1.1 Nature and Scope of Managerial Economics

Introduction

Managerial economics is a discipline which deals with the application of economic theory to business management. It deals with the use of economic concepts and principles of business decision making.

Formerly it was known as "Business Economics" but the term has now been discarded in favour of Managerial Economics. Managerial Economics is often called as Business Economics or Economic for Firms.

Meaning

Managerial economics is a branch of economics that applies microeconomic analysis to decision methods of businesses or other management units.

Definitions

Managerial economics has been defined by different scholars as follows.

1. "Managerial economics is the integration of economic theory with business practice for the purpose of facilitating decision-making and forward planning by management".

   - Spencer and Siegelman

2. "Managerial economics is the use of economic models of thought to analyze business situations"

   - Mc Nair and Meriam

3. "Managerial economics is the application of economic theory and methodology to business administration practice"

   - Brigham and Pappas

Managerial economics by nature is a specialized discipline of management studies that deals with the application of economic theory, tools and methodologies to business management practice.

Management economics has evolved as an integration of economic theory and decision sciences with business management.

Nature of Managerial Economics

a) **Close to microeconomics :** Managerial economics is concerned with finding the solutions for different managerial problems of a particular firm. Thus, it is more close to microeconomics.

b) **Operates against the backdrop of marcoeconomics :** The macro-economic conditions of the economy are also seen as limiting factors for the firm to operate. In other words, the managerial economist has to be aware of the limits set by the macroeconomic conditions such as government industrial policy, inflation, and so on.

c) **Normative statements :** A normative statement usually includes or implies the words 'ought' or 'should'. They reflect people's moral attitudes and are expressions of what a tam of people ought to do. For instance, it deals with statements such as 'Government of India should open up the economy'.

d) **Prescriptive actions :** Prescriptive action is goal oriented. Given a problem and the objectives of the firm, it suggests the course of action from the available alternative fro optimal solution. It does not merely mention the concept, it also explains whether the concert can be applied in a given context or not. For instance, the fact that variable costs are marginal costs can be used to judge the feasibility of an export order.

e) **Applied in nature :** 'Models' are built to reflect the real life complex business situations and these models are of immense help to managers for decision making. The different areas where models are extensively used include inventory control, optimization, project management etc. In managerial economics, we also employ cases study method to conceptualize the problem, identify the alternatives and determine the best course of action.

f) **Offers scope to evaluate each alternative :** Managerial economics provides an opportunity to evaluate each alternative in terms of its costs and revenues. The managerial can decide which is the better alternative to maximize the profits for the firm.

g) **Interdisciplinary :** The contents, tools and techniques of managerial economics are draws from different subjects such as economics, management, mathematics, statistics, accountancy, psychology organisational behaviour, sociology, etc.

h) **Assumptions and limitations :** Every concept and theory of managerial economics is based on certain assumptions and as such their validity is not universal. Where there is change in assumptions, the theory may not hold good at all.

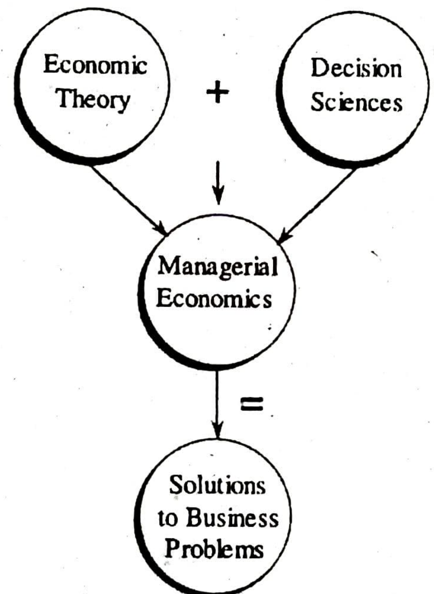


Fig.: Nature of Managerial Economics

1.2 Scope of Managerial Economics

The scope of managerial economics include all the economic concepts, theories, ideas, principles, tools and techniques that can be used to analyze the business environment and find solutions to practical business problems. The following business areas can be considered as the scope of managerial economics.

1. **Objectives of a Business Firm or Organization :** Managerial economics provides a sound framework by facilitating a business firm to frame its objectives both in the short-run and long-run.

2. **Resource Allocation :** Managerial economics provide the methods of effective resource allocation. It mainly aims at achieving high output through low and proper allocation of resources.

3. **Demand Analysis and Demand Forecasting :** It suggests the methodologies for analyzing the demand of a product. The demand forecasting techniques it provides are proven to be quite efficient for meeting the competition.

4. **Competitive Analysis :** The techniques provided by managerial economics facilities a firm to withstand in a competitive situation.

5. **Strategic Planning :** Managerial economics guides a business manager in making strategic decisions.

6. **Production Management :** Managerial economics plays a vital role in production management. It's effective tools helps to plan the business schedule, regulate the production process and effectively place the output in the market.

7. **Cost Analysis :** Managerial economics provide various cost concepts and cost curves that facilitate in determining cost-output relationship both in short-run and long-run.

8. **Pricing Strategies :** Managerial economics provide various cost concepts and cost curves that facilitate in determining cost-output relationship both in short-run and long-run.

9. **Market Structure Analysis :** The techniques and concepts of managerial economics analyze the market structure and guide in taking necessary decisions that are required for a firm to exist in the market.

10. **Investment and Capital Budgeting Decisions :** The concept of opportunity cost provided by managerial economics facilitates in making appropriate investment decisions and choose the best alternative that fits the organisational requirements.

11. **Marketing Strategies :** Managerial economics provide marketing strategies like

    - Product policy
    - Sales promotion
    - Segmentation, Targeting and positioning of markets.

12. **Economics of Scale :** Managerial economics in the long-run helps a firm to enjoy economics and diseconomics of scale.

