#  Chapter One: Managerial Economics

# This chapter discusses more about meaning and importance of managerial economics, phases in business decision making process furthermore it describes about the scope of managerial economics.

## Definition of Managerial Economics

Managerial economics has been generally defined as the study of economic theories, logic and tools of economic analysis, used in the process of business decision making. It involves the understanding and use of economic theories and techniques of economic analysis in analyzing and solving business problems.

Managerial economics, meaning the application of economic methods in the managerial decision-making process, is a fundamental part of any business or management course. Economic principles contribute significantly towards the performance of managerial duties as well as responsibilities. Managers with some working knowledge of economics can perform their functions more effectively and efficiently than those without such knowledge. Taking appropriate business decisions requires a good understanding of the technical and environmental conditions under which business decisions are taken. Application of economic theories and logic to explain and analyze these technical conditions and business environment can contribute significantly to the rational decision-making process.

## Factors that contributed for the emergence of Managerial Economics

Managerial Economics as a course required for effective resource management was put in place due to the following developments in the global business environment:

1. Growing complexity of business decision-making processes.
2. Increasing need for the use of economic logic, concept, theories, and tools of economic analysis in the process of decision-making.
3. Rapid increases in the demand for professionally trained managerial manpower.

These developments have made it necessary that every manager aspiring for good leadership and achievement of organizational objectives be equipped with relevant economic principles and applications. Unfortunately, a gap has been observed in this respect among today’s managers. It is therefore the aim of this course to bridge such gap.

## Importance of Managerial Economics

In a nutshell, three major contributions of economic theory to business economics have been enumerated:

1. ***Building of analytical models*** that help to recognize the structure of managerial problems, eliminate the minor details that can obstruct decision making, and help to concentrate on the main problem area.

2. ***Making available a set of analytical methods*** for business analysis thereby, enhancing the analytical capabilities of the business analysts.

3. **Clarification of the various concepts** used in business analysis, enabling the managers avoids conceptual pitfalls.

## Economic Analysis and Business Decisions

Business decision-making basically involves the selection of best out of alternative opportunities open to the business organization. Decision making processes involve four main phases, including:

***Phase One***: Determining and defining the objective to be achieved (identifying target objectives).

***Phase Two****:* Collection and analysis of information on economic, social, political, and technological environment.

***Phase Three:*** Inventing, developing and analyzing possible course of action.

***Phase Four:*** Selecting and implementing a particular course of action from available alternatives which best confirm with the target objective.

***Note that*** phases two and three are the most crucial in business decision-making. They put the manager’s analytical ability to test and help in determining the appropriateness and validity of decisions in the modern business environment.

Personal intelligence, experience, intuition and business acumen of the manager need to be supplemented with quantitative analysis of business data on market conditions and business environment.

It is in fact, in this area of decision-making that economic theories and tools of economic analysis make the greatest contribution in business. If for instance, a business firm plans to launch a new product for which close substitutes are available in the market; one method of deciding whether or not this product should be launched is to obtain the services of a business consultant. The other method would be for the decision-maker or manager to decide. In doing this, the manager would need to investigate and analyze the following thoroughly:

* Production related issues; and,
* Sales prospects and problems.

With regards to production, the manager will be required to collect and analyze information or data on:

* available production techniques;
* cost of production associated with each production technique;
* supply position of inputs required for the production process;
* input prices;
* production costs of the competitive products; and,
* Availability of foreign exchange, if inputs are to be imported.

Regarding the sales prospects and problems, the manager will be required to collect and analyze data on:

* general market trends;
* the industrial business trends;
* major existing and potential competitors, as well as their respective market shares;
* prices of the competing products;
* pricing strategies of the prospective competitors;
* market structure and the degree of competition; and,
* the supply position of complementary goods.

***Third,*** it provides consistency to business analysis and helps in arriving at right conclusions.

## Relationship between Managerial Economics and Other Disciplines

As such **I** can be seen as a means to an end by managers, in terms of finding the most efficient way of allocating their scarce resources and reaching their objectives. As an approach to decision-making, managerial economics is related to economic theory, decision sciences and business functions. These relationships are now discussed as follows.

### Relationship with Economic Theory

The main branch of economic theory with which managerial economics is related is microeconomics, which deals essentially with how markets work and interactions between the various components of the economy. In particular, the following aspects of microeconomic theory are relevant:

* ***Theory of the Firm*:** A firm can be considered as amalgamation of people, physical and financial resources and a variety of information. Firms exist because they perform useful functions in society by producing and distributing goods and services. In the process of accomplishing this, they employ society's scarce resources, provide employment and pay taxes.

If economic activities of society can be simply put into two categories- production and consumption-firms are considered the most basic economic entities on the production side, while consumers form the basic economic entities on the consumption side. The behavior of firms is usually analyzed in the context of an economic model, which is an idealized version of a real-world firm. The basic economic model of a business enterprise is called the theory of the firm.

* ***Theory of Consumer Behavior (Demand):*** The role of consumers in an economy is of vital importance since consumers spend most of their incomes on goods and services produced by firms. Consumers use what firms produce. Thus, study of the theory of consumer behavior is accorded importance. It is desirous to know the ultimate objective of a consumer. Economists have an optimization model for consumers, which is analogous to that applied to firms or producers. While it is assumed that firms attempt at maximizing profits, similarly there is an assumption that consumers attempt at maximizing their utility or satisfaction. While more goods and services provide greater utility to a consumer, however, consumers, like firms, are subject to constraints. Their consumption and choices are limited by a number of factors, including the amount of disposable income (the residual income after income taxes are paid for). A consumer's choice to consume is described by economists within a theoretical framework usually termed the theory of demand.
* production and cost theory (supply)
* price theory
* market structure and competition theory

There is one main difference between the emphasis of microeconomics and that of managerial economics: the former tends to be descriptive, explaining how markets work and what firms do in practice, while the latter is often prescriptive, stating what firms should do, in order to reach certain objectives.

### Relationship with Decision Sciences

The decision sciences provide the tools and techniques of analysis used in managerial economics. The most important aspects are as follows:

* numerical and algebraic analysis
* optimization
* statistical estimation and forecasting
* analysis of risk and uncertainty
* discounting and time-value-of-money techniques

### Relationship with Business Functions

All firms consist of organizations that are divided structurally into different departments or units, even if this is not necessarily performed on a formal basis. Typically the units involved are:

* production and operations
* marketing
* finance and accounting
* human resources

All of these functional areas can apply the theories and methods mentioned earlier, in the context of the particular situation and tasks that they have to perform. Thus a production department may want to plan and schedule the level of output for the next quarter, the marketing department may want to know what price to charge and how much to spend on advertising, the finance department may want to determine whether to build a new factory to expand capacity, and the human resources department may want to know how many people to hire in the coming period and what it should be offering to pay them. It might be noted that all the above decisions involve some kind of quantitative analysis; not all managerial decisions involve this kind of analysis. There are some areas of decision-making where the tools and techniques of managerial economics are not applicable. For example a sales manager may want to motivate a salesperson to achieve a higher level of performance. In this case an understanding and application of behavioral and psychological principles is relevant. That is not to say that economists can ignore these, but managerial economics tends to focus more on behavioral aspects when they concern consumers rather than when they concern the behavior of employees.

