control b) international buffer stocks and c) international investment control.



14.10 MODEL QUESTIONS

Q 1: What do you mean by business cycles? Briefly discuss its various phases.

Q 2: Discuss the various phases of business cycles.

Q 3: Enumerate the significances of various phases of business cycles.

Q 4: Discuss critically Hicks' theory of Business cycles.

Q 5: What is meant by business cycles? Suggest important anti-cyclical measures.

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UNIT 15: INFLATION, DEFLATION AND STAGFLATION

UNIT STRUCTURE

15.1 Learning Objectives

15.2 Introduction

15.3 Inflation

- 15.3.1 Meaning and Definition
- 15.3.2 Types and Theories: Demand pull and Cost-push Inflation

15.4 Effects of Inflation and Anti-Inflationary Measures

- 15.4.1 Effects of Inflation
- 15.4.2 Anti-Inflationary Measures

15.5 Deflation

- 15.5.1 Meaning and Definition
- 15.5.2 Causes of Deflation
- 15.5.3 Effects of Deflation
- 15.5.4 Anti-Deflationary Measures
- 15.5.5 Inflation vs. Deflation

15.6 Stagflation: Meaning and Concept

15.7 Let Us Sum Up

15.8 Further Readings

15.9 Answers to Check Your Progress

15.10 Model Questions

15.1 LEARNING OBJECTIVES

After going through this unit, you will be able to –

- put forward the meanings of the terms ‘inflation’ and ‘deflation’ and discuss their different types
- discuss the causes that give rise to such phenomena (i.e., inflation and deflation) in an economy, and also enumerate their effects
- explain about demand-pull and cost-push inflation, as well as state about the anti-inflationary and anti-deflationary measures and

- make a comparative analysis between inflation and deflation
- discuss the meaning and concept of stagflation.

15.2 INTRODUCTION

Inflation is a monetary phenomenon characterized by rising prices. However, it is to be noted that inflation is a complex phenomenon and hence it cannot be precisely defined. In this unit, we shall try to look at some of the important definitions of inflation. We shall also discuss its various types, causes and the important anti-inflationary measures.

Deflation is another monetary phenomenon and is termed as opposite to inflation. It is characterized by falling prices. However, only the situation of falling prices is not called deflation. In this unit, we shall discuss its definition, types, causes and effects. Apart from that, the unit will also enable you to state the anti-deflationary measures and finally, to make a comparative analysis between inflation and deflation.

Stagflation is defined as the situation in an economy in which periods of recession and rising unemployment coupled with positive rates of price inflation. In this unit, we shall discuss briefly its meaning and the concept.

15.3 INFLATION

As we have already stated, *inflation* is a monetary phenomenon characterized by a continuous rise in prices. However, the phenomenon of inflation is very complex, and hence it cannot be precisely defined. In this section, we shall try to derive the meaning of inflation and discuss a few important definitions of it.

15.3.1 Meaning and Definition

We have already stated that inflation is a complex monetary phenomenon characterized by *rising prices*. Here, the phrase *rising prices* is important. This is because inflation denotes a situation where the prices are rising continuously and not for

once only. Thus, a sudden increase in the ***price level*** of the economy will not be termed as inflation; unless it is not experienced on a continuous basis. However, it is also true that there can be inflation even without a rise in the price level. This type of inflation may occur during a war period. On account of many controls and rationing that exist during wartime, prices will be kept under check. But the moment controls are withdrawn, prices will go up. So the real test of inflation is neither an increase in the amount of money nor a rise in prices, but the appearance of abnormal profits. Whenever businessmen and producers make huge profits, it is a sign of inflation.

Definition of Inflation: As we have already discussed, inflation is a complex, multi-dimensional phenomenon. Many economists have tried to define it; but often they end up highlighting on certain aspects while leaving aside others. Therefore, it is very difficult to put forward an all acceptable definition of inflation. Even then, we shall discuss some of the important definitions of this term.

Crowther has defined the term in these simple words: *"Inflation is a state in which the value of money is falling, i.e, prices are rising"*. So it is generally regarded that during a period of inflation, the price level will rise. It is also described as a situation where too much money chases too few goods resulting in an abnormal increase of price level. Ackley has defined inflation as *"a persistent and appreciable rise in the general level or average of prices"*. **Milton Friedman** has defined it as a process of *"a steady and sustained rise in prices"*.