13. **Profit Management** : Managerial economics mainly concentrates on the primary goal of a firm i.e., profit maximization. It deals with the activities like profit estimation and profit planning.

14. **Input and Output Analysis** : The concept of production function managerial economics depicts the input and output relationship.

15. **Inventory Control** : Effective inventory control techniques of managerial economics readily meet the organisational requirements.

1.3 CHARACTERISTICS

Understanding of the main features of managerial economics helps in appreciating the subject in its true perspective. These characteristic features are the following,

1. Managerial economics is micro-economic in character as it concentrates only on the study of the firm and not on the working of the economy.

2. Managerial economics takes the help of macro economics to understand and adjust to the environment in which the firm operates.

3. Managerial economics in normative rather than positive in character. It is prescriptive rather than descriptive. That is, it is concerned with the type of decisions that the firm should take in order to prosper, which involves value judgments and not a mere description of behaviour of the firm.

4. It is both conceptual and metrical. It takes the help of conceptual framework to understand and analyse the decision problems and takes the help of quantitative techniques to measure the impact of different factors and policies.

5. The contents of managerial economics are based mainly on the 'theory of firm'. It is only for the analysis of profits that help is taken of the 'theory of distribution'.

6. Knowledge of managerial economics helps in making wise choices. Managers continue to face the problem of scarcities and consequently, must continue to make choices. Managerial economics, being the study of the allocation of the resources available to a firm among the activities of that unit, is useful as it is goal-oriented and aims at maximum achievement of objectives.

Significance of Managerial Economics

Managerial Economics is a useful subject. In fact is the most significant of all social sciences. Its study is highly useful for analyzing and understanding the various economic problems. Its study brings utility to all sections of the people.

Managerial Economics became the intellectual region of the day. Managerial Economics is described as both light giving and fruit bearing science. It enriches our knowledge and brings utility or significance. Managerial Economics is explained from the following points :

A) Theoretical Significance

1. **Understanding the Economic Behavior :** The study of Managerial Economics help us to understand the economic behavior of human beings.

2. **Working of the Economic System :** Managerial Economics explains the conditions which influence the progress of the economy. It makes suggestions for overcoming the complicated problems faced by the people and the government in various economic systems. Hence it has great significance for understanding the working of the economic system.

3. **Intellectual value :** The study of Managerial Economics sharpens the intellectual calibers of individuals. It imparts certain qualities like rational behavior, proper allocation of resources etc.,

4. **Economics Tools :** Mrs. John Robinson described economics as a box of economic tools. It provides a good knowledge regarding the nature, causes, effects of various economic phenomena.

5. **Economic Growth :** managerial Economics suggests various ways and means for maintaining the growth rates in the developed economies. I also analyses the factors obstructing the economic growth of these countries.

6. **Economic Development :** Developing countries aim at achieving economic development with in a short span of time. Managerial Economics enables us to understand the nature and conditions necessary for the successful organizations of business firm.

7. **Performance of the Economy :** Managerial Economics helps us to asses the performance of the economy. We can judge the position, progress and future of an economy through several theories and models of Managerial Economies.

8. **Economic Planning :** Economics planning is an important branch of economics. Economics provides a good knowledge and information regarding the techniques of economic planning. It sharpens our mental abilities by clearly explaining the types, aims and objectives of economic plans.

9. **Prediction :** Managerial Economics serve as the best means for predicting the economic events. It helps us to predict the consequence of various economic phenomena.

10. **Ethical Value :** Managerial Economics indicates certain ethical norms like honesty, responsibility and adjustability etc., It upholds the moral and cultural values of individual. It makes them honest and dignified citizens.

B) Practical Significance

1. **Useful of the Finance Minister :** The study of Managerial Economics is highly useful to the finance minister and the personal working in the finance department. It provides a good knowledge about public revenue, public debt and public expenditure. It helps them in forming a sound financial policy and result oriented budget.

2. **Useful to the Minister for Planning :** The study of Managerial Economics is also useful to the minister for planning It furnishes a good knowledge about the various types of plans. Mobilization, plan implementation, capital output ratio, investment strategy etc.,

3. **Useful to the Bankers :** Managerial Economics is also useful to the bankers. It enables them to understand the nature, purpose and implications of different economic policies implemented by the business firms.

4. **Trade Union Leaders :** Knowledge of Managerial Economics is also significant for the trade union leaders. The study of Managerial Economics helps the trace union leaders to understand the nature and causes of industrial disputes, wages problems etc.,

5. **Businessmen :** Economics is also useful to the businessmen. Businessmen with the help of Managerial Economics can study the fluctuations in business, prices, production and employment. They can adopt a proper strategy for producing goods and services according to the charges in demand.

6. **Statesmen :** Statesman will also get benefit by studying managerial economics. It enables them to understand the nature an causes of economic problems. It helps them to solve the economic problems like unemployment, inflation, scarcity of goods etc.,

7. **International Economic Problems :** International economics as an important branch of economics. It deals with the matters like terms of trade, balance of payments, export and import regulations etc., Its knowledge enables the international agencies to determine the foreign exchange value of various national currencies. Thus, managerial economics has both theoretical and practical significance. Its study is useful to all sections of the people.

Unit - I

1.1 Introduction

1.0 Origin and Meaning of Economics

1.1 Introduction
1.1.0 Free goods and Economic goods
1.1.1 Distinction between Free goods and Economic goods
1.1.2 Consumer goods
1.1.3 Producer goods or Capital goods
1.1.4 Intermediary goods.
1.1.5 Wealth
1.1.6 Income
1.1.7 Utility
1.1.8 Types of utility
1.1.9 Value
1.2.0 Price
1.2.1 Wants
1.2.2 Welfare

At the beginning of your studies, you may wonder, why study economics? A number of reasons can be adduced here. Some of those who study economics may hope to make money. Others may be under the impression that if they do not study the fundamental laws of supply and demand, they may be considered as illiterates. Now that the society is under the spell of computers and Information revolution, they may be interested in knowing how Information and Communication Technology is changing the society or why societies are experiencing widening of income inequalities or why poverty eradication is not succeeding in developing countries. There may be many other reasons for studying economics.