## Scope of Managerial Economics

Managerial economics comprises both micro and macro-economic theories. Generally, the scope of managerial economics extends to those economic concepts, theories, and tools of analysis used inanalyzing the business environment, and to find solutions to practical business problems. In broad terms, managerial economics is applied economics. The areas of business issues to which Managerial economics can be directly applied are divided into two broad categories:

* Operational or internal issues; and,
* Environment or external issues.

***Operational problems*** are of internal nature. These problems include all those problems which arise within the business organization and fall within the control of management. Some of the basic internal issues include:

* choice of business and the nature of product (what to produce);
* choice of size of the firm (how much to produce);
* choice of technology (choosing the factor combination);
* choice of price (product pricing);
* how to promote sales;
* how to face price competition;
* how to decide on new investments;
* how to manage profit and capital; and,
* how to manage inventory.

***Environmental issues:*** These are issues related to the general business environment. These are issues related to the overall economic, social, and political atmosphere of the country in which the business is situated. The factors constituted ***under environmental*** *a*spect issues include the following:

* the existing economic system
* general trends in production, income, employment, prices, savings and investment, and so on.
* structure of the financial institutions.
* magnitude of and trends in foreign trade.
* trends in labor and capital markets.
* government’s economic policies.
* social organizations, such as trade unions, consumers’ cooperatives, and producer unions.
* the political environment.
* the degree of openness of the economy.

Managerial economics is particularly concerned with those economic factors that form the business climate. In macroeconomic terms, managerial economics focus on business cycles, economic growth, and content and logic of some relevant government activities and policies which form the business environment in general.

## Managerial Economics and Gap between Theory and Practice

### The Gap between Theory and Practice

It is a general knowledge that there exists a gap between theory and practice in the world of economic thinking and behavior. By implication, a theory which appears logically sound might not be directly applicable in practice. Take for instance, when there are economies of scale, it seems theoretically sound that when inputs are doubled, output will be more or less doubled, and when inputs are tripled, output would be more or less tripled. This theoretical conclusion may not hold in practice. Economic theories are highly simplistic because they are propounded on the basis of economic models based on simplifying assumptions. Through economic models, economists create a simplified world with its restrictive boundaries from which they derive their conclusions. Although economic models are said to be an extraction from the real world, the closeness of this extraction depends on how realistic the assumptions of the model are. It is a general belief that assumptions of economic models are unrealistic in most cases. The most common assumption of the economic models, as you may recall, is the ***ceteris paribus*** assumptions (that is all other things being constant or equal). This assumption has been alleged to be the most unrealistic assumption.

Though economic theories are, no doubt, hypothetical in nature, in their abstract form however, they do look divorced from reality. Abstract economic theories cannot be simply applied to real life situations. This however, does not mean that economic models and theories do not serve useful purposes. Microeconomic theory, for example, facilitates the understanding of what would be a complicated confusion of billions of facts by constructing simplified models of behavior that are sufficiently similar to the actual phenomenon to be of help in understanding them. It cannot, nevertheless, be denied the fact that there is a gap between economic theory and practice.

The gap arises from the fact that there exists a gap between the abstract world of economic models and the real world. It suffices to say that although economic theories do not directly offer custom-made solutions to business problems, they provide a framework for logical economic thinking and analysis. The need for such a framework arises because the real economic world is too complex to permit consideration of every bit of economic facts that influence economic decisions. Economic analysis presents the business decision makers with a road map; it guides them to their destinations, and does not take them to their destinations. Managerial economics can bridge the gap between economic theory and real world business decisions. The managerial economic logic and tools of analysis guide business decision makers in:

* identifying their problems in the achievement
* collecting the relevant data and related facts;
* processing and analyzing the facts;
* drawing the relevant conclusions;
* determining and evaluating the alternative means of achieving the goal; and,
* taking a decision.

Without the application of economic logic and tools of analysis, business decisions may likely be irrational and arbitrary. Irrationality is highly counter-productive.

### Theory of profit –an overview

The term ***profit*** means different things to different people. Businesspeople, accountants, tax collectors, employees, and economists have their individual meaning of profit. Before exposing you to the theories of profit, it will be helpful for you to distinguish between two often misunderstood profits concepts: the Accounting profit and the Economic profit.

In its general sense, profit is regarded as income accruing to equity holders, in the same sense as wages accrue to the workers; rent accrues to owners of rentable assets; and, interest accrues to the money lenders. To the accountant, ‘profit’ means the excess of revenue over all paid out costs, such as manufacturing and overhead expenses. It is more like what is referred to a ‘net profit’. For practical purposes profit or business income refers to *profit* in accounting sense.

***The Accounting Profit:*** Accounting profit may be defined as follows:

You can observe that when calculating accounting profit, it is only the explicit or book costs that are considered and subtracted from the total revenue (TR).

***The Economic or Pure Profit:*** Unlike accounting profit, economic profit takes into account both the explicit costs and implicit or imputed costs. The implicit or opportunity cost can be defined as the payment that would be necessary to draw forth the factors of production from their most remunerative alternative use or employment. *Opportunity cost* is the income foregone which the business could expect from the second best alternative use of resources. The foregone incomes include interest, salary, and rent, often called ***transfer costs.***

Economic profit also makes provision for (a) insurable risks,

(b) depreciation, (c) necessary minimum payment to shareholders to prevent them from withdrawing their capital investments. Economic profit may therefore be defined as ‘residual left after all contractual costs, including the transfer costs of management, insurable risks, depreciation, and payments to shareholders have been met.

Thus,

Note that economic profit as defined by the above equation may necessarily not be positive. It may be negative since it may be difficult to decide beforehand the best way of using the business resources. Pure profit is a short-term phenomenon. It does not exist in the long-run under perfectly competitive conditions.

To say that products that can be produced profitably will be, and those that cannot be produced profitably will not begs the question of what we mean by “profit.”

What is commonly thought of as profit by the accountant may not match the meaning assigned to the term by an economist. An economist’s notion of profit goes back to the basic fact that resources are scarce and have alternative uses. To use a certain set of resources to produce a good or service means that certain alternative production possibilities were forgone. Costs in economics have to do with forgoing the opportunity to produce alternative goods and services. The economic, or opportunity, cost of any resource in producing some good or service is its value or worth in its next best alternative use.

Given the notion of opportunity costs, economic costs are the payments a firm must make, or incomes it must provide, to resource suppliers to attract these resources away from alternative lines of production. Economic costs (*TC*) include all relevant opportunity costs. These payments or incomes may be either explicit, “out-of-pocket” (cash expenditures) or implicit costs which represent the value of resources used in the production process for which no direct payment is made. This value is generally taken to be the money earnings of resources in their next best alternative employment. When a computer software programmer quits his or her job to open a consulting firm, the forgone salary is an example of an implicit cost. When the owner of an office building decides to open a hobby shop, the forgone rental income from that store is an example of an implicit cost. When a housewife decides to redeem a certificate of deposit to establish a day-care center for children, the forgone interest earnings represent an implicit cost. In short, any sacrifice incurred when the decision is made to produce a good or service must be taken into account if the full impact of that decision is to be correctly assessed.