LET US KNOW

On the basis of the rate of increase in the price level, inflation may be categorized as the following types:

Creeping or Persistent inflation: This type of inflation is the mildest. A rate of inflation (i.e. rise in prices) up to 10 percent per



Price level: the general level of prices in an economy. It refers to consumer goods prices (this is measured by retail price index) or to all goods produced, including investment and government purchses as well as consumer goods (this is measured by a GDP deflator. GDP deflator is a tool to assess whether there has been a real rise or fall in GDP from year to another year.)

decade or 1 percent per annum is called creeping or persistent inflation. This type of inflation is not viewed as dangerous for the economy.

Walking inflation: This type of inflation is comparatively more serious than creeping inflation. Thus, increase in the price level to the tune of 30-40 percent per decade or 3-4 percent per annum is called walking inflation. This type of inflation is viewed as warning signal to the economy.

Running Inflation: This type of inflation is even more serious than walking inflation. In this case, the rise in the price level may touch 100 percent per decade or 10 per cent per annum.

Galloping or Hyper Inflation: This is the most serious type of inflation. For example, it was experienced in Germany after World War I and in Hungary and China after World War II. In this situation, prices rise to a very great extent at high speed and high prices have to be paid even for cheap things. And money becomes quite worthless and new currency has to be introduced. This situation is known as galloping inflation or hyper-inflation. The rate of rise in the price level may touch beyond 100 percent per decade or more than 10 per cent per annum.

Some other important types of inflation include:

Bottleneck Inflation: This refers to inflation that results from shortages, imbalances and rising marginal costs as full employment output is approached.

Profit – Push Inflation*:* Just as trade unions manage to push up wages, oligopolists and monopolists will raise prices more than enough to cover the increase in costs with the aim of making monopoly profits. This leads to inflation. Generally during war and in the post- war period, there will be inflation. Since modern wars are so expensive, the Government has to depend upon the created money to finance war. This leads to inflation. And inflation breeds inflation. It means that inflation leads to further inflation.

15.3.2 Types and Theories of Inflation: Demand-pull and Cost-push Inflation

In general, based on the four types of inflation, four theories of inflation exist: a) Demand-pull inflation, b) Cost-push inflation, c) Mixed demand-pull cost-push inflation and d) Sectoral-demand shift theory. In this unit, we shall basically deal with the first two theories of inflation.



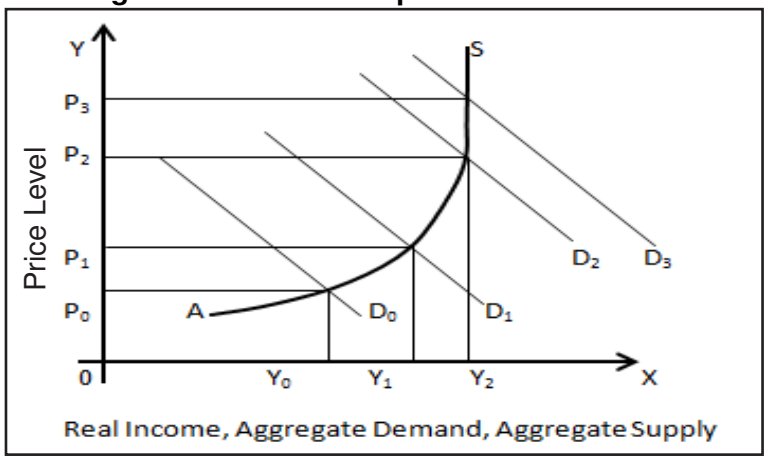
Real balance effects: It refers to the situation in which as real wealth of the people increases, they spend more and this leads to creation of more employment. This is also known as Pigou effect. This is same as Don Patinkin's direct real balance effects.

Demand – Pull Inflation: This type of inflation is loosely described as *"too much money chasing too few goods"*. It refers to the situation where general price level rises because the demand for goods and services exceeds the supply available at the existing prices.

Traditionally, classical economists viewed that increase in the supply of money is mainly responsible for inflation in the economy. Thus, according to them, rise in the price level is proportionate to the rise in quantity of money supply. For example, an increase in the quantity of money supply by 5% raises the price level by 5%. Keynes however, rejected such direct and proportionate relationship between the quantity of money and level of aggregate demand. It is to be noted here that there exists three major approaches to the demand pull theory of inflation; viz., (a) Keynes' inflationary gap analysis, the excess demand analysis and (b) Bent Hansen's demand inflation theory. In this unit, we shall, however, utilise only the excess demand analysis approach to explain the demand-pull theory of inflation.