Economics is a social science which studies individuals and organisations engaged in production, distribution and consumption of goods and services. This science analyses the economic behaviour of people and its consequences. Economics is the systematic study of the never ending efforts of man to satisfy his endless wants with limited resources.

The term 'economics' is originally derived from the Greek words 'OIKOS' (a house) and NEMEIN (to manage), meaning household management. Prior to Adam Smith, Economics was known by the name 'political economy'. Later, after the publication of Adam Smith's famous book "An Enquiry into the Nature and causes of wealth of Nations" in 1776, Economics emerged as a science.

Economics has been described as the study of that aspect of human behaviour which arises from the scarcity of means to achieve given ends. The individuals and societies require resources for management of various economic activities. Wants are virtually limitless, while the resources to satisfy them are scarce. There are basically two categories of scarce resources, human and non human resources. Human resources consist of labour including entrepreneurship and management. Non human resources include land and all natural resources, technology information and capital.

In any economy most pressing wants are food, clothing and housing. These basic needs are to be satisfied first by making use of the available resources. When the economy is developing, advances in technology and the development of new means of transport and communication gives rise to new wants and bring about new ways of satisfying existing wants. The advancement in the field of science and technology brought about a change in the lifestyles of people. As a result the need for use of cars and other electronic goods have become indispensable as the wants of people grew gradually. Similarly various modes of travel enabled people to satisfy their wants, which in the past was difficult and unavailable. Thus, when society develops human wants multiply. The individuals and economic system may find that the available resources are not sufficient to meet all the requirements. Therefore, the 'economic problem' arises mainly because unlimited wants are to be satisfied with limited resources.

An important point to be noted here is that resources are not only limited but also they have alternative uses. A decision to satisfy one set of wants means sacrificing some other set. Individuals forego other opportunities whenever scarce resources are used to produce specific goods and services. This is called opportunity cost by the economists. Every society faces the 'scarcity of resources' that gives rise to the problem of 'choice'. As economic goods are scarce, the society must choose among the limited goods that can be produced with the available resources. Therefore, society has to decide on how to allocate the scarce resources optimally to different sections of people to satisfy their needs according to their importance and urgency. This is a problem of 'choice.'

> Economics is the study of how people allocate their scarce resources to produce and consume goods and services to satisfy their unlimited wants with the objective of maximising their gains.

The problem of scarcity of resources and unlimited wants is universal in nature. Methods of dealing with scarcity problem may differ from society to society but the fundamental problem is the same everywhere and at all times. Therefore unlimited wants, scarcity of resources and the choices are thus key elements in understanding economics. In times of globalisation, understanding of economic issues and principles are necessary for every individual to lead a happy life and to improve his standard of living.

All nations have to decide in some way or other about these crucial issues in an economy.

1. What goods and services are produced?
2. How are goods and services produced?
3. For whom the goods and services are produced?

(Detailed discussion of these fundamental questions is presented later)

1.6 Micro and Macro Economics

Modern economists adopted two approaches to economic problems and analysis. They are

1. Micro economics,
2. Macro economics.

Professor Ragnar Frisch of Oslo University (Norway) was the first person to develop these two concepts in the year 1933. Micro economics studies the behaviour of individual units where as macro economics is the study of aggregates. Now let us examine the scope and importance of each of these two.

1.6.1 Micro Economics

The term 'micro economics' is derived from the Greek word 'micros' which means small. Thus micro economics deals with the analysis of a particular economic unit and considers in detail the behaviour of that particular unit. In other words micro economics is the microscopic study of the economy. Here we study the behaviour of individual units such as households, firms and industries. For example, it studies how an individual tries to get maximum satisfaction with his limited income? Or how a particular firm maximises its profits? Thus

Micro economics is the study of economic actions of individuals or group of individuals.

According to K.E.Boulding

"Micro economics" is the study of particular firms, particular households, individual prices, wages, incomes, individual industries and particular commodities.

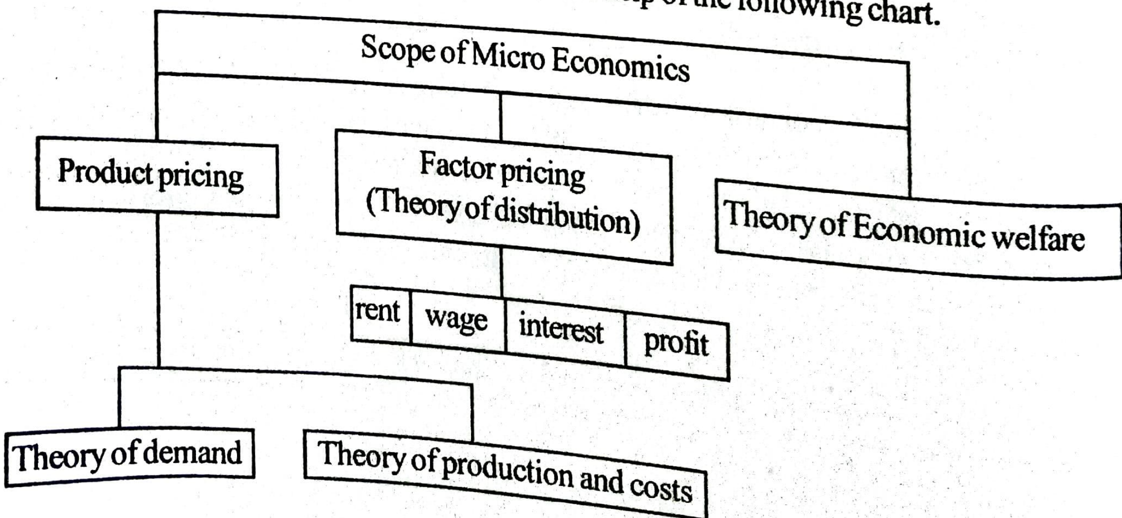
1.6.2 Scope of Micro Economics

Professor Marshall popularised micro economics. His famous book 'Principles of Economics' is considered as the best example of micro economic analysis. Micro economics is mainly based on the assumption of 'full employment' and 'marginal analysis'. These two are regarded as two pillars of micro economics. The theory of consumer's behaviour which is explained by the Law of Diminishing marginal utility and the Law of Equimarginal utility are derived directly from marginal analysis.