Economist’s concept of profit is the *pure profit* or ‘economic profit’. Economic profit is a return over and above the *opportunity cost*, *that is, the income expected from the second alternative investment or use of business resources.* In this unit, emphasis will be placed on the various concepts of profit. These relationships may be summarized as follows:

1. Abera operates a small shop specializing in party favors. He owns the building and supplies all his own labor and money capital. Thus, Abera incurs no explicit rental or wage costs. Before starting his own business Abera earned Birr 1,000 per month by renting out the store and earned Birr 2,500 per month as a store manager for a large department store chain. Because Abera uses his own money capital, he also sacrificed Birr 1,000 per month in interest earned on bonds. Abera’s monthly revenues from operating his shop are Birr 10,000 and his total monthly expenses for labor and supplies amounted to Birr 6,000. Calculate Abera’s monthly accounting and economic profits.

***Solution:*** Total accounting profit is calculated as follows:

Total revenue Birr 10,000

Total explicit costs (6,000)

Accounting profit =**Birr 4,000**

On the other hand, )

Accounting profit:

Abera’s accounting profit appears to be a healthy Birr 4,000 per month.

However, if we take into account Abera’s implicit costs, the story is quite different. Total economic profit is calculated as follows:

Total revenue = Birr10, 000

Total explicit costs (6,000)

Forgone rent 1,000

Forgone salary 2,500

Forgone interest income 1,000

Total implicit costs (4,500)

Total economic costs 10,500

Economic profit (loss) = **Birr (500)**

Economic profits are equal to total revenue less total economic costs, which is the sum of explicit and implicit costs. Accounting profits, on the other hand, are equal to total revenue less total explicit costs.

It is, of course, a simple matter to make accounting profit equivalent to economic profit by making explicit all relevant implicit costs. Suppose, for example, that an individual quits a Birr 40,000 per year job as the manager of a family restaurant to open a new restaurant. Since this is a sacrifice incurred by the budding restaurateur, the forgone salary is an implicit cost. On the other hand, this implicit cost can easily be made explicit by putting the restaurant owner “on the books” for a salary of Birr 40,000.The somewhat arbitrary distinction between explicit and implicit costs is illustrated in the following problem.

1. ***Neway*** is the owner of a small grocery store in Debre Markos town. Neway’s annual revenue from operating the grocery is Birr200, 000 and his total explicit cost is Birr 180,000 per year. (Neway pays himself an annual salary of Birr 30,000). A supermarket chain wants to hire him as the general manager for Birr 60,000 per year.
2. What is the opportunity cost to Neway of owning and managing the grocery store?
3. What is Neway’s accounting profit?
4. What is Neway’s economic profit?

**Solution**

1. Opportunity cost is the Birr 60,000 in forgone salary that Neway might have earned had he decided to work as general manager for the supermarket chain.

= -Birr 10,000

Another way of looking at this problem is to consider Neway’s forgone income following his decision to continue to operate the grocery store. Neway’s forgone income may be summarized as follows:

This is the same as the result in part b, since the grocery store salary less the supermarket salary is just the opportunity cost as defined.

**Theories of Profit**

The unsettled controversy on the sources of profit has led to the emergence of various theories of profit in economics. The following discussions summarize the main theories.

***Walker’s Theory of Profit: Profit as Rent of Ability:*** One of the widely known theories of profit was stated by F. A. Walker who theorized *‘profit’ as the rent of “exceptional abilities that an entrepreneur may possess”* over others. He believes that profit is the *difference between the earnings of the least and the most efficient entrepreneurs*. Walker assumes a state of perfect competition, in which all firms are presumed equal managerial ability. In Walker’s view, under perfectly competitive conditions, there would be no pure or economic profit and all firms would earn only marginal wages, which is popularly known in economics as ***’normal profit’***.

***Clark’s Dynamic Theory:*** The J. B. Clark’s theory is of the opinion that profits arise in a dynamic economy, not in a static economy. A static economy is defined as the one in which there is absolute freedom of competition; population and capital are stationary; production process remains unchanged over time; goods continue to remain homogeneous; there is freedom of factor mobility; there is no uncertainty and no risk; and if risk exists, it is insurable. In a static economy therefore, firms make only the ‘normal profit’ or the wages of management.

A dynamic economy on the other hand, is characterized by the following generic changes:

* Population increases
* Increase in capital
* Improvement in production technique
* Changes in the forms of business organizations and,
* Multiplication of consumer wants.

The major functions of entrepreneurs or managers in a dynamic environment are in taking advantage of the generic changes and promoting their businesses, expanding sales, and reducing costs. The entrepreneurs who successfully take advantage of changing conditions in a dynamic economy make pure profit.

 From Clark’s point of view, pure profit exists only in the short-run. In the long-run, competition forces other firms to imitate changes made by the leading firms, leading to a rise in demand for factors of production. Consequently, production costs rise, thus reducing profits, especially when revenue remains unchanged.

***Hawley’s Risk Theory of Profit:*** The risk theory of profit was initiated by F. B. Hawley in 1893. According to Hawley, risk in business may arise due to such reasons as obsolescence of a product, sudden fall in the market prices, non-availability of crucial raw materials, introduction of better substitutes by competitors, risk due to fire, war and the like. Risk taking is regarded as an inevitable accompaniment of dynamic production, and those who take risk have **a sound claim of a separate reward, referred to as ‘profit’**. Hawley simply refers to profit as the price paid by society for assuming business risk. He suggests that businesspeople would not assume risk without expecting adequate compensation in excess of actuarial value, that is, premium on calculable risk.

***Schumpeter’s Innovation Theory of Profit:***The innovation theory of profit was developed by Joseph A. Schumpeter. Schumpeter was of the opinion that factors such as emergence of interest and profits, recurrence of trade cycles are only incidental to a distinct process of economic development; and certain principles which could explain the process of economic development would also explain these economic variables or factors. Schumpeter’s theory of profit is thus embedded in his theory of economic growth. In his explanation of the process of economic growth, Schumpeter began with the state of stationary equilibrium, characterized by equilibrium in all spheres. Under conditions of stationary equilibrium, total receipts from the business are exactly equal to the total cost outlay, and there is no positive profit. According to the Schumpeter’s theory, profit can be made only by introducing innovations in manufacturing technique, as well as in the methods of supplying the goods. Sources of innovation include:

* Introduction of new commodity or a better quality good;
* Introduction of new method of production;
* Opening of a new market;
* Discovery of new sources of raw material; and,
* Organizing the industry in an innovative manner with the new techniques.

## Profit Maximization Objective

Profit maximization objective helps in predicting the behavior of business firms in thereal world, as well as in predicting the behavior of price and output under differentmarket conditions. There are some theoretical profit-maximizing conditions that we musthave in our finger tips. These are presented below:

### The Profit-Maximizing Conditions

We first define profit as:

……………… (Equation 1.1)

There are two major conditions that must be fulfilled for equation (1.1) to be a maximum profit: (i) the first-order (or necessary) condition, and (ii) the second-order (or supplementary) condition.