Excess Demand Analysis Approach: This approach views inflation as the process of rising prices initiated and sustained by excess of demand for goods and services over the level of their supply. The concept can be explained with the help of figure 3.1 as shown in the next page.

Figure 15.1: Demand-pull Inflation



In the above figure 15.1, the price level has been shown in the Y-axis, while real income has been depicted on the X-axis. Here, D_0, D_1 and D_2 are the aggregate demand curves, while AS represents the aggregate supply function. These aggregate demand curves exhibit Don Patinkin's direct ***real balance effects***. It can be seen from the figure that as the level of real income increases, the level of aggregate demand also rises. Thus, as real income rises from Y_0 to Y_1, this induces level of aggregate demand to rise from D_0 to D_1. As a result, price level increases from P_0 to P_1. However, it is to be noted, that as level of aggregate demand rises as a consequence to the rise in the level of real income, this induces aggregate supply to rise as well. Finally, the stage comes when aggregate supply can not increase further. This is the stage where the economy reaches the level of full employment. As level of full employment has been reached, the level of real income can not increase further. Thus, at this stage, supply will also not increase further; this will make aggregate supply curve become parallel to the Y-axis. The significance of this situation is that given real income, any rise in aggregate demand further will only induce the price level to rise. This is what is known as demand pull inflation.

b) Cost–push Inflation: According to the cost–push inflation approach, inflation is induced by rising costs. This approach to inflation became popular during and after the World War II. The

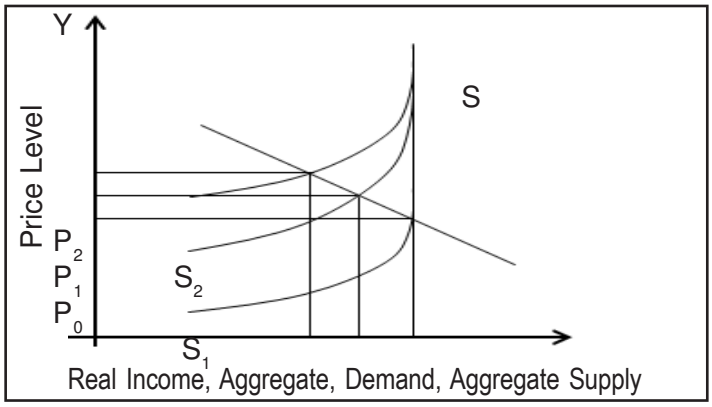
underlying idea of this approach is that inflation may arise even in the absence of excess demand for goods and services. Thus, this theory propagates that even in the absence of demand-pull situations, certain factors may push-up the cost of production and this increased cost of production may result in inflation. The factors that may push cost of production are basically three viz., (a) *increase in wage rates* (wage push inflation); (b) *increase in profits* (profit-push inflation) and (c) *adoption of mark-up pricing policies* (mark-up inflation). Out of these three approaches, we shall however use wage-push inflation only to discuss the concept of cost-push inflation.

Wage-push approach: Before discussing the wage-push approach to inflation in detail, let us consider some of its underlying propositions. First, this type of inflation is experienced in industries where the sellers can exercise great discretionary control in the formulation of pricing of products and wage rates. Secondly, increase in the wage rate is the result of persisting pressures of trade unions (and not for increase in their productivity). Let us suppose, the factory owner increases the price of the final product. This may be due to the increase in the price of inputs or increased wage rate. This increase in price of the goods and services will adversely affect the living standard of the labours. As a result, the labour union will pressurize the factory owner to raise their wage rate so that their real income remains unaffected. This will further increase the price of the goods and services; which in turn push up the price level to another height. Thus, the inflationary process continues and at each time, the increase in money wage and costs (i.e., cost push) will move the price level up. Interestingly, in such movements of the price level, the pressure of excess demand is absent all the while.

Economists point out that such type of inflation will affect employment adversely. The higher wage rate and subsequent rise in the price level will ultimately reduce the level of output and

employment in each stage of the cycle. This has been explained with the help of figure 15.2 in the next page.