Theory of product pricing, theory of factor pricing and the theory of welfare are the three major fields covered by micro economics. Under the theory of product pricing, micro economics studies how the individual consumer attains equilibrium position by distributing their limited money to different uses. It also studies how the prices of various goods and services are determined and what quantity of different factors of production should be used to minimise the cost of production i.e., the theory of costs.

Another important aspect that comes under the purview of micro economics is the determination of prices of factors of production (Theory of distribution). Micro economics is also called as 'Price Theory' because it explains pricing in product market as well as factor market.

Micro economics also examines whether the resources are efficiently allocated to individual consumers and producers in the economy. This is related to the study of welfare economics. The scope of micro economics can be explained with the help of the following chart.



1.6.3 Importance of Micro Economics

The following points explain the importance of micro economics.

1. Micro economics provides the basis for understanding the operation of the economy as a whole. In order to understand the problems of the economy, it is necessary to study the problems of individual units.
2. This study is useful to the Government for the efficient use of scarce resources to achieve growth and stability.
3. Micro economics provides an analytical tool for evaluating the economic policies of the Government. For example, if the government wants to impose new taxes, it can make necessary changes in it, by knowing the reactions of the people regarding the new taxes through this analysis.
4. Micro economics can be used to examine the conditions of economic welfare and it suggests ways and means to bring about maximum social welfare.
5. This study is also applicable to the field of international trade in the determination of exchange rates.

1.6.4 Macro Economics

Macro economics is derived from the Greek word 'Macros' which means large. Macro economics is the study of economic system as a whole. It is not concerned with the individual units but all such units combined together. Thus macro economics is a study of aggregates like national income, total consumption, total saving, total investment and total employment. Most of the modern economics is Macro economics. Let us study the definition of macro economics.

According to K.E.Boulding, macro economics studies national income, not individual income, general price level instead of individual prices and national output instead of individual output.

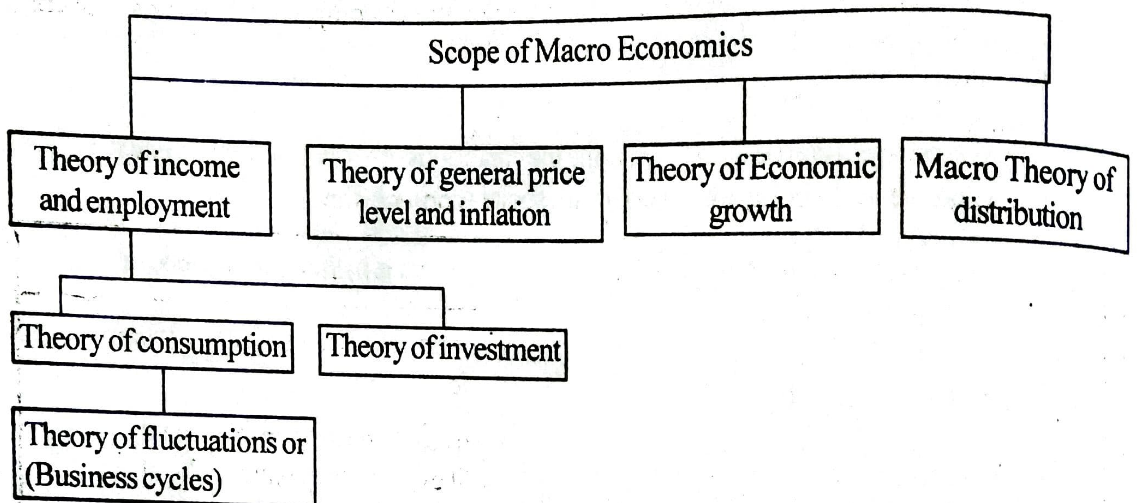
1.6.5 Scope of Macro Economics

J.M.Keynes popularised macro economics. He published his book 'General Theory of Employment Interest and Money' during the great depression of 1930's, after which the macro economic theory has become popular. Macro economics is also known as 'income and employment theory' as its main concern is to explain the theory of income, output and employment.

Macro economics deals with the general price level and its fluctuations overtime instead of dealing with relative prices of goods and services. The problem of rising prices i.e., inflation is the major problem of many countries in the world. Macro economics studies the causes of inflation and suggests measures to control it.

Theory of economic growth is another important area of study in macro economics. Most of the modern economies are concerned with economic growth, particularly the developing countries whose main objective is to achieve high rate of economic growth and economic development. Poverty reduction is an important aspect of economic development. All these problems are studied under macro economics.

Macro economics also deals with the theory of distribution i.e., the determination of relative shares of various classes from the total income. The causes of business cycles, the monetary and fiscal policies to control these business cycles to achieve economic stability are also studied under macro economics. The scope of the macro economics can be explained with the help of the following chart.



1.6.6 Importance of Macro Economics

Macro economics became popular because of the following reasons.

1. Macro economic study is very much useful for the formulation and execution of Government policies. The main objective of the government is to achieve maximum social benefit. For that it has to deal with all the citizens of the country, but not an individual. Therefore, the study of macro economics acquires more importance.

2. Macro economics helps in understanding the problems of unemployment, inflation etc., and provides solutions to solve them.