The ***first-order condition*** requires that at a maximum profit, marginal revenue (MR) mustequal marginal Cost (MC). Note that by the term ‘marginal revenue’, we mean the revenue obtained from the production and sale of one additional unit of output, while ‘marginal cost’ is the cost arising from the production of the one additional unit of output. The ***second-order condition*** requires that the first-order condition must be satisfied under the condition of decreasing marginal revenue (MR) and increasing marginal cost (MC).

Fulfillment of these two conditions makes the second-order condition the *sufficientcondition* for profit maximizations. In technical terms, the profit-maximizing conditions can be formulated as follows:

Given profit to be maximized,

let:

where Q = quantity produced and sold.

Then ………………. (Equation 1.2)

The first-order condition requires that the first derivative of equation (1.2) should bezero.

Now let’s find the derivative of at any value and let represent the change in from to . The corresponding change in is . To maximize profits, marginal profits must be zero.

i.e …………………………..(Equation 1.3)

You can observe that this condition holds only when: i.e when MR=MC

To get the second-order condition, we take the second derivative of the profit function to get:

…………………………..(Equation 1.4)

The second-order condition requires that equation (1.4) is negative, so that:

 Or ………….Equation (1.5)

Equation (1.5) may also be written as: slope of MR < Slope of MC,since the left-hand side of equation (1.5) represents the slope of MR and the right-hand side represents the slope of MC. This implies that at the optimum point of profit maximization, marginal cost (MC) mustintersect the marginal revenue (MR) from below. We conclude that maximum profit occurs where the first- and second-order conditionsare satisfied.

**Example:**Suppose that the unit price of a commodity is defined by:

………….Equation 1.6

Then, ………Equation 1.7

TR

Suppose also that the total cost of producing this commodity is defined by the costfunction:

……………………Equation 1.8

You are required to apply the first-order condition for profit maximization and determine the profit-maximizing level of output.

According to the first-order condition, profit is maximized where: MR = MC,

Given equations (1.7) and (1.8), we get:

It follows that profit is maximized where:MR = MC

Or………….………………Equation 1.11

Solving for Q in equation (1.11), we get:

The output level of 20 units satisfies the first-order condition. Let us see if it satisfies the Second-order condition.

Therefore and this is less than zero. Thus the second-order condition is also satisfied at the output level of 20 units. We therefore conclude that the profit-maximizing level of output in this problem is 20 units. To determine the maximum profit, you will substitute 20 for Q in the original profit function. Thus, the maximum profit will be:

 Birr

We conclude that the maximum profit is 900.

**Self check exercises**

1. Assuming the unit price of a commodity is defined by: , and the cost functionis given as: ,
	1. Determine the profit-maximizing level of output and the unit price?
	2. Determine the cost-minimizing level of output?
2. Tilly’s Trilbies has estimated the following revenues and expenditures for the next fiscal year:
* Revenues Birr ………...6,800,000
* Cost of goods sold ….…5,000,000
* Cost of labor………….. 1,000,000
* Advertising ………….…100,000
* Insurance …………….…50,000
* Rent ………………….….350,000
* Miscellaneous expenses ..100,000
	1. Calculate Tilly’s accounting profit.
	2. Suppose that to open her trilby business, Tilly gave up a Birr 250,000 per year job as a buyer at the exclusive Hammocker Shlumper department store. Calculate Tilly’s economic profit.

**Chapter Two**

**Fundamental Economic Concepts**

This chapter deals about managerial analysis and the interaction of demand and supply. Furthermore the chapter discuss about price ceiling, price floor and equilibrium price and quantity, and time value of money.

**At the end of this chapter, students will be able to;**

* Understanding the concept of marginal analysis
* Understand the interaction of demand and supply.
* Understand the meaning of price ceiling and price floor
* Solve the problem involving equilibrium price and quantity.
	1. **Concept of Marginal Analysis**

To analyze extent of decisions, we break down the decision into tiny steps and then examine the costs and benefits of taking another one of these tiny steps. You should take another step if the benefits of taking that step are greater than the costs of doing so. Stop when the costs of taking another step are greater than the benefits of doing so. We call this approach *marginal analysis*.

To illustrate, we analyze the common extent decision of how much to sell, where marginal analysis applies to both costs and revenues.

***Marginal cost (MC)*** is the additional cost incurred by producing and selling one more unit.

***Marginal revenue (MR)*** is the additional revenue gained from selling one more unit.

If the benefits of selling another unit (MR) are bigger than the costs (MC), then sell another unit. Sell more if ; sell less if . If , you are selling the right amount (maximizing profit).

Marginal analysis works for any extent decision, such as whether *to change the level of advertising*, *the quality of service, the size of your staff, or the number of parking spaces to lease*. The same principle applies to each decision do more if , and do less if .

The main difficulty in applying marginal analysis is measuring the costs and benefits of additional steps. However, the following Example will help you to understand it in a better manner.

**Example 2.1**Suppose you are working for Ethio-Telecom, communication company trying to decide whether to adjust the amount you spend for TV advertising. If you recently increased your TV advertising budget by Birr 50,000, and the ads yielded 1,000 new customers, the data can tell you something about marginal benefit of additional TV advertising expenditures.

In this example, we have data on a big jump (Birr 50,000) but not on the little steps (Birr 1) that make up the jump. The only available data correspond to the bigger change, so we do the best that we can. We estimate the marginal effect of another dollar of advertising by dividing the Birr 50,000 by 1,000 customers to get Birr 50 per customer, sometimes called the ***acquisition cost of a customer***. This means that the marginal cost of acquiring another customer is Birr 50. If the marginal benefit of another customer is bigger than Birr 50, then increase advertising. Otherwise, do not.

***Note that*** marginal analysis points you in the right direction, but it cannot tell you how far to go. After taking a step, re-compute marginal costs and benefits to see whether further steps are warranted. When the marginal benefit equals the marginal cost, stop then because you are maximizing profit (i.e., further steps are unprofitable).

We can also use marginal analysis to compare the *relative effectiveness of two different advertising media*. For example, suppose that you are trying to decide how to adjust your promotional budget, currently allocated between TV advertising and telephone solicitation. How much should you spend on advertising for each medium?

In this case, the opportunity cost of spending one more dollar on TV advertising is the forgone opportunity to spend that dollar on telephone solicitation. Increase spending on whichever medium has a higher marginal effect, and pay for the increase by reducing spending on the other medium.

If you recently decreased your telephone solicitation budget and this saved Birr 10,000, but you lost 100 customers, the marginal effectiveness of phone solicitation is one customer for Birr 100 (alternatively, the marginal customer acquisition cost is Birr 100). Note that we are implicitly assuming that you could get the customers back by restoring your telephone solicitation budget.

Since it is cheaper to gain another customer using TV advertising, increase TV advertising and spend less on telephone solicitation. Note that marginal analysis doesn’t even require you to measure the marginal benefit of acquiring a customer. All it requires is that you measure the marginal effectiveness of each activity. If one activity has higher marginal effectiveness than the other, then increase that activity and reduce expenditures on the other. Then re-measure and decide whether to make further changes.