Figure 15.2: Cost-push Inflation



From the above figure, it can be seen that the initial level of aggregate supply and demand are represented by the curves S_0S and D_0 respectively. The output and employment level at this stage is $0Y_0$; and the price level is $0P_0$. Now, as wage increases (which are basically for the pressure of the trade union and not because of any increase in labour productivity) from S_0 to S_1, the new supply curve becomes S_1S. Given the aggregate demand, this increase in wage rate will push-up the price level to $0P_1$. This increase in the price level in turn reduces the level of employment from $0Y_0$ to $0Y_1$. Again, increased price will also have unfavourable effect on the real income of the wage earners. Thus, the trade union will further put pressure on their employees to increase their wage rate further (such that their real income remains unchanged). Thus, as the wage rate is increased further, the supply curve will further shift from S_1S to S_2S. This will push the price level up from $0P_1$ to $0P_2$. As a result, with the level of aggregate demand remaining the same, the level of output and employment will further decline from $0Y_1$ to $0Y_2$. Such movements in the price level cause cost-push inflation in the economy.

This cycle is, however, likely to discontinue for an infinite period (or in the long-run). This is because reduction in employment (or increase in unemployment) will affect the workers and their

families as well. The children of the workers will remain unemployed. This may restrain the trade union itself from pressurizing the owner to increase their wage rate further.



CHECK YOUR PROGRESS

Q1: What meant by demand-pull inflation?

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Q2: What meant by creeping inflation?

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15.4 EFFECTS OF INFLATION AND ANTI-INFLATIONARY MEASURES

15.4.1 Effects of Inflation

Inflation is not considered bad so far it creates additional employment for the factors of production of the economy. The evil effects of inflation start when it fails to do so. The major effects of inflation include the following:

- **Effects on production:** So far as there are unemployed resources in the economy, a mild inflation may induce business to invest more. But as the level of full employment is reached, a mild inflation tends to turn into hyper inflation very soon. Inflation adversely affects the production activities in an economy. It hampers the proper functioning of the price mechanism, capital formation in the economy. Harmful and unlawful practices like hoarding, speculative trading, etc., on the other hand, go up.

- **Effects on distribution:** Inflation also adversely affects redistribution of income and wealth. Due to inflation, the value of money falls. This affects the poorer section of the society more than the richer section. Rising prices may help businessmen, hoarders, speculators and black marketers earn huge profits. But, it adversely affects the fixed income earners (salaried people) and the poor section of the people. Thus, inflation may result in redistribution of income in favour of the richer section of the society and thus causes serious problem in social equity and justice.
- **Debtors and creditors:** During inflation creditors (who lend money) tend to lose while the debtors (who borrow money) tend to gain. This is because inflation causes decline in the value of money. When the creditor lends money, he charges a fixed rate of interest. But as the value of money falls, he tends to lose. For example, let us suppose Mr. X lends Mr. Y a sum of Rs. 1000/- on 1st of January, 2008. He charges 8 percent per annum interest on it. Mr. Y repays the money with interest on June 30, 2009. Thus, Mr. Y pays him a total amount of Rs.1120/- (Rs. 1000/- + interest Rs.120/-) on June 30, 2009. But at the same time, the price level rises by 10 percent per annum. This means that to purchase a product Mr. X had to pay Rs. 1000/- in January 2008. But for the same good, he will now have to pay Rs. 1150/- in June 2009. Thus, he loses in terms of ***purchasing power*** of money. But contrarily Mr. Y gains. Because, he repays back less purchasing power to Mr X.
- **Farmers:** Farmers tend to gain during inflation. This is because his receipts (i.e., prices of food grains) go up. But his payments on the other hand, remain either constant or do not increase much. When the farmer has to pay interest on his loan previously opted during the cultivation period, he stands to gain (as we saw in case of Mr. Y). Similarly, if he has to pay taxes on his



Purchasing Power: Quantity of goods which can be bought by an amount of money.

income, he ultimately pays less (as rate of tax is already fixed at the beginning of a financial year).

- **Entrepreneurs:** Entrepreneurs just like as the farmers gain from inflation. They get higher prices for their products. This increases the profitability of the entrepreneurs and induces them to invest more. Again, as they often undertake loans for running/ expansion of the business activities, they tend to gain from that side as well.
- **Wage earners:** Wage earners are hit adversely. As the rate of inflation rises the cost of living also rises; but contrary to this the wage rate is not raised proportionately. Again, inflation causes rise in the prices of different commodities at different rates. Prices of some commodities may increase more while the prices of some commodities may increase slightly. Even when the wage rate is increased to the ***cost of living index***, this is unlikely to relieve the wage earners to the fullest. This is because the price of a very essential commodity not included in the ***cost of living index*** may rise very high and thus, may adversely affect the real income of the wage earners. The real value of past savings also declines during inflation. This also adversely affects the wage earners.