3. Macro economic study is very important in evaluating the overall performance of the economy in terms of national income. The national income data is very useful to understand the distribution of national income among different sections of people in the economy.

4. Fluctuations in aggregate demand, aggregate supply and aggregate savings lead to economic fluctuations (business cycles) and they are serious problems for any country. The study of macro economics helps in analysing the causes of economic fluctuations and provides solutions to them.

5. The theory of economic growth is a part of the study of macro economics. Analysing the problems of developing countries like how to increase national income and its rate of growth, how to increase output and employment have become much easier with macro economic studies.

6. Macro economics is also helpful in understanding the behaviour of individual units. For example, the determination of wage rate in an industry will be influenced by the general wage rate of the economy. In the same manner the demand for individual products depends on the aggregate demand in the economy. Thus the study of individual units is not possible without macro economics.

7. Macro economic study is useful for making international comparisons in terms of average national income.

Difference between micro and macro economics.

The main differences between micro and macro economics are as follows:

Micro Economics	Macro Economics
1. Micro economics is the study of Individual units of the economy.	Macro economics is the study of economy as a whole.
2. It is called as 'price theory' as it explains the allocation of resources on the basis of relative prices of various goods and services.	It is called as 'income and employment theory' as it explains the changing levels of national income during any particular time period.
3. Micro economics explains price determination in both commodity and factor markets.	Macro economics deals with national income, total employment, total consumption, aggregate savings and investment, general price level and economic growth.
4. The basis of Micro Economics is price mechanism which depends on demand and supply.	The basis for Macro Economics is aggregate demand and aggregate supply.

Micro and Macro economics are interrelated to each other. Both the approaches are important for better understanding of the problems of the economy. What is true of an individual may not be true for the whole economy. For example, increase in individual's income does not mean that national income also increases. Similarly, increase in national income does not imply that every individual's income increases.

2.2 The Law of diminishing Marginal Utility

The law of diminishing marginal utility was originally explained by Hermann Heinrich Gossen in 1854. Hence it is called Gossen's first law. But Alfred Marshall popularised this law and explained it in a more scientific manner.

The law of diminishing marginal utility is based on the fact that though human wants are unlimited any particular want is satiable. Further this law analyses consumer's behaviour in case of a single commodity. It is the general experience of everybody that if a person goes on consuming more and more units of a commodity, the additional utility he derives from the consumption of additional units of the commodity goes on diminishing. This phenomenon of human behaviour is explained by this law. Moreover this law of diminishing marginal utility explains the relationship between the utility and the stock of the commodity.

For example, let us assume that a person is fond of sweets. If he starts consuming the first piece of sweet he will get the highest utility or satisfaction. But as he consumes second, third and fourth pieces of sweets the utility he derives from these successive units will diminish. After consuming a certain quantity of sweets, regardless of how much the consumer likes sweets his desire for sweet will be completely satisfied. Further if he consumes additional pieces of sweets, his utility will be negative. Thus the law of diminishing marginal utility implies decreasing functional relationship between the quantity of a commodity consumed and the marginal utility derived from consuming an additional unit.

2.2.1 Definitions of the Law

"The additional benefit which a person derives from a given increase of his stock of a thing diminishes with every increase in the stock that he already has" ... Alfred Marshall.

"As a consumer increases the consumption of any one commodity, keeping constant the consumption of all other commodities the marginal utility of the variable commodity must eventually decline".. Kenneth E. Boulding.

2.2.2 Assumptions

The basic assumptions of the law of diminishing marginal utility are as follows.

1. This law is based on cardinal measurement of utility where utility can be measured and compared numerically.

2. Consumer is a rational man which means he always tries to get maximum satisfaction.

3. Utilities are independent which implies that the utility of any commodity depends on its own quantity.

4. Units of the commodity are similar in quality, size, taste and colour etc: Otherwise, for example,second apple is more sweeter when compared to the first one and the consumer may obtain more utility from the second one.

5. The tastes and preferences of the consumer remain constant.

6. There should be continuity in the consumption of the commodity. For example,if a consumer consumes an apple in the morning and the second one in the evening, he may get same utility from both.

7. Units of the commodity are not rare collections like stamps, coins or paintings.

8. Units of the commodity should be of suitable size, that is neither too big nor too small.

9. It is assumed that marginal utility of money remains constant.

10. The law is also based on the assumption that the commodity is divisible into small units.

It is necessary to understand the concepts of total utility and marginal utility before studying the law of diminishing marginal utility.

2.2.3 Total Utility and Marginal Utility

Total utility is the total amount of satisfaction which a person derives from the consumption of all units of the commodity. For example, let us assume that the consumer is interested in the consumption of apples. He consumed 3 apples and the first apple gives him 20 utils of utility, second one 15 utils and the third one 10 utils of utility. If you add up these utilities we get the total utility derived from the consumption of 3 apples i.e., 20 + 15 + 10 = 45. One important thing to be noted here is that when the quantity of consumption increases total utility also increases, but at a diminishing rate. In our example the first apple's utility is 20 utils where as the consumer is deriving only 10 utils from the third apple. On the whole the consumer is getting 45 utils of total utility by consuming 3 apples. Total utility can also be obtained by adding up the marginal utilities of different units of the commodity. Thus the total utility is a function of total quantity.

$$TU_n = f(Q_n)$$

where TU_n = Total utility of n commodity, f = functional relationship, Q_n = quantity of n commodity.

> Total utility is the total satisfaction obtained by the consumer from the consumption of a given quantity of the commodity. It is the sum of marginal utilities.

Marginal Utility

Marginal utility is the addition made to the total utility by consuming one more unit of the commodity. Let us consider our previous example, where the first apple gives 20 utils of utility to

the consumer, 2 apples gives him 35 utils of utility which means the additional utility of the second apple is 15 utils i.e., 35 – 20 = 15. This is called 'marginal utility'. It is the additional utility which a consumer derives from the consumption of an additional unit of the commodity.