When you adjust your advertising expenditures, make the changes one at a time. Do not increase telephone solicitation at the same time you decrease TV advertising because you lose valuable information about the marginal impact of each change when you change both at the same time. Only by changing them separately can you measure the marginal effectiveness of each expenditure to see whether further changes are profitable.

It is essential that you not confuse marginal cost with average cost. Recall that to calculate the *average cost, divide total cost by the number of units produced*. In our current example, the average per-customer cost for TV would be computed by dividing the total spent on TV advertising by the total number of customers gained. Remember that average costs do not provide the information you need to make extent decisions. In some instances, they might lead to poor decisions. To compute marginal cost, look only at the additional cost of producing one more unit. The two cost figures may be very different. For example, some psychological models of advertising say that any fewer than four exposures to an advertisement has no effect on purchase decisions. The marginal effectiveness of that fourth exposure is thus very large, but the average effectiveness of the entire advertising budget would be much lower.



**Example** 2: Consider the following hypothetical data which shows Abebe’s investment activity. He has decided to engage in project A, B, C, &D each of them having variety proportion of marginal gain and marginal loss.

|  |
| --- |
|  Project activities  |
| Cash flows  | A | B | C | D |
| Marginal befits | 200 |  250 |  300 |  350 |
| Marginal costs  | 180 |  250 |  380 |  390 |
| Net results  | +20 |  0 |  (-80) |  (-40) |

From the above given hypothetical projects, it is clearly shown that only project ‘’A’’ generates a positive net marginal benefits. Concerning project ‘’B’’ Abebe is indifferent about whether to continue or quit the proposed project idea while the remaining project ‘’C’’and ‘’D’’ are clearly not valid projects.

* 1. **Equilibrium Analysis: Supply and Demand Relationships**

We can now use the concepts of demand and supply to explain the functioning of the market mechanism. Consider the following figure, which brings together the market demand and supply function. In our hypothetical market, the market equilibrium price is *P\**. At that price, the quantity of a good or service that buyers are able and willing to buy is precisely equal to *Q*\*, the amount that firms are willing to supply. At a price below *P\**, the quantity demanded exceeds the quantity supplied. In this situation, consumers will bid among themselves for the available supply of *Q*, which will drive up the selling price. Buyers who are unable or unwilling to pay the higher price will drop out of the bidding process. At the higher price, profit-maximizing producers will increase the quantity supplied. As long as the selling price is below *P*\*, excess demand for the product will persist and the bidding process will continue. The bidding process will come to an end when, at the equilibrium price, excess demand is eliminated. In other words, at the equilibrium price, the quantity demanded by buyers is equal to the quantity supplied. It is important to note that in the presence of excess demand, the adjustment toward equilibrium in the market emanates from the demand side. That is, prices are bid up by consumers eager to obtain a product that is in relatively short supply. Suppliers, on the other hand, are, in a sense, passive participants, taking their cue to increase production as prices rise. On the other side of the market equilibrium price is the situation of excess supply. At a price above *P*\*, producers are supplying amounts of *Q* in excess of what consumers are willing to purchase. In this case, producers’ inventories will rise above optimal levels as unwanted products go unsold. Since holding inventories is costly, producers will lower price in an effort to move their product. At the lower price, the number of consumers who are willing and able to purchase, say, wheat increases. Producers, on the other hand, will adjust their production schedules downward to reflect the reduced consumer demand.

In this case, where the quantity supplied exceeds the quantity demanded, producers become active players in the market adjustment process. That is, in the presence of excess supply, producers provide the impetus for lower product prices in an effort to avoid unwanted inventory accumulation. Consumers, on the other hand, are passive participants, taking their cue to increase consumption in response to lower prices initiated by the actions of producers but having no direct responsibility for the lower prices.

***Example:*** The market demand and supply equations for a product are given as

Where *Q* is quantity and *P* is price. What are the equilibrium price and quantity for this product?

***Solution.*** Equilibrium is characterized by the condition at which *Q*D = *Q*S. Substituting the demand and supply equations into the equilibrium condition, we obtain:



*Figure 1 Equilibrium Analysis: Supply and Demand interaction*

* 1. **Price ceilings and price floors**
		1. **Price ceiling**

A ban on price increases above a certain level is called a price ceiling. The rationale underlying the imposition of a price ceiling typically revolves around the issue of “fairness.” A price ceiling is a maximum price for a good or service that has been legally imposed on firms in an industry.

The following figure depicts the situation of excess demand *Q*’’-*Q*’ at price *P*1 arising from a decrease in the supply. Of course, the excess demand might also have arisen from an increase in the demand for a good or service. Without price controls, the equilibrium quantity would have fallen from *Q*1to *Q*2. Thus, the rationing function of prices could have guaranteed that only the well-to-do had access to available commodities. In the interest of “fairness,” and to maintain morale on the home front, the government imposed price ceilings, such as *P*1 as shown in the following figure.



* + 1. **Price floors**

The counterpart to price ceilings is the price floor. Whereas price ceilings are designed to keep prices from rising above some legal maximum, price floors are designed to keep prices from falling below some legal minimum. A price floor is a legally imposed minimum price that may be charged for a good or service. The problem with price floors is that they create surpluses, which ultimately have to be dealt with. In the case of agricultural price supports, to maintain the price of the product at *P*1 in next Figure the government has two policy options: either pay certain farmers not to plant, thereby keeping the supply curve from shifting from *SS* to *S*’*S*’ or enter the market and effectively buy up the surplus product, which is analytically equivalent to shifting the demand curve from *DD* to *D*’*D*’.

*** Excess supply***

* + 1. Suppos**e** the market demand and supply equations for a product are given as

**Self check exercises**

Where *Q* is quantity and *P* is price.

1. What are the equilibrium price and quantity for this product?
2. Suppose that an increase in consumer income resulted in the new demand equation of, what are the new equilibrium price and quantity for this product?
3. Suppose the government enacts legislation that imposes a price ceiling equivalent to the original equilibrium price. What is the result of this legislation?

 **Chapter Three**

**Optimization Techniques**

This chapter mainly shows how optimization principles apply in business decision for constrained optimization by substitution and lagragian method. At the end of this chapter, you will be expected to:

* Understand the meaning and importance of constrained optimization
* Know the applicable techniques in constrained optimization
* be able to apply optimization principles in business decisions
* Solve the problem involving constrained optimization
	1. **Introductions**

Many problems in decision requires determination of the optimal solution .A decision maker may wish to determine the level of output that will maximize the required profit or minimize the given cost function .The process of determining and adopting the best course of action in the way of allocating scarce resources so as to achieve the desired target objective is referred to optimization in economic terms.

**Types of Optimization**

Basically, there are two fundamental types of optimization whether the given objective function is determination of the maximum profit or the given function is minimization of the costs. These are

* Unconstrained optimization
* Constrained optimization

**Unconstrained optimization**: in the case of unconstrained optimization, it is assumed that firms operate under no constraint imposed on their activity which ideal concept. In the real world, however, firms face serious of resource constraints.