Cost of Living Index: A tool to measure the cost of living. This is shown as a percentage increase on the figure for the previous year. This is similar to consumer price index; the only difference is that it also includes some other items such as interest on mortgages.

15.4.2 Anti-Inflationary Measures

Since inflation has many evils, every government tries to check it. Inflation has destroyed many economies. For example, the inflation that took place in 1923 in Germany destroyed her economic system. Inflation can be checked by some or all of the following measures:



Fiscal measures: Fiscal measures are adopted by the government.

- **Fiscal Measures:** Following fiscal measures may be adopted for the control of inflation:
  - **Cutting down unnecessary spending:** During inflation the government should attempt to cut down unnecessary developmental spending. This will help in curbing the additional flow of money to the economy.

- **Raising tax rates:** Raising of tax rates especially on luxurious commodities, the corporate tax rates etc can help in checking inflation. At the same time, promotion of saving through the provision of higher interest rates on savings can also help in controlling inflationary pressure on the economy as people will save more and spend less. Keynes in this regard prescribed for compulsory saving (he called it *'deferred payment')* to increase saving and curb the money supply in the economy.
- **Surplus budget:** Government should present surplus budget (means collection of more revenue than expenditure) during inflation to present a surplus budget is an important fiscal instrument.
- **Public debt:** Postponement of repayment of public debt is another instrument of controlling inflation. When the government postpones payment of public debt, it reduces the volume of liquidity available in the economy.



Monetary measures: Monetary measures are adopted by the central bank of a country.

- **Monetary Measures:** Following monetary measures may be adopted for the control of inflation:
  - **Credit control:** For reducing the availability of liquidity in the economy, the central bank of the country may undertake various credit control measures. These include raising the *bank rate* and *reserve ratio*, sale of *government securities* in the open market among others.
  - **Issue of new currency:** This is an extreme measure of monetary control. Under this system, one new currency note is exchanged for a number of old currency notes. The value of bank deposits is also changed accordingly. Such measure is adopted during hyperinflation.
- **Other Measures:** Other important measures for the control of inflation include:
  - **Increase in production and productivity:** Increase in production of essential commodities as well as increasing

the productivity of the production system producing such categories of products is one important tool of controlling inflation. Increasing the production of essential commodities will check the price rise of the important commodities. Again, raising the productivity will also help in reducing the cost of production.

- **Price control:** Price control (means fixing an upper limit of the sale price) of essential commodities is another important tool to control inflation in the economy. This helps in easing out the inflationary pressure of the economy and in maintaining the living standard of the people.
- **Wage freeze policy:** Sometimes a 'wage freeze' is recommended to check inflation. That is, trade unions are requested not to ask for an increase in wages during a given period.

The success of the above measures in tackling inflation depends upon the efficiency of the government in implementing the measures.



CHECK YOUR PROGRESS

Q3: How are the wage earners affected during inflation?

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Q4: Why and how does a debtor stand to lose during an inflation?