It can be explained as

$$MU_n = TU_n - TU_{n-1}$$

Where n denotes number

MU_n = Marginal utility of nth unit

TU_n = Total utility of n units

TU_{n-1} = Total utility of n – 1 units.

In our example, marginal utility of the second unit is equal to

$$MU_2 = TU_2 - TU_1 = 35 - 20 = 15.$$

Marginal utility can also be expressed in this way.

$$M.U = \frac{\Delta TU}{\Delta Q} = \frac{\text{Change in total utility}}{\text{Change in Quantity}} = \frac{15}{1} = 15.$$

Thus marginal utility is the additional utility derived from the consumption of an extra unit of the commodity.

2.2.4 Explanation of the Law of Diminishing Marginal Utility

The law of diminishing marginal utility explains consumer's behaviour when he is interested in the consumption of a single commodity. The law states that, if the consumer increases the consumption of any particular commodity the additional utility or marginal utility must eventually decline.

The more of commodity one has, less will be the marginal utility that a consumer gets from its successive units. This law can be explained with the help of a table.

2.2.5 Table and Explanation

Table - 2.1

Units of the commodity (Apples)	Total utility (Utils)		Marginal utility (Utils)	
1	20	increasing	20	positive
2	35		15	
3	45		10	
4	50		05	
5	50	maximum	0	Zero
6	45	decreasing	-15	Negative
7	35		-10	

Table 2.1 explains the relationship between the total quantity consumed, total utility and marginal utility. First column shows units of the commodity (apples), second and third columns total utility and marginal utility respectively. We can infer from this table that as the quantity of apples increases the marginal utility is diminishing. Total utility is increasing up to the fifth unit of apple but at a diminishing rate. It becomes maximum at the 5th unit and starts diminishing. Marginal utility is falling from the beginning and becomes zero when total utility is at 50, that is the maximum. The economic implication of zero marginal utility is that the desire for that particular commodity is fully satisfied. After this point if the consumer continues the consumption of the commodity he will get negative satisfaction. At this stage total utility is falling and marginal utility becomes negative. The relationship between the total utility and marginal utility can be explained in the following manner.

1. When marginal utility falls, but positive, total utility increases at a diminishing rate.
2. When marginal utility is equal to zero, total utility will be maximum.
3. When marginal utility is negative, total utility decreases.

It is clear from the above explanation that according to the law of diminishing marginal utility, the marginal utility goes on diminishing as the consumer uses more and more units of a commodity.

The law of diminishing marginal utility can be explained with the help of a diagram.

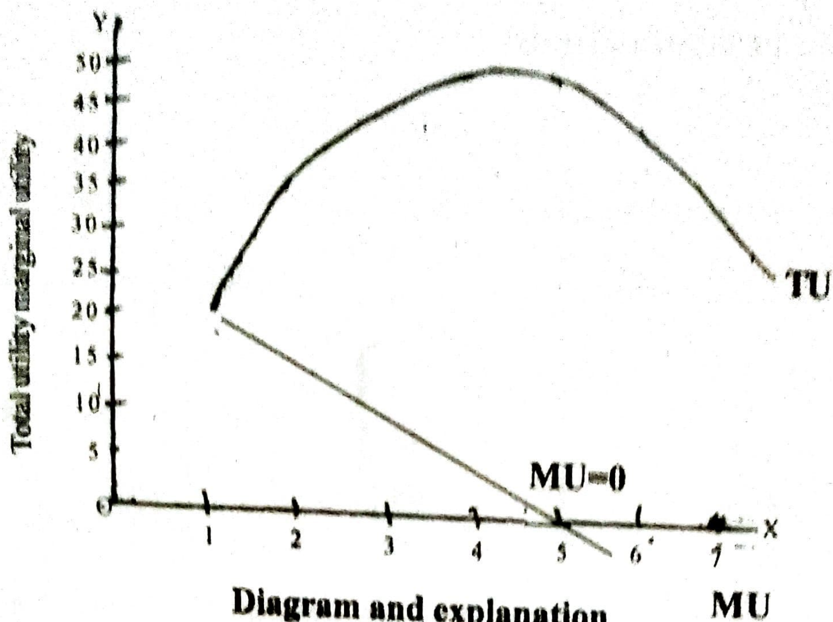


Diagram and explanation

Fig. 2.1

In the above diagram total utility and marginal utility are measured on the Y-axis and quantity of apples on the x-axis. TU represents total utility curve and MU represents marginal utility curve. It is clear from the above diagram that the total utility curve is sloping upwards initially, reaches its maximum level and starts diminishing indicating that as the stock of apples increases, total utility is increasing and reaches the maximum level at the fifth unit of apple and afterwards starts declining. The shape of the marginal utility curve indicates that as the consumption increases utility is falling. The marginal utility curve touches the X-axis, where marginal utility is equal to zero and when the total utility is at the maximum. This point indicates that the consumer is completely satisfied with the consumption of apples. Marginal utility curve lies below the X-axis as the marginal utility is negative for the sixth and seventh units of apple.

> The law of diminishing marginal utility states that as the stock of a commodity with the consumer increases its marginal utility diminishes.

2.2.6 Limitations of the Law

The law of diminishing marginal utility is one of the important laws of consumption. According to this law as the amount consumed of a commodity increases, the utility derived by the consumer from the additional units goes on diminishing. There are certain limitations to the law.

1. One of the important assumptions of the law is that consumer's tastes and preferences remains constant. If there is any change in consumer's habits and preferences this law does not hold good.

2. This law is not applicable for durable goods, as we can use these commodities for a longer time and measurement of utility is not possible.

3. In case of complimentary goods where we need two or more goods to satisfy a single want this law does not apply.

4. If it is not possible to divide the commodity into small units, we can not measure the utility of successive units. So this law is not applicable for indivisible goods.