* 1. **Constrained Optimization**

The maximization and minimization techniques referred as ***unconstrained*** optimization or minimization when firms are assumed to operate under no constraints on their activities. In the real business world however, firms face serious resource constraints. They need, for example, to maximize output with given quantity of capital and labor time. The techniques used to optimize the business objective(s) under constraints are referred to as ***constrained optimizationtechniques.*** The three common techniques of optimization include:

* *Linear Programming,(****independent reading required****)*
* *Constrained optimization by substitution, and*
* *Lagrange multiplier technique.*
	+ 1. ***Constrained Optimization by Substitution Method***

This technique will be illustrated in two ways:

1. constrained profit maximization problem, and
2. (ii) Constrained cost minimization problems.
3. ***Constrained Profit Maximization***

**Example**: Let the profit function of the hypothetical firm is given as:

………………………(1)

Where represent two products.

We wish to maximize equation (1) subject to the constraint that the sum of the output of must be equal to 30 units.

That is,

A constrained problem of this kind can be solved by substitution method, as illustrated below. The process of solution involves two steps.

* Express one of the variables (X or Y in this case) in terms of the other and solve the constraint equation for one of them (X or Y), and
* Substitute the solution obtained into the objective function (that is, the function to be maximized or the profit function) and solves the outcome for the other variable.

**Solution**

Given the constraint equation (2), we solve for the values of in terms of one another to obtain:. This can be re written as or.

By substituting the value of into the profit equation (1), we obtain:

………………………………..(3)

Now taking the first derivatives of the above function with respect to (y) and equating it to zero, we obtain

………….(4)

Then setting equation (4) equal to zero, we get then

Substituting 17 for Y into the constraint equation, we get:, and .

It follows that the optimum solution for the constrained profit maximization problem is unitsandunits. This values of and satisfies the constraint. Expressed differently, the firm maximizes profit by producing and selling 13 units of product and units of product .

The maximum profit under the given constraint can now be obtained by substituting the above values of X and Y into the profit function, equation (1):

Thus, the maximum profit under constraint is Birr 2,645. It can be shown that maximum profits under constraints are less than maximum profits without constraints.

1. ***Constrained Cost Minimization***

We now apply the substitution method to the problem of constrained cost minimization.

Suppose the cost function of a firm producing two goods, X and Y, is given by:

And the firm must meet a combined order of 36 units of the two goods. The problem is to find and optimum combination of the products X and Y that minimize the cost of Production. Alternatively stated, we ---------------------(5)

Subject to -------------- (6)

Again, substitution method requires that the constraint equation (6) is expressed in terms of any of the two goods, X and Y, and then substituted into the *objective function* (equation (5)). Expressing X in terms of Y, we get:

-------------------------- (7)

Substituting equation (7) for X in the objective function, the result will be:

 ----------- ( 8)

According to the optimization rule, for this objective function (equation (8)) to be minimized, the first derivative must be equal to zero, Thus,

When …………..(9)

Solving for Y in equation (9), we get the value of Y as follows:

Substituting this value into the constraint equation (6) the result will be,:

Thus, the optimum solution demands those 21 units of X and 15 units of Y to minimize the cost of meeting the combined order of 36 units (that is, units). The minimum cost of producing 21 units of X and 15 units of Y can be obtained as follows, using equation (3.1.5), the objective function:

Minimum

Thus, the minimum cost of producing the combined order is Birr 1,242.

**Example 2:**The total cost function of a firm that produces its product on two assembly lines is given as**TC (x, y) = 3x2 + 6y2 - xy**

The problem facing the firm is to determine the least-cost combination of output on assembly lines *x* and *y* subject to the side condition that total output equal 20 units. This problem may be formally written as

Minimize:

Subject to:

The substitution method involves first solving the constraint, say for *x*, and substituting the result into the original objective function. Consider, again, the foregoing example

Substituting into the objective function yields

In other words, this problem reduces to one of solving for one decision variable, *y*, and inserting the solution into the objective function. Taking the first derivative of the objective function with respect to *y* and setting the result equal to zero, we get

Note also that the second-order condition for total cost minimization isalso satisfied:

Substituting *y* = 7 into the constraint yields

Finally, substituting the values of *x* and *y* into the original *TC* function yields:

**3.2.2 Constrained Optimization by Lagrange Multiplier Method**

The Lagrange method is most useful in solving complex optimization problems. In this discussion, we summarize this method using two illustrations:

1. constrained profit maximization problem, and
2. constrained cost minimization problem

To find the relative extreme of the function subject to the constraint (assuming that these extreme values exist),

1. Form an auxiliary functioncalled the Lagrangian function (the variable λ is called the Lagrangemultiplier).
2. Solve the system that consists of the equations, , and for all values of x, y, and λ.
3. The solutions found in step 2 are candidates for the extrema of f.
4. **Constrained Profit Maximization**

We refer to the profit function of the previous equation, with some constraint imposed, so that we:

**Example 1:** Maximize

Subject to

The basic approach of the Lagrange method is to combine the objective function and the constraint equation to form a Lagrange function. This is then solved using partial first-order derivatives.

The Lagrange function is formulated simply by: First, setting the constraint equation equal to zero:

Second, multiplying the resulting equation by λ (Greek letter, “lambda”):

Adding this to the objective function, we get the Lagrange function as:

…………….(e)

Equation (e) is the Lagrange function with three unknowns, X, Y, and λ. The values of these unknowns that maximize Z will also maximize Profit (П). The Greek letter, λ, is referred to as the Lagrange multiplier. It measures the impact of a small change in the constraint on the objective functions. We are now required to maximize Z. To do this, we first obtain the partial derivatives of Z with respect to X, Y, and λ and set each equal to zero to satisfy the first-order condition for optimization. This will give rise to a simultaneous equation system in three unknowns, X, Y, and λas indicated below:

Z = 100X – 2X2 – XY + 180Y – 4Y2 + λ (X + Y – 30)

∂Z= 100 – 4X – Y + λ= 0

∂X

∂Z= -X +180 – 8Y + λ= 0

∂Y

∂ Z= X + Y – 30 = 0

∂ λ

Solving for **X, Y**, and **λ** in the above simultaneous equation system, you obtain the values of **X, Y**, and **ƛ** that maximize the objective function in equation (3.2.1). Using the necessary technique of solving simultaneous equation systems, you obtain the solutions:

X = 13

Y = 17, and,

 λ = 31.

The value of λ implies that if output is increased by 1 unit, that is, from 30 to 31 units, profit will increase by about Birr 31, and if output is decreased from 30 to 29 units, profit will decrease by about Birr 31.

**Example 2:**A profit-maximizing firm faces the following constrained

Maximization problem:

Maximize:π(*x*, *y*) = 80*x* - 2*x*2 - *xy*- 3*y*2 + 100*y*

Subject to: *x* + *y* = 12

Determine profit-maximizing output levels of commodities *x* and *y* subjectto the condition that total output equals 12 units.