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15.5 DEFLATION

15.5.1 Meaning and Definition

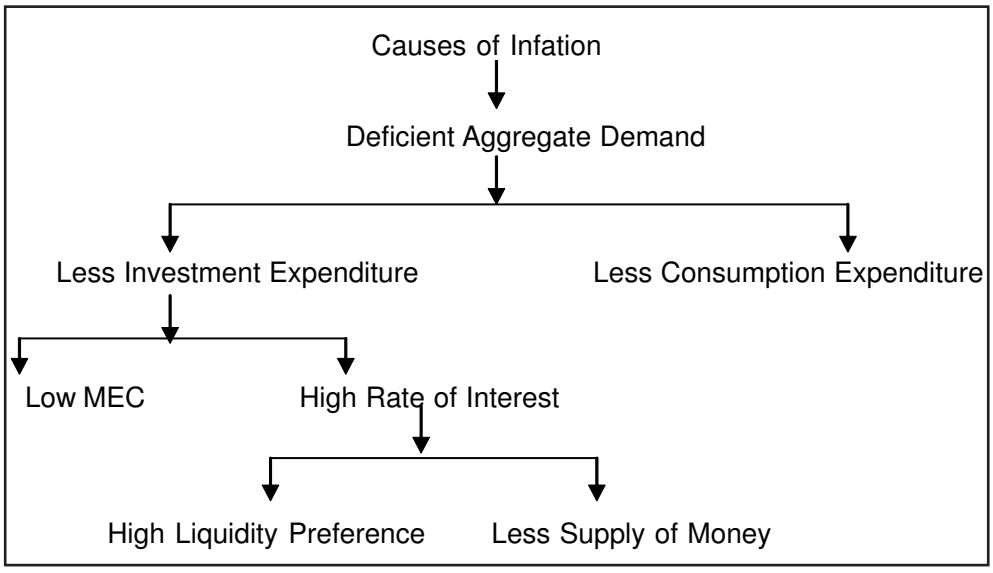
Both inflation and deflation refer to the movement of prices. Deflation is the opposite of inflation. In loose terms, it may be described as the phenomenon of falling prices. During deflation, since prices fall faster than costs, there will be heavy losses for producers and businessmen. There will not be profits in any branch of economic activity. So there will be a fall in investment. This results in unemployment. Crowther, defines deflation as a '*state in which the value of money is rising, i.e., prices are falling*'.

15.5.2 Causes of Deflation

The following are the important causes of deflation:

- **Keynes' Explanation:** Keynes developed a theoretical model explaining the various causes of deflation the key elements in this model can be shown with the help of the following tree diagram 15.3:

Figure 15.3: Causes of Deflation according to Keynes



Let us elaborate on these elements in brief.

- ***Deficient aggregate demand:*** The root cause of deflation according to Keynes is the lack of aggregate demand. Lack of aggregate demand results in over-production and unemployment.
- ***Less investment expenditure:*** Investment expenditure is adversely affected basically for two reasons viz., low MEC (or low profitability of capital) and high rate of interest.
- ***Less consumption expenditure:*** From unit 4 of block-1 you have already known that people in general spend proportionately less in consumption as their income increases (this has been termed as psychological law of consumption). This adversely affects the profitability (i.e., MEC) of fresh investments.
- ***High rate of interest:*** When MEC falls, people tend to keep money in cash instead of investing money in securities. This raises the rate of interest which further reduces investment.

  Thus, according to Keynes, rising rate of interest, declining MEC and falling consumption expenditure lead to deficient aggregate demand that ultimately leads to deflationary tendencies in the economy.

- **Reduction in government Expenditure:** If the government decides to reduce the level of public investment, it adversely affects the national income and the aggregate demand level of the economy. This also results in the reduction in employment. All these lead to lower investment activities in the economy and the economy moves towards deflationary conditions.
- **Heavy Taxes:** When government imposes heavy tax rates, it reduces the disposable income with the people. This leads to the reduction in both consumption expenditure and investment expenditure which ultimately results in deflationary situation in the economy.

- **Public Borrowing:** When government borrows from the public, it reduces the liquidity available with the public. This reduces aggregate demand and the economy is pushed towards deflationary situation.



CHECK YOUR PROGRESS

Q5: How does the reduction in the government expenditure lead to deflation?

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15.5.3 Effects of Deflation

The major effects of deflation include the following:

- **Effects on production:** Deflation adversely affects the production activities. During deflation the prices of finished goods tend to fall; but the costs of producing those goods do not fall. Again, the aggregate demand for goods and services also falls. Thus, production is adversely affected due to deflation.
- **Traders:** Just as the producing class, traders are also adversely affected during deflation. This is because they have to buy goods at prices which tend to fall as time passes. Thus, they have to buy goods at higher prices; but they have to sell those at lower prices.
- **Consumers:** Due to the phenomenon of falling prices, consumers stand to gain. As prices of goods and services fall, value of money rises.
- **Wage earners:** Wage earners gain during inflation. As prices of goods and services tend to fall, the value of money rises. Again, as wage rate cannot be reduced (as trade union will oppose it) easily, the falling prices help wage earners to better their life styles.

- **Effects on the economy:** Deflation slows the process of economic growth; it adversely affects the investment climate of the economy, employment generation and increases poverty. Banking sector of the economy is also adversely affected due to the lack of fresh investments. If sustained for a long time, deflation may lead to depression and ruin the whole economy.