5. Hobbies like stamps and coin collection are an exception to the law of diminishing marginal utility, as the additional units give more satisfaction to the consumer.

2.2.7 Importance of the Law

1. The law of diminishing marginal utility explains the difference between value in use and value in exchange. It provides an answer to the famous 'water diamond paradox.' Water is essential to life and its total utility is very high but its marginal utility is very less. It has a very high value in use but its exchange value is insignificant. On the other hand even though the total value of diamond is not high, its marginal utility is more, that is the use value of diamond is very less but the exchange value is very high. Thus this law becomes the basis for the theory of value.

2. This law helps the government while formulating taxation policies. The finance minister can justify progressive taxation by imposing more taxes on the rich people as the marginal utility of money to the rich is lower than it is for the poor.

3. The law of diminishing marginal utility is the basis for law of diamond. According to this law as the price of the commodity decreases, its demand increases. This is due to the fact that if the consumer purchases more of a commodity its marginal utility diminishes. That is the reason why he wants to purchase more quantity at a lower price. So the demand curve always slopes downwards from left to right.

4. This law also plays an important role in the policy of redistribution of income and wealth. As the marginal utility of income will be low for the rich people, the Government can acquire the surplus wealth of the rich people and distribute it to the poor.

2.3 Law of Equi-marginal Utility - Consumer's Equilibrium

Law of equi-marginal utility is an important law of consumption. It is called as 'Gossen's second law', as its formulation is associated with the name of H.H.Gossen. The law of diminishing marginal utility explains the consumer's behaviour, consuming only one commodity. But in actual practice consumer buys a certain combination of goods and services. He has always limited income to spend on the purchase of different goods and services. Being a rational consumer he always seeks maximum satisfaction. In this case the principle of equi-marginal utility is useful. The law of equi-marginal utility explains how the consumer obtains maximum satisfaction with his limited income. Therefore this law is known as 'law of maximum satisfaction'.

According to this law the consumer has to distribute his money income on different uses in such a manner that the last rupee spent on each commodity gives him the same marginal utility. Equalisation of marginal utility in different uses will maximise his total satisfaction. That is why the law is known as the 'law of equi-marginal utility'.

2.3.1 Definition of the Law

In the words of Marshall,

"If a person has a thing which can be put to several uses, he will distribute it among these uses in such a way that it has the same marginal utility in all."

While purchasing goods and services the consumer always follows the principle of substitution to get the same marginal utility in case of different commodities. If he thinks that a rupee spent on one commodity gives him more utility, when compared to the other he will try to substitute the former commodity till the satisfaction derived from the last rupee spent on both commodities is equal. Thus the consumer transfers his purchases from those goods which yield him lower marginal utility to those which give him more marginal utility. For example, consumer wants to spend his money on two goods namely, apple and orange. The consumer derives 20 utils of utility from one unit of orange whose price is one rupee. Suppose by spending one rupee on apple, he gets more than 20 utils of utility then the consumer substitutes apples for oranges. This process goes on till the consumer gets same marginal utility for the last rupee from both the commodities. Then the consumer gets maximum satisfaction. Therefore, this law is also known as the 'law of substitution'.

2.3.2 Consumer's Equilibrium

The law of equi-marginal utility explains consumer's equilibrium. Equilibrium is a state of balance. It refers to a situation where in the consumer gets maximum satisfaction with his limited income. This law says that the consumer attains equilibrium position when marginal utility of money spent on each commodity is the same. According to this law of equi-marginal utility maximum satisfaction is obtained by the consumer if the allocation of income on different goods is made in such a way, that the marginal utilities of different goods are proportional to their prices.

The condition required for consumer's equilibrium can be explained like this

$$\frac{MU_A}{P_A} = \frac{MU_B}{P_B} = \ldots \frac{MU_n}{P_n}.$$

Where MU_A = Marginal utility of commodity A

P_A = Price of commodity A

MU_B = Marginal utility of commodity B

P_B = Price of commodity B

MU_n = Marginal utility of nth commodity

P_n = Price of nth commodity.

2.3.3 Assumptions of the Law

The law of equi-marginal utility depends on the following assumptions.

1. This law is based on cardinal measurement of utility, where measurement of utility is possible in terms of numbers.
2. Consumer is a rational man always aiming at maximum satisfaction.
3. The marginal utility of money remains constant.
4. Consumer's income is limited and he is prepared to spend the entire amount on different goods.
5. The prices of goods are unchanged.
6. Utility derived from one commodity is independent of the utility of the other commodity.

2.3.4 Explanation of the Law

The law of equi-marginal utility says that for obtaining maximum satisfaction the consumer will spend his income on various goods and services in such a way that the marginal rupee spent on each commodity gives him the same satisfaction. This can be explained with the help of an example, let us assume that the consumer's income is Rs.5 and he wants to spend it on two commodities namely A and B. Further it is assumed that the price of each commodity is one rupee only. The marginal utilities, the consumer is deriving from his expenditure on both the commodities is shown in the following table.

2.3.5 Table – Explanation

Table - 2.2

Units of money (in rupees)	Marginal utility of Expenditure on A	Marginal utility of Expenditure on B
1	15 (1st)	14 (3rd)
2	14 (2nd)	13 (5th)
3	13 (4th)	12
4	12	11
5	11	10
Total Utility	65	60

In table 2.2 first column shows units of money, second and third columns show marginal utilities of expenditure on commodities A and B respectively. It is clear from the above table that the consumer spends his first two rupees on commodity A because it gives him more utility when compared to B. But he will spend the third rupee on commodity B, as it gives him the next highest utility. Again fourth rupee he will spend on A and the fifth one on B, where the marginal utilities are equal in both the cases. Thus, the consumer spends three rupees on commodity A and two rupees on commodity B, so that he can maximise his total utility. Here the marginal utility of expenditure on both the commodities is same that is 13. By spending rupees 3 on commodity A, the consumer is obtaining a total utility of 15 + 14 + 13 = 42, and the total utility derived from B is equal to 14 + 13 = 27. Therefore by spending rupees 5 on both A and B, the consumer is able to get the total utility of 69 (42 + 27).