**Solution:** rom the Lagrange expression

**L**(*x*, *y*) = 80*x* - 2*x*2 - *xy*- 3*y*2 + 100*y* + l (12 - *x* - *y*)

The first-order conditions are:

∂**L=L**X=80-4X-Y-λ=0

∂X

∂**L=LY**= -X-6Y+100**-**λ

∂Y

∂**L= L**λ=12-X-Y=0

∂λ

This system of three linear equations in three unknowns can be solved for the following values:

 *x* = 5; *y* = 7; = 53

Substituting the values of *x* and *y* back into our original objective function yields the maximum value for profits:

 Π=868

The interpretation of λis that if our constraint is relaxed by one unit, say increased from an output level of 12 units to 13 units, the firm’s profits will increase by Birr 53. Similarly, if output is reduced from say 12 units to 11 units, profits will be decreased by Birr 53.

1. **Constrained Cost Minimization**

Suppose a firm has to supply a combined order of 500 units of products X and Y. The joint cost function for the two products is given by:

C = 100X2 + 150Y2

Since the quantities to be produced of X and Y are not specified in the order, the firm is free to supply X and Y in any combination. The problem is therefore, to find the combination of X and Y that minimizes cost of production, subject to the constraint, X +Y = 500. Thus, we are required to:

Minimize C = 100X2 + 150Y2

Subject to X + Y = 500

The Lagrange function can be formulated as in equation below:

Zc = 100X2 + 150Y2 + λ (500 – X – Y)

As before, the first-order partial derivatives yield:

dZc= 200X - λ= 0 (a)

dX

dZc= 300Y -λ= 0 (b)

dY

d Zc= 500 – X – Y = 0 (c)

dλ

Again, solving the above simultaneous equations for X, Y, and λ, we get the solution to the cost minimization problem.

For simplicity, subtract equation (b) from equation (a), you get:

200X - λ- (300Y - λ) = 0

200X – 300Y = 0

200X = 300Y

X = 1.5Y (d)

Substituting 1.5Y for X in equation (c), we get:

500 – 1.5Y – Y = 0

500 – 2.5Y = 0

2.5Y = 500

Y = 200 Units

Substituting Y = 200 into the constraint equation (3.2.8), you get:

X + 200 = 500

X = 300.Units

It follows that the solution to the minimization problem is that X = 300 and Y = 200 will minimize the cost of producing the combined 500 units of the products X and Y. The minimum cost is obtained by using the objective function as follows:

C = 100X2 + 150Y2

= 100(300)2 + 150(200)2

= 9,000,000 + 6,000,000

= 15,000,000Birr

Thus the minimum cost of supplying the combined 500 units of products X and Y is Birr 15 million.

**Self check exercise**

1. The B-Products Plc produces two products, X and Y. The profit function of thiscompany is given by:

The company is under the obligation to produce a minimum combined output of 40units. Find the number of units that will be produced ofthe products X and Y, subject to the total of 40 units, thatmaximizes profit. Use the Lagrangian multiplier method.

1. Assume that the firm’s operation is subject to the following productionfunction and price data:

*Q* = 3*X* + 5*Y* – *XY*

*Px*= Birr 3;*Py*= Birr 6where *X* and *Y* are two variable input factors employed in the production of *Q*.

* 1. In the unconstrained case, what levels of *X* and *Y* will maximize *Q*?
	2. It is possible to express the cost function associated with the use of *X*and *Y* in the production of *Q* as *TC* = 3*X* + 6*Y*. Assume that the firmhas an operating budget of Birr 250. Use the Lagrange multiplier techniqueto determine the optimal levels of *X* and *Y*.What is the firm’stotal output at these levels of input usage?

**Chapter Four**

**Theory of Demand and its Application**

**Introduction**

It is of vital importance for any firm to have an understanding of the demand for its products. Demand relationships determine revenues and indirectly affect output and costs; they thus have a fundamental impact on profits. An understanding of demand is also relevant for planning purposes, involving production, transportation, inventory, sales, marketing and finance functions. The identification of factors affecting demand and the precise effects that these have is therefore a core element in managerial economics.

**Meaning of Demand**

Unfortunately the word ‘demand’ can be used in a variety of senses, which often causes misunderstanding and errors of analysis. We can talk about demand curves, schedules, functions, equations, relationships or points. When economists use the single word ‘demand’ they are referring to the relationship that is frequently called the demand curve. In this sense, demand refers to *the quantities that people are or would be willing to buy at different prices during a given time period, assuming that other factors affecting these quantities remain the same*. It is worth noting that this definition incorporates three important concepts:

* It involves three parameters – price, quantity and time.
* It refers to quantities in the plural, therefore a whole relationship, not a single quantity.
* It involves the ceteris paribus (other things being equal) assumption, which is a very common one in making statements in economics.

The second of the above concepts, in particular, tends to cause misunderstandings, since it is common in both business and marketing to refer to demand as a single quantity. For example, consider the following statement: the demand for Coke is 80 cans per day at the price of 50 pence per can. First of all there are issues of definition and measurement. Whose demand is being considered? Does ‘Coke’ include Diet Coke and different flavors? What is the size of the can? How do we include bottles? However, even if these issues are clarified, the statement is still technically incorrect from an economist’s standpoint. The statement refers to a quantity demanded, not to demand.



*Figure 4.1Demand table*

**Types of Demand**

The major types of demand encountered in business decisions are outlined below.
**Individual and Market Demand**

The quantity of a commodity an individual is willing and able to purchase at a particular price, during a specific time period, given his/her money income, his/her taste, and prices of other commodities, such as substitutes and complements, is referred to as the ***individual demand*** for the commodity.

|  |  |  |
| --- | --- | --- |
| Price of product | Quantity of A demanded by | Market demand |
| X | Y | Z |
| 10 | 5 | 1 | 0 | 6 |
| 8 | 7 | 2 | 0 | 9 |
| 6 | 10 | 4 | 1 | 15 |
| 4 | 14 | 6 | 2 | 22 |

*Table 4.1Individual and Market Demand*

As illustrated in Table 4.1 above, the total quantity which all the consumers of the commodity are wining and able to purchase at a given price per time unit, given their money incomes, their tastes, and prices of other commodities, is referred to as the *market demand* for the commodity.

***Demand for firm’s and Industry’s Product***

The quantity of a firm's product that can be sold at a given price over time is known as the demand for the firm's product. The sum of demand for the products of all firms in the industry is referred to as the market demand or industry demand for the product.

***Autonomous and Derived Demand***

An *autonomous: demand* or direct demand for a commodity is one that arises on its own out of a natural desire to consume or possess a commodity. This type of
demand is independent of the demand for other commodities. Autonomous demand may also arise clue to *demonstration effect* of a rise in income, increase in population, and advertisement of new products.

The demand for a commodity which arises from the demand for other commodities, called *'parent products'* is called *derived demand.* Demand for land, fertilizers and agricultural tools, is a derived demand because these commodities are demanded due to demand for food. In addition, demand for bricks, cement, and the like are derived demand from the demand for house and other types of buildings. In general, demand for producer goods or industrial inputs are a derived demand.