15.5.4 Anti-Deflationary Measures

Since deflation may ruin the economy, every government must try to control it. Deflation may lead to depression. Deflation can be checked by some or all of the following measures:

- **Reduction in tax rates:** Reduction in tax rates will help motivate entrepreneurs to invest in new projects.
- **Redistribution of income:** Redistribution of income from richer section of the society to the poorer section will help in raising the income level of the poor. Again, as the marginal propensity to consume is higher for the poor, this will ultimately enhance the aggregate demand level in the economy.
- **Repayment of public debt:** Repayment of public debt will increase the purchasing power of the people. This will help in raising the aggregate demand level in the economy.
- **Subsidies:** Provision of government subsidies will help to raise the investment activities in the economy.
- **Public investment:** Public investment is an important tool to control deflation. Public investment should aim at supplementing private investment in the economy. Public investments in building up infrastructural facilities are highly recommended during deflation.
- **Deficit financing:** Deficit financing and setting up of infrastructural facilities thereby can help increasing private investment in the economy. Again, public investment in development activities will help to raise the standard of living of the people and thereby boost the level of aggregate demand.

- **Other measures:** Other important measures to control deflation include reduction in rate of interest, credit expansion measures, export promotion & import restriction measures and regulation of production in the economy. Reduction in rate of interest can help in boosting investment in the economy. Credit expansion measures will help investors in the same line. Export promotion & import restriction measures will stimulate domestic production. And the regulation of production will help in eliminating excess production in the economy.

15.5.5 Inflation vs. Deflation

Both inflation and deflation are evils. Both inflation and deflation adversely affect the economy and hence the society. A comparative analysis of the two, however, shows that deflation is more undesirable than inflation. Following points are important in this regard:

- Inflation adversely affects redistribution of income in favour of the richer section of the society, but deflation reduces the national income.
- Inflation occurs after the attainment of full employment, while deflation occurs in under-employment situations.
- Inflation is easier to control than deflation.
- Mild inflation is better as it promotes economic growth; but deflation always adversely affects the economy.
- Though deflation may redistribute income in favour of the poor, yet it reduces output and employment at the same time. This generates poverty in the society. Thus, it ultimately adversely affects the poor section of the people. This means that deflation adversely affects both the rich and poor sections of the society, while inflation adversely affects the poor sections. Again, deflation may lead to depression and complete ruin of the economy.

15.6 STAGFLATION: MEANING AND CONCEPT

The term 'stagflation' has been coined by joining together 'stag' of stagnation and 'flation' and of 'inflation'. The term was coined to describe a phenomenon the world witnessed during the early 1970s, in which two paradoxical situations: inflation, on one hand and declining output, employment and under-utilisation of productive capacity on the other, were found to co-exist. Thus, the term stagflation is defined as the situation in an economy in which periods of recession and rising unemployment coupled with positive rates of price inflation.

The phenomenon of stagflation was first witnessed in the western countries in the 1970s. As an economic phenomenon, stagflation emerges when sudden shock increases the costs of supply. The stagflation of the early 1970s was caused by the sudden increase in the oil prices enforced by the ***OPEC*** countries. In 1973, the OPEC countries increased the oil prices by four times. Such sharp rise in oil prices adversely affected the oil importing countries. For example, due to such steep rise in oil prices, the prices of manufactured goods in USA increased sharply, as a consequence, the rate of inflation in the US economy in 1974 increased upto 12 percent. The result was a decline of the ***real GNP*** growth rate, which further led to high rate of unemployment in the economy, which shot upto nearly 9 percent. This was however, not seen only in the USA, but also seen in the developed economies like UK, Germany and France, etc.

These countries started to recover from such recession in 1975 and it took a few years to recover. However, a revolution broke out in Iran in 1979 again led to a crisis in the world oil market. This time, OPEC doubled its oil prices. This brought back stagflation in the developed countries.

The phenomenon of stagflation, i.e., the combination of high rate of inflation coupled with high rate of unemployment, is not easily comprehensible from the theoretical perspectives of Economics. In fact, this phenomenon puzzled many who believed in the theoretical framework of the monetarists or the Keynesian economics; as both were unable to explain this phenomenon adequately. This led to the emergence of a new economic thought called as the supply side economics. You would be able to know more about these concepts later on.



CHECK YOUR PROGRESS

Q6: How does redistribution of income help controlling deflationary pressure in the economy?

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Q7: Would you like to prescribe for deficit financing during deflation? (Yes/No). Justify your answer.