Suppose if he spends his entire amount on commodity A, he can obtain total utility of 65. In the same manner if the total money is spent on commodity B, the consumer will get a total utility of 60 only. Any other combination of expenditure on both the commodities gives him less amount of satisfaction. It is not possible for him to get higher satisfaction because his income is limited (5 rupees). Thus, the consumer gets maximum satisfaction by equating the marginal utilities of A and B by spending rupees 3 on A and rupees 2 on B.

$$M = P_A Q_A + P_B Q_B.$$

$$5 = 1 \times 3 + 1 \times 2.$$

Where M = Money income, P_A = Price of commodity A, Q_A = Quantity of commodity A, P_B = Price of commodity B, Q_B = Quantity of commodity B.

$$\text{Here } \frac{MU_A}{P_A} = \frac{MU_B}{P_B} = 13.$$

2.3.6 Diagrammatic Explanation

The law of equi-marginal utility can be explained with the help of a diagram.

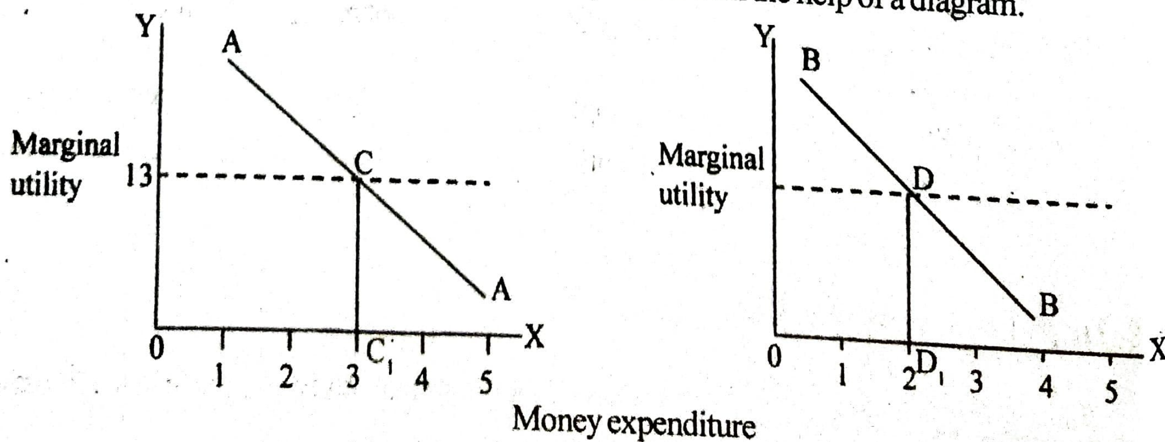


Fig.2.2

In the above diagram money expenditure is measured on X-axis and the marginal utility of money on the Y-axis. AA is the marginal utility curve of A and BB is the marginal utility curve of B. CC_1 represents the expenditure i.e., 3 rupees on A, DD_1 expenditure on B ie., 2 rupees. By spending rupees 3 on A and rupees 2 on B the consumer derives the same marginal utility i.e., 13, from both the commodities. As per the law of equi-marginal utility the consumer is able to attain equilibrium position when he derives same marginal utility from all the commodities by spending his limited income.

The law of equi-marginal utility says that,the consumer gets maximum satisfaction if he spends his limited income on different uses in such a way,that the last rupee spent on each commodity gives him the same marginal utility.

2.3.7 Limitations of the Law

The law of equi-marginal utility has been subject to certain limitations which are as given here under.

1. One of the important limitations of the law is that it is not applicable when goods are indivisible. For example, it is not easy to divide a house, a car etc. Further it is not possible for the consumer to purchase one and half cars. In actual practice it is very difficult for the consumer to compare the marginal utilities of different commodities.

2. The law assumes that consumer is a rational man and always tries to get maximum satisfaction. But it is not possible always to weigh the utilities derived from different commodities. Most of the consumers are influenced by the impact of fashion, advertisement, taste and traditions while purchasing goods. In such cases this law does not work.

3. The law is based on certain unrealistic assumptions such as cardinal measurement of utility and marginal utility of money remain constant. As utility is a subjective concept, measurement is not possible. In reality marginal utility of money does not remain constant.

4. The law of equi-marginal utility is not applicable in case of ignorant consumer. If he is not aware of the existing market prices and utilities of different commodities he can not obtain maximum satisfaction.

2.3.8 Importance of the Law

Though there are certain limitations the law of equi-marginal utility is applicable to almost all branches of economics. The importance of the law can be explained as follows.

1. This law is the basis for consumer's expenditure. It serves as a guide to the consumer to allocate his limited resources on different uses in order to get maximum satisfaction.

2. In production theory also this law is useful. As every producer tries to get maximum output, he will try to substitute one factor unit for the other till he gets same marginal returns from different factors of production.

3. Exchange is based on law of equi-marginal utility. People exchange their goods and services in such a way that they will get maximum satisfaction.

4. The distribution theory also involves the principle of substitution. As the factor prices are determined by their respective marginal productivities, an optimum distribution theory is based on equalisation of marginal productivities of different factors of production.

5. This law is also applicable in the filed of public finance. The Government has to formulate the tax policy in such a way that the marginal loss/sacrifice of each tax payer is equal. While taking up the public projects also, Government tries to equalise the social marginal benefit of each .

6. An intelligent consumer tries to allocate his limited resources between present consumption and future use so as to have same marginal utility in each. Thus this law is not only the basis for present consumption but also for future investment.

The above analysis shows that the law of equi-marginal utility has a wider application in different areas of economic activity.