***Demand for Durable and Non-Durable Goods***

Durable goods are those goods for which the total utility or usefulness is not exhaustible in the short-run use. Such goods can be used repeatedly over a period of time. Durable consumer goods include houses, clothing, shoes, furniture, refrigerator, and the like.

Durable producer goods include mainly the items under 'fixed assets', such as
building, plant, machinery, and office furniture. The demand for durable goods changes over a relatively longer period than that of the non-durable goods. The demand for non-durable goods depends largely on their current prices, consumers’ income, and fashion. It is also subject to frequent changes.

Durable goods create replacement demand, while non-durable goods do not. In addition, the demand for non-durable goods change linearly, while the demand for durable goods change exponentially as the stock of durable goods changes.

***Short-term and Long-term Demand***

Short-term *demand* refers to the demand for goods over a short period. The type of goods involved in the short-term demand are most fashion consumer goods, goods used seasonally, inferior substitutes for superior goods during scarcities. Short term demand depends mainly on the commodity price, price of their substitutes, current disposable income of the consumers, the consumer’s ability to adjust their consumption pattern, and their susceptibility to advertisement of new products.

The *long-term demand* refers to the demand which exists over a long period of time. Changes in long-term demand occur only after a long period. Most generic goods have long-term demand. The long-term demand depends on the long-term income trends, availability of better substitutes, sales promotion, consumer credit facility, and the like.

**Determinants of Market Demand**

For corporate managers at large and specifically, the marketing managers, it is highly important to understand the factors affecting the market demand for their products. This understanding is required for analyzing and estimating demand for
the products. Though there are several factors affecting market demand for a product, the most important are:

1. Price of the *product or the own price* (Po). This is the most important determinant of demand for a product. The own price of a product and the quantity demanded of are inversely related so that,
2. ***The price of the related goods, such as substitutes and complements (Ps and Pc)*** When two goods are *substitutes* for each other, the change in price of one affects the demand for the other in the same direction. If goods X and Yare substitute goods, then an increase in the price of X will give rise to an increase in the demand for Y. Note that changes in the price of related goods cause shifts in the demand for the goods. Changes in demand are illustrated graphically as rightward shifts (for increase) and leftward shifts (for decrease) in the demand for the products.

Symbolically, and

When two goods are complements for each other, one complements the use of another, Petrol and car a complement goods. If an increase in the price of one good causes a decrease in demand for the other, the goods are said to be complements. Thus if the demand function for a car (Dc) in relation to petrol price (Pp) is specified by:

1. ***Consumers Income***. This is the major determinant of demand for any product since the purchasing power of the consumer is determined by the disposable income. Managers; need to know that income-demand relationship is of a more varied nature than those between demand and its other determinants. The relationship between demand for commodity X, for example, and the consumers income, say Y, keeping other factors constant, can be expressed by a demand function:

You should note that consumer goods of different nature have different relationships with income of different categories of consumers. The manager needs, therefore, to be completely aware of the goods they deal with and their relationship with consumer's income, particularly with respect to the assessment of both existing and prospective demand for a product. Regarding income-demand analysis, consumer goods and services are grouped under *four* broad categories:

1. ***Essential Consumer Goods (ECG).***Goods and services in this category are referred to as 'basic needs', and are consumed by all persons in a society. Such goods and services include food grains, salt, vegetable oil, cooking, fuel, housing, and minimum clothing. The demand for such goods and services increase with increases in consumer's income, but only up to a. certain limit, even though the total expenditure may increase in accordance with the quality of goods consumed, all things being equal. The relationship between goods and services of this category and consumer's income is shown by the curve ECG in figure 4.2 below.

Figure 4.2 Income-Demand **Relationships**

1. ***Inferior Goods (IG)****:* Inferior and superior goods are widely known to both buyers and sellers. Economists define inferior goods as goods in which their demands decrease as consumer's income increases, beyond a certain level of income. Demand for such goods rises only up to a certain level of income.
2. ***Nominal Goods (NG):*** In economic terms, normal goods are goods demanded in increasing quantities as consumer's income rises. Examples of normal goods are clothing; furniture, and automobiles.
3. ***Luxury and Prestige Goods:*** All such goods that add to the pleasure and prestige of the consumer without enhancing his or her earning fall in the category of luxury goods. Prestige goods are special category of luxury goods, examples, rare paintings and antiques, prestigious schools, and the like. Demand for - such goods arise beyond a certain level of consumer's income. Producers of such goods, while assessing the demand for their product, need to consider the income changes in the richer section of the society.
4. ***Consumer Tests and Preferences****:* Consumers' tastes and preferences play important role in the determination of the demand for a product. Tastes and preferences generally depend on life style, social customs, religious values attached to a commodity, habit of the people, age and sex of the consumers, and the like. Changes in these factors tend to change consumers' tastes and preferences.
5. *Advertisement ex****penditures.*** Advertisement costs are incurred while
attempting to promote sales. It helps in increasing product demands in at least four ways:
* by informing the potential consumers about the product's availability;
* by showing the product's superiority over the rival product;
* by influencing consumer's choice against the rival product; and,
* by setting new fashions and changing tastes. The impact of these causes upward shifts in the demand for the product. All things being equal, as expenditure on advertisement increases, it is expected that volume of sales will increase. The relationship between sales (8) and advertisement outlays (AD) can be expressed by the function:

.

Consumers are fairly sensitive and responsive to various modes of advertisement

1. The rival firms do not react to the advertisement made by the firm,
2. The level of demand has not reached the saturation point and advertisement
makes only marginal impact on demand for a product,
3. Adding of advertisement cost to the product price does not make the price
prohibitive for consumers, compared to the price of substitutes
4. ***Consumer Expectations:***The consumers' expectations about the future
product prices, income, and supply position of goods play significant role in the determination of demand for goods and services in the short run. A rational consumer who expects a high rise in the price of a nonperishable commodity would buy more of it at the high current price with a view to avoiding the pinch of the high price rise in the future. This partly explains the high demand for fuel during periods of expected increase of pump price of fuel in Nigeria. On the contrary, if a rational consumer expects a fall in the price of goods be/she purchases, he/she would postpone the purchase of such goods with a view to taking advantage of lower prices in the future. This is e specially the case for nonessential goods. This behavior tends to reduce the current demand for goods whose prices are expected to decrease in the future. An expected increase in income would similarly increase current demand for goods and services. For instance, a corporate announcement of bonuses or upward revision of salary scales would induce increases in current demand for goods and services.
5. **Demonstration Effect:** Whenever new commodities or models of commodities are introduced in the market, many households buy them not because of their genuine need for them but because their neighbors have purchased them. This type of purchase arises out of such feelings jealousy, competition, and equality in the peer group, social. inferiority, and the desire to raise once social status. Purchases based on these factors are the result of what economists refer to as 'demonstration effect' orthe 'Band-Wagon effect’.These effects have positive impacts on commodity demand. On the contrary, when a commodity becomes a thing of common use, some rich people decrease their consumption of such goods. This behavior is referred to in economics as the 'snob effect'. This has negative impact on the demand for the commodity concerned. Other determinants of demand for commodities include *consumer-Credit facility,* the *population of consumers,* and *income distribution.*