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15.7 LET US SUM UP

- Inflation is generally described as the situation when the price level keeps on rising. It is also described as a situation where too much money chases too few goods, resulting in an abnormal increase of price level.
- Based on four types of inflation, four theories of inflation exist, viz., Demand-pull inflation, Cost-push inflation, Mixed demand inflation and Sectoral-demand shift theory of inflation.
- Demand – Pull Inflation is loosely described as *"too much money chasing too few goods"*. It refers to the situation where the general price level rises because the demand for goods and services exceeds the supply available at the existing prices.
- There exists three major approaches to the demand pull theory of inflation; viz., Keynes' inflationary gap analysis, the excess demand analysis and Bent Hansen's demand inflation theory.
- Excess Demand Analysis views inflation as the process of rising prices initiated and sustained by excess of demand for goods and services over the level of their supply.

- According to the cost – push inflation approach, inflation is induced by rising costs. The underlying idea of this approach is that inflation may arise even in the absence of excess demand for goods and services.
- The factors that may push cost of production are basically three viz., increase in wage rates (wage push inflation); increase in profits (profit-push inflation) and adoption of mark-up pricing policies (mark-up inflation).
- On the basis of the rate of increase in the price level, inflation may be categorized in to the following types:
  - Creeping or Persistent inflation
  - Walking inflation
  - Running Inflation
  - Galloping or Hyper Inflation
- Some other important types of inflation include:
  - Bottleneck Inflation, and
  - Profit – Push Inflation.
- Inflation adversely affects the production activities in an economy. It hampers the proper functioning of the price mechanism, capital formation in the economy.
- Inflation also adversely affects redistribution of income and wealth.
- During inflation creditors (who lend money) tend to lose while the debtors (who borrow money) tend to gain.
- Important anti-inflationary monetary measures include:
  - Credit control and
  - Issue of new currency.
  - Increase in production and productivity
  - Price control and
  - Wage freeze policy
- Deflation is opposite of inflation. In loose terms, it may be described as the phenomenon of falling prices.
- Both inflation and deflation adversely affect the economy. However, it can be said that deflation causes more adverse affects on the economy.



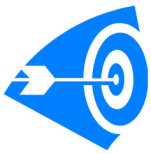
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15.9 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Demand – Pull Inflation is loosely described as *"too much money chasing too few goods"*. It refers to the situation where general price level rises because the demand for goods and services exceeds the supply available at the existing prices.

Ans to Q No 2: Creeping or Persistent inflation is considered most mild in terms of the rate of increase in the price level. A rate of inflation (i.e. rise in prices) up to 10 percent per decade or 1 percent per annum is called creeping or persistent inflation.

Ans to Q No 3: Wage earners are adversely affected during inflation. Compared to the rate of inflation, the wage rate is not raised proportionately. Even when wage rate is increased to the cost of living index, this is unlikely to relieve the wage earners to the fullest. The real value of past savings also declines during inflation.

Ans to Q No 4: During inflation debtors stand to gain. This is because by the time debtors pay back the loan amount, the value of money declines. The rate of interest remaining the same, the debtors transfer less purchasing power to the creditors. Thus, the debtors gain during inflation.

Ans to Q No 5: When the government reduces the level of public investment, this adversely affects the national income and the aggregate demand level of the economy. This reduces employment. All these lead to lower investment activities in the economy and the economy moves towards deflationary conditions.

Ans to Q No 6: Redistribution of income from the richer section of the society to the poorer section will help in raising the income level of the poor. Again, as the marginal propensity to consume is higher for the poor, this will ultimately enhance the aggregate demand level in the economy.

Ans to Q No 7: Yes. This is because deficit financing and setting up of infrastructural facilities thereby can help increasing private investment in the economy. Again, public investment in development activities will help raising the standard of living of the people and thereby boost the level of aggregate demand.



15.10 MODEL QUESTIONS

Q 1: Make a comparative analysis between inflation and deflation.

Q 2: Write a short note on the causes of deflation in an economy.

Q 3: Describe anti-inflationary measures other than fiscal measures.

Q 4: Discuss the inflation in the framework of demand pull inflation. Suggest some anti-inflationary measures.

Q 5: Describe the cost-push approach to inflation. How does inflation affect the economy?

Q 6: Write an essay on anti-inflationary anti-deflationary measures.

*** ***** ***